



City of Kenmore - 18120 68th Avenue NE - P.O. Box 82607 - Kenmore, WA 98028
Phone: 425-398-8900 - Fax: 425-481-3236 - E-mail: cityhall@kenmorewa.gov

City of Kenmore
REVISED City Council Regular Meeting Agenda

7:00 p.m., Monday, November 23, 2015

Kenmore City Hall, Council Chambers
18120 68th Ave. NE, Kenmore, WA 98028

If you have any questions or to confirm agenda items prior to the meeting, or if you require special accommodations, please call the City Clerk at 425-398-8900. You may also stop by City Hall at 18120 68th Avenue NE, Kenmore. Council agendas are also available on our website at www.kenmorewa.gov.

I. CALL MEETING TO ORDER

II. ROLL CALL

III. FLAG SALUTE

IV. AGENDA APPROVAL

V. CITIZEN COMMENTS

- A. This is an opportunity to express your views on issues that are important to you and to the community. Please limit your comments to three (3) minutes.

VI. CONSENT AGENDA

- A. Approve Check Nos. 33213 - 33291 in the Amount of \$256,317.08 and Electronically Transferred Payroll Funds Totaling \$80,153.79 for the Period Ending November 6, 2015.
[Checks for Approval](#)
- B. Approve Check Nos. 29160 - 29239 in the Amount of \$959,120.34 and Electronically Transferred Payroll Funds Totaling \$65,054.71 and an Investment Purchase in the Amount of \$985,779.17 for the Period Ending December 23, 2013
[Agenda Bill & Attachment](#)
- C. Adopt Resolution No. 15-265 and Authorize City Manager to Execute Interlocal Agreement, Contract No. 15-C1489 with Municipal Research and Services Center (MRSC) for Small Public Works, Consultant, and Vendor Rosters, Pending Legal Review
[Agenda Bill & Attachments](#)
- D. Approve Amendment No. 1 to Contract No. 14-C1267 with South Correctional

Entity (SCORE) for Jail Services

[Agenda Bill & Attachments](#)

- E. Approve Amendment No. 3 to Contract No. 10-C873 with Progressive Animal Welfare Society (PAWS) for Animal Sheltering Services

[Agenda Bill & Attachments](#)

- F. Adopt Ordinance No. 15-0409, Regarding Tree Windthrow

[Agenda Bill & Attachment](#)

- G. Adopt Resolution No. 15-266, Hazard Mitigation Plan

[Agenda Bill](#)

[20 Attachment 3 - KENMORE ANNEX to Regional Hazard Mitigation Plan](#)

[01 Attachment 1 - Vol. 1 Table of Contents](#)

[02 Attachment 1 - Executive Summary](#)

[03 Attachment 1 - Appendices A & B](#)

[04 Attachment 1 - Appendices C & D](#)

[05 Attachment 1 - Appendix E](#)

[06 Attachment 1 - Appendix F Pt 1](#)

[07 Attachment 1 - Appendix F Pt 2](#)

[08 Attachment 1 - Appendix F Pt 3](#)

[09 Attachment 1 - Appendix G](#)

[10 Attachment 1 - Part 1 Planning Process - Chapters 1-4](#)

[11 Attachment 1 - Part 2 Risk Assessment - Chapters 5-8](#)

[12 Attachment 1 - Part 2 Chapters 8-11](#)

[13 Attachment 1 - Part 2 Chapters 12-15](#)

[14 Attachment 1 - Part 2 Chapters 16-19](#)

[15 Attachment 1 - Part 3 Mitigation Strategy - Chapters 20-21](#)

[16 Attachment 2 - Vol. 2 Table of Contents, Intro. & Appendices A-C](#)

[17 Attachment 2 - Appendix C1](#)

[18 Attachment 2 - Appendix C2](#)

[19 Attachment 2 - Appendix C3](#)

[21 Attachment 4 - Resolution No. 15-266](#)

VII. BUSINESS AGENDA

- A. A Regional Coalition for Housing (ARCH) Trust Fund Briefing - Nancy Ousley, Assistant City Manager, and Arthur Sullivan, ARCH Program Manager

[Agenda Bill & Attachments](#)

- B. Approve Contract No. 15-C1487, Regional Equitable Development Initiative (REDI) Fund Interlocal Agreement with ARCH - Nancy Ousley, Assistant City Manager, and Arthur Sullivan, ARCH Program Manager

[Agenda Bill & Attachments](#)

- C. Puget Sound Energy (PSE) Briefing on System Reliability - Nancy Ousley, Assistant City Manager, and RaeLynn Asah, PSE Interim Community Engagement Manager, Municipal Relations

[Agenda Bill](#)

- D. Adopt Ordinance No. 15-0413 Amending the 2015-2016 Biennial Budget - Joanne Gregory, Finance & Administration Director
[Agenda Bill & Attachments](#)
- E. Adopt Ordinance No. 15-0412 Amending the 2015-2020 Capital Improvement Program (CIP) - Joanne Gregory, Finance & Administration Director
[Agenda Bill & Attachments](#)
- F. Adopt Ordinance No. 15-0411 Relating to the 2016 Regular Property Tax Levy - Joanne Gregory, Finance & Administration Director
[REVISED Agenda Bill & Attachments](#)
- G. Adopt Resolution No. 15-269, Making a Declaration of Substantial Need for Purposes of Setting the Limit Factor for the 2016 Property Tax Levy - Joanne Gregory, Finance & Administration Director
[Agenda Bill & Attachment](#)
- H. Adopt Resolution No. 15-270, with the City of Lake Forest Park for Joint Emergency Management, and Authorize the City Manager to Execute Interlocal Agreement, Contract No. 15-C1492. Authorize the City Manager to Execute Interlocal Agreement, Contract No. 15-C1488 with the City of Lake Forest Park, Northshore Utility District, and Northshore Fire District, Forming the Northshore Emergency Management Coalition (NEMC) - Bryan Hampson, Development Services Director
[Agenda Bill & Attachments](#)

VIII. STAFF REPORT

IX. COUNCILMEMBER REPORTS & COMMENTS

X. COUNCILMEMBER INITIATIVES

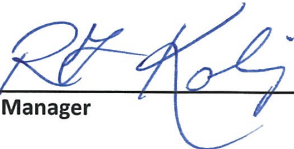
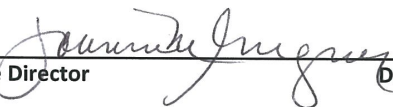
XI. ADJOURNMENT

Upcoming Meetings:

Mon., November 30, 2015 7:00 p.m. Special City Council Executive Session Meeting
Tues., December 1, 2015 7:00 p.m. Planning Commission Regular Meeting
Mon., December 14, 2015 7:00 p.m. City Council Regular Meeting

Voucher Certification and Approval

I, the undersigned, do hereby certify under penalty of perjury that the materials have been furnished, the services rendered or the labor performed as described herein and that the following claims, paid by checks 33213-33291 which total \$256,317.08, and electronically transferred payroll funds totalling \$80,153.79, are just, due and unpaid obligations against the City of Kenmore/KingCounty/Washington, and that I am authorized to authenticate and certify to said claims.

	11/9/15
City Manager	Date
	11/9/15
Finance Director	Date

Check #	Vendor Name	Description	Check Amount
33213	BANNER BANK BAKER	Hotel, Meals, Transportation	2,706.95
33214	CITY OF KENMORE	PERS Retro Reimbursement	26.87
33215	NATIONWIDE FINANCIAL 401a	Social Security Replacement Plan	11,306.37
33216	NATIONWIDE RETIREMENT SOLUTIONS 457	Deferred Comp Payroll Deduction	285.00
33217	ICMA RETIREMENT TRUST 457 - 304745	Deferred Comp Payroll Deduction	2,835.43
33218	CITY OF KENMORE FS	Flexible Spending Medical Plans	334.21
33219	BANK OF AMERICA 941	Payroll Taxes	16,096.51
33220	DEPARTMENT OF RETIREMENT SYSTEMS	WA State Retirement	18,067.37
33221	DEPARTMENT OF LABOR AND INDUSTRIES	Worker's Compensation	2,676.48
33222	UNITED WAY OF KING COUNTY	Employee Charitable Contribution	513.24
33223	STATE OF FLORIDA DISBURSEMENT UNIT	Payroll Deduction	275.00
33224	HSA BANK	Employee Health Savings Acct. Contribution	150.00
33225	BAKER, DAVID	Oct. Mileage Reimbursement	118.45
33226	CASCADE PEST CONTROL	Oct. Rhododendron Park Pest Control	142.35
33227	CLYDE/WEST	Part for Street Sweeper	154.31
33228	REPUBLIC SERVICES	Oct. City Hall & Rhod. Park Solid Waste Svcs	911.09
33229	CALPORTLAND COMPANY	Drainage Materials	77.26
33230	INSLEE, BEST, DOEZIE & RYDER, P.S.	September Legal Services	19,100.72
33231	JET CITY PRINTING	NTP Meeting Advertisement/Postcards	753.90
33232	KING COUNTY ANIMAL SVCS	New & Renewal Pet Licenses Sept/Oct	620.00
33233	KING COUNTY FINANCE	Sept. Adult/Juv Det. Work Release/Booking	6,259.65
33234	KUSTOM SIGNALS, INC.	Police Antennas	136.64
33235	LIGHTHOUSE CONSULTING INC	Sept IT Svcs/Web Hosting/Protection Svcs	1,679.73
33236	NORTHSHORE SCHOOL DISTRICT	3rd Qtr Human Services Program	2,500.00
33237	NORTHSHORE SENIOR CENTER	3rd Qtr Human Services Program	5,500.00
33238	VOID	Void	-
33239	OFFICE DEPOT	Office Supplies	655.77
33240	PEOPLES STORAGE	Return of Facility Rental Deppsit	250.00
33241	PETTY CASH CUSTODIAN	Replenish Petty Cash Fund	423.55
33242	PUGET SOUND ENERGY	9/14-10/13 Electricity/St. Lights/Crosswalks	19,580.78
33243	CEMEX	Asphalt for Berm @ 6207 NE 159th	156.37

VI. A. Approve Check Nos. 33213 - 33291 in the Amount of \$25...

33244	SEATTLE TIMES	10/16 Legal Ad- Ord. No. 15-0406	107.19
33245	TOTAL LANDSCAPE CORP	Oct. NS Summit/Squires Landing/Parks/C.H.	8,232.87
33246	WASHINGTON STATE O.M.W.B.E.	Agency 1470 Politcal Subdivision Fee	100.00
33247	WETLANDS & WOODLANDS INC	WNPS Project Purchase of Trees & Shrubs	1,268.39
33248	ICMA RETIREMENT TRUST 457 - 304745	2016 Dues for Nancy Ousley	1,104.67
33249	BERK & ASSOCIATES	Sept. Parks & Transportation Consulting	18,977.88
33250	KING COUNTY RECORDER'S OFFICE	Parcel 89 SR522 West A - Recording Fee	152.00
33251	FINANCIAL CONSULTANTS INT'L INC	Police Dept. Brackets for Radar	108.90
33252	NORTHSHORE ROTARY CLUB	3rd Qtr Dues & Meals	238.00
33253	BANNER BANK KENMORE	Registration/Supplies/Materials	2,339.49
33254	A+ CONFERENCING	Conference Calls	73.47
33255	SHRED-IT	10/14 Shredding Service	51.73
33256	ALCALDE & FAY	Oct. Government Affairs Consulting	5,046.06
33257	HORIZON DISTRIBUTORS INC	Irrigation Supplies	56.89
33258	SARAH ROBERTS	October Prosecution Services	10,508.04
33259	PHSI PURE HEALTH SOLUTIONS INC.	Incubator Bldg Filtered Water	50.32
33260	AM TEST, INC	Swamp Creek TMDL Samples	200.00
33261	WELLS FARGO FINANCIAL	1st & 2nd Floor 10-21-11-20 Xerox Leases	1,041.25
33262	HOPKINS, CRAIG	Police Volunteer Mileage Reimbursement	65.55
33263	DEVRIES, DENIS	Police Volunteer Mileage Reimbursement	38.53
33264	MCALLISTER, TERESA	Mileage Reimbursement for Conference	65.78
33265	PRO-VAC	Vault Cleaning & Cartridge Installation	21,563.84
33266	CONTECH ENGINEERED SOLUTIONS, INC	Water Quality Filters for Vaults	17,936.10
33267	WASHINGTON STATE PATROL	Aug & Sept Samm. River Bridge Enforcement	577.52
33268	GREATER BOTHELL CHAMBER OF COMMERCE	Aug. & Sept. Hrs - Billing for KBA Expenses	400.00
33269	ANCHOR QEA, LLC	Sept. Preparation for Pedestrian Bridge SEPA	597.00
33270	WAGE WORKS	Flexible Spending Acct. Monthly Admin. Fee	50.00
33271	INNOVAC	Vactor Services	6,734.57
33272	FASTSIGNS	Signs for NTPP Meeting Advertising	75.56
33273	VERTICAL VISUAL SOLUTIONS INC.	City Hall Skate Park & 522 Signage	13,249.51
33274	HANSEN, COREY	Oct. Bus. Incubator Consulting	3,425.00
33275	LACONNER CHANNEL LODGE	Deposit for Council Retreat Jan 8th & 9th	200.00
33276	STARDOM SERVICES, INC.	Oct. Incubator Bldg Janitorial	510.00
33277	APPLIED TECHNOLOGIES NW INC.	A/V - Audio Fan Replacement	246.38
33278	A & A LIMOUSINE & BUS SERVICE	Play Day & Aug. 6th Concert Shuttle Service	912.00
33279	CONYERS, JODY	Reimbursement for PE License	116.00
33280	LANGTON SPIETH, LLC	Sept. Prof. Svcs - Community Engagement	2,500.00
33281	KPFF CONSULTING ENGINEERS	Sept. 62nd Ave Corridor Improvements	7,676.36
33282	VICENTE, JOHN	Mileage/Lodging/Meals	303.85
33283	BILLY-JOE PARK LLC	Utility Easement Proj. Parcel # 89	3,500.00
33284	BENDZAK, ROBERT	Cash Deposit Release PSP2005-091	2,048.59
33285	REFINO HOMES OF WASHINGTON LLC	Cash Deposit Release for Work in ROW	7,500.00
33286	PUBLIC AGENCY TRAINING COUNCIL	Police Training Registration - 2 Officers	700.00
33287	PARTNER CONSTRUCTION PRODUCTS	Roadway/Signage Supplies	189.70
33288	SETON IDENTIFICATION PRODUCTS	Parking Pass Holders for Incubator	29.99
33289	CAPITAL ONE COMMERCIAL/ COSTCO	Emergency Prep. Workshop Supplies	42.75
33290	HONEY BUCKET	Rental - Summer Concert & Squires Landing	501.35
33291	FRUHLING SAND & TOPSOIL	Asphalt/Concrete/Brush Disposal	610.00
10/30/2015	PAYROLL	Direct Deposit	80,153.79
			<u>\$ 336,470.87</u>

VI. A. Approve Check Nos. 33213 - 33291 in the Amount of \$25...

2015	PRIOR VENDOR ACTIVITY	TOTAL	FOR 2015
	314 PIE		24.00
	A & A AIRPORT LIMOUSINE SERVICE		798.00
	A+ CONFERENCING		380.34
	A-1 LANDSCAPING & CONSTRUCTION, INC.		7,177.73
	AA ASPHALTING, INC		16,583.78
	AA PARTY RENTALS		3,016.27
	AAA FLAG & BANNER MFG. CO., INC.		5,620.28
	AAA PRINTING		723.80
	AABCO BARRICADE COMPANY INC.		1,046.88
	ACTION ENTERTAINMENT		790.00
	ACTIVE SHOOTER TRAINING LLC		1,334.52
	ADVANCE TESTING & SERVICE INC		702.00
	AFLAC		4,385.10
	ALCALDE & FAY		45,833.58
	ALEXANDER, JEFF		250.00
	ALL CITY FENCE CO.		4,089.83
	ALL TRAFFIC DATA SERVICES, INC.		1,250.00
	ALLISON & PARTNERS		9,600.00
	ALPHA SUPPORTED LIVING SERVICES		250.00
	ALPHAGRAPHICS US718		1,713.76
	AM TEST, INC		500.00
	AMERICAN GENERAL		4,437.20
	AMERICAN PLANNING ASSOCIATION		2,111.00
	AMERICAN PUBLIC WORKS ASSOCIATION		960.00
	AMERICAN SOCIETY OF COMPOSERS		341.40
	ANCHOR QEA, LLC		7,860.84
	ANDERSON, RICK		300.00
	APBP		85.00
	APPLIED TECHNOLOGIES NW INC.		8,700.25
	ARC - PACIFIC NORTHWEST		675.46
	ARTS OF KENMORE		3,240.25
	ASSOCIATION OF WA CITIES		16,925.94
	ATHENAS		101.00
	AURORA RENTS		1,142.07
	AV CAPTURE ALL		2,757.43
	AWC EMPLOYEE BENEFITS		419,663.44
	BAKER, DAVID		3,112.04
	BANK OF AMERICA 941		320,165.58
	BANNER BANK BAKER		10,905.86
	BANNER BANK BH		3,267.00
	BANNER BANK CS		4,158.58
	BANNER BANK DB		1,397.50
	BANNER BANK JG		6,065.93
	BANNER BANK JGORDON		24,254.88
	BANNER BANK KENMORE		29,826.66
	BANNER BANK LD		9,881.41
	BANNER BANK NO		3,205.67
	BANNER BANK PS		226.82
	BANNER BANK VAN NESS		5,709.50
	BASTYR UNIVERSITY		50,200.00

VI. A. Approve Check Nos. 33213 - 33291 in the Amount of \$25...

BEARCOM	199.29
BECKER, THEODORE J	1,675.00
BEN & JERRY'S	11.00
BERK & ASSOCIATES	44,826.96
BLACKBAUD	6,283.89
BOHMAN, BRIAN	300.00
BORROMEO, ALEXANDER	75.00
BOTTLEROCKET	500.00
BRIEN, GAYLYNN	500.00
BUILDERS EXCHANGE OF WASHINGTON INC	183.85
BULGER SAFE & LOCK, INC.	48.83
CALPORTLAND COMPANY	2,013.96
CAPITAL ONE COMMERCIAL/ COSTCO	1,479.65
CASCADE PEST CONTROL	1,281.15
CATHOUSE PIZZA	48.00
CEMEX	3,544.70
CENTER FOR HUMAN SERVICES	15,000.00
CENTER FOR PRIORITY BASED BUDGETING	12,500.00
CHAVEZ, FRANCISCO	1,500.00
CHICK'N FIX	48.00
CHINOOK BOOK	1,642.50
CITY OF BELLEVUE	119,726.46
CITY OF KENMORE	402.29
CITY OF KENMORE FS	6,684.20
CITY OF KENT	500.00
CITY OF LAKE FOREST PARK	661,117.00
CITY OF SHORELINE	8,013.16
CITYWORKS/ AZTECA SYSTEMS INC.	20,074.64
CLK CONSTRUCTION LLC	9,811.11
CLOWNS UNLIMITED, INC.	876.00
COASTAL WEAR PRODUCTS INC	2,713.42
COASTWIDE LABORATORIES	7,341.99
COBRA BEC, INC.	526.15
CODE PUBLISHING COMPANY	8,052.69
COLUMBIA FORD	72,062.80
COLUMBIA RIDGE LANDFILL	5,778.63
COMCAST	3,197.27
CONSOLIDATED PRESS	9,279.12
CONTOUR FENCE CO. INC.	802.64
CONYERS, JODY	54.63
CROWN PRODUCTS LLC	1,021.30
CULLEY, AMBERLY	204.33
CUNNINGHAM, ED	250.00
CURTIS, DR. MILTON	1,326.64
DAILY JOURNAL OF COMMERCE	5,004.80
DANSOUND INC	7,568.64
DAY WIRELESS SYSTEMS	1,325.67
DENUSKI, STACEY	756.72
DEPARTMENT OF ECOLOGY	20,592.50
DEPARTMENT OF LABOR AND INDUSTRIES	24,108.44
DEPARTMENT OF RETIREMENT SYSTEMS	306,973.42
DEVRIES, DENIS	335.89

DIGITAL REPROGRAPHICS SERVICES INC.	404.65
DLT SOLUTIONS	1,600.67
DRS 457	19,560.00
DURRANT, JEFF	337.50
EAGLE EYE CONSULTING ENGINEERS	125.00
ECONOMIC DEV COUNCIL OF SEATTLE/KC	5,000.00
EE-NA ENTERPRISES LLC	13,593.15
EMERGENCY SERVICE COORDINATING AGCY	50,559.00
EMPLOYMENT SECURITY DEPT	22,986.02
ENVIRONMENTAL SYSTEMS RESEARCH INST.	7,008.00
EVERGREEN PRINT SOLUTIONS	781.24
EVERGREEN SAFETY COUNCIL	299.00
EVER-MARK, LLC	1,571.33
FASTSIGNS	1,479.72
FAZZARI MARKETING	2,965.26
FERGUSON ENTERPRISES INC #1539	9,391.56
FIRE PROTECTION, INC	9,329.27
FIRST AMERICAN TITLE	466.00
FISHER, ALENE	712.34
FLEMINGS HOLIDAY LIGHTING LLC	5,330.64
FRONTIER	10,276.48
FRUHLING SAND & TOPSOIL	4,396.26
FUNRENT	575.81
G & H PRINTING	429.68
GA JORGENSEN CO. INC.	253.81
GALLATIN PUBLIC AFFAIRS	33,091.85
GATES, JANICE	40.74
GENERAL DYNAMICS	890.00
GENERAL ELECTRIC CO	1,183.70
GEOENGINEERS INC	3,292.25
GIP'S DOWN-HOME BBQ	168.00
GOODSELL POWER EQUIPMENT #2 INC.	2,872.78
GORDON THOMAS HONEYWELL	33,362.17
GOREENG	66.00
GOVDELIVERY, INC.	10,500.00
GOVERNMENT FINANCE OFFICERS ASSOC	190.00
GOVERNMENT FINANCE RESEARCH GROUP	1,995.00
GRABER MANUFACTURING, INC.	2,525.00
GRAINGER	2,106.27
GRAKLANOFF, ANNA	75.00
GREATER BOTHELL CHAMBER OF COMMERCE	3,452.09
GREGORY, JOANNE	1,835.87
GRINDLINE SKATEPARKS INC.	209,473.39
HAMPSON, BRYAN	53.55
HANSEN, COREY	30,825.00
HARRIS & SMITH PUBLIC AFFAIRS	1,581.25
HARRIS COMPUTER SYSTEMS	7,390.06
HAVESON, CRAIG	7,500.00
HAWTHORNE LANE LLC	7,500.00
HDR	586,324.25
HELMETS R US INC	296.75
HERMANSON COMPANY, LLP	4,617.20

HESTON VISUAL ARTS	672.33
HEWITT	301,134.86
HOLLY, BRANDAN	100.00
HOME DEPOT CREDIT SERVICES	1,703.22
HONEY BUCKET	4,126.36
HOPELINK	15,250.00
HOPKINS, CRAIG	667.55
HORIZON DISTRIBUTORS INC	855.22
HORTON, JEANINE	280.32
HSA BANK	1,200.00
ICMA RETIREMENT TRUST 457 - 304745	57,388.60
ICOMPASS TECHNOLOGIES, INC.	9,879.20
IDEA DECANter	500.00
INDEPENDENT STATIONERS	3,057.43
INDUSTRIAL PHYSICAL CAPABILITY SVCS	170.00
INGLEMOOR HIGH SCHOOL MUSIC BOOSTERS	1,600.00
INNOVAC	21,932.15
INSLEE, BEST, DOEZIE & RYDER, P.S.	144,244.18
INTEGRA TELECOM	8,517.69
INTERNATIONAL CODE COUNCIL, INC	56.39
INTERNATIONAL INST OF MUNI CLERKS	220.00
INTERNET DOMAIN NAME SERVICES INC.	180.00
IWORQ SYSTEMS	2,800.00
J&K ASSOCIATES	7,485.42
JACOBS ENGINEERING GROUP	69,523.80
JAYMARC - AV	897.90
JET CITY PRINTING	4,562.75
JOHN E. REID & ASSOCIATES	1,080.00
JOHNSON, WES	530.00
JOYCE ZIKER PARKINSON	16,162.50
KARLINSEY, ROB	420.29
KARN, DAVID	166.67
KEEP POSTED INC	276.00
KENMORE CAMERA	1,235.05
KENMORE COMMERCIAL LLC	33,820.00
KENMORE ELEMENTARY PTA	4,500.00
KENMORE JR HIGH SCHOOL	75.00
KIEWIT/GENERAL/MANSON	7,500.00
KING CO. UTILITY COORDINATION COUNCIL	75.00
KING COUNTY ANIMAL SVCS	3,273.00
KING COUNTY DISTRICT COURT	142,660.00
KING COUNTY FINANCE	846,673.63
KING COUNTY FINANCE W.L.R.D.	56,553.63
KING COUNTY FINANCE/ GIS	2,007.19
KING COUNTY FLEET ADMIN	383.18
KING COUNTY MUNICIPAL CLERKS ASSOC	25.00
KING COUNTY OFFICE OF FINANCE	5,498.64
KING COUNTY PARKS	72.41
KING COUNTY RADIO COMM SERVICES	850.83
KING COUNTY REAL ESTATE SVCS	500.00
KING COUNTY RECORDER'S OFFICE	107.00
KING COUNTY SHERIFF	2,038,561.33

KING COUNTY SUPERIOR COURT CLERK	141,200.00
KING COUNTY TREASURY	13,507.11
KING CTY EASTSIDE TRANSP PARTNERSH	200.00
KONICA MINOLTA BUSINESS SOLUTIONS	4,897.29
KPFF CONSULTING ENGINEERS	7,822.72
KUKER-RANKEN INC	29.51
KUSTOM SIGNALS, INC.	18.00
LAKE CITY PICTURE FRAMING	249.89
LANDSCAPE FORMS, INC.	2,602.82
LANGTON SPIETH, LLC	18,953.74
LANSING HOMES II LLC	55.05
LAW OFFICE OF JOHN RUNGERUDE, PS	2,700.00
LEE BRIANTE	1,000.00
LEGACY FORD	31,111.73
LIGHTHOUSE CONSULTING INC	46,924.19
LINCOLN NATIONAL LIFE INSURANCE	8,810.39
LOYUK, SAMANTHA	1,285.48
MACDONALD MILLER FACILITY SOLUTIONS	7,603.88
MAGEE, SCOTT	2,800.00
MAIL FINANCE	2,109.00
MANTLE INDUSTRIES INC	3,277.34
MARINE FLOATS CORPORATION	10,916.06
MARSHBANK CONSTRUCTION	4,010,908.71
MASTEC NETWORK SOLUTIONS	5,722.86
MEEHAN, NANCY	355.26
MIGHTY BISON BOOKING	3,500.00
MILLER STEPHENS, MARY	10,000.00
MILLS, VIC	250.00
MINZGHOR, NICHOLAS	416.69
MOBILE ELECTRICAL DISTRIBUTORS INC	13.47
MOBILE MINI, INC.	2,961.81
MODERN ENTERPRISES, LLC	1,750.00
MORGAN SOUND INC	3,426.26
MR. T'S TROPHIES	3,562.86
MUMMA, RYAN	1,105.97
MUNSON, JOSHUA	12.73
NARANCIC, SHEILA	3,250.00
NATIONAL BUSINESS INCUBATION ASSOC.	525.00
NATIONAL LEAGUE OF CITIES	1,489.00
NATIONAL LIFE OF VERMONT	1,343.42
NATIONAL NEIGHBORHOOD WATCH INSTITUTE	345.00
NATIONWIDE FINANCIAL 401a	233,788.37
NATIONWIDE RETIREMENT SOLUTIONS 457	5,700.00
NEEMA'S COMFORT	55.92
NEOPOST NORTHWEST	274.82
NORTHSHORE FIRE DEPT	6,037.25
NORTHSHORE PARK & REC SERVICE AREA	1,360.00
NORTHSHORE ROTARY CLUB	988.00
NORTHSHORE SCHOOL DISTRICT	5,000.00
NORTHSHORE SENIOR CENTER	15,950.00
NORTHSHORE UTILITY DIST	84,083.07
NORTHSHORE YMCA	3,250.00

NORTHSHORE YOUTH & FAMILY SERVICES	12,000.00
NORTHWEST ATHLETICS	350.00
NORTHWEST LANDSCAPE SERVICES	12,830.31
NORTHWEST MARINE TRADE ASSOCIATION	425.00
NORTHWEST TROPHY	189.44
NW ENVIRONMENTAL TRAINING CENTER	1,325.00
OFFICE DEPOT	9,262.80
OFFICE MAX	6,119.24
OFFICE TEAM	9,042.70
OfficeMax Workplace Interiors	9,871.11
OLYMPIC ENVIRONMENTAL RESOURCES INC	37,599.97
OSBORN CONSULTING INC.	167,292.33
OUSLEY, NANCY	1,136.72
OVERLEESE, KRISTEN	77.88
PACIFIC TOPSOILS	5,782.61
PARADISE AMUSEMENTS	100.00
PARISI, NICK	44.00
PART WORKS INC	461.93
PASIFIKA ARTIST NETWORK LLC	2,250.00
PAT'S TREES AND LANDSCAPE INC.	13,507.24
PAWS	2,873.00
PENDLETON, MICHAEL	3,523.84
PEOPLES STORAGE	1,900.00
PERSONAL BEST/ TOPHEALTH	197.77
PERTEET INC.	199,710.49
PETERSON, JANET	1,175.00
PETTY CASH CUSTODIAN	826.83
PHAM, CHOUNG	98.54
PHSI PURE WATER FINANCE	1,328.15
PIEDMONT DIRECTIONAL	2,896.68
PIPERS CREEK NURSERY	188.34
PLANNING ASSOCIATION OF WASHINGTON	80.00
PREPARE NORTHWEST	500.00
PRINTWEST	492.75
PROTECTION TECHNOLOGIES, INC	374.95
PUBLIC HEALTH DEPT. OF KING COUNTY	100.00
PUGET SOUND BUSINESS JOURNAL	97.00
PUGET SOUND CLEAN AIR AGENCY	14,740.00
PUGET SOUND ENERGY	156,168.70
PUGET SOUND REGIONAL COUNCIL	15,270.00
PURE WATER TECHNOLOGY OF PUGET SOUND	448.52
QUALITY BUSINESS SYSTEMS	8,110.94
RANDALL, BRIAN	234.31
REDMOND, MICHAEL	61.25
REPUBLIC SERVICES	8,090.87
RICHMOND AMERICAN HOMES OF WA	60.00
RM HOMES LLC	412.01
ROAD CONSTRUCTION NW, INC.	87,043.22
RODGERS, DEUTSCH & TURNER PLLC	70,600.00
ROGERS, GLENN	20.91
RONGERUDE, JOHN	900.00
SAFRIN, PATTY	101.35

SAMYN, DR. JEFFREY	250.00
SANDRA OWEN DESIGN	1,962.50
SARA CAHOONE	750.00
SARAH ROBERTS	94,572.36
SAUVE, GAYLEN	700.00
SAWYER, RICHARD	1,433.31
SCHAUFFLER, CYNTHIA	65.65
SCHINDLER ELEVATOR CORPORATION	1,524.53
SCHOCK, BRETT	227.04
SCORE	483,896.53
SEATTLE TIMES	14,172.36
SECRETARY OF STATE	57.60
SEES TREES AND EXCAVATION INC	1,029.30
SESAC	360.00
SEXTANT MARKETING GROUP	6,940.61
SHELTON, CINDY	42.55
SHERWIN-WILLIAMS CO. #8099	154.79
SHRED-IT	533.31
SIGN UP, SIGN CO, INC	2,250.23
SILVER KITE COMMUNITY ARTS CONSULT.	300.00
SNOHOMISH COUNTY	7,426.00
SNOHOMISH COUNTY HEARING EXAMINER	500.00
SOCRATA, INC.	9,198.00
SOLODVNIK, EUGENE & TATYANA	57.50
SOUND CITIES ASSOC	12,798.49
SOUND LAW CENTER	12,495.00
SOUND PUBLISHING, INC.	11,566.43
SOUTHWEST PLUMBING	34.51
SPERRY, LAURIE	91.95
SPORTWORKS NORTHWEST, INC.	597.17
SPOT HOT DOG & BRATS	97.00
SREBNIK, DEBRA	57.90
ST OF WA DEPT OF FISH & WILDLIFE	500.00
STARDOM SERVICES, INC.	4,540.00
STATE AUDITOR'S OFFICE	33,483.76
STATE OF FLORIDA DISBURSEMENT UNIT	5,500.00
STATE OF WA DEPT. OF LICENSING	30.00
STEWART MACNICHOLS HARMELL, INC.	55,533.08
STEWART TITLE COMPANY	4,380.00
STOPTECH, LTD.	4,544.25
STUDIO 3 SIGNS	2,299.50
SUNGARD PUBLIC SECTOR INC.	19,875.00
SUSSMAN/PREJZA & CO, INC	5,790.00
TALPALATSKI, IGOR	166.67
TELESYSTEMS WEST	2,219.85
TERREBONNE LIMITED	337.34
THE DOWNTOWN MOUNTAIN BOYS	1,000.00
THE KIPLINGER LETTER	99.00
THOMAS, MICHAEL	133.36
TIKOR CONSULTING	52.79
TOPIA TECHNOLOGY/ BIS	3,890.00
TOTAL LANDSCAPE CORP	77,534.05

TOWN CENTER HARDWARE	2,005.52
TREE SOLUTIONS, INC.	855.00
TWEDT, CHARLES	1,500.00
TWO BROTHERS' TREES	600.00
ULINE	1,544.27
UNITED RENTALS NW, INC	1,829.67
UNITED STATES POSTMASTER	4,777.84
UNITED WAY OF KING COUNTY	5,132.40
UPS STORE	2,315.19
URBAN LAND INSTITUTE	215.00
US POSTAL SERVICE (HASLER)	8,673.58
U-SAVE OIL CO	2,150.00
UTILITIES UNDERGROUND LOCATION CTR	1,693.77
V2WORKS	3,544.42
VAN NESS, ALLAN	1,987.33
VAUGHAN, KENT	116.00
VERIZON WIRELESS	11,174.78
VERTICAL VISUAL SOLUTIONS INC.	14,375.39
W.S.S.O. Advanced Training	500.00
WA ASSOC OF BUILDING OFFICIALS	950.00
WA ASSOC OF PUBLIC RECORDS OFFICERS	140.00
WA CITIES INSURANCE AUTHORITY	212,941.00
WA FINANCE OFFICERS ASSOCIATION	150.00
WA GUARANTEED EDUCATION TUITION	800.00
WA STATE CONSOLIDATED TECH SVCS	875.00
WA STATE DEPT OF CORRECTIONS	230.50
WA STATE DEPT OF ENTERPRISE SVCS	175.00
WA STATE DEPT OF LABOR & INDUSTRIES	141.60
WA STATE DEPT OF TRANSPORTATION	29,804.73
WAGE WORKS	450.00
WALL, JOHN	596.78
WALTERS, GEORGE	206.00
WASHINGTON CITY/COUNTY MGMT ASSOC	365.00
WASHINGTON STATE PATROL	2,139.13
WASHINGTON TREE SERVICE INC	3,066.00
WAYNE'S ROOFING INC.	72,027.98
WELLS FARGO FINANCIAL	10,669.43
WELWEST CONSTRUCTION INC.	4,868.03
WESTERN DISPLAY FIREWORKS, LTD.	17,000.00
WETLANDS & WOODLANDS INC	183.96
WHITEMAN, TELA	50.60
WINTER, KENDL	750.00
WINTERBOURNE LANDSCAPE	574.88
WONDERLAND DEVELOPMENT	3,750.00
YOUM, PAUL	166.67
ZONAR SYSTEMS	749.68
ZORNES, GARY	600.00
ZUMAR	3,293.32
	<u>14,297,096.28</u>



**City Council Business Agenda Item
City of Kenmore, WA**

Subject/Topic: Approval of Checks Proposed Council Action/Motion: Approval of Check Nos. 29160-29239 in the Amount of \$959,120.34 and Electronically Transferred Payroll Funds Totaling \$65,054.71 and an Investment Purchase in the Amount of \$985,779.17 for the Period Ending December 23, 2013	For Council Meeting Agenda of: November 23, 2015 Departments: Finance and Administration Prepared by: Joanne Gregory, Finance and Administration Director <table style="width: 100%;"> <tr> <td style="width: 70%;">Approved by Department Head:</td> <td style="width: 30%; text-align: center;"><u>Initial & Date</u></td> </tr> <tr> <td>Approved by City Attorney:</td> <td style="text-align: center;">Jmg 11/13/15</td> </tr> <tr> <td>Approved by Finance Director:</td> <td style="text-align: center;">Jmg 11/13/15</td> </tr> <tr> <td>Approved by City Manager:</td> <td style="text-align: center;">Jg</td> </tr> </table> Exhibits/Attachments: City of Kenmore Voucher Certification and Approval	Approved by Department Head:	<u>Initial & Date</u>	Approved by City Attorney:	Jmg 11/13/15	Approved by Finance Director:	Jmg 11/13/15	Approved by City Manager:	Jg
Approved by Department Head:	<u>Initial & Date</u>								
Approved by City Attorney:	Jmg 11/13/15								
Approved by Finance Director:	Jmg 11/13/15								
Approved by City Manager:	Jg								
Expenditure Required \$0	Amount Budgeted \$0	Appropriation Required \$0							
<u>INFORMATION/BACKGROUND:</u> Finance staff has discovered that Check Nos. 29160-29239 in the amount of \$959,120.34, the payroll transfer of \$65,054.71, and an investment purchase of \$985,779.17 were not presented on an agenda for approval by the Council. These were transactions on and around December 24, 2013 and should have been on a January 2014 agenda. Staff is requesting Council approval at this time.									
<u>FISCAL CONSIDERATION:</u> None									
<u>COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:</u> Effective and efficient services									

City of Kenmore Voucher Certification and Approval

I, the undersigned, do hereby certify under penalty of perjury that the materials have been furnished, the services rendered or the labor performed as described herein and that the following claims, paid by checks 29160-29239 which total \$959,120.34 and electronically transferred payroll funds totalling \$65,054.71, and an Investment Purchase in the amount of \$985,779.17, are just, due and unpaid obligations against the City of Kenmore/King County/Washington, and that I am authorized to authenticate and certify to said claims.

 12/23/13
 City Manager Date

 12/24/13
 Finance Director Date

Check #	Vendor Name	Description	Check Amount
29160	NATIONWIDE FINANCIAL 401a	Social Security Replacement Plan	7,344.06
29161	NATIONWIDE RETIREMENT SOLUTIONS 457	Deferred Comp Payroll Deduction	200.00
29162	ICMA RETIREMENT TRUST 457 - 304745	Deferred Comp Payroll Deduction	2,594.83
29163	DRS 457	Deferred Comp Payroll Deduction	875.00
29164	CITY OF KENMORE FS	Flexible Spending Medical Plans	253.08
29165	BANK OF AMERICA 941	Payroll Taxes	14,060.22
29166	DEPARTMENT OF RETIREMENT SYSTEMS	WA State Retirement	12,012.47
29167	STATE OF FLORIDA DISBURSEMENT UNIT	Payroll Deduction	275.00
29168	PUGET SOUND FINANCE OFFICERS ASSOC	PSFOA Luncheon Registration	50.00
29169	ESA ADOLFSON	Swamp Creek Park Professional Services	850.00
29170	BANNER BANK	Senior Center Lights/Raingear/Supplies	331.45
29171	CITY OF LAKE FOREST PARK	November Public Works Services	70,338.26
29172	COASTWIDE LABORATORIES	Park Restroom & Facility Maint. Supplies	796.28
29173	DEPARTMENT OF ECOLOGY	Stormwater NPDES Permit Fee	5,790.74
29174	FRUHLING SAND & TOPSOIL	Asphalt & Brush Dumping/ Topsoil	163.80
29175	CALPORTLAND COMPANY	Restock Sand for Snow/Ice	291.38
29176	HOME DEPOT CREDIT SERVICES	Parts- Swing Installation @ Linwood Park	65.96
29177	KING COUNTY FINANCE	November Road Svcs/Signs/Signals/Drainage	50,764.37
29178	SOUND PUBLISHING, INC.	November Advertising	859.06
29179	KING COUNTY OFFICE OF FINANCE	Oct/Nov Public Defense Indigency Screening	2,113.13
29180	KING COUNTY SHERIFF	November & December Police Services	497,037.30
29181	LIGHTHOUSE CONSULTING INC	Nov. IT Services/Software Lic./Server Backup	4,330.29
29182	PENDLETON, MICHAEL	Retreat Consultant	1,349.91
29183	MORGAN SOUND INC	Holiday Tree Lighting Event So	497.68
29184	NORTHSHORE FIRE DEPT	November Fire Marshal Review	160.00
29185	NORTHSHORE UTILITY DIST	Utility Bills & Nov. Vehicle Maint. & Fuel	5,224.82
29186	OFFICE DEPOT	Office Supplies	243.52
29187	PUGET SOUND ENERGY	10/31-12/02 Signals/Lights/Electricity Chgs	12,276.24
29188	SEATTLE TIMES	November Legal Ads	1,314.21
29189	WA STATE CONSOLIDATED TECH SVCS	November Listserve	175.00
29190	COLUMBIA RIDGE LANDFILL	November Dump Fees	1,194.37

29191	SEES TREES AND EXCAVATION INC	Tree Trimming Services	427.05
29192	AMERICAN SOCIETY OF COMPOSERS	License Fees 2013/2014	331.39
29193	SNOHOMISH COUNTY	November Vactor Dump Fees	208.00
29194	KONICA MINOLTA BUSINESS SOLUTIONS	Nov Business Incubator Copier Lease	209.32
29195	SAFRIN, PATTY	Reimburse Oct/Nov Bus. Expenses	227.90
29196	WA STATE ASSOC OF PERMIT TECHNICIAN	Yearly Membership Dues	35.00
29197	BANNER BANK LD	Special Events/ Volunteer Supplies	1,335.34
29198	BANNER BANK DB	N.S. Summit Park Irr. Meter Installation	2,800.00
29199	BANNER BANK NO	Meals/ Parking	119.55
29200	BANNER BANK JG	Planner/ Parking	30.93
29201	TOPIA TECHNOLOGY/ BIS	Website Development/ Web Hosting	14,392.50
29202	BANNER BANK KENMORE	Registration/ Supplies/ Web Svcs	1,110.83
29203	SHRED-IT	12/10/13 Shredding Services	49.50
29204	ALCALDE & FAY	11/15-12/15 Govt Affairs Consulting	5,023.38
29205	BOB'S HEATING & AC	Refund Duplicate Bldg Permit	78.90
29206	COMCAST	12/14/13-1/13-14 CH Internet/Cable	119.21
29207	TOWNE CENTRE HARDWARE	Public Works & Facility Supplies	198.32
29208	SARAH ROBERTS	November Prosecution Services	10,302.00
29209	INTEGRA TELECOM	12/8/13-1/7/14 City Hall Phone	777.03
29210	AM TEST, INC	TMDL Sample Analysis	125.00
29211	PAWS	November Animal Sheltering Services	990.00
29212	PURE WATER TECHNOLOGY OF PUGET SOUND	Incubator Bldg. Water Filter	61.76
29213	INDEPENDENT STATIONERS	Printer Ink/ Office Supplies	472.20
29214	WELLS FARGO FINANCIAL	11/25-12/24 Upstairs Xerox Lease	278.13
29215	SNOHOMISH COUNTY TREASURER/ SHERIFF	November Jail Service Fees	16,699.88
29216	BANNER BANK BH	WABO Membership	50.00
29217	ACTIVE SHOOTER TRAINING LLC	Police Dept. LazerBrite Markers	613.20
29218	MILLER STEPHENS, MARY	Nov. Snohomish Cty Public Defense Svcs.	1,250.00
29219	COLUMBIA BANK	Retainage for Road Const. NW	6,409.42
29220	BROADCAST MUSIC, INC.	11/1/13-10/31/14 Dues	327.00
29221	CANTEEN REFRESHMENT SERVICES	Coffee Supplies	293.50
29222	VERIZON WIRELESS	11/27-12/26 Cell Phones/ I-Pad	1,335.57
29223	BANNER BANK VAN NESS	Business Meeting Exp/ Registration	316.00
29224	BANNER BANK BAKER	Travel/Business Meeting Exp.	16.90
29225	BANNER BANK ROGERS	Business Mtg. Lunch	8.49
29226	JOYCE ZIKER PARKINSON	November Legal Services	1,650.00
29227	RAZZ CONSTRUCTION	Final Billing/ 61st/181st Signal & Culvert	11,538.93
29228	PETERSON, JANET	Ergonomics Services 12/11/13	670.00
29229	WAGE WORKS	Nov. Administrative Fee	50.00
29230	UTILITIES UNDERGROUND LOCATION CTR	Nov. Utility Locate Services	101.91
29231	OSBORN CONSULTING INC.	October Consulting Services	42,677.79
29232	RNR CONSULTING	11/1-12/6 IT Governance Committee	1,725.51
29233	ECONOMIC DEV COUNCIL OF SEATTLE/KC	2014 Public Sector Membership	5,000.00
29234	HESTON VISUAL ARTS	Commercial Photography	164.25
29235	SPRAGUE PEST SOLUTIONS	Rodent Abatement Northshore Summit Park	332.60
29236	V2WORKS	Business Seminar Photography	202.50
29237	THE METALSMITHS	Refund unnecessary permit fee	94.45
29238	ROAD CONSTRUCTION NW, INC.	Northshore Summit Park Work thru 11/30/13	133,956.77
29239	WA TRUST FOR HISTORIC PRESERVATION	Membership Fee	100.00
12/13/13	PAYROLL	Direct Deposit	65,054.71
			<u>\$ 1,024,175.05</u>

2013	PRIOR VENDOR ACTIVITY	TOTAL	FOR 2013
	A. GAUL CULLEY		1,205.06
	A+ CONFERENCING		414.91
	AA ASPHALTING, INC		11,291.64
	AA PARTY RENTALS		1,252.68
	AAA FLAG & BANNER MFG. CO., INC.		9,465.52
	AAA PRINTING		192.10
	ACF WEST INC		394.20
	ACTION ENTERTAINMENT		790.00
	ACTIVE SHOOTER TRAINING LLC		940.20
	ADVANCE TESTING & SERVICE INC		540.00
	AFLAC		5,047.90
	AL KING, PE		711.75
	ALCALDE & FAY		55,443.49
	ALLIED WASTE SERVICES #172		1,682.74
	ALLPLAY SYSTEMS LLC		91.98
	ALPHAGRAPHICS US718		907.06
	AM TEST, INC		2,150.00
	AMERICAN GENERAL		5,742.96
	AMERICAN PLANNING ASSOCIATION		1,990.00
	AMERICAN PUBLIC WORKS ASSOCIATION		1,115.67
	ANCHOR QEA, LLC		91,508.81
	ARC - PACIFIC NORTHWEST		508.31
	ARTS OF KENMORE		840.00
	ASP, ANGELA		630.00
	ASSOCIATED BOAT TRANSPORT		1,440.00
	ASSOCIATED UNDERWATER SERVICES, INC		8,822.64
	ASSOCIATION OF WA CITIES		15,549.34
	AT HOME ARTIST MANAGEMENT, INC.		1,750.00
	AURORA RENTS		3,349.59
	AWC EMPLOYEE BENEFITS		421,414.27
	BADGLEY'S LANDSCAPE LLC		2,491.13
	BAKER, DAVID		3,501.54
	BANANA ENTERPRISES, INC.		8,200.00
	BANK OF AMERICA 941		333,981.60
	BANNER BANK BAKER		10,731.21
	BANNER BANK BH		5,798.57
	BANNER BANK CS		6,878.26
	BANNER BANK DB		936.64
	BANNER BANK JG		10,045.08
	BANNER BANK JGORDON		12,730.65
	BANNER BANK KENMORE		27,536.07
	BANNER BANK LD		3,308.83
	BANNER BANK NO		8,924.57
	BANNER BANK PS		2,430.20
	BANNER BANK ROGERS		6,597.60
	BANNER BANK VAN NESS		5,343.65
	BARCLAY DEAN ARCHITECTUAL PRODUCTS		711.75
	BASTYR UNIVERSITY		50,899.35
	BEARCOM		70.08

BEEGEE TOLPA	700.00
BENT, DEBORAH A	26.00
BERK & ASSOCIATES	22,500.00
BINW	16,528.79
BIS	175.00
BLACKBAUD	5,204.11
BLACKLINE, INC.	43,615.60
BONOMI, ANGELO	545.04
BOOGIE BROWN PRODUCTIONS, INC.	2,000.00
BOTELHO, PAULA	1,850.00
BRABEC, MARY	3,500.00
BRIEN, GAYLYNN	425.00
BROWN, ANDY	250.00
BUENA VISTA SERVICES, INC.	3,960.00
BULGER SAFE & LOCK, INC.	245.94
C. ANDERSON & CO.	930.75
CALPORTLAND COMPANY	678.01
CANTEEN REFRESHMENT SERVICES	2,332.78
CAPITAL ONE COMMERCIAL/ COSTCO	325.31
CARLSON, THOMAS G.	100.00
CASCADE PEST CONTROL	1,708.20
CEMEX	3,129.94
CENTER FOR HUMAN SERVICES	18,750.00
CHAMPION COURIER	51.53
CHICAGO TITLE	15,000.00
CHIEF LAW ENFORCEMENT SUPPLY	188.21
CITY OF BELLEVUE	141,721.91
CITY OF KENMORE	210.58
CITY OF KENMORE FS	6,073.92
CITY OF KENT	500.00
CITY OF LAKE FOREST PARK	695,543.92
CITY OF SHORELINE	2,075.28
CITYWORKS/ AZTECA SYSTEMS INC.	29,995.00
CLARITY SIGNS	5,635.32
CLOWNS UNLIMITED, INC.	2,805.30
COASTAL WEAR PRODUCTS INC	1,356.71
COASTWIDE LABORATORIES	9,018.12
CODE PUBLISHING COMPANY	3,825.36
COLUMBIA RIDGE LANDFILL	6,120.67
COMCAST	2,849.60
CONNELLY, MARC	48.14
CONSOLIDATED PRESS	9,933.70
CONTOUR FENCE CO. INC.	2,011.52
CORNERSTONE ROOFING	101.32
CROWN PRODUCTS LLC	1,216.98
CSAT, LLC	500.00
CUES	12,537.75
CULLEY, AMBERLY	1,000.00
CURTIS, DR. MILTON	322.24
DAILY JOURNAL OF COMMERCE	1,257.40
DANSOUND INC	5,913.00

DAY WIRELESS SYSTEMS	1,448.82
DEPARTMENT OF ECOLOGY	5,540.78
DEPARTMENT OF LABOR AND INDUSTRIES	33,299.57
DEPARTMENT OF LICENSING	52.00
DEPARTMENT OF RETIREMENT SYSTEMS	266,091.86
DIGITAL REPROGRAPHICS SERVICES INC.	452.58
DRS 457	38,330.35
DUGAN, GERALD & GAIL	1,650.00
DURRANT, JEFF	855.58
EARTHCORPS	10,360.73
EASTSIDE TRANSP PARTNERSHIP	200.00
ECONOMIC DEV COUNCIL OF SEATTLE/KC	10,000.00
EFFICIENCY INC	987.69
EJ USA, INC.	1,549.96
EMERGENCY SERVICE COORDINATING AGCY	49,476.00
EMIL'S CONCRETE CONSTRUCTION CO.	2,589.68
ENTERPRISE SEATTLE	5,000.00
ENTERTAINMENT FIREWORKS INC	17,000.00
ENVIRONMENTAL SYSTEMS RESEARCH INST	4,779.00
ESA ADOLFSON	1,815.00
EVERGREEN FIRE AND SAFETY, INC.	135.51
EVERGREEN HEALTH	25.00
EVERGREEN PRINT SOLUTIONS	754.02
EVERGREEN SAFETY COUNCIL	175.00
EVER-MARK, LLC	1,165.88
FASTSIGNS	1,051.38
FAZZARI MARKETING	244.85
FERGUSON ENTERPRISES INC #1539	6,836.97
FINANCIAL CONSULTANTS INT'L INC	250.24
FIRE PROTECTION, INC	3,083.54
FIRST AMERICAN TITLE	9,142.60
FLEMINGS HOLIDAY LIGHTING LLC	5,496.59
FOLK, BRADFORD LEE	1,750.00
FOUR PARK AVENUE	363.07
FRAUSE	34,797.43
FRONTIER	39,561.79
FRUHLING SAND & TOPSOIL	1,638.19
G & H PRINTING	71.45
GAMETIME	5,779.30
GARMIRE IRON WORKS, INC.	6,958.73
GEODESIGN INC.	2,816.80
GEOENGINEERS INC	32,539.20
GLACIER PEAK CONSTRUCTION LLC	29,055.04
GOODSELL POWER EQUIPMENT #2 INC.	98.43
GORDON THOMAS HONEYWELL	39,769.64
GORDON, JENNIFER	174.02
GOVERNMENT FINANCE OFFICERS ASSOC	190.00
GRAINGER	60.07
GRAY & OSBORNE, INC	18,468.81
GREATER BOTHELL CHAMBER OF COMMERCE	595.00
GREGORY, JOANNE	806.65

H.W. LOCHNER, INC.	391,497.93
HAMBLETON RESOURCES, INC.	10,500.00
HAMILTON-LANE CONSULTING	1,000.00
HAMPSON, BRYAN	3,694.29
HANDY ANDY RENT-A-TOOL INC	134.40
HARBOR HISTORY MUSEUM	400.00
HARRIS & SMITH PUBLIC AFFAIRS	14,771.17
HARRIS COMPUTER SYSTEMS	6,832.20
HEBERT RESEARCH, INC.	8,788.00
HERO HOUSE	1,050.00
HESTON VISUAL ARTS	1,560.38
HOME DEPOT CREDIT SERVICES	2,389.49
HONEY BUCKET	881.13
HOPE HEALTH/IHAC	65.19
HOPELINK	34,312.50
HORIZON DISTRIBUTORS INC	512.45
HO'S PLUMBING COMPANY	33.34
HOVDE, RICHARD	106.21
HP'S SMOKEHOUSE BBQ	187.00
HWA GEOSCIENCES INC.	5,934.41
ICMA RETIREMENT TRUST 457 - 304745	62,132.84
ICOMPASS TECHNOLOGIES, INC.	8,120.00
INDEPENDENT STATIONERS	1,942.63
INGALLINAS BOX LUNCH	283.64
INNOVAC	41,231.85
INSLEE, BEST, DOEZIE & RYDER, P.S.	334,846.75
INTEGRA TELECOM	8,693.74
INTERNATIONAL CITY/CNTY MGMT ASSOC	2,285.02
INTERNATIONAL INST OF MUNI CLERKS	185.00
iWORQ SYSTEMS	4,800.00
JACOBS ENGINEERING GROUP	55,705.78
JAYMARC - AV	1,842.90
JBS INSTRUMENTS	1,052.00
JET CITY PRINTING	2,107.23
JOHN E. REID & ASSOCIATES	550.00
JOYCE ZIKER PARKINSON	65,659.82
JRW ENTERPRISES	2,250.23
JSH PROPERTIES, INC.	26,690.24
KARLINSEY, ROB	8,090.50
KAUBOY PRODUCTIONS LLC	550.00
KBA INC.	112,831.49
KCDA PURCHASING COOP	2,298.13
KEATING, BUCKLIN & MCCORMACK	1,519.90
KEEP POSTED INC	246.00
KENMORE AIR	337.50
KENMORE CAMERA	250.00
KENMORE COMMERCIAL LLC	31,416.00
KENMORE ELEMENTARY PTA	4,000.00
KENMORE SENIOR CENTER	5,500.00
KING COUNTY ANIMAL SVCS	5,485.00
KING COUNTY DISTRICT COURT	46,337.00

KING COUNTY FINANCE	625,094.08
KING COUNTY FINANCE W.L.R.D.	62,047.81
KING COUNTY FINANCE/ GIS	6,014.77
KING COUNTY MUNICIPAL CLERKS ASSOC	25.00
KING COUNTY OFFICE OF FINANCE	10,269.81
KING COUNTY RADIO COMM SERVICES	1,016.68
KING COUNTY RECORDER'S OFFICE	729.00
KING COUNTY SHERIFF	2,622,145.19
KING COUNTY SUPERIOR COURT CLERK	11,000.00
KING COUNTY TREASURY	37,566.63
KING COUNTY UTILITY COORDINATION CO	40.00
KING CTY DEPT OF PERMITTING/ENVIRON.	9.38
KONICA MINOLTA BUSINESS SOLUTIONS	4,289.59
KUSTOM SIGNALS, INC.	2,111.17
KVO INDUSTRIES, INC	365.00
LAMB, BARBARA	2,000.00
LANGUAGE LINE SERVICES, INC.	11.67
LIGHTHOUSE CONSULTING INC	41,933.83
LIGHTING GROUP NORTHWEST	3,095.13
LOU'S GLOVES, INC.	89.00
LOWE SABRA	250.00
MACLEOD RECKORD	7,529.00
MAIL FINANCE	3,009.12
MCALLISTER, TERESA	94.81
MEEHAN, NANCY	182.16
MILLER STEPHENS, MARY	12,500.00
MINZGHOR, NICHOLAS	740.26
MOBILE ELECTRICAL DISTRIBUTORS INC	104.65
MOBILE MINI, INC.	961.92
MORGAN SOUND INC	1,888.88
MR. T'S TROPHIES	467.63
NATIONAL BARRICADE CO	689.85
NATIONAL BUSINESS INCUBATION ASSOC.	525.00
NATIONAL CITIZEN SURVEY	9,025.00
NATIONAL IMPRINT CORPORATION	292.30
NATIONAL LEAGUE OF CITIES	3,038.00
NATIONAL LIFE OF VERMONT	2,583.79
NATIONWIDE FINANCIAL 401a	239,395.66
NATIONWIDE RETIREMENT SOLUTIONS 457	4,800.00
NEXTEL COMMUNICATIONS	885.09
NEXXPOST	300.76
NORTH COAST ELECTRIC	1,964.60
NORTH LAKE MARINA	1,520.51
NORTHSHORE FIRE DEPT	8,075.00
NORTHSHORE PARK & REC SERVICE AREA	1,360.00
NORTHSHORE ROTARY CLUB	256.00
NORTHSHORE SCHOOL DISTRICT	415.30
NORTHSHORE SENIOR CENTER	14,300.00
NORTHSHORE UTILITY DIST	80,069.85
NORTHSHORE YMCA	4,875.00
NORTHSHORE YOUTH & FAMILY SERVICES	18,750.00

NORTHWEST LANDSCAPE SERVICES	10,775.51
NORTHWEST MARINE TRADE ASSOCIATION	460.00
OFFICE CLEANING CREW	248.00
OFFICE DEPOT	1,270.91
OFFICE MAX	8,762.43
OFFICE TEAM	12,740.45
OLYMPIC ENVIRONMENTAL RESOURCES INC	42,072.30
OSBORN CONSULTING INC.	142,393.40
OTAK	17,956.91
OUSLEY, NANCY	915.55
OVERLEESE, KRISTEN	315.67
PACIFIC NORTHWEST WATERWAYS ASSOC	360.00
PACIFIC TOPSOILS	13,607.53
PART WORKS INC	544.62
PASSPORT TRAVEL AND TOURS	1,093.60
PATTY PAN GRILL	80.00
PAWS	6,105.00
PENDLETON, MICHAEL	6,751.16
PEOPLES STORAGE	2,070.50
PERSONAL BEST/ TOPHEALTH	395.54
PERTEET INC.	153,786.85
PETTY CASH CUSTODIAN	854.23
PHAM, NY THI	5,500.00
PHOTOTAINMENT	1,231.88
PHSI PURE WATER FINANCE	1,680.35
PICKLEBALL STUFF, LLC	384.00
PLANNING ASSOCIATION OF WASHINGTON	85.00
POTELCO, INC.	1,240.27
PRIMA PLUMBING	851.91
PROTECTION TECHNOLOGIES, INC	17,493.42
PRSA	307.00
PUBLIC HEALTH DEPT. OF KING COUNTY	100.00
PUGET SOUND BUSINESS JOURNAL	96.00
PUGET SOUND CLEAN AIR AGENCY	11,309.00
PUGET SOUND ENERGY	185,903.33
PUGET SOUND FINANCE OFFICERS ASSOC	50.00
PUGET SOUND REGIONAL COUNCIL	7,414.00
PURE WATER TECHNOLOGY OF PUGET SOUND	239.82
QUALITY BUSINESS SYSTEMS	6,005.39
RAZZ CONSTRUCTION	818,977.12
REPUBLIC SERVICES	7,646.50
RESULTS DRIVEN	8,000.00
RNR CONSULTING	35,046.49
ROD STEVENS	5,895.70
ROGERS, GLENN	125.32
ROLLABELS	37.15
SAFEWAY	84.00
SAFRIN, PATTY	467.11
SARAH ROBERTS	103,020.00
SAUVE, GAYLEN	300.00
SCHINDLER ELEVATOR CORPORATION	1,844.34

SCHNEE, CARLA	49.16
SCHWARZWALTER, MARK	90.00
SEATTLE TIMES	8,779.04
SEES TREES AND EXCAVATION INC	1,319.48
SELECT AIR SERVICES DBA GREENWOOD	119.19
SERGOVIA, CARLOS	1,650.00
SESAC	327.00
SHELTON, CINDY	249.88
SHRED-IT	544.50
SIGN UP, SIGN CO, INC	1,635.94
SITELINES	111.36
SKAGIT GARDENS	1,266.61
SMITH, BRENT	91.03
SMITH, JARRETT	150.00
SMS	2,934.51
SNOHOMISH COUNTY	11,419.00
SNOHOMISH COUNTY SHERIFF'S OFFICE	297,449.78
SNOHOMISH COUNTY TREASURER/ SHERIFF	17,104.71
SOUND CITIES ASSOC	11,767.00
SOUND LAW CENTER	12,631.50
SOUND PUBLISHING, INC.	7,753.85
SPATIAL DEVELOPMENT	1,945.00
SPERRY, LAURIE	126.23
SPINNAKER STRATEGIES	11,799.40
SPRAGUE PEST SOLUTIONS	73.91
ST EDWARD STATE PARK	11,180.94
ST OF WA DEPT OF FISH & WILDLIFE	300.00
STANSFIELD, CLAYTON	2,619.30
STARLIGHT CHILDRENS FOUNDATION	240.00
STATE AUDITOR'S OFFICE	28,365.31
STATE OF FLORIDA DISBURSEMENT UNIT	6,600.00
STATE OF WA DEPARTMENT OF LICENSING	116.00
STEWART MACNICHOLS HARMELL, INC.	59,370.00
SUNBELT	1,270.69
SUSSMAN/PREJZA & CO, INC	8,479.09
TACHTEVRENIDOU, PROMISE	7,605.79
TELESYSTEMS WEST	1,058.06
THE KIPLINGER LETTER	99.00
TIMEMARK INCORPORATED	119.59
TITAN OUTDOOR, LLC	1,352.39
TOPIA TECHNOLOGY/ BIS	22,547.50
TOTAL LANDSCAPE CORP	56,846.41
TOWN & COUNTRY FENCE, INC	416.10
TOWNE CENTRE HARDWARE	2,754.74
TRANE U.S. INC.	8,211.13
UNITED RENTALS NW, INC	579.81
UNITED STATES POSTMASTER	4,967.74
UNITED WAY OF KING COUNTY	3,288.00
UNIVERSAL FIELD SERVICES	3,797.23
UNIVERSITY OF WASHINGTON	1,654.00
UPS STORE	2,785.29

URBAN LAND INSTITUTE	225.00
US POSTAL SERVICE (HASLER)	4,211.60
UTILITIES UNDERGROUND LOCATION CTR	1,011.59
VAN NESS, ALLAN	1,880.62
VERIZON WIRELESS	9,380.36
VIBRANT PLANTS INC	755.16
VIKING GRIDIRON CLUB	250.00
VOLGISTICS, INC	372.00
W.S.S.O. Advanced Training	500.00
WA ASPHALT PAVEMENT ASSOC.	180.00
WA ASSOC OF BUILDING OFFICIALS	128.09
WA ASSOC OF CODE ENFORCEMENT	305.00
WA CITIES INSURANCE AUTHORITY	161,086.00
WA FINANCE OFFICERS ASSOCIATION	575.00
WA GUARANTEED EDUCATION TUITION	1,290.00
WA RECREATION & PARK ASSOCIATION	104.00
WA STATE ASSOC OF PERMIT TECHNICIAN	95.00
WA STATE CONSOLIDATED TECH SVCS	1,050.00
WA STATE DEPARTMENT OF AGRICULTURE	33.00
WA STATE DEPT OF ENTERPRISE SVCS	6,057.54
WA STATE DEPT OF LABOR & INDUSTRIES	125.30
WA STATE DEPT OF TRANSPORTATION	22,768.48
WAFFLE WAGON	45.00
WAGE WORKS	500.00
WALC INSTITUTE	2,579.97
WASHINGTON ENERGY SERVICES	28.14
WASHINGTON MUNICIPAL CLERKS ASSOC	75.00
WASHINGTON STATE DEPT OF INFO SERV	700.00
WASHINGTON STATE OFFICE CASH MGMT	843.00
WASHINGTON TREE SERVICE INC	1,423.50
WEINSTEIN AU	1,327.50
WEISBAND, BARRY	30,000.00
WELLS FARGO FINANCIAL	11,227.65
WELWEST CONSTRUCTION INC.	109,872.85
WESTERN ENTRANCE TECHNOLOGY	3,460.20
WILCOX, ROBERTA	933.84
WINTERBOURNE LANDSCAPE	2,168.12
WM. DICKSON CO.	58,041.97
WONDERLAND DEVELOPMENT	6,750.00
ZEP SALES AND SERVICE	865.49
ZONAR SYSTEMS	525.33
ZORNES, GARY	239.52
ZUMAR	3,563.12
	<u>\$ 10,825,984.90</u>

Subject/Topic: Resolution No. 15-265 and Contract No. 15-C1489 MRSC Rosters for Small Public Works, Consultants and Vendors Proposed Council Action/Motion: Approve Resolution No. 15-265 and Authorize the City Manager to enter into contract with the Municipal Research and Services Center for Small Public Works, Consultant and Vendor Rosters, pending legal review.	For Council Meeting Agenda of: November 23, 2015 Department: Public Works Prepared by: Jennifer Gordon, Public Works Operations Manager <table border="0"><tr><td>Approved by Department Head:</td><td><u>Initial & Date</u></td></tr><tr><td>Approved by City Attorney:</td><td>Pending</td></tr><tr><td>Approved by Finance Director:</td><td>Jessie H. 11/20/15</td></tr><tr><td>Approved by City Manager:</td><td>[Signature]</td></tr></table> Exhibits/Attachments: Resolution No. 15-265 Contract No. 15-C1489 MRSC Roster Contract	Approved by Department Head:	<u>Initial & Date</u>	Approved by City Attorney:	Pending	Approved by Finance Director:	Jessie H. 11/20/15	Approved by City Manager:	[Signature]
Approved by Department Head:	<u>Initial & Date</u>								
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Approved by City Manager:	[Signature]								
<table border="0"><tr><td>Expenditure Required \$360 Annually</td><td>Amount Budgeted \$0</td><td>Appropriation Required \$</td></tr></table>		Expenditure Required \$360 Annually	Amount Budgeted \$0	Appropriation Required \$					
Expenditure Required \$360 Annually	Amount Budgeted \$0	Appropriation Required \$							
<u>INFORMATION/BACKGROUND:</u> The eCityGov Alliance was formed in 2001 by nine cities located in the Puget Sound region of Washington State. The cities partnered to form an inter-local agency with a mission of providing convenient and consistent online services to the public. The current principal partners of the Alliance are the cities of Bellevue, Bothell, Issaquah, Kenmore, Kirkland, Mercer Island, Sammamish, and Snoqualmie. One of the services provided through the eCityGov Alliance is the Shared Procurement Portal (SPP) for its Small Public Works, Consultant and Vendor Rosters. The eCitygov Alliance is terminating the SPP line of business at the end of 2015. The options for a small works roster are very limited. The City could choose to create its own roster, to join with another city or group of cities, or joint the Municipal Research and Services Center Rosters. The Municipal Research and Services Center (MRSC) can provide full maintenance of the City's Small Public Works, Consultant and Vendor Rosters. MRSC hosts individual Public Agency Rosters in a searchable shared database, support business registration, and post roster legal notices. Over 400 Washington cities, counties and special districts use the MRSC Rosters.									

Businesses apply free at anytime and have the convenient option to join multiple Public Agency rosters in one application, which is renewed annually. There are currently over 5000 businesses in the shared database.

FISCAL CONSIDERATION:

While there will be no cost savings to the City with the termination of the Shared Procurement Portal, the annual membership is minimal and can be absorbed into the current budget.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

Effective and Efficient Services

CITY OF KENMORE
WASHINGTON
RESOLUTION NO. 15-265

A RESOLUTION OF THE CITY COUNCIL OF KENMORE,
WASHINGTON, ON THE SUBJECTS OF ESTABLISHING A SMALL
PUBLIC WORKS ROSTER PROCESS TO AWARD PUBLIC WORKS
CONTRACTS, A CONSULTING SERVICES ROSTER FOR
ARCHITECTIURAL, ENGINEERING, AND OTHER PROFESSIONAL
SERVICES, AND A VENDOR ROSTER FOR GOODS AND SERVICES
NOT RELATED TO PUBLIC WORKS CONTRACTS.

WHEREAS, RCW 39.04.155 and other laws regarding contracting for public works by municipalities, allow certain contracts to be awarded by a small works roster process; and

WHEREAS, Ch. 39.80 RCW and other laws regarding contracting for consulting services by municipalities allow certain contracts to be awarded by a consultant roster process; and

WHEREAS, RCW 39.04.190, regarding purchase of materials, supplies, or equipment not connected to a public works project, allows certain purchasing contracts to be awarded by a vendor roster process;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF KENMORE, WASHINGTON,
DOES RESOLVE AS FOLLOWS:

Section 1. Replaces any previous resolutions designating rosters.

Section 2. MRSC Rosters. The City wishes to contract with the Municipal Research and Services Center of Washington (MRSC) to have their official rosters hosted in the online database for City use for small public works contracts, consulting services, and vendor services developed and maintained by MRSC through MRSC Rosters and authorize the City Staff to sign that contract.

Section 3. Small Public Works Roster. The following small works roster procedures are established for use by the City pursuant to RCW 39.04.155:

1. **Cost.** The City need not comply with formal sealed bidding procedures for the construction, building, renovation, remodeling, alteration, repair, or improvement of real property where the estimated cost does not exceed Three Hundred Thousand Dollars (\$300,000.00), which includes the costs of labor, material, equipment, sales, or use taxes as applicable. Instead, the City may use the Small Public Works Roster procedures for public works projects as set forth in this resolution. The breaking of any project into units or accomplishing any projects by phases is prohibited if it is done for the purpose of avoiding the maximum dollar amount of a contract that may be let using the small works roster process.

2. **Publication.** At least once a year, MRSC shall, on behalf of the City, publish in a newspaper of general circulation within the municipality's jurisdiction a notice of the existence of the small works roster and solicit the names of contractors for the small works roster. MRSC shall add responsible contractors to the small works roster at any time that a contractor completes the online application provided by MRSC, and meets minimum State requirements for roster listing.

3. Telephone, Written, or Electronic Quotations. The City shall obtain telephone, written, or electronic quotations for public works contracts from contractors on the appropriate small works roster to assure that a competitive price is established and to award contracts to a contractor who meets the mandatory bidder responsibility criteria in RCW 39.04.350(1). The City may establish supplementary bidder criteria under RCW 39.04.350 (2) to be considered in the process of awarding a contract.

- a) A contract awarded from a small works roster will not be advertised. Invitations for quotations shall include an estimate of the scope and nature of the work to be performed as well as materials and equipment to be furnished. However, detailed plans and specifications need not be included in the invitation.
- b) Quotations may be invited from all appropriate contractors on the appropriate small works roster. As an alternative, quotations may be invited from at least five contractors on the appropriate small works roster who have indicated the capability of performing the kind of work being contracted, in a manner that will equitably distribute the opportunity among the contractors on the appropriate roster. "Equitably distribute" means that the City may not favor certain contractors on the appropriate small works roster over other contractors on the appropriate small works roster who perform similar services.

If the estimated cost of the work is from one hundred and fifty thousand dollars (\$150,000) to three hundred thousand dollars (\$300,000), the City may choose to solicit bids from less than all the appropriate contractors on the appropriate small works roster but must notify the remaining contractors on the appropriate small works roster that quotations on the work are being sought. The City has the sole option of determining whether this notice to the remaining contractors is made by:

- (i) publishing notice in a legal newspaper in general circulation in the area where the work is to be done;
 - (ii) mailing a notice to these contractors; or
 - (iii) sending a notice to these contractors by facsimile or email.
- c) At the time bids are solicited, the City representative shall not inform a contractor of the terms or amount of any other contractor's bid for the same project;
 - d) A written record shall be made by the City representative of each contractor's bid on the project and of any conditions imposed on the bid. Immediately after an award is made, the bid quotations obtained shall be recorded, open to public inspection, and available by telephone inquiry.

4. Limited Public Works Process. If a work, construction, alteration, repair, or improvement project is estimated to cost less than thirty-five thousand dollars (\$35,000), the City may award such a contract using the limited public works process provided under RCW 39.04.155 (3). For a limited public works project, the City will solicit electronic or written quotations from a minimum of three contractors from the appropriate small works roster and shall award the contract to the lowest responsible bidder as defined under RCW 39.04.010. After an award is made, the quotations shall be open to public inspection and available by electronic request.

For limited public works projects, the City may waive the payment and performance bond requirements of chapter 39.08 RCW and the retainage requirements of chapter 60.28 RCW, thereby assuming the liability for the contractor's nonpayment of laborers, mechanics, subcontractors, material men, suppliers, and taxes imposed under Title 82 RCW that may be due from the contractor for the limited public works project. However, the City shall have the right of recovery against the contractor for any payments made on the contractor's behalf.

The City shall maintain a list of the contractors contacted and the contracts awarded during the previous 24 months under the limited public works process, including the name of the contractor, the contractor's registration number, the amount of the contract, a brief description of the type of work performed, and the date the contract was awarded.

5. **Determining Lowest Responsible Bidder.** The City Council shall award the contract for the public works project to the lowest responsible bidder provided that, whenever there is a reason to believe that the lowest acceptable bid is not the best price obtainable, all bids may be rejected and the City Council may call for new bids. A responsible bidder shall be a registered or licensed contractor who meets the mandatory bidder responsibility criteria established by Chapter 133, Laws of 2007 (SHB 2010) and who meets any supplementary bidder responsibility criteria established by the City.

6. **Award.** All of the bids or quotations shall be collected by the City Manager or his designee.

- a) The City Manager or his designee shall then present all bids or quotations and their recommendation for award of the contract to the City Council. The City Council shall consider all bids or quotations received, determine the lowest responsible bidder, and award the contract; or
- b) If the City Council delegates the authority to award bids to an City Manager of the City for public works projects costing less than or equal to \$50,000.00, the City Manager shall have the authority to award public works contracts without City Council approval, provided that the City Council shall ratify the City Manager's approval at the next scheduled City Council meeting by means of the consent agenda. For public works projects costing more than \$50,000.00, the City Council shall award all public works contracts.

Section 4. Consulting Services Roster. The following consulting services roster procedures are established for use by the City pursuant to RCW 39.80.030:

1. **Consulting Services.** Consulting services are professional services that have a primarily intellectual output or product and include architectural and engineering services as defined in RCW 39.80.020.

2. **Publication.** At least once a year, MRSC shall, on behalf of the City, publish in a newspaper of general circulation within the municipality's jurisdiction a notice of the existence of the consulting services roster and solicit the names of consultants for the consulting services roster. MRSC shall add responsible consultants to the consulting services roster at any time that a consultant completes the online application provided by MRSC, upload a Statement of Qualifications, and meets minimum State requirements for roster listing.

3. **Review and Selection of the Statement of Qualifications Proposals.** The City shall use the following process to select the most highly qualified Architectural or Engineering firm off of the Consulting Services Roster to provide the required services:

- a) The City Council shall establish criteria that the City Manager, or their designee, must consider in evaluating Architectural or Engineering firms for a given project. Such criteria shall include a plan to insure that minority and women-owned firms and veteran-owned firms are afforded the maximum practicable opportunity to compete for and obtain public contracts for architectural or engineering services. The level of participation by minority and women-owned firms and veteran-owned firms shall be consistent with their general availability within the jurisdiction of the City of Kenmore.
- b) The City Manager, or their designee, shall evaluate the written statements of qualifications and performance data on file with City of Kenmore at the time that architectural or engineering services are required;

- c) Such evaluations shall be based on the criteria established by the City Council; and
- d) The City Manager, or their designee, shall conduct discussions with one or more firms regarding anticipated concepts and the relative utility of alternative methods of approach for furnishing the required services.
- e) The firm deemed most highly qualified by the agency to do the project will be selected.

4. Award.

- a) The City Council considers the proposal received and awards the contract; or
- b) If the City Council delegates the authority to award projects to the City Manager of the City for consulting services costing less than or equal to \$50,000.00, the City Manager shall have the authority to award contracts for consulting services without City Council approval, provided that the City Council shall ratify the City Manager's approval at the next scheduled City Council meeting by means of the consent agenda. For consulting services costing more than \$50,000.00, the City Council shall award all contracts for consulting services.

Section 5. Vendor List Roster. The following vendor list roster procedures are established for use by the City pursuant to RCW 39.04.190:

1. Purchase of materials, supplies, or equipment not connected to a public works project. The City is not required to use formal sealed bidding procedures to purchase materials, supplies, or equipment not connected to a public works project where the cost will not exceed \$50,000.00. The City will attempt to obtain the lowest practical price for such goods and services.

2. Publication. At least twice per year, MRSC shall, on behalf of the City, publish in a newspaper of general circulation within the municipality's jurisdiction a notice of the existence of the vendor list roster and solicit the names of vendors for the vendor list roster. MRSC shall add responsible vendors to the vendor list roster at any time when a vendor completes the online application provided by MRSC, and meets minimum State requirements for roster listing.

3. Telephone, Written, or Electronic Quotations. The City shall use the following process to obtain telephone or written quotations from vendors for the purchase of materials, supplies, or equipment not connected to a public works project:

- a) A written description shall be drafted of the specific materials, supplies, or equipment to be purchased, including the number, quantity, quality, and type desired, the proposed delivery date, and any other significant terms of purchase;
- b) The City Manager, or their designee, shall make a good faith effort to contact at least three (3) of the vendors on the roster to obtain telephone or written quotations from the vendors for the required materials, supplies, or equipment;
- c) The City Manager, or their designee, shall not share telephone or written quotations received from one vendor with other vendors soliciting for the bid to provide the materials, supplies, or equipment;
- d) A written record shall be made by the City Manager, or their designee, of each vendor's bid on the material, supplies, or equipment, and of any conditions imposed on the bid by such vendor;

4. Determining the Lowest Responsible Bidder. The City shall purchase the materials, supplies, or equipment from the lowest responsible bidder, provided that whenever there is reason to believe that the lowest acceptable bid is not the best price obtainable, all bids may be rejected and the City may call for new bids.

5. Award. All of the bids or quotations shall be collected by the City Manager or his designee. The City Manager, or their designee, shall create a written record of all bids or quotations received, which shall be made open to public inspection or telephone inquiry after the award of the contract. Any contract awarded under this subsection need not be advertised.

- a) The City Manager, or their designee, shall then present all bids or quotations and their recommendation for award of the contract to the City Council. The City Council shall consider all bids or quotations received, determine the lowest responsible bidder, and award the contract; or
- b) If the City Council delegates the authority to award bids to an City Manager of the City for materials, supplies, or equipment costing less than or equal to \$50,000.00, the City Manager shall have the authority to award public works contracts without City Council approval, provided that the City Council shall ratify the City Manager's approval at the next scheduled City Council meeting by means of the consent agenda. For materials, supplies, or equipment costing more than \$50,000.00, the City Council shall award all vendor contracts.

6. Posting. A list of all contracts awarded under these procedures shall be posted at the City main administrative offices once every two months. The list shall contain the name of the vendor awarded the contract, the amount of the contract, a brief description of the items purchased, and the date it was awarded.

PASSED BY THE CITY COUNCIL OF THE CITY OF KENMORE, WASHINGTON, AT A REGULAR MEETING THEREOF THIS ____ DAY OF _____, 2015.

CITY OF KENMORE

David Baker, Mayor

ATTEST/AUTHENTICATED:

Patty Safrin, City Clerk

APPROVED AS TO FORM:

Rod Kaseguma, City Attorney



Washington Public Agency Contract Small Works and Consultant Rosters

This contract (the "Contract") is made by and between Municipal Research and Services Center of Washington ("MRSC"), a not-for-profit corporation, and the Washington local government (the "Public Agency"),

City of Kenmore

1. Purpose. The purpose of this Contract is to provide the Public Agency with membership in MRSC Rosters.
2. Scope of Services. MRSC shall host the entire Public Agency's individual Small Public Works Roster ("Small Works Roster") and individual Consultant Roster ("Consultant Roster"), (collectively "Rosters"). MRSC shall advertise at least annually for the Small Works Roster and Consultant Roster in accordance with statutory requirements on behalf of the Public Agency. MRSC will assist small public works and consultant business (collectively, "businesses") with roster registration throughout the year, receive applications, review applicant eligibility for compliance with basic statutory eligibility requirements, and maintain business applications in an online database.
3. Effective Date and Term. This Contract shall be effective in the year in which it is signed on either May 1 if signed prior to May 1 or December 1 if signed prior to December 1, for a period of one year.
4. Access to MRSC Rosters by Public Agency Prior to Legal Notice. As of the Contract effective date, the Public Agency may access the MRSC Rosters database at www.mrsicrosters.org by entering its account login information, as will be provided by MRSC. The Public Agency may search for and view business applications as of the effective date of the Contract, but it may not contact businesses about roster projects until after the legal notice is posted.
5. Notification of Transition to MRSC Rosters. As of the contract effective date, the Public Agency may begin notifying interested businesses that they may register with the Public Agency at any time in the MRSC Rosters, but that the Public Agency will not begin using the hosted rosters until after the legal notice is posted.
6. Roster Legal Notice. MRSC shall post the statutorily-required roster legal notice on behalf of the Public Agency in a newspaper of general circulation relative to the location of the Public Agency. The notice will occur the first Monday of January or June, or during the week of the first Monday of January or June for weekly newspapers.
7. Use of MRSC Rosters by Public Agency. As of the date of the applicable legal notice in January or June, all departments of the Public Agency will discontinue use of any previously-maintained rosters and begin using the MRSC Rosters exclusively when choosing to follow a roster contracting process, in accordance with the following statutory requirements:
 - (a) Small Works Roster. The Public Agency will use the Small Works Roster to select businesses for public work projects in accordance with RCW 39.04.155, as now or hereafter amended. The Public Agency shall be responsible for its own and the selected businesses' compliance with all other laws and regulations governing public works contracting, including retainage and bonds, prevailing wages, and any other applicable requirements.
 - (b) Consultant Roster. The Public Agency will use the Consultant Roster to select businesses for consultant projects in accordance with the laws and ordinances applicable to the Public Agency, including Chapter 39.80 RCW when contracting for architectural and engineering services. The Public Agency shall be responsible for its own and the selected businesses' compliance with all laws and regulations governing the purchase of services.

8. Compensation of Businesses. The Public Agency shall be responsible for payments to any business that it selects as a result of its use of MRSC Rosters. The Public Agency shall make all such payments directly to the businesses selected by the Public Agency.

9. Annual Membership Fee. The Public Agency will pay MRSC an annual membership fee based on the five-year average of the Public Agency's total capital expenditures. Payment of the annual membership fee is due within thirty (30) days of the Contract effective date.

Based on the following Membership Fee Scale, the Public Agency will pay an annual membership fee of \$ **360**.

Total Capital Expenditures	Annual Membership Fee
Less than 5 million	\$120
5 to 10 million	\$240
10 to 15 million	\$360
15 to 25 million	\$480
25 to 50 million	\$600
More than 50 million	\$900

10. Relationship of Parties. MRSC will perform the services under this Contract as an independent contractor and not as an agent, employee, or servant of the Public Agency. Nothing in this Contract shall be construed to render the parties partners or joint venturers.

11. Limitation of MRSC Liability. MRSC shall not be, directly or impliedly, a party to any contract with small works, consulting, or vendor businesses which the Public Agency may enter into as a result of the Public Agency's use of the MRSC Rosters. MRSC does not accept responsibility or liability for the performance of any business used by the Public Agency as a result of its use of the MRSC Rosters.

12. Hold Harmless and Indemnification. Each party shall defend, indemnify, and hold the other party harmless from any and all claims, injuries, damages, losses, or suits, including attorney fees, to the extent arising from any negligent act or omission of that party's officers, employees, volunteers, and agents in connection with the performance of this Contract.

13. Termination. This Contract may be terminated, with or without cause, by written notice of either party to the other. Termination shall be effective thirty (30) days after written notice. Termination of the contract by the Public Agency does not entitle the Public Agency to a refund of the membership fee prorated as to the time remaining in the contract term following termination.

14. Renewal. This Contract may be renewed annually by completing the online renewal process that includes confirming that the Public Agency will continue abiding by the terms outlined in this Contract and making payment within thirty (30) days from the effective date of either May 1 or December 1.

15. Non-assignment. MRSC shall contract with Upwards Technologies for the hosting of the Public Agency rosters in the online database. MRSC shall not otherwise subcontract or assign any of the rights, duties, or obligations imposed upon it by this Contract without the prior express written consent of the Public Agency.

16. Governing Law and Venue. This Contract shall be governed by the laws of the State of Washington.

18. Severability. Should any clause, phrase, sentence or paragraph of this Contract be declared invalid or void, the remaining provisions of this Contract shall remain in full force and effect.

19. Complete Agreement. This Contract constitutes the entire understanding of the parties. Any written or verbal agreements that are not set forth herein or incorporated herein by reference are expressly excluded.

20. Public Agency Information. For purposes of Contract administration, the Public Agency provides the following information:

Official Public Agency Name: City of Kenmore
 Common Public Agency Name (if different): _____
 Mailing Address: PO Box 82607
Kenmore, WA 98028

 County: KING
 Type of Public Agency: City
 Website: www.cityofkenmore.com

Primary Contact:

Name: Jennifer Gordon
 Title: Public Works Operations Manager
 Email: jgordon@kenmorewa.gov
 Telephone: 425-984-6160
 Facsimile: 425-486-3236

Additional Contact:

Name: Joanne Gregory
 Title: Finance Director
 Email: jgregory@kenmorewa.gov
 Telephone: 425-984-6190
 Facsimile: 425-486-3236

21. Signatures. By signing this Contract, the Public Agency signatory below certifies that he/she has the authority to enter into this Contract on behalf of the entire Public Agency.

PUBLIC AGENCY

 [Signature]

 [Title]

 [Date]

MRSC

 [Signature]
MRSC Rosters Manager
 [Title]

 [Date]

Subject/Topic: Amendment #1 to Contract No. 14-C1267, an Interlocal Agreement between the City of Kenmore and SCORE (South Correctional Entity) for inmate housing and jail services	For Council Meeting Agenda of: 23 November 2015 Department: Executive Prepared by: Leslie Harris, Community Relations Manager/Policy Analyst; Cliff Sether, Police Chief; Joanne Gregory, Finance Director <u>Initial & Date</u> Approved by Department Head: Approved by City Attorney: Approved by Finance Director: Approved by City Manager:	
Proposed Council Action/Motion: Approve Amendment #1 to Contract No. 14-C1267, an Interlocal Agreement between the City of Kenmore and SCORE (South Correctional Entity) for inmate housing and jail services	Exhibits/Attachments: 1) Proposed Amendment #1 to Contract No. 14-C1267 2) Original Contract No. 14-C1267	
Expenditure Required \$968,000	Amount Budgeted \$968,000 in 2015-2016 Biennium for jail services	Appropriation Required \$0
<u>INFORMATION/BACKGROUND:</u> In April 2014, the City entered into an Interlocal Agreement with the South Correctional Entity (SCORE) for inmate housing and jail services after receiving notification that the Snohomish County Jail would no longer be able to accommodate the cities' misdemeanor jail population in the County jail. The proposed contract amendment renews the City's Interlocal Agreement with SCORE for inmate housing and jail services. SCORE continues to be the most cost effective alternative. The current contract expires on December 31, 2015. Notable amendments to the contract include: • Extends the term of the contract to December 31, 2018. • Adjusts the rate for 2016 by an increase of approximately 9%. Rates are established based upon actual expenses from the period of April 1 – March 31 of each year. Most of the increase is based upon additional staffing in the areas of medical and mental health services. SCORE has seen an increase in both the volume and severity of medical and mental health issues and will need to adjust staffing to continue to meet the needs and service level expectations. ▪ Guaranteed Bed Rate in 2016: \$105, increase from the 2015 rate of \$97. The guaranteed bed rates include a monthly average of nine (9) beds. ▪ Non-Guaranteed Bed Rate in 2016: \$157, increase from the 2015 rate of \$145. This bed rate applies when the City exceeds their usage of the guaranteed beds by more than 100%, or 18 beds.		

- Eliminates the specialty housing surcharge..
- It provides for SCORE to provide hospital guarding services at the rate of \$65 per hour. If an inmate is admitted to a hospital, the City is responsible for hospital security. With a small police department, it can be difficult to find an officer to go to the hospital for guard duty. This arrangement will allow the City to request SCORE to provide hospital security services, if available.

The City maintains its agreement with King County for those instances when SCORE refuses inmates or when the judge orders work release. This agreement does not expire until December 31, 2020.

FISCAL CONSIDERATION:

The jail services line item is operating ahead of budget. Staff will review in 2016 to see if a budget amendment is required based on volume experience and the increase in the bed rate.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

Consistent with Mission Statement on providing efficient, effective services and public safety

**FIRST AMENDMENT TO INTERLOCAL AGREEMENT BETWEEN
CITY OF KENMORE AND SCORE FOR
INMATE HOUSING AND JAIL SERVICES**

THIS FIRST AMENDMENT TO INTERLOCAL AGREEMENT FOR INMATE HOUSING AND JAIL SERVICES (hereinafter FIRST Amendment to the Original Agreement”), dated April 4, 2014, is made and entered into by and between the **SOUTH CORRECTIONAL ENTITY**, a governmental administrative agency formed pursuant to RCW 39.34.030(3) (“SCORE”) and the **CITY OF KENMORE**, a municipal corporation organized under the laws of the State of Washington (hereinafter the “City,” and together with SCORE, the “Parties” or individually a “Party”), and amends that certain Agreement for Inmate Housing effective for the period May 1, 2014 through December 31, 2015 by and between the Parties, as previously amended (the “Original Agreement”).

WHEREAS, the Parties entered into the Original Agreement for the purpose of establishing the terms and conditions pursuant to which the City will transfer custody of certain inmates to SCORE to be housed at SCORE’s correctional facility (the “Facility”); and

WHEREAS, at a regular meeting held on July 22, 2015, the Administrative Board of SCORE (the “Board”) approved a new rate structure for inmate housing at the Facility; and

WHEREAS, the Parties now desire to amend the Original Agreement to reflect the new rate structure as set forth herein;

NOW, THEREFORE, the Parties hereto agree as follows:

Section 1.01. Definitions. All capitalized words and phrases, including those in the recitals, not otherwise defined herein shall have the meanings given to them in the Original Agreement.

Section 1.02. Amendments to Original Agreement.

1) Bed Rate. Effective January 1, 2016, Section 27 of the Original Agreement is hereby replaced in its entirety with the following:

27. Bed Rate. In consideration of SCORE’s commitment to house City Inmates, the City shall pay SCORE based upon the rates and other applicable fees or charges stated in this Agreement.

A. Guaranteed Bed Rate:

2016	\$105.00
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Number of Guaranteed Beds	9
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Non-Guaranteed (or excess use) Rate:

2016	\$157.00
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City's use of guaranteed beds is averaged on a monthly basis. All contract rates are established to recover full cost of services. Guaranteed Rates for the following year will be based upon actual expenses from the period of April 1 – March 31 of each calendar year. An estimate of the Guaranteed Rates will be provided by July 1 of each year for the following year.

The Guaranteed Rate includes all in-facility medical, dental (if available), and mental health services, and pharmaceuticals, except for medications for HIV, hepatitis, and biologics. In the event a City Inmate requires out-of-facility medical, dental or mental health services, the City shall be responsible for the cost of the services.

SCORE shall not charge a booking fee in connection with housing the City's Inmates.

Should the City exceed their usage of the guaranteed beds by more than 100%, or 18 beds, the rate for those beds in excess of that amount will be charged at the Non-Guaranteed Rate.

The City will have an opportunity to adjust the guaranteed bed quantity prior to July 1, of the proceeding year for the next calendar year.

2) Specialty Housing Surcharge. Effective January 1, 2016, Section 28 (Specialty Housing Surcharge) of the Original Agreement is hereby removed in its entirety.

3) Health Care. Effective January 1, 2016, Section 12 (Health Care) of the Original Agreement is hereby replaced with the following:

Health Care. SCORE shall provide in-facility medical care commonly associated with corrections operations as guided by American Correctional Association or National Commission on Correctional Health Care standards if accredited.

City Inmates shall be responsible for co-payment for health services according to SCORE policy. The City shall not be responsible to SCORE for City Inmate co-payments. No City Inmate shall be denied necessary health care because of an inability to pay for health services.

SCORE shall notify the City's designee(s) via electronic means, including e-mail or fax, at the notice address identified in this Agreement if a City Inmate requires medical, mental health, dental, or other medical services at an outside medical or health care facility. The City shall be responsible to promptly notify SCORE of any changes in its designee(s).

SCORE shall notify the City within a reasonable time period before the City Inmate receives medical, mental health, dental or any other medical services outside of the SCORE Facility. The City acknowledges that such notice may not be reasonably possible prior to emergency care.

The City shall pay for all medical, mental health, most pharmaceuticals, dental or any other medical services that are required to care for City Inmates outside of the SCORE Facility. Pharmaceutical prescribed for the treatment of Hepatitis, HIV, and biologics are not covered within the daily rate. Lack of prior notice shall not excuse the City from financial responsibility for related medical expenses, and shall not be a basis for imposing financial responsibility for related medical expenses on SCORE. SCORE shall bear the expense of any such medical care necessitated by improper conduct of SCORE, or of its officers or agents.

If a City inmate is admitted to a hospital, the City will be responsible for hospital security unless other arrangements are made with SCORE. SCORE may provide hospital security services at a rate of \$65 per hour for each hour if staff is available.

Outside medical expenses for City Inmates housed on behalf of more than one jurisdiction shall be the sole responsibility of the City, which will be solely responsible to recoup these expenses from other jurisdictions.

4) **Term.** Based upon the conditions established in Section 32 of the Original Agreement, the Term is hereby modified to reflect the following:

1. Purpose and Term. The purpose and intent of this Agreement is to establish the terms under which SCORE will house certain inmates of the City for the period of January 1, 2016 through December 31, 2018.

Section 1.03. Effective Date of Rate Modification. The Parties hereby agree that the rate amendment set forth in Section 1.02(1) of this First Amendment shall be effective beginning January 1, 2016.

Section 1.04. Survival of Provisions. Except to the extent modified by this First Amendment, the terms of the Original Agreement shall continue in full force and effect until the expiration or termination of the Original Agreement in accordance with its terms.

IN WITNESS WHEREOF, the parties hereto have executed this First Amendment, all as of the day and year first above mentioned.

CITY OF KENMORE

SOUTH CORRECTIONAL ENTITY

By _____

By _____
Penny Bartley, Executive Director

ATTEST:

By _____

City Clerk

APPROVED AS TO FORM:

By _____

City Attorney

City of Kenmore Contract No. 14-C1267

**INTERLOCAL AGREEMENT BETWEEN
CITY OF KENMORE AND SCORE FOR
INMATE HOUSING & JAIL SERVICES**

THIS INTERLOCAL AGREEMENT FOR INMATE HOUSING AND JAIL SERVICES (hereinafter "Agreement") is made and entered into by and between the **South Correctional Entity**, a governmental administrative agency formed pursuant to RCW 39.34.030(3) ("SCORE") and **City of Kenmore**, a municipal corporation organized under the laws of the State of Washington (hereinafter the "City," and together with SCORE, the "Parties" or individually "Party").

This Agreement is made in accordance with chapters 39.34.080, 39.34.180, and 70.48 of the Revised Code of Washington ("RCW") for the purpose of establishing the terms and conditions pursuant to which the City will transfer custody of certain inmates to SCORE to be housed at SCORE's correctional facility.

In consideration of the mutual covenants, conditions, and promises contained herein, the Parties hereto mutually agree as follows:

1. Purpose and Term. The purpose and intent of this Agreement is to establish the terms under which SCORE will provide jail services and house certain City Inmates for the period of May 1, 2014 through December 31, 2015.

2. Definitions.

Business Day – Monday through Friday excluding SCORE observed holidays.

Committing Court – the court that issued the order or sentence that established the City's custody of a City Inmate.

Credit for Time Served – credit authorized by the sentencing court against the number of days to be served in confinement.

Detainer – a legal order authorizing or commanding another agency a right to take custody of a person.

City Inmate – a person subject to City custody who is transferred to SCORE's custody under this Agreement. "City Inmate" shall not include a person arrested for a felony offense by a City officer, a person arrested on a warrant issued by another jurisdiction or for charges initiated by a non-City officer, or a person charged by the prosecutor with a felony or an attempt to commit a felony even if there is a plea to or conviction of a lesser offense.

Good Time – Time earned by Inmates for good behavior while in custody. Good Time will be awarded at the conclusion of an Inmate's sentence and will comply with restrictions imposed by RCW 9.92.151

Inmate – persons transferred to SCORE's custody to be housed at the SCORE Facility, which shall include City Inmates.

Member City – shall have the meaning set forth in the Amended and Restated SCORE Interlocal Agreement dated as of October 1, 2009 among the Cities of Auburn, Burien, Des Moines, Federal Way, Renton, SeaTac and Tukwila, Washington, as amended from time to time.

SCORE Facility – the correctional facility operated by SCORE located at 20817 17th Avenue South, Des Moines, WA 98198.

Specialty Housing – Inmates classified and held within specialty populations, either in medical or mental health housing, or other Specialty Housing such as administrative segregation.

3. General Provisions. SCORE shall accept City Inmates according to the terms of this Agreement and shall furnish its facilities and personnel and provide housing, care, and custody of those City Inmates pursuant to SCORE policies and procedures and in the same manner and to the same extent as SCORE provides such services to other contracting agencies.

SCORE shall manage, maintain, and operate the SCORE Facility in compliance with all applicable federal, state, and local laws and regulations.

4. Right to Refuse or Return City Inmate. To the greatest extent permitted by law, SCORE shall have the right to refuse to accept a City Inmate or to return a City Inmate to the City if the City Inmate has a current illness or injury that is listed in **Attachment A – Medical Acceptability**, or in the reasonable judgment of SCORE presents a substantial risk of escape, or of injury to self or other persons or property, or of adversely affecting or significantly disrupting the operations of the SCORE Facility. SCORE shall provide notice to the City at least one business day prior to transport if a City Inmate is being returned to the City. The cost of transport shall be paid by the City.

5. Inmate Transport. The City is responsible for the transportation of City Inmates to the SCORE Facility, including costs associated therewith. SCORE will provide transportation upon release to either the closest Member City of arrest, or the Member City of residence, whichever is closer, unless confirmed transportation is available at the time of release. The City will also designate drop-off locations within their jurisdiction for this purpose that are mutually acceptable.

6. Inmate Medical Records. Should a City Inmate receive medical care for injuries or illness at the time of arrest, and prior to booking at the SCORE Facility, to the extent permitted by law, the City shall provide copies of medical records documenting such medical care to SCORE at the time of booking if the City has access to such records. SCORE may require these records to determine if City Inmates meet conditions identified in **Attachment A – Medical Acceptability**. If the City cannot provide such records, SCORE, in its sole discretion, may refuse to accept a City Inmate.

7. Inmate Property. SCORE shall accept City Inmate property in accordance with **Attachment B – Property**, and shall be responsible only for City Inmate property actually delivered into SCORE's possession. SCORE shall hold and handle each City Inmate's property pursuant to SCORE policies and procedures and in the same manner it holds and handles property of other Inmates. In the event a City Inmate is being transported from a City designated detention or correction facility, it will be the responsibility of the City to process the City Inmate's property not delivered and accepted into SCORE's possession. When returning City Inmates to the City, SCORE shall transport City Inmate property according to the provisions of **Attachment B – Property**, and it shall be the responsibility of SCORE to process any of the City Inmate's property not transported with the City Inmate.

8. Booking. City Inmates shall be booked pursuant to SCORE's booking policies and procedures, which policies and procedures SCORE shall provide to the City upon execution of this Agreement.

Pursuant to RCW 70.48.130, and as part of the booking procedure, SCORE shall obtain general information concerning the City Inmate's ability to pay for medical care, including

insurance or other medical benefits or resources to which a City Inmate is entitled. The information is to be used for third party billing.

9. Classification. City Inmates shall be classified pursuant to SCORE's classification policies and procedures, and within the sole discretion and judgment of SCORE. The City shall provide information regarding each City Inmate as specified in **Attachment C – Classification**.

10. Housing. City Inmates shall be assigned to housing pursuant to SCORE's policies and procedures, and within the sole discretion and judgment of SCORE.

11. Inmate Work Programs. SCORE may assign City Inmates to work programs such as inside and outside work crews, kitchen and facility duties, and other appropriate duties pursuant to SCORE's policies and procedures and within the sole discretion and judgment of SCORE.

12. Health Care. SCORE shall provide in-facility medical care commonly associated with corrections operations as guided by American Correctional Association or National Commission on Correctional Health Care standards if accredited.

City Inmates shall be responsible for co-payment for health services according to SCORE policy. The City shall not be responsible to SCORE for City Inmate co-payments. Pursuant to RCW 70.48.130, no City Inmate shall be denied necessary health care because of an inability to pay for health services.

SCORE shall notify the City's designee(s) via electronic means, including e-mail or fax, at the notice address identified in this Agreement if a City Inmate requires medical, mental health, dental, or other medical services at an outside medical or health care facility. The City shall be responsible to promptly notify SCORE of any changes in its designee(s).

SCORE shall notify the City within a reasonable time period before the City Inmate receives medical, mental health, dental or any other medical services outside of the SCORE Facility. The City acknowledges that such notice may not be reasonably possible prior to emergency care.

The City shall pay for all medical, mental health, most pharmaceuticals, dental or any other medical services that are required to care for City Inmates outside of the SCORE Facility. Pharmaceutical prescribed for the treatment of Hepatitis, HIV, and biologics are not covered within the daily rate. Lack of prior notice shall not excuse the City from financial responsibility for related medical expenses, and shall not be a basis for imposing financial responsibility for related medical expenses on SCORE. SCORE shall bear the expense of any such medical care necessitated by improper conduct of SCORE, or of its officers or agents.

If a City inmate is admitted to a hospital, the City will be responsible for hospital security unless other arrangements are made with SCORE. SCORE may provide hospital security services for an additional charge if staff is available.

Outside medical expenses for City Inmates housed on behalf of more than one jurisdiction shall be the sole responsibility of the City, which will be solely responsible to recoup these expenses from other jurisdictions.

The above paragraphs relating to medical costs are intended solely to define the obligations between the Parties to this Agreement. Nothing contained herein shall be construed to waive the rights of either Party to seek reimbursement for costs from the

department of social and health services, or from the City Inmate, or any other responsible third party.

13. Inmate Discipline. SCORE shall discipline City Inmates according to SCORE policies and procedures and in the same manner which other Inmates are disciplined; provided, however, nothing contained herein shall be construed to authorize the imposition of a type of discipline that would not be imposed on a comparable Inmate, up to and including the removal of earned early release credits as approved by the City.

14. Removal from the SCORE Facility. Except for work programs or health care, and during emergencies, City Inmates shall not be removed from the SCORE Facility without written authorization from the City or by the order of a court of competent jurisdiction. Other jurisdictions may "borrow" a City Inmate only according to the provisions of **Attachment D – Borrowing**. In the event of the City Inmate's emergency removal, SCORE shall notify the City by electronic means, including e-mail or fax, as soon as reasonably possible. No early release or alternative to incarceration, home detention, or work release shall be granted to any Inmate without written authorization by the committing court.

15. Visitation. SCORE shall provide reasonable scheduled visitation for attorneys, spouses, family and friends of City Inmates. Inmate visitation by friends and family will be accessible via video connection by third party provider at off-site locations for an access fee. Complimentary video access is available at the SCORE facility. Off-site professional visits (legal and religious) will be provided without additional costs to the City.

16. Inmate-Attorney Communication. Confidential telephones or visitation rooms shall be available to City Inmates to communicate with their legal counsel. City will provide to SCORE any numbers inmates should use to reach legal counsel.

17. Inmate Accounts. SCORE shall establish and maintain a non-interest bearing account for each City Inmate. SCORE shall ensure family members and others have a reasonable process to add funds to a City Inmate's account. Upon returning custody of a City Inmate to the City, SCORE shall transfer the balance of that City Inmate's account that is not subject to charges, to the City Inmate or to the City in the form of cash, check, debit card or other agreed upon methods in the name of the City Inmate.

In the event that SCORE contracts with a company/business that furnishes technology for wireless inmate account crediting, the City may allow SCORE (or SCORE's contracted representative) to install the equipment necessary for use of the system. The City shall not be financially responsible for any aspect of the system, including but not limited to installation or maintenance costs. The City shall not receive any compensation or profits arising from such a system.

18. Detainers. Inmates in a "Detainer" status shall be handled according to **Attachment E – Warrants/Other Court Orders/Detainers**.

19. Releases. Inmates will be released in accordance with **Attachment F – Inmate Release**.

SCORE shall not transfer custody of a City Inmate housed pursuant to this Agreement to any party other than the City, except as provided in this Agreement or as directed by the City.

20. Jail Sentence Calculations. SCORE will award Good Time credits for Inmates in custody in accordance with state law and any policies adopted by SCORE. City is

responsible to notify SCORE of any credit days awarded for time served by use of court commitment forms.

21. Release of Holds and Court Appearances. If a court of limited jurisdiction of the City releases a hold on a City Inmate still incarcerated at the SCORE Facility, SCORE will not facilitate further court appearances of that City Inmate except if the City wishes to use the video arraignment system at the SCORE Facility. In such case, there will be a twenty-five dollar (\$25) hearing fee assessed per video appearance for court matters for which the inmate is not being held.

22. Escape. If a City Inmate escapes SCORE's custody, SCORE shall notify the City as soon as reasonably possible. SCORE shall use all reasonable efforts to pursue and regain custody of escaped City Inmates.

23. Death. If a City Inmate dies while in SCORE custody, SCORE shall notify the City as soon as reasonably possible. The King County Medical Examiner shall assume custody of the City Inmate's body. Unless another agency becomes responsible for investigation, SCORE's Member Cities shall investigate and shall provide the City with a report of its investigation. The City may participate in the investigation. If another agency becomes responsible for investigation, SCORE shall serve as a liaison or otherwise facilitate the City's communication with and receipt of reports from the other agency.

The City shall provide SCORE with written instructions regarding the disposition of the City Inmate's body. The City shall pay for all reasonable expenses for the preparation and shipment of the body. The City may request in writing that SCORE arrange for burial and all matters related or incidental thereto and the City shall be responsible for all costs associated with this request.

24. Reporting Requirements. SCORE will work with the City to provide access to jail management systems that provide statistical information about Inmates. Other reports may be available within standard workload limitations.

25. City's Right of Inspection. The City shall have the right, upon reasonable advance notice, to inspect the SCORE Facility at reasonable times. During such inspections, the City may interview City Inmates and review City Inmates' records. The City shall have no right to interview Inmates housed for other jurisdictions or to review their records, unless City is properly authorized to do so by the Inmate or the other jurisdiction.

26. Technology. SCORE and the City may each permit the other continuous access to its computer database regarding all City Inmates housed by SCORE. This continuous access feature may be accomplished through a computer link between a computer(s) designated by the City and appropriate computer(s) of SCORE.

27. Bed Rate. In consideration of SCORE's commitment to house City Inmates, the City shall pay SCORE based upon the rates and other applicable fees or charges stated in this Agreement. The Bed Rate includes the per day inmate fee that the City agrees to pay SCORE for housing City Inmates at the SCORE Facility and providing the jail services contemplated by this Agreement.

Guaranteed Bed Rate: **\$90**

The City hereby selects to guarantee 5 beds.

The City declines to guarantee beds and will pay the Non-Guaranteed bed rate. _____

Non-Guaranteed Bed Rate: **\$135**

The above referenced Non-Guaranteed Bed Rate (the "Daily Rate") is based on available space at the SCORE Facility. All contract rates are established to recover full cost of services. Daily Rates for the following year will be based upon actual expenses from the period of April 1 – March 31 of each calendar year. SCORE will provide the City with an estimate of the Daily Rates by July 1 of each year for the following year.

28. Specialty Housing Surcharge. Should the City have Inmates that are in Specialty Housing for more than 24 hours, SCORE may charge and a housing surcharge of \$50 for each and every calendar day.

29. Billing and Payment. SCORE shall provide the City with monthly statements itemizing the name of each City Inmate, the number of days of housing, including the date and time booked into the SCORE Facility and date and time released from SCORE and itemization of any additional charges including a description of the service provided, date provided and reason for service.

SCORE shall provide said statement for each month on or about the 15th day of the following month. Payment shall be due to SCORE within 30 days from the date the bill is received. SCORE may bill the City electronically. Payments not received by the 30th day shall bear interest at the rate of one percent per month until payment is received.

The Daily Rate for City Inmates housed on charges from multiple agencies will be divided equally among those agencies.

30. Billing and Dispute Resolution. Withholding of any amount billed or alleging that any Party is in violation of any provision of this Agreement shall constitute a dispute, which shall first attempt to be resolved as follows, and as a mandatory predicate to termination as provided in Section 36.C:

For billing and other disputes:

A. City must provide written notice of dispute to SCORE within 60 days of billing and other disputed charges.

B. SCORE shall respond in writing to such disputes within 60 days of receipt of such disputes.

C. For both billing and other types of disputes, SCORE and the City shall attempt to resolve the dispute by negotiation. If such negotiation is unsuccessful, either party may refer the dispute to the SCORE Operations Board for resolution. The decision of the SCORE Operations Board is the final internal administrative remedy the City must exhaust before pursuing other contractual, legal, equitable, or alternative dispute resolutions.

31. Operations Board Representatives. In accordance with the SCORE Interlocal Agreement, Section 6, Subsection A, membership of the Operations Board will include two (2) at-large members selected, by majority vote, of the contract agencies to represent the contract agencies. At the time set for election of the at-large members, only the representatives of the contract agencies, then in attendance, will participate in the election of at-large members. The at-large members shall serve one-year terms, unless otherwise determined by the majority vote of the Operations Board. The purpose and duties of the Operations Board shall be established by the Administrative Board.

32. Duration of Agreement. The duration of this Agreement shall be from May 1, 2014, at 12:00 A.M. and shall end at 11:59 P.M., on December 31, 2015 unless otherwise terminated in accordance with Section 35 of this Agreement. This Agreement may be

renewed for any successive period by written addendum under terms and conditions acceptable to SCORE and the City.

33. Independent Contractor. In providing services under this Agreement, SCORE is an independent contractor and neither it nor its officers, nor its agents nor its employees are employees of the City for any purpose, including responsibility for any federal or state tax, industrial insurance, or Social Security liability. Neither shall the provision of services under this Agreement give rise to any claim of career service or civil service rights, which may accrue to an employee of the City under any applicable law, rule or regulation. Nothing in this Agreement is intended to create an interest in or give a benefit to third persons not signing as a party to this Agreement.

34. Hold Harmless, Defense, and Indemnification. SCORE shall hold harmless, defend, and indemnify the City, its elected officials, officers, employees, and agents from and against any and all suits, actions, claims, liability, damages, judgments, costs and expenses, including reasonable attorney's fees, and also including, but not limited to, claims related to false arrest or detention, alleged mistreatment, alleged violation of civil rights, injury, or death of any City Inmate, or loss or damage to City Inmate property while in SCORE custody that result from or arise out of the acts or omissions of SCORE, its elected officials, officers, employees, and agents in connection with or incidental to the performance or non-performance of SCORE's services, duties, and obligations under this Agreement.

The City shall hold harmless, defend, and indemnify SCORE, its elected officials, officers, employees, and agents from and against any and all suits, actions, claims, liability, damages, judgments, costs and expenses, including reasonable attorney's fees, and also including, but not limited to, claims related to false arrest or detention, alleged mistreatment, alleged violation of civil rights, injury, or death of any City Inmate, or loss or damage to City Inmate property while in SCORE custody that result from or arise out of the acts or omissions of the City, its elected officials, officers, employees, and agents in connection with or incidental to the performance or non-performance of the City's services, duties, and obligations under this Agreement.

In the event the acts or omissions of the officials, officers, agents, and/or employees of both the City and SCORE in connection with or incidental to the performance or non-performance of the City's and or SCORE's services, duties, and obligations under this Agreement are the subject of any liability claims by a third party, the City and SCORE shall each be liable for its proportionate concurrent negligence in any resulting suits, actions, claims, liability, damages, judgments, costs and expenses and for their own attorney's fees.

Nothing contained in this section or this Agreement shall be construed to create a right in any third party to indemnification or defense.

SCORE and the City hereby waive, as to each other only, their immunity from suit under industrial insurance, Title 51 RCW. This waiver of immunity was mutually negotiated by the parties hereto.

The provisions of this section shall survive any termination or expiration of this Agreement.

35. Insurance. SCORE and the City shall provide each other with evidence of insurance coverage, in the form of a certificate or other competent evidence from an insurance provider, insurance pool, or of self-insurance sufficient to satisfy the obligations set forth in this Agreement.

SCORE and the City shall each maintain throughout the term of this Agreement coverage in minimum liability limits of one million dollars (\$1,000,000) per occurrence and two million dollars (\$2,000,000) in the aggregate for its liability exposures, including comprehensive general liability, errors and omissions, auto liability and police professional liability. The insurance policies shall provide coverage on an occurrence basis.

36. Termination.

A. **Mutual Agreement:** This Agreement may be terminated by mutual written consent between SCORE and the City with 90 days written notice to the other party and to the State Office of Financial Management as required by RCW 70.48.090 stating the grounds for said termination and specifying plans for accommodating the affected City Inmates.

B. **Imperiling Conditions:** The City shall have the right to terminate this Agreement where: 1) conditions and/or circumstances at the SCORE Facility present an imminent risk of serious injury or death to the City's Inmates ("Imperiling Conditions"); 2) the City has sent SCORE written notice by certified mail, return receipt requested describing with reasonable specificity the Imperiling Conditions; and 3) SCORE has failed to cure the Imperiling Conditions within a reasonable period of time, which, unless the Parties agree in writing to a longer period, shall be no more than 45 days after SCORE receives the City's notice. Termination pursuant to this section 34(B) shall be effective if and when: 1) after at least 45 days, SCORE has not cured the Imperiling Condition(s); 2) the City has removed its Inmates; and 3) the City has given SCORE formal written notice of final termination pursuant to this Section 36.B.

C. **Material Breach:** Subject to compliance with Section 30 above, either party shall have the right to terminate this Agreement if: 1) the other party is in material breach of any term of this Agreement; 2) the terminating party has sent the breaching party written notice of its intent to terminate this Agreement under this section by certified mail, return receipt requested describing with reasonable specificity the basis for the termination; and 3) the breaching party has failed to cure the breach within 90 days, unless the parties agree in writing to a longer cure period.

37. Real or Personal Property. It is not anticipated that any real or personal property will be acquired or purchased by the parties solely because of this Agreement.

38. Equal Opportunity. Neither party shall discriminate against any person on the grounds of race, creed, color, religion, national origin, sex, age, marital status, sexual orientation, veterans and military status, political affiliation or belief or the presence of any sensory, mental or physical handicap in violation of any applicable federal law, Washington State Law Against Discrimination (chapter 49.60 RCW) or the Americans with Disabilities Act (42 USC 12110 *et seq.*). In the event of the violation of this provision, the other party may terminate this Agreement as provided in Sections 30 and 36 above.

39. Assignment. This Agreement, or any interest herein, or claim hereunder, shall not be assigned or transferred in whole or in part by SCORE to any other person or entity without the prior written consent of the City, which consent shall not be unreasonably withheld. In the event that such prior written consent to an assignment is granted, then the assignee shall assume all duties, obligations, and liabilities of SCORE stated herein.

40. Non-Waiver. The failure of either party to insist upon strict performance of any provision of this Agreement or to exercise any right based upon a breach thereof or the acceptance of any performance during such breach shall not constitute a waiver of any right under this Agreement.

41. Severability. If any portion of this Agreement is changed per mutual Agreement or any portion is held invalid, the remainder of the Agreement shall remain in full force and effect.

42. Governing Law. This Agreement shall be governed by and construed in accordance with the laws of the State of Washington. Any actions, suit, or judicial or administrative proceeding for the enforcement of this Agreement shall be brought and tried in the Federal or Superior Court for the State of Washington in King County.

43. Approval and Filing. Each party shall approve this Agreement by resolution, ordinance or otherwise pursuant to the laws of the governing body of each party. The attested signatures of the authorized signatory(ies) and SCORE Presiding Officer below shall constitute a presumption that such approval was properly obtained. A copy of this Agreement shall be filed pursuant to RCW 39.34.040.

44. General Provisions. Unless otherwise agreed in writing executed by both Parties, on and after May 1, 2014, and so long as this Agreement remains in effect, this document constitutes the entire Agreement between the City and SCORE under which SCORE houses City Inmates, and no other oral or written agreements between the parties shall affect this Agreement.

No changes or additions to this Agreement shall be valid or binding upon either party unless such change or addition be in writing and executed by both parties.

Any provision of this Agreement that is declared invalid or illegal shall in no way affect or invalidate any other provision.

This Agreement may be executed in any number of counterparts.

45. Notices. Unless stated otherwise herein, all notices and demands shall be in writing and sent or hand-delivered to the parties to their addresses as follows:

TO CONTRACT AGENCY:

City Manager
18120 68th Ave NE
P. O. Box 18120
Kenmore, Washington 98028
Phone: 425-398-8900
Fax: 425-481-3236

TO SCORE:

Director
20817 17th Avenue South
Des Moines, Washington 98198
Phone: (206) 257-6200
Fax: (206) 257-6310

Alternatively, to such other addresses as the parties may hereafter designate in writing. Notices and/or demands shall be sent by registered or certified mail, postage prepaid, or

hand-delivered. Such notices shall be deemed effective when mailed or hand-delivered at the addresses specified above.

SIGNATURE BLOCKS	
Agency: <u>City of Kenmore</u>	South Correctional Entity
By: <u><i>Rob Karlinsey</i></u>	By: <u><i>Penny Bartley</i></u>
Printed: <u>Rob Karlinsey</u>	Printed: <u>Penny Bartley</u>
Title: <u>City Manager</u>	Title: <u>Director</u>
Date: <u>4/24/14</u>	Date: <u>4/24/2014</u>

ATTACHMENT A

MEDICAL ACCEPTABILITY

SCORE shall determine the medical and mental acceptability of Inmates for booking or housing using the following guidelines. However, final acceptance is based upon approval of medical staff at the time of booking. Excluding criteria include but are not limited to:

1. Signs of untreated broken bones or dislocated joints.
2. Any injury or illness requiring emergency medical treatment.
3. Unconsciousness.
4. Inmates unable to stand and walk under their own power, unless they normally use an assistive device, such as a wheelchair, for mobility.
5. Bed bound individuals.
6. Individuals with attached IV or requiring IV medications.
7. Individuals requiring the use of oxygen tanks.
8. AMA (Against Medical Advice) from the hospital.
9. Individuals having had major invasive surgery within the last 72 hours. Non-invasive surgery such as oral surgery, laser-eye surgery and minor surgery may be evaluated on a case by case basis.
10. Wounds with drainage tubes attached.
11. Persons with Alzheimer's, dementia or other psychological conditions to the point where the Inmate cannot perform activities of daily living ("ADL's") or who do not have the capacity to function safely within a correctional environment.
12. Persons who are diagnosed as developmentally delayed and who do not have the capacity to function safely within a correctional environment or who cannot perform ADL's.
13. Persons undergoing chemotherapy and/or radiation treatment.
14. Persons undergoing dialysis.
15. Persons with suicidal ideations or gestures within the past 72 hours.
16. Persons, if prescribed, who have not taken psychotropic medications for at least 72 hours.
17. Persons who have by self-disclosure, admitted to attempting suicide within the last 30 days.
18. Persons who have attempted suicide during their current incarceration.
19. Persons displaying current psychotic episode.

ATTACHEMENT B

PROPERTY

SCORE will only accept Inmate property as follows:

1. The property shall be sealed in a single property bag no larger than a common paper grocery bag.
2. Money, valuables, and medications shall be placed in a clear envelope and sealed within the Inmate's property bag.
3. Checks and documents (court, warrants, etc.) shall be attached to the outside of the property bag.
4. SCORE will not accept or transport the following:
 - a). Backpacks, suitcases, etc.
 - b). Unpackaged food products or food products in packaging that has been opened.
 - c). Any type of weapon (includes pocket knives).
 - d). Liquids.
 - e). Helmets or any kind.
 - f). Any items that will not fit into the property bag.
 - g). Material deemed to be contraband.

SCORE will limit property returned with the Inmate to the City according to these criteria.

ATTACHMENT C

CLASSIFICATION

The City shall supply SCORE with the following Classification related information, if known to or in possession of the City:

1. If the City Inmate has been classified to a special housing unit and/or if the City Inmate has been classified as protective custody.
2. If the City Inmate is a violent offender or has displayed violent behavior during present or past incarcerations.
3. If the City Inmate is an escape risk.

ATTACHMENT D

BORROWING

One contracting agency may "borrow" another contracting agency's Inmate as follows:

1. If a contracting agency requests the transport of another contracting agency's Inmate from SCORE the requesting agency must notify each agency with rights to custody of the Inmate, and if each agency with rights to custody of the Inmate notifies SCORE in writing (e-mail) of its approval, SCORE shall provide the requested transport to the requesting agency. SCORE will complete a custody transfer form that lists all outstanding detainers. The custody transfer paperwork will accompany the Inmate.
2. Once custody of the Inmate has been transferred to the requesting agency, it is the responsibility of the requesting agency to determine whether the Inmate shall be returned to the custody of SCORE, and if so, the requesting agency shall make all necessary and proper arrangements with SCORE and any agency with rights to custody of the Inmate, for the Inmate's return according to the terms of this Agreement. The requesting agency, to the full extent permitted by law, defend, indemnify, save and hold harmless SCORE as provided in Section 34 of the Agreement.
3. SCORE will not track the Inmate once he or she has left SCORE's facility.
4. If the Inmate is returned to the custody of SCORE, the requesting agency shall provide SCORE with sentencing/charge information. The requesting agency shall supply all pre-sentence, and post-sentence paperwork from agreeing agencies that authorized the borrowing of the Inmate. This will aid SCORE in determining split billing and release dates.
5. SCORE will transport the Inmate only to an agency that also contracts with SCORE for Inmate housing.

ATTACHMENT E

WARRANTS/OTHER COURT ORDERS/DETAINERS

The following shall apply to City Inmates who are subject to warrants from other jurisdictions or to other court orders for confinement or detainers:

1. When receiving a City Inmate, the Booking Officers shall review all paperwork provided by the City for all grounds to hold the Inmate.
2. Prior to releasing a City Inmate, SCORE shall check the NCIC and WACIC systems to determine if the Inmate is subject to any valid warrants or other detainers.
 - a) If the Inmate is subject to a warrant that is limited to King County, SCORE will, upon receiving written permission (e-mail) from the City, transport the Inmate to the custodial agency for the jurisdiction that issued the warrant. However, SCORE will not assume responsibility to serve any such warrants.
 - b) If the City Inmate is subject to a warrant from a western Washington jurisdiction outside King County, SCORE will either process the Inmate for transfer on the Cooperative Transport Chain or provide transfer to a jurisdiction that participates in Cooperative Transport Chain.
 - c) If the City Inmate is subject to a warrant from an eastern Washington jurisdiction, SCORE will send the Inmate to a jurisdiction that participates in the Cooperative Transport Chain.
 - d) If, upon return from SCORE to the City, the Inmate is subject to a warrant that provides for statewide extradition, SCORE will either transport the Inmate to the detention/correction facility in King County designated by the agency/jurisdiction that issued the warrant if it is in King County, or will send the Inmate to the agency/jurisdiction that issued the warrant on the Mini-Chain.
3. City Inmates who have or are subject to Immigration and Custom Enforcement (ICE) detainers shall be transferred to ICE upon release from SCORE.

ATTACHMENT F

INMATE RELEASE

SCORE personnel will release City Inmates as follows:

1. To the City for return to the Inmate's residence or closest Member City of arrest.
2. City Inmates for whom bail is posted, or who otherwise have a right to be released may:
 - a) Choose to remain in custody, by signing written waiver, and return to City by the regularly scheduled transport.
 - b) Be released to a family member or friend with confirmed transportation.
 - c) Be released via private taxi.

Subject/Topic: Amendment #3 to Contract No. 10-C873 with Progressive Animal Welfare Society (PAWS) for animal sheltering services Proposed Council Action/Motion: Approve Amendment #3 to Contract No. 10-C873 with PAWS for animal sheltering services	For Council Meeting Agenda of: 23 November 2015 Department: Executive Prepared by: Leslie Harris, Community Relations Manager/Policy Analyst <i>LH</i> <u>Initial & Date</u> Approved by Department Head: <u>NKO 12 Nov 2015</u> Approved by City Attorney: _____ Approved by Finance Director: <u>Jung 11/12/15</u> Approved by City Manager: <u>PJK</u> Exhibits/Attachments: 1) Proposed Amendment #3 to Contract No. 10-C873 2) Original Contract No. 10-C873 with Amendment #1 and #2	
Expenditure Required \$7,287/yr estimate	Amount Budgeted \$25,361 in 2015-2016 Biennium for Animal Services Contracts (includes King County Regional Animal Services and PAWS)	Appropriation Required \$0
<u>INFORMATION/BACKGROUND:</u> The proposed contract amendment renews the City's contract with Progressive Animal Welfare Society (PAWS) for sheltering services for cats and dogs, which was originally approved in 2010. The current contract expires on December 31, 2015. The amendment extends the term of the contract through December 31, 2017 and adjusts the per animal intake fee from \$169 to \$175 for 2016. For 2017, the intake rate will be increased by either 2.5% or the June CPI-U, whichever is greater. The Administration is very satisfied with the services that have been provided under this contract. The animals taken to PAWS can be lost (stray) or surrendered by their guardians who reside within city limits. The lost animals are brought in by King County Animal Control Officers, City officials or private citizens. Between 2011 and 2013, the use trend for Kenmore animals remained fairly consistent at about 50-55 animals per year. In 2014, there was a slight decline to approximately 40 animals. For 2015, there have been 20 animals taken to PAWS. A notable amendment to the contract is that the City will provide funding assistance to Kenmore resident's that are unable to cover the cost of the intake fee for animals brought to PAWS by City officials or King County Animal Control Officers. When citizens reunite with the animals brought in by King County Animal Control Officers they have to pay the		

medical, and the purchase of a license. By charging this fee to the citizen who has utilized the animal control and shelter service, the City is striving to get a “full cost recovery” from the citizen.

In limited circumstances, approximately 2-5 times a year, a guardian cannot afford the City’s “Intake” fee, which may result in animals being abandoned or surrendered to PAWS or the animal’s holding time is extended so they can arrange to get the funding. This lengthens the amount of time PAWS has to hold and care for the animal, and that space is not open for another animal in need.

In order to reunite the animal with the guardian as quickly as possible, PAWS is proposing to separate the per-animal cost paid to PAWS and the “full cost recovery” fee charge to the citizen to mitigate this issue. The proposed contract amendment includes \$750 in the 2016 budget and 2017 proposed budget to be allocated toward reducing or fully covering the pet owner’s cost of the intake fee for animals brought to PAWS by City officials or King County Animal Control Officers.

In addition, the City and PAWS will continue to collaborate on promoting animal licensing, spay and neuter, and other activities that promote animal welfare and reduce animal care costs.

The City of Shoreline also contracts with PAWS and approved similar renewal amendments to their contract for 2016. PAWS also contracts with Lake Forest Park, Woodinville, and four Snohomish County cities for sheltering services.

FISCAL CONSIDERATION:

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

Consistent with Mission Statement on providing efficient, effective services and public safety

**Contract No. 10-C873
Amendment No. 3**

The following sections of the animal sheltering services contract dated June 29, 2010, between the City of Kenmore and Progressive Animal Welfare Society (PAWS) are amended to read in its entirety as set forth (i.e. below and in attachment). All other terms and conditions of the underlying contract shall remain in full force and effect.

Section 1. Scope of Services to be Performed by Consultant. The Consultant shall perform the services described in Exhibit "A" of this Agreement. In performing the services, the Consultant shall comply with all federal, state and local laws and regulations applicable to the services. The Consultant shall perform the services diligently and completely and in accordance with professional standards of conduct and performance.

Section 2. Compensation and Method of Payment. The City shall pay Consultant:

X According to the rates set forth in Exhibit "B"

Section 3. Duration of Agreement.

- A. This Agreement shall be in full force and effect for a period commencing on June 1, 2010 and ending at midnight on December 31, 2017, unless sooner terminated under the provisions of the Agreement.

Section 17. Notices. Notices to the City of Kenmore shall be sent to the following address:

City Manager
City of Kenmore
P.O. Box 82607
Kenmore, Washington 98028-0607

With copies to:

City Clerk
City of Kenmore
P.O. Box 82607
Kenmore, Washington 98028-0607

Notices to the Consultant shall be sent to the following address:

Annette Laico, CEO
PAWS
P.O. Box 1037
Lynnwood, WA 98046

Exhibit A—attached

Exhibit B—attached

DATED this ____ day of _____, 20__.

CITY OF KENMORE:

CONSULTANT:

BY: _____
Rob Karlinsey
Title: City Manager

By: _____
Title: _____

Address: _____

Attest/Authenticated:

Patty Safrin, City Clerk

Approved as to Form:

Rod Kaseguma, City Attorney

EXHIBIT A

Scope of Services to be Provided by Consultant. The Consultant shall independently provide the following services to the City:

1. Services Provided by Consultant ("PAWS")

- A. PAWS shall furnish animal shelter services to the City. Animal shelter services shall include sheltering and holding of dogs and cats at facilities operated by PAWS, releasing animals to owners, and disposing of animals that are not claimed by owners after the period prescribed by City ordinance, in a responsible and lawful manner (including adoption or destruction).
- B. PAWS shall provide veterinary care at the discretion of PAWS' Director of Companion Animal Services or, in his or her absence, his or her designated representative (collectively, "Manager" or "Shelter Manager"). If agreed upon by the Shelter Manager and a licensed veterinarian, ill or injured stray animals, whether licensed or not, whose owners cannot be notified, because the animal has no identification that is traceable or the owner can not be reached by a single phone call, may be euthanized if the animal is in pain that cannot be relieved by such care as the shelter staff can reasonably provide. PAWS shall have a policy and procedure to follow to euthanize the animal and to reach the owner. When reasonably possible, PAWS shall recover costs from the owner of the animal for such veterinary treatment prior to release of the animal or euthanasia procedure.
- C. PAWS agrees to abide by and strictly follow any and all procedures of Title 6 of the Kenmore Municipal Code, as now or hereafter amended, regulating animals, particularly the provisions of Title 6 related to the duration of impoundment, before disposing of any animals. PAWS and the City agree that Title 6, as now or hereafter amended, is incorporated by reference and shall be part of this Agreement as if set forth in full herein. The City shall provide PAWS with current copies of all applicable policies, procedures, and City ordinances at least thirty (30) days prior to the effective date of any amendment affecting PAWS' performance under this Agreement.
- D. If any animal is brought to PAWS by a City official or a King County Animal Control Officer and then claimed by its owner during the applicable holding period, the owner will be solely responsible for paying any and all reasonable fees and costs charged by PAWS for its care and sheltering of the animal. PAWS may choose not to release any sheltered animal to any person until PAWS is reasonably satisfied that the person has paid all applicable, shelter and other fees related to housing and caring for any animal and has evidence of the ownership of said animal.
- E. PAWS will hold unlicensed stray dogs and cats for a period of seventy two (72) hours from time of delivery, except as provided herein. Stray dogs and cats bearing a current license issued within the State of Washington or positively identified by a City official or King County Animal Control Officer or by a traceable microchip shall be held for a period of ten (10) days. PAWS shall be responsible for delivering notification to owners that their licensed dog or cat has been impounded, unless notification has already been done by a City official or an Animal Control Officer, and PAWS has been provided evidence of such notification. Such notice may be based on information provided by the City in accordance with the City's Animal Control policies and procedures. PAWS shall release animals to owners within the applicable holding period prescribed herein in accordance with the procedures outlined in Section 1.D.
- F. PAWS shall dispose of animals not claimed by an owner once the applicable holding period prescribed herein has expired, either by release for adoption, euthanasia, or transfer to another agency in accordance with applicable laws and terms of this Agreement. PAWS shall not sell any animals to research institutes or licensed dealers for research purposes. Animals held under RCW 16.52.085 will be held for fifteen (15) business days before any disposition of the animal by PAWS.

Any animal not redeemed by its owner during the prescribed holding period or which, in the opinion of a licensed veterinarian or the Shelter Manager, is suffering from serious injury or disease, may be humanely destroyed, or in the discretion of the Shelter Manager may be held for a longer period and redeemed by any person upon payment of reasonable medical and holding costs. Animals deemed dangerous by the City shall not be released to their owners without a court order.

- G. If not claimed by an owner during the applicable holding period, an animal immediately becomes the property of PAWS. Disposition of the animal is then at PAWS' discretion, provided however, that PAWS shall not dispose of an animal while any legal proceedings of which it has notice and relating to the disposition of that animal are pending or in contravention of any court order of which it has notice.
- H. PAWS reserves the right to refuse all animals other than dogs or cats, where, in PAWS' opinion, it does not have the facilities appropriate or available to accommodate the needs of such animal. PAWS further reserves the right to refuse any animal if the animal shelter is at its maximum capacity. The Manager shall have the authority to make such determinations. The Manager can decline owned animals that need to be placed on "bite quarantine" if a City official or the King County Animal Control Officer approves that the animal(s) can remain at the owner's house or be housed at another boarding facility, such as a veterinary office, at the owner's sole expense.

2. Work and Facility Inspection

The City reserves the right, upon reasonable notice, to inspect, review and approve the work and facilities of PAWS to assure that it has been completed as specified, prior to payment.

3. Representations

PAWS represents and warrants that it has the requisite training, skill and experience necessary to provide the services and is appropriately accredited and licensed by all applicable agencies and governmental entities.

4. Property and Confidential Information

PAWS shall not, without the prior written consent of the City, disclose to third parties information it obtains from the City that is not otherwise subject to public disclosure, and shall only disclose in a manner consistent with Section 14 of the Contract for Consultant Services.

5. Collaboration and Promotion

The City and PAWS will collaborate to promote responsible guardianship and attempt to reduce future sheltering and animal control costs. The City will continue to support the community's movement to a safer and more humane environment by participating with PAWS as follows:

- a) The City will continue to ensure that information on lost/found pets and licensing information is presented on the City website including appropriate links to PAWS and animal control providers.
- b) The City will work with PAWS to be visible in the community through appropriate and available city events and educational information.

EXHIBIT B

Rates for Services to be Provided by Consultant. The Consultant shall furnish the services in accordance with the following rates:

1. In consideration of PAWS performing the services contemplated by this Agreement, the City agrees to pay an intake fee of \$175.00 for each animal brought to PAWS from the City's jurisdiction for the year 2016. For the year 2017, the \$175.00 intake fee rate will be increased by either 2.5% or the June to June Seattle-Bellevue-Tacoma CPI-U, whichever is greater. The intake fee dollar amount will be rounded up to the nearest dollar.

For animals that are brought to PAWS by City officials or King County Animal Control Officers and released to their owners prior to the applicable holding period expiring pursuant to Section 1.E of this Scope of Work, PAWS will attempt to recover the intake fee from the animal's owner. However, if PAWS is not successful in recovering either the entire intake fee or a portion of the fee, the balance of this intake fee amount will be billed to the City. This includes licensed or unlicensed stray animals found within the City limits of Kenmore and brought to PAWS by a City Official or a King County Animal Control Officer.

2. PAWS may also charge the City a per day fee of Twenty Dollars (\$20.00) per animal for animals held, at the City's written request, beyond the time periods specified in Section 1.E. of the Exhibit A - Scope of Services. In the event of legal proceedings or court order, the City will provide PAWS with prompt written notice of the same and direct that the animal shall be held until further notice.

3. The City will include in the City's proposed 2016 and 2017 budgets \$750, totaling \$1,500, to be allocated toward reducing or fully covering the pet owner's cost of the intake fee as established in the agreement for animals brought to PAWS by City officials or King County Animal Control Officers. PAWS will continue to attempt to recover the intake fee from the animal's owner, however, if PAWS is not successful in recovering either the entire intake fee or a portion of the fee, the balance of this intake fee may be covered by funds in the Apprehension Fee Mitigation Fund. PAWS may, at its discretion and in good faith, allocate a maximum of the full cost of the intake fee considering the following requirements:

a) Funds from the Apprehension Fee Mitigation Fund will only be allocated to offset costs of the intake fee for animals brought to PAWS by City officials or King County Animal Control Officers. PAWS may allocate a maximum of \$750 toward this cause for 2016 and 2017 each, not to exceed a total of \$1,500. The City will remit payments for a maximum of \$750 for 2016 and 2017 each.

b) Once a pet-owner has been allocated any amount of funds to offset the costs of the intake fee for animals brought to PAWS by City officials or King County Animal Control Officers, they may not receive any additional funds for this purpose for the remainder of the calendar year.

c) PAWS will submit, with each monthly bill, an invoice for any funds allocated toward offsetting intake fee for animals brought to PAWS by City officials or King County Animal Control Officers, the animal ID number, animal name, primary breed, intake type, time and date of intake, and the owner's name and address.

4. The above mentioned payments shall be the sole compensation for work performed and/or services rendered by PAWS, and for supervision, labor, supplies, materials, equipment or use thereof, and for all other expenses and incidentals necessary to complete all the services required by this Agreement.

5. Each month, PAWS shall submit a properly executed invoice to the City to request payment pursuant to Section 1 of Exhibit A - Scope of Services. Said invoices shall indicate the total number of animals handled during the month for the City. Expenditures under this Agreement that are determined by audit to be ineligible for reimbursement and for which payment has been made to PAWS shall be refunded to the City within 30 days of notification. PAWS shall maintain adequate records to support billings. Said records shall be maintained for a period consistent with Section 8 of the Contract for Consultant Services.

6. In accord with Section 3.C of the Agreement, PAWS agrees to provide its best efforts to submit to the City an estimate of the rates/charges for the provision of services described herein by October 1st of the year the contract is set to expire. The parties acknowledge that such an estimate would enable the City sufficient time to review and confer with PAWS regarding said rates/charges prior to the end term of this Agreement.

CONTRACT FOR CONSULTANT SERVICES
Contract No. 10-C873

This Agreement is entered into by and between the City of Kenmore, Washington, a municipal corporation ("City") and Progressive Animal Welfare Society (PAWS), whose principal office is located at 15305 44th Avenue West, Lynnwood, WA ("Consultant").

WHEREAS, the City desires to have certain services performed for its citizens; and

WHEREAS, the City has selected the Consultant to perform such services pursuant to certain terms and conditions;

NOW, THEREFORE, in consideration of the mutual benefits and conditions set forth below, the parties agree as follows:

1. Scope of Services to be Performed by Consultant. The Consultant shall perform the services described in Exhibit "A" of this Agreement. In performing the services, the Consultant shall comply with all federal, state and local laws and regulations applicable to the services. The Consultant shall perform the services diligently and completely and in accordance with professional standards of conduct and performance.

2. Compensation and Method of Payment. The Consultant shall request payment for work performed using the billing invoice form at Exhibit "C."

The City shall pay Consultant:

[Check applicable method of payment]

x__ According to the rates set forth in Exhibit "B".

 x A sum not to exceed \$15,000

 Other (describe): _____

The Consultant shall complete and return to the City Exhibit "D," Tax Identification Number," prior to or along with the first billing invoice. The City shall pay the Consultant for services rendered within ten (10) days after City Council voucher approval.

3. Duration of Agreement.

A. This Agreement shall be in full force and effect for a period commencing on June 1, 2010 and ending at midnight on December 31, 2010, unless sooner terminated under the provisions of this Agreement.

B. If the maximum compensation amount of this contract is reached prior to the end of the contract term and the contract is not amended to provide for a greater maximum compensation amount, PAWS shall have no obligation for the remainder of the contract term. PAWS agrees to notify the City when it is within \$7,000 of the maximum compensation amount of this contract so that the City has the time to amend the contract if so desired.

C. By November 1, 2010, PAWS agrees to provide its best efforts to submit to the City an estimate of the 2011 rates/charges for the provision of services described herein. The parties acknowledge that such an estimate would enable the City sufficient time to review and confer with PAWS regarding said rates/charges prior to the end term of this Agreement.

D. Time is of the essence of this Agreement in each and all of its provisions in which performance is required.

4. Response to Public Records Requests

PAWS agrees to timely provide the City with all City-related documents and data responsive to public records requests received by the City.

5. Independent Contractor.

A. The Consultant and the City agree that the Consultant is an independent contractor with respect to the services provided pursuant to this Agreement. The Consultant will be solely responsible for its acts and for the acts of its agents, employees, subconsultants or representatives during the performance of this Agreement. Nothing in this Agreement shall be considered to create the relationship of employer and employee between the parties.

B. PAWS, not the City, shall have the power to control and direct the details, manner or means of services. Specifically, but not by means of limitation, PAWS shall have no obligation to work any particular hours or particular schedule and shall retain the right to designate the means of performing services covered by this Agreement, and PAWS shall be entitled to employ other workers at such compensation and on such other conditions as it may deem proper, provided, however, that any contract so made by PAWS is to be paid by it alone, and that by employing such workers, it is acting individually and not as an agent for the City.

C. The City shall not be responsible for withholding or otherwise deducting federal income tax or Social Security or contributing to the State Industrial Insurance Program, or otherwise assuming the duties of an employer with respect to PAWS or any employee of PAWS.

6. Indemnification.

A. The Consultant shall protect, defend, indemnify and hold harmless the City, its officers, employees and agents from any and all costs, claims, suits, losses or liabilities of any nature, including attorneys' fees, arising out of or in connection with the negligent acts or omissions of the Consultant, its officers, employees and agents in performing this Agreement.

B. The City shall protect, defend, indemnify and save harmless the Consultant, its officers, employees and agents from any and all costs, claims, suits, losses or liabilities of any nature, including attorneys' fees, arising out of or in connection with the negligent acts or omissions of the City, its officers, employees and agents in performing this Agreement.

C. Consultant specifically and expressly waives Consultant's immunity under the Washington Industrial Insurance Act, Title 51 RCW, as respects the City only to the extent necessary to provide each party with a full and complete indemnity of claims made by the other party's employees. The parties acknowledge that this waiver has been mutually negotiated by the parties.

D. The provision of this section shall survive the expiration or termination of this Agreement.

7. Insurance.

The Consultant shall procure and maintain for the duration of this Agreement, insurance against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder by the Consultant, its agents, representatives or employees.

A. Minimum Scope of Insurance.

Consultant shall obtain insurance of the types described below:

1. Automobile Liability insurance covering all owned, non-owned, hired, and leased vehicles. Coverage shall be written on Insurance Services Office (ISO) form CA 00 01 or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage.

2. Commercial General Liability insurance shall be written on ISO occurrence form CG 00 01 and shall cover liability arising from premises, operations, independent contractors, and personal injury and advertising injury. The City shall be named as an insured under the Contractor's Commercial General Liability insurance policy with respect to the work performed for the City.

3. Workers' Compensation coverage as required by the Industrial Insurance laws of the State of Washington.

4. Professional Liability insurance appropriate to the Consultant's profession.

B. Minimum Amounts of Insurance.

Consultant shall maintain the following insurance limits:

1. Automobile Liability insurance with a minimum combined single limit for bodily injury and property damage of \$1,000,000 per accident.

2. Commercial General Liability insurance shall be written with limits no less than \$1,000,000 each occurrence, \$1,000,000 general aggregate.

3. Professional Liability insurance shall be written with limits no less than \$1,000,000 per claim and \$1,000,000 policy aggregate limit.

C. Other Insurance Provisions.

The insurance policies are to contain, or be endorsed to contain, the following provisions for Automobile Liability, Professional Liability, and Commercial General Liability insurance:

1. The Consultant's insurance coverage shall be primary insurance as respects the City. Any insurance, self-insurance or insurance pool coverage maintained by the City shall be in excess of the Consultant's insurance and shall not contribute with it.

2. The Consultant's insurance shall be endorsed to state that coverage shall not be canceled by either party except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the City.

D. Verification of Coverage.

Consultant shall furnish the City with original certificates and a copy of the amendatory endorsements, including but not necessarily limited to the additional insured endorsement, evidencing the insurance requirements of the Consultant before commencement of the work.

8. Record Keeping and Reporting.

A. The Consultant shall maintain accounts and records, which sufficiently and properly reflect all costs expended and services performed pursuant to this Agreement. The Consultant shall also maintain such other records as may be deemed

necessary by the City to ensure proper accounting of all funds contributed by the City to the performance of this Agreement.

B. Pursuant to the retention laws required of the City, the foregoing records shall be maintained for a period of seven (7) years after termination of this Agreement, unless permission to destroy them is granted by the Office of the Archivist in accordance with Chapter 40.14 RCW and by the City.

9. Audits and Inspections. The records and documents with respect to all matters covered by this Agreement shall be subject at all times to inspection, review or audit by the City during the performance of this Agreement.

10. Termination.

A. The City reserves the right to terminate or suspend this Agreement at any time, with or without cause, upon sixty (60) days prior written notice. In the event of termination or suspension, all finished or unfinished documents, data, studies, worksheets, models, reports or other materials prepared by the Consultant pursuant to this Agreement shall promptly be submitted to the City.

B. In the event this Agreement is terminated or suspended, the Consultant shall be entitled to payment for all services performed and reimbursable expenses incurred to the date of termination.

C. If, upon written notice from Consultant that Consultant is unavailable to perform the scope of services, the City may, at its option, cancel this Agreement immediately.

D. The Consultant reserves the right to terminate this Agreement with not less than sixty (60) days written notice, or in the event that outstanding invoices are not paid within sixty (60) days.

E. This provision shall not prevent the City from seeking any legal remedies it may otherwise have for the violation or nonperformance of any provisions of this Agreement.

11. Discrimination Prohibited. In hiring or employment made possible or resulting from this Agreement, there shall be no unlawful discrimination against any employee or applicant for employment because of sex, age, race, color, creed, national origin, marital status, sexual orientation or the presence of any sensory, mental, or physical handicap, unless based upon a bona fide occupational qualification, or any other status protected under federal or state law. This requirement shall apply to but not be limited to the following: employment, advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. No person shall be denied or subjected to discrimination in receipt of or in benefit of any services or activities made possible by or resulting from this Agreement, on the basis of

race, color, religion, creed, sex, sexual orientation, age [except minimum age] and retirement provisions, national origin, marital status, or presence of any sensory, mental or physical disability, or any other status protected under federal or state law.

12. Assignment and Subcontract. The Consultant shall not assign or subcontract any portion of the services contemplated by this Agreement without the prior written consent of the City. This provision shall not affect the ability of the Consultant to use third-party service providers, such as foster care or alternative shelter or medical care, as it deems fit.

13. Conflict of Interest. The Consultant represents to the City that it has no conflict of interest in performing any of the services set forth in Exhibit "A." In the event that the Consultant is asked to perform services for a project with which it may have a conflict, Consultant will immediately disclose such conflict to the City.

14. Confidentiality. All information regarding the City obtained by the Consultant in performance of this Agreement shall be considered confidential. Consultant shall not disclose to third parties information that it obtains from the City that is not otherwise subject to public disclosure unless:

- The information is in the public domain at the time of disclosure by PAWS;
- The information is also received by PAWS from a third party who does not have an obligation to keep the same confidential; or
- The information is subject to court order or lawfully issued subpoena.

Breach of confidentiality by the Consultant shall be grounds for immediate termination.

15. Non-appropriation of Funds. If sufficient funds are not appropriated or allocated for payment under this Agreement for any future fiscal period, the City will so notify the Consultant and shall not be obligated to make payments for services or amounts incurred after the end of the current fiscal period. This Agreement will terminate upon the completion of all remaining services for which funds are allocated. No penalty or expense shall accrue to the City in the event that the terms of the provision are effectuated.

16. Entire Agreement. This Agreement contains the entire agreement between the parties, and no other agreements, oral or otherwise, regarding the subject matter of this Agreement shall be deemed to exist or bind either of the parties. Either party may request changes to the Agreement. Changes which are mutually agreed upon shall be incorporated by written amendments to this Agreement.

17. Notices. Notices to the City of Kenmore shall be sent to the following address:

City Clerk
City of Kenmore
P.O. Box 82607
Kenmore, Washington 98028-0607

Notices to the Consultant shall be sent to the following address:

Annett Laico, Executive Director
PAWS
PO Box 1037
Lynnwood, WA 98046

18. Applicable Law; Venue; Attorneys' Fees. This Agreement shall be governed by and construed in accordance with the laws of the State of Washington. Any dispute arising out of any alleged breach of this Agreement shall first be submitted to non-binding mediation for resolution. If the dispute is not resolved in mediation, the dispute shall be subject to mandatory and binding arbitration under the Commercial Arbitration Rules of the American Arbitration Association. In the event any suit is instituted to appeal arbitration, the parties specifically understand and agree that venue shall be exclusively in King County, Washington. The prevailing party in any such action shall be entitled to its attorneys' fees and costs of suit, which shall be fixed by the judge hearing the case and such fee shall be included in the judgment.

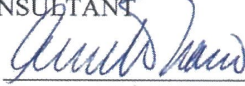
19. Severability. Any provision or part of this Agreement held to be void or unenforceable under any law or regulation shall be deemed stricken and all remaining provisions shall continue to be valid and binding upon the City and the Consultant, who agree that the Agreement shall be reformed to replace such stricken provision or part with a valid and enforceable provision that comes as close as reasonably possible to expressing the intent of the stricken provision.

CITY OF KENMORE, WASHINGTON

By: 
Frederick C. Stouder
Title: City Manager

Date: 6/29/10

CONSULTANT

By: 
Title: Executive Director

Date: 7/2/10

ATTEST AS TO FORM:

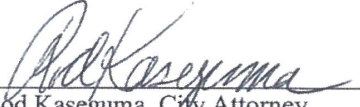

Rod Kaseguma, City Attorney

EXHIBIT A

Scope of Services to be Provided by Consultant. The Consultant shall independently provide the following services to the City:

1. Services Provided by Consultant ("PAWS")

- A. PAWS shall furnish animal shelter services to the City. Animal shelter services shall include sheltering and holding of dogs and cats at facilities operated by PAWS, releasing animals to owners, and disposing of animals that are not claimed by owners after the period prescribed by City ordinance, in a responsible and lawful manner (including adoption or destruction).
- B. PAWS shall provide veterinary care at the discretion of PAWS' Director of Companion Animal Services or, in his or her absence, his or her designated representative (collectively, "Manager" or "Shelter Manager"). If agreed upon by the Shelter Manager and a licensed veterinarian, ill or injured stray animals, whether licensed or not, whose owners cannot be notified, because the animal has no identification that is traceable or the owner can not be reached by a single phone call, may be euthanized if the animal is in pain that cannot be relieved by such care as the shelter staff can reasonably provide. PAWS shall have a policy and procedure to follow to euthanize the animal and to reach the owner. When reasonably possible, PAWS shall recover costs from the owner of the animal for such veterinary treatment prior to release of the animal or euthanasia procedure.
- C. PAWS agrees to abide by and strictly follow any and all procedures of Title 6 of the Kenmore Municipal Code, as now or hereafter amended, regulating animals, particularly the provisions of Title 6 related to the duration of impoundment, before disposing of any animals. PAWS and the City agree that Title 6, as now or hereafter amended, is incorporated by reference and shall be part of this Agreement as if set forth in full herein. The City shall provide PAWS with current copies of all applicable policies, procedures, City ordinances, and promptly provide subsequent amendments affecting PAWS' performance under this Agreement.
- D. If any animal is brought to PAWS by a City official and then claimed by its owner during the applicable holding period, the owner will be solely responsible for paying any and all reasonable fees and costs charged by PAWS for its care and sheltering of the animal. PAWS may choose not to release any sheltered animal to any person until PAWS is reasonably satisfied that the person has paid all applicable, shelter and other fees related to housing and caring for any animal and has evidence of the ownership of said animal.
- E. PAWS will hold unlicensed stray dogs and cats for a period of seventy two (72) hours from time of delivery, except as provided herein. Stray dogs and cats bearing a current license issued within the State of Washington or positively

identified by Animal Control Officers or by a traceable microchip shall be held for a period of ten (10) days. PAWS shall be responsible for delivering notification to owners that their licensed dog or cat has been impounded, unless notification has already been done by a City official or an Animal Control Officer, and PAWS has been provided evidence of such notification. Such notice may be based on information provided by the City in accordance with the City's Animal Control policies and procedures. PAWS shall release animals to owners within the applicable holding period prescribed herein in accordance with the procedures outlined in Section 1.D.

- F. PAWS shall dispose of animals not claimed by an owner once the applicable holding period prescribed herein has expired, either by release for adoption, euthanasia, or transfer to another agency in accordance with applicable laws and terms of this Agreement. PAWS shall not sell any animals to research institutes or licensed dealers for research purposes. Animals held under RCW 16.52.085 will be held for fifteen (15) business days before any disposition of the animal by PAWS.

Any animal not redeemed by its owner during the prescribed holding period or which, in the opinion of a licensed veterinarian or the Shelter Manager, is suffering from serious injury or disease, may be humanely destroyed, or in the discretion of the Shelter Manager may be held for a longer period and redeemed by any person upon payment of reasonable medical and holding costs. Animals deemed dangerous by the City shall not be released to their owners without a court order.

- G. If not claimed by an owner during the applicable holding period, an animal immediately becomes the property of PAWS. Disposition of the animal is then at PAWS' discretion, provided however, that PAWS shall not dispose of an animal while any legal proceedings of which it has notice and relating to the disposition of that animal are pending or in contravention of any court order of which it has notice.
- H. PAWS reserves the right to refuse all animals other than dogs or cats, where, in PAWS' opinion, it does not have the facilities appropriate or available to accommodate the needs of such animal. PAWS further reserves the right to refuse any animal if the animal shelter is at its maximum capacity. The Manager shall have the authority to make such determinations.

2. Work and Facility Inspection

The City reserves the right, upon reasonable notice, to inspect, review and approve the work and facilities of PAWS to assure that it has been completed as specified, prior to payment.

3. Representations

PAWS represents and warrants that it has the requisite training, skill and experience necessary to provide the services and is appropriately accredited and licensed by all applicable agencies and governmental entities.

4. Property and Confidential Information

PAWS shall not, without the prior written consent of the City, disclose to third parties information it obtains from the City that is not otherwise subject to public disclosure, and shall only disclose in a manner consistent with Section 14 of the Contract for Consultant Services.

EXHIBIT B

Rates for Services to be Provided by Consultant. The Consultant shall furnish the services in accordance with the following rates:

1. In consideration of PAWS performing the services contemplated by this Agreement, the City agrees to pay an intake fee of \$145.00 for each animal brought to PAWS from the City's jurisdiction, not to exceed a total of \$15,000 for 2010, provided that no fee will be charged to the City for animals that are brought to PAWS by City officials and released to their owners prior to applicable holding period expiring pursuant to Section 1.E of Exhibit A - Scope of Services. This includes licensed or unlicensed stray animals found within the City limits of Kenmore and brought to PAWS by an Animal Control Officer.
2. PAWS may also charge the City a per day fee of Twelve Dollars (\$12.00) per animal for animals held, at the City's written request, beyond the time periods specified in Section 1.E. of the Exhibit A - Scope of Services. In the event of legal proceedings or court order, the City will provide PAWS with prompt written notice of the same and direct that the animal shall be held until further notice.
3. The above mentioned payment shall be the sole compensation for work performed and/or services rendered by PAWS, and for supervision, labor, supplies, materials, equipment or use thereof, and for all other expenses and incidentals necessary to complete all the services required by this Agreement.
4. Each month, PAWS shall submit a properly executed invoice to the City to request payment pursuant to Section 1 of Exhibit A - Scope of Services. Said invoices shall indicate the total number of animals handled during the month for the City. Expenditures under this Agreement that are determined by audit to be ineligible for reimbursement and for which payment has been made to PAWS shall be refunded to the City within 30 days of notification. PAWS shall maintain adequate records to support billings. Said records shall be maintained for a period consistent with Section 8 of the Contract for Consultant Services.
5. In accord with Section 3.C of the Agreement, by November 1, 2010, PAWS agrees to provide its best efforts to submit to the City an estimate of the 2011 rates/charges for the provision of services described herein. The parties acknowledge that such an estimate would enable the City sufficient time to review and confer with PAWS regarding said rates/charges prior to the end term of this Agreement.

EXHIBIT C
City of Kenmore
Billing Invoice

To: City of Kenmore
PO Box 82607
Kenmore, Washington 98028
Phone: (425) 398-8900
Fax: (425) 481-3236

Invoice Number: _____ Date of Invoice: _____

Consultant: _____

Mailing Address: _____

Telephone: () _____

Contract Period: _____ Reporting Period: _____

Amount requested this invoice: \$ _____

Attach itemized description of services provided.

Specific Program: _____

Authorized signature

For Department Use Only

BUDGET SUMMARY

Total contract amount	\$ _____
Previous payments	\$ _____
Current request	\$ _____
Balance remaining	\$ _____

Approved for Payment by: _____ Date: _____

EXHIBIT D
CITY OF KENMORE
P.O. Box 82607
Kenmore, WA 98028
Phone: (425) 398-8900
Fax: (425) 481-3236

TAX IDENTIFICATION NUMBER

In order for you to receive payment from the City of Kenmore, the must have either a Tax Identification Number or a Social Security Number. The Internal Revenue Service Code requires a Form 1099 for payments to every person or organization other than a corporation for services performed in the course of trade or business. Further, the law requires the City to withhold 20% on reportable amounts paid to unincorporated persons who have not supplied us with their correct Tax Identification Number or Social Security Number.

Please complete the following information request form and return it to the City of Kenmore prior to or along with the submittal of the first billing invoice.

Please check the appropriate category:

☐ Corporation
 ☐ Partnership
 ☐ Government Consultant
☐ Individual/Proprietor
 ☐ Other (explain)

TIN No.: _____

Social Security No.: _____

Print Name: _____

Title: _____

Business Name: _____

Business Address: _____

Business Phone: _____

Date

Authorized Signature (Required)

**Contract No. 10-C873
Amendment No. 1**

The following sections of the animal sheltering services contract dated June 29, 2010, between the City of Kenmore and Progressive Animal Welfare Society (PAWS) are amended to read in its entirety as set forth (i.e. below and in attachment). All other terms and conditions of the underlying contract shall remain in full force and effect.

Section 2. Compensation and Method of Payment. The City shall pay Consultant:

- X According to the rates set forth in Exhibit "B"
- X A sum not to exceed \$30,000

Section 3 Duration of Agreement.

- A. This Agreement shall be in full force and effect for a period commencing on June 1, 2010 and ending at midnight on December 31, 2012, unless sooner terminated under the provisions of the Agreement.

Section 17 Notices. Notices to the City of Kenmore shall be sent to the following address:

Frederick Stouder, City Manager
City of Kenmore
P.O. Box 82607
Kenmore, Washington 98028-0607

With copies to:

City Clerk
City of Kenmore
P.O. Box 82607
Kenmore, Washington 98028-0607

Notices to the Consultant shall be sent to the following address:

Annett Laico, Executive Director
PAWS
P.O. Box 1037
Lynnwood, WA 98046

Exhibit A—attached

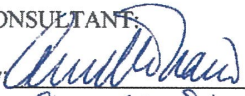
Exhibit B—attached

DATED this 22nd day of November, 2010.

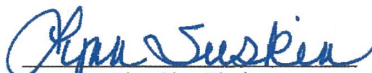
CITY OF KENMORE:

BY: 
Frederick C. Stouder
Title: City Manager

CONSULTANT:

By: 
Title: Executive Director
Address: PAWS

Attest/Authenticated:


Lynn Suskin, City Clerk

15305 44th Ave W
Lynnwood, WA 98087

mailing address:
PO Box 1037
Lynnwood, WA 98046

Approved as to Form:

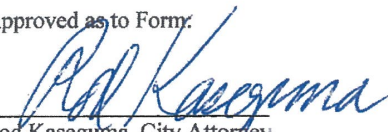

Rod Kaseguma, City Attorney

EXHIBIT A

Scope of Services to be Provided by Consultant. The Consultant shall independently provide the following services to the City:

1. Services Provided by Consultant ("PAWS")

- A. PAWS shall furnish animal shelter services to the City. Animal shelter services shall include sheltering and holding of dogs and cats at facilities operated by PAWS, releasing animals to owners, and disposing of animals that are not claimed by owners after the period prescribed by City ordinance, in a responsible and lawful manner (including adoption or destruction).
- B. PAWS shall provide veterinary care at the discretion of PAWS' Director of Companion Animal Services or, in his or her absence, his or her designated representative (collectively, "Manager" or "Shelter Manager"). If agreed upon by the Shelter Manager and a licensed veterinarian, ill or injured stray animals, whether licensed or not, whose owners cannot be notified, because the animal has no identification that is traceable or the owner can not be reached by a single phone call, may be euthanized if the animal is in pain that cannot be relieved by such care as the shelter staff can reasonably provide. PAWS shall have a policy and procedure to follow to euthanize the animal and to reach the owner. When reasonably possible, PAWS shall recover costs from the owner of the animal for such veterinary treatment prior to release of the animal or euthanasia procedure.
- C. PAWS agrees to abide by and strictly follow any and all procedures of Title 6 of the Kenmore Municipal Code, as now or hereafter amended, regulating animals, particularly the provisions of Title 6 related to the duration of impoundment, before disposing of any animals. PAWS and the City agree that Title 6, as now or hereafter amended, is incorporated by reference and shall be part of this Agreement as if set forth in full herein. The City shall provide PAWS with current copies of all applicable policies, procedures, City ordinances, and promptly provide subsequent amendments affecting PAWS' performance under this Agreement.
- D. If any animal is brought to PAWS by a City official or an Animal Control Officer and then claimed by its owner during the applicable holding period, the owner will be solely responsible for paying any and all reasonable fees and costs charged by PAWS for its care and sheltering of the animal. PAWS may choose not to release any sheltered animal to any person until PAWS is reasonably satisfied that the person has paid all applicable, shelter and other fees related to housing and caring for any animal and has evidence of the ownership of said animal.
- E. PAWS will hold unlicensed stray dogs and cats for a period of seventy two (72) hours from time of delivery, except as provided herein. Stray dogs and cats bearing a current license issued within the State of Washington or positively identified by a City official or Animal Control Officer or by a traceable microchip shall be held for a period of ten (10) days. PAWS shall be responsible for delivering notification to owners that their licensed dog or cat has been impounded, unless notification has already been done by a City official or an Animal Control Officer, and PAWS has been provided evidence of such notification. Such notice may be based on information provided by the City in accordance with the City's Animal Control policies and procedures. PAWS shall release animals to owners within the applicable holding period prescribed herein in accordance with the procedures outlined in Section 1.D.
- F. PAWS shall dispose of animals not claimed by an owner once the applicable holding period prescribed herein has expired, either by release for adoption, euthanasia, or transfer to another agency in accordance with applicable laws and terms of this Agreement. PAWS shall not sell any animals to research institutes or licensed dealers for research purposes. Animals held under RCW

16.52.085 will be held for fifteen (15) business days before any disposition of the animal by PAWS.

Any animal not redeemed by its owner during the prescribed holding period or which, in the opinion of a licensed veterinarian or the Shelter Manager, is suffering from serious injury or disease, may be humanely destroyed, or in the discretion of the Shelter Manager may be held for a longer period and redeemed by any person upon payment of reasonable medical and holding costs. Animals deemed dangerous by the City shall not be released to their owners without a court order.

- G. If not claimed by an owner during the applicable holding period, an animal immediately becomes the property of PAWS. Disposition of the animal is then at PAWS' discretion, provided however, that PAWS shall not dispose of an animal while any legal proceedings of which it has notice and relating to the disposition of that animal are pending or in contravention of any court order of which it has notice.
- H. PAWS reserves the right to refuse all animals other than dogs or cats, where, in PAWS' opinion, it does not have the facilities appropriate or available to accommodate the needs of such animal. PAWS further reserves the right to refuse any animal if the animal shelter is at its maximum capacity. The Manager shall have the authority to make such determinations.

2. Work and Facility Inspection

The City reserves the right, upon reasonable notice, to inspect, review and approve the work and facilities of PAWS to assure that it has been completed as specified, prior to payment.

3. Representations

PAWS represents and warrants that it has the requisite training, skill and experience necessary to provide the services and is appropriately accredited and licensed by all applicable agencies and governmental entities.

4. Property and Confidential Information

PAWS shall not, without the prior written consent of the City, disclose to third parties information it obtains from the City that is not otherwise subject to public disclosure, and shall only disclose in a manner consistent with Section 14 of the Contract for Consultant Services.

EXHIBIT B

Rates for Services to be Provided by Consultant. The Consultant shall furnish the services in accordance with the following rates:

1. In consideration of PAWS performing the services contemplated by this Agreement, the City agrees to pay an intake fee of \$160.00 for each animal brought to PAWS from the City's jurisdiction beginning January 1, 2011, provided that no fee will be charged to the City for animals that are brought to PAWS by City officials or Animal Control Officers and released to their owners prior to applicable holding period expiring pursuant to Section 1.E of Exhibit A - Scope of Services. This includes licensed or unlicensed stray animals found within the City limits of Kenmore and brought to PAWS by a City official or an Animal Control Officer.
2. PAWS may also charge the City a per day fee of Twelve Dollars (\$12.00) per animal for animals held, at the City's written request, beyond the time periods specified in Section 1.E. of the Exhibit A - Scope of Services. In the event of legal proceedings or court order, the City will provide PAWS with prompt written notice of the same and direct that the animal shall be held until further notice.
3. The above mentioned payment shall be the sole compensation for work performed and/or services rendered by PAWS, and for supervision, labor, supplies, materials, equipment or use thereof, and for all other expenses and incidentals necessary to complete all the services required by this Agreement.
4. Each month, PAWS shall submit a properly executed invoice to the City to request payment pursuant to Section 1 of Exhibit A - Scope of Services. Said invoices shall indicate the total number of animals handled during the month for the City. Expenditures under this Agreement that are determined by audit to be ineligible for reimbursement and for which payment has been made to PAWS shall be refunded to the City within 30 days of notification. PAWS shall maintain adequate records to support billings. Said records shall be maintained for a period consistent with Section 8 of the Contract for Consultant Services.
5. In accord with Section 3.C of the Agreement, by November 1, 2010, PAWS agrees to provide its best efforts to submit to the City an estimate of the 2011 rates/charges for the provision of services described herein. The parties acknowledge that such an estimate would enable the City sufficient time to review and confer with PAWS regarding said rates/charges prior to the end term of this Agreement.

**Contract No. 10-C873
Amendment No. 2**

The following sections of the animal sheltering services contract dated June 29, 2010, between the City of Kenmore and Progressive Animal Welfare Society (PAWS) are amended to read in its entirety as set forth (i.e. below and in attachment). All other terms and conditions of the underlying contract shall remain in full force and effect.

Section 1. Scope of Services to be Performed by Consultant. The Consultant shall perform the services described in Exhibit "A" of this Agreement. In performing the services, the Consultant shall comply with all federal, state and local laws and regulations applicable to the services. The Consultant shall perform the services diligently and completely and in accordance with professional standards of conduct and performance.

Section 2. Compensation and Method of Payment. The City shall pay Consultant:

X According to the rates set forth in Exhibit "B"

Section 3 Duration of Agreement.

A. This Agreement shall be in full force and effect for a period commencing on June 1, 2010 and ending at midnight on December 31, 2015, unless sooner terminated under the provisions of the Agreement.

Section 17 Notices. Notices to the City of Kenmore shall be sent to the following address:

City Manager
City of Kenmore
P.O. Box 82607
Kenmore, Washington 98028-0607

With copies to:

City Clerk
City of Kenmore
P.O. Box 82607
Kenmore, Washington 98028-0607

Notices to the Consultant shall be sent to the following address:

Annett Laico, Executive Director
PAWS
P.O. Box 1037
Lynnwood, WA 98046

Exhibit A—attached

Exhibit B—attached

DATED this 20 day of Dec, 2012

CITY OF KENMORE:

BY: [Signature]
Rob Karlinsey
Title: City Manager

CONSULTANT:

By: [Signature], PAWS
Title: Executive Director
Address: 15305 44th Ave W
Lynden WA 98087

Attest/Authenticated:

[Signature]
Patty Safran, City Clerk

Approved as to Form:

Rod Kaseguma, City Attorney

EXHIBIT A

Scope of Services to be Provided by Consultant. The Consultant shall independently provide the following services to the City:

1. Services Provided by Consultant ("PAWS")

- A. PAWS shall furnish animal shelter services to the City. Animal shelter services shall include sheltering and holding of dogs and cats at facilities operated by PAWS, releasing animals to owners, and disposing of animals that are not claimed by owners after the period prescribed by City ordinance, in a responsible and lawful manner (including adoption or destruction).
- B. PAWS shall provide veterinary care at the discretion of PAWS' Director of Companion Animal Services or, in his or her absence, his or her designated representative (collectively, "Manager" or "Shelter Manager"). If agreed upon by the Shelter Manager and a licensed veterinarian, ill or injured stray animals, whether licensed or not, whose owners cannot be notified, because the animal has no identification that is traceable or the owner can not be reached by a single phone call, may be euthanized if the animal is in pain that cannot be relieved by such care as the shelter staff can reasonably provide. PAWS shall have a policy and procedure to follow to euthanize the animal and to reach the owner. When reasonably possible, PAWS shall recover costs from the owner of the animal for such veterinary treatment prior to release of the animal or euthanasia procedure.
- C. PAWS agrees to abide by and strictly follow any and all procedures of Title 6 of the Kenmore Municipal Code, as now or hereafter amended, regulating animals, particularly the provisions of Title 6 related to the duration of impoundment, before disposing of any animals. PAWS and the City agree that Title 6, as now or hereafter amended, is incorporated by reference and shall be part of this Agreement as if set forth in full herein. The City shall provide PAWS with current copies of all applicable policies, procedures, and City ordinances at least thirty (30) days prior to the effective date of any amendment affecting PAWS' performance under this Agreement.
- D. If any animal is brought to PAWS by a City official or a King County Animal Control Officer and then claimed by its owner during the applicable holding period, the owner will be solely responsible for paying any and all reasonable fees and costs charged by PAWS for its care and sheltering of the animal. PAWS may choose not to release any sheltered animal to any person until PAWS is reasonably satisfied that the person has paid all applicable, shelter and other fees related to housing and caring for any animal and has evidence of the ownership of said animal.
- E. PAWS will hold unlicensed stray dogs and cats for a period of seventy two (72) hours from time of delivery, except as provided herein. Stray dogs and cats bearing a current license issued within the State of Washington or positively identified by a City official or King County Animal Control Officer or by a traceable microchip shall be held for a period of ten (10) days. PAWS shall be responsible for delivering notification to owners that their licensed dog or cat has been impounded, unless notification has already been done by a City official or an Animal Control Officer, and PAWS has been provided evidence of such notification. Such notice may be based on information provided by the City in accordance with the City's Animal Control policies and procedures. PAWS shall release animals to owners within the applicable holding period prescribed herein in accordance with the procedures outlined in Section 1.D.
- F. PAWS shall dispose of animals not claimed by an owner once the applicable holding period prescribed herein has expired, either by release for adoption, euthanasia, or transfer to another agency in accordance with applicable laws and terms of this Agreement. PAWS shall not sell any animals to research institutes or licensed dealers for research purposes. Animals held under RCW 16.52.085 will be held for fifteen (15) business days before any disposition of the animal by PAWS.

Any animal not redeemed by its owner during the prescribed holding period or which, in the opinion of a licensed veterinarian or the Shelter Manager, is suffering from serious injury or disease, may be humanely destroyed, or in the discretion of the Shelter Manager may be held for a longer period and redeemed by any person upon payment of reasonable medical and holding costs. Animals deemed dangerous by the City shall not be released to their owners without a court order.

- G. If not claimed by an owner during the applicable holding period, an animal immediately becomes the property of PAWS. Disposition of the animal is then at PAWS' discretion, provided however, that PAWS shall not dispose of an animal while any legal proceedings of which it has notice and relating to the disposition of that animal are pending or in contravention of any court order of which it has notice.
- H. PAWS reserves the right to refuse all animals other than dogs or cats, where, in PAWS' opinion, it does not have the facilities appropriate or available to accommodate the needs of such animal. PAWS further reserves the right to refuse any animal if the animal shelter is at its maximum capacity. The Manager shall have the authority to make such determinations. The Manager can decline owned animals that need to be placed on "bite quarantine" if the King County Animal Control Officer approves the animal(s) can remain at the owner's house or be housed at another boarding facility at the owner's sole expense.

2. Work and Facility Inspection

The City reserves the right, upon reasonable notice, to inspect, review and approve the work and facilities of PAWS to assure that it has been completed as specified, prior to payment.

3. Representations

PAWS represents and warrants that it has the requisite training, skill and experience necessary to provide the services and is appropriately accredited and licensed by all applicable agencies and governmental entities.

4. Property and Confidential Information

PAWS shall not, without the prior written consent of the City, disclose to third parties information it obtains from the City that is not otherwise subject to public disclosure, and shall only disclose in a manner consistent with Section 14 of the Contract for Consultant Services.

5. Collaboration and Promotion

The City and PAWS will collaborate to promote responsible guardianship and attempt to reduce future sheltering and animal control costs. The City will continue to support the community's movement to a safer and more humane environment by participating with PAWS as follows:

- a) The City will continue to ensure that information on lost/found pets and licensing information is presented on the City website including appropriate links to PAWS and animal control providers.
- b) The City will work with PAWS to be visible in the community through appropriate and available city events and educational information.

EXHIBIT B

Rates for Services to be Provided by Consultant. The Consultant shall furnish the services in accordance with the following rates:

1. In consideration of PAWS performing the services contemplated by this Agreement, the City agrees to pay an intake fee of \$165.00 for each animal brought to PAWS from the City's jurisdiction for the years 2013 and 2014. For the year 2015, the \$165.00 intake fee rate will be increased by either 2.5% or the June to June Seattle-Bellevue-Tacoma CPI-U, whichever is greater. The intake fee dollar amount will be rounded up to the nearest dollar.

For animals that are brought to PAWS by City officials or King County Animal Control Officers and released to their owners prior to the applicable holding period expiring pursuant to Section 1.E of this Scope of Work, PAWS will attempt to recover the intake fee from the animal's owner. However, if PAWS is not successful in recovering either the entire intake fee or a portion of the fee, the balance of this intake fee amount will be billed to the City. This includes licensed or unlicensed stray animals found within the City limits of Kenmore and brought to PAWS by a City Official or a King County Animal Control Officer.

2. PAWS may also charge the City a per day fee of Fifteen Dollars (\$15.00) per animal for animals held, at the City's written request, beyond the time periods specified in Section 1.E. of the Exhibit A - Scope of Services. In the event of legal proceedings or court order, the City will provide PAWS with prompt written notice of the same and direct that the animal shall be held until further notice.

3. The above mentioned payment shall be the sole compensation for work performed and/or services rendered by PAWS, and for supervision, labor, supplies, materials, equipment or use thereof, and for all other expenses and incidentals necessary to complete all the services required by this Agreement.

4. Each month, PAWS shall submit a properly executed invoice to the City to request payment pursuant to Section 1 of Exhibit A - Scope of Services. Said invoices shall indicate the total number of animals handled during the month for the City. Expenditures under this Agreement that are determined by audit to be ineligible for reimbursement and for which payment has been made to PAWS shall be refunded to the City within 30 days of notification. PAWS shall maintain adequate records to support billings. Said records shall be maintained for a period consistent with Section 8 of the Contract for Consultant Services.

5. In accord with Section 3.C of the Agreement, by November 1, 2010, PAWS agrees to provide its best efforts to submit to the City an estimate of the 2011 rates/charges for the provision of services described herein. The parties acknowledge that such an estimate would enable the City sufficient time to review and confer with PAWS regarding said rates/charges prior to the end term of this Agreement.



City Council Business Agenda Item
City of Kenmore, WA

Subject/Topic: Ordinance 15-0409, adopting tree windthrow amendments for new development. Proposed Council Action/Motion: Approve Ordinance 15-0409.	For Council Meeting Agenda of: 11/23/15 Department: <u>Community Development</u> Prepared by: <u>Debbie Bent, Community Development Director, Lauri Anderson, Senior Planner, and Ashley McCulley, Graduate Intern</u> Initial & Date Approved by Department Head: <u>DA 11/6/15</u> Approved by City Attorney: <u>RK email 11/9/15</u> Approved by Finance Director: <u>[Signature] 11/10/15</u> Approved by City Manager: <u>[Signature]</u> Exhibits/Attachments: 1. Draft Ordinance
Expenditure Required \$0 Amount Budgeted: \$0 Appropriation Required \$0	
<u>INFORMATION/BACKGROUND:</u> At the joint City Council/Planning Commission meeting on October 26, 2015, Council authorized preparation of an ordinance adopting tree windthrow code amendments for new development. The draft ordinance is attached. <u>Background:</u> Tree windthrow occurs when a tree trunk acts as a lever under the pressure of the wind and the tree is uprooted. Trees most at risk are those whose environment has recently changed (in the last 5-10 years). When trees that were living in the midst of the urban forest lose the protection of a rim of trees and become stand-alones on new housing lots, or become the new edge trees of the urban forest, they are made more vulnerable to strong weather elements. They lose the physical protection of surrounding trees that had kept them from breaking or falling. Moreover, land clearing may wound a tree's roots, providing an opportunity for infection by wood decay fungi and making the tree more vulnerable to windthrow. Compacting soil, or changing grade and drainage patterns also can damage or kill roots. Factors related to tree windthrow beyond reduced shelter by other trees and root disturbance include: height relative to neighboring trees (if the remaining trees are taller than average, they will take the brunt of the force from a windstorm); topography in the tree's location (affecting the level of wind exposure); and type of foliage (trees that shed their leaves annually carry a higher risk of failure). Urban forest management best practices suggest that although there are multiple factors that contribute to windthrow, cities can adopt tree protection ordinances that reduce the potential for such failures. Best practices include but are not limited to: protecting groves and interior trees, providing alternatives to trenching (such as under-root boring), and preservation of trees' lateral root system health and integrity. Ultimately, a tree protection professional must determine both the potential for tree windthrow and appropriate mitigation measures. Under the proposed regulations, a tree windthrow evaluation would be included as part of the standard tree protection plan preparation and review for new development.	
<u>FISCAL CONSIDERATION:</u> None at this time.	
<u>COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:</u> Addressing tree windthrow was a Council docket item request.	

I:/City Clerk/Agenda Items/Templates

Attachment 1

**CITY OF KENMORE
WASHINGTON
ORDINANCE NO. 15-0409**

**AN ORDINANCE OF THE CITY OF KENMORE,
WASHINGTON, RELATING TO TREE WINDTHROW;
AMENDING SECTIONS 18.20.2207, 18.57.050 AND 18.57.080
OF THE KENMORE MUNICIPAL CODE; ADOPTING
NEW SECTIONS 18.20.3090 AND 18.57.085 OF THE
KENMORE MUNICIPAL CODE; AND PROVIDING AN
EFFECTIVE DATE.**

WHEREAS, in 2015, the City Council assigned review of tree windthrow issues to the Planning Commission as part of the 2015 docket; and

WHEREAS, the Planning Commission has reviewed and recommended amendments to Title 18 of the Municipal Code to address tree windthrow; and

WHEREAS, on September 1, 2015, the Planning Commission held a public hearing to receive public feedback on the proposed amendments; and

WHEREAS, the City's Responsible Official under the State Environmental Policy Act has issued a determination of non-significance for the amendments; and

WHEREAS, the Washington State Department of Commerce was notified of the proposed amendments pursuant to RCW 36.70A.106; and

WHEREAS, on October 26, 2015, the Planning Commission presented their tree windthrow recommendations to the City Council in a joint meeting; and

WHEREAS, the City Council desires to adopt regulations to guard against increased risk of tree windthrow created by new development;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF KENMORE, WASHINGTON, DO ORDAIN AS FOLLOWS:

Section 1. Adoption of Revisions to Sections 18.20.2207, 18.57.050 and 18.57.080 of the Kenmore Municipal Code. The City Council adopts tree windthrow amendments to Sections 18.20.2207, 18.57.050 and 18.57.080 of the Kenmore Municipal Code to read as set forth in Attachment A, attached hereto and incorporated herein by reference.

Section 2. Adoption of New Sections 18.20.3090 and 18.57.085 of the Kenmore Municipal Code. The City Council adopts new sections 18.20.3090 and 18.57.085 of the Kenmore Municipal Code addressing tree windthrow to read as set forth in Attachment B, attached hereto and incorporated herein by reference.

Section 3. Effective Date. This Ordinance shall be published in the official newspaper of the City, and shall take effect and be in full force five (5) days after the date of publication.

PASSED BY THE CITY COUNCIL AT A REGULAR MEETING THEREOF ON THE ____TH DAY OF _____, 2015.

CITY OF KENMORE

David Baker, Mayor

ATTEST/AUTHENTICATED:

Patty Safrin, City Clerk

Approved as to form:

Rod P. Kaseguma, City Attorney

Filed with the City Clerk:
Passed by the City Council:
Ordinance No.: 15-0409
Date of Publication:
Effective Date:

ATTACHMENT A

AMEND THE DEFINITION OF QUALIFIED TREE PROTECTION PROFESSIONAL AS FOLLOWS (changes noted in yellow highlighting):

18.20.2207 Qualified tree protection professional.

“Qualified tree protection professional” means a licensed professional with academic and/or field experience that makes her or him a recognized expert in *tree* preservation and management. The tree protection professional **may shall** be an arborist certified by the International Society of Arboriculture or be an arborist registered with the American Society of Consulting Arborists, and shall have specific experience with *tree* management in the State of Washington. A qualified tree protection professional must possess the ability to evaluate the health and hazard potential of existing *trees*, and the ability to prescribe appropriate measures necessary for the preservation of *trees* during *development*.

AMEND KMC SECTION 18.57.050 AS FOLLOWS (changes noted in yellow highlighting):

18.57.050 Tree protection plan required.

A. Requirement Established. Except for the exemptions enumerated in this chapter, no individual, partnership, corporation, association, organization, cooperative, public or municipal corporation, or agency of any governmental unit, however designated, shall remove, transplant, or destroy, or cause to be removed, transplanted, or destroyed, on any land in the *City*, any *tree* as defined in this chapter, without first obtaining the *city manager's* approval of a tree protection plan and receiving a clearing permit from the *City*. For *sites* proposed for land *development*, including the division of a parcel of land into two or more parcels, having *trees* below the minimum tree density, even though no *trees* are proposed to be removed, a tree protection plan is required to bring the *site* up to the minimum tree density standard herein established.

B. Submittal of Tree Protection Plan. Where the *site* proposed for *development* requires site or plat or short plat review, the tree protection plan shall be submitted concurrent with a site plan or plat or short plat application.

C. Tree Protection Plan Requirements. Attached to the *applicant* information and site plan information required for the clearing permit applications, the *applicant* shall include the following tree protection plan information:

1. *Tree Survey*. For all *development proposals*, a *tree survey*, drawn to scale by a land surveyor licensed in Washington State, identifying the exact location and conditions of existing *trees* as defined in this title and containing the following information:

- a. Common and botanical name of each *tree*.
- b. *Trees* proposed to remain and to be removed.
- c. *Groves* with indication of predominant species, number of *trees* and size of d.b.h.
- d. Any off-site *tree* with a root protection zone which could be adversely affected by the proposed activity.
- e. The location and dimensions of established and proposed perimeter *landscaping*, natural *vegetation* easements, and open space areas for public, *private*, or community use.
- f. *Net buildable areas*.
- g. *Critical areas* and their *buffers*.
- h. Stormwater tracts.
- i. Limits of construction line.
- j. North arrow, scale, and date of survey.

2. An assessment of *tree windthrow* potential as described in KMC Section 18.57.085, along with any proposed mitigation measures to minimize windthrow. These measures shall be incorporated into the proposed tree protection plan described in subsection 5 of this section.

23. A statement describing how *trees* intended to remain will be identified, marked, and protected before the start of and during *development* as further described in KMC 18.57.090.

34. A statement that describes replacement tree quality as conforming to the American Standards for Nursery Stock (ANSI).

45. Proposed Tree Protection Plan. The permit *applicant* shall have a *qualified tree protection professional* prepare recommendations for the a tree protection plan. The tree protection plan shall be drawn to scale using the *tree* survey as a base and containing the following information:

- a. The exact location and conditions of protected *trees*.
- b. The exact location, common name, botanical name, and *caliper* of each *tree* species to be planted.
- c. The *site* minimum tree density calculation indicating the total number, size, and species of existing *trees* to be preserved and the replacement *trees* to be planted as described in KMC 18.57.060.
- d. The *site* replacement tree calculation as described in KMC 18.57.060 with an explanation including the number, *caliper*, and species.
- e. The location, materials, dimensions, and layout of the protective barriers.

56. Submit a landscape bond quantity form.

67. Additional Information. Any additional or more detailed information required by the *city manager* to ensure compliance with the provisions of this chapter (i.e., aerial photograph). The *city manager* may waive the requirements for the scaled drawing and other submission data if he finds that the information presented is sufficient to determine the project's compliance with the provisions of this chapter.

AMEND KMC SECTION 18.57.080 AS FOLLOWS (changes noted in yellow highlighting):

18.57.080 Tree protection plan review standards.

The following standards shall govern the approval of a tree protection plan and the granting or denial of an application for clearing permit:

A. Design. *Development* shall be designed, located, and conducted so as to minimize the loss of healthy *groves* and protected *trees* as identified by a *qualified tree protection professional*, degradation of wildlife habitat as identified through environmental review, and the potential for *erosion* and slope failure.

B. *Tree Protection Priority*. In designing a development project and in meeting the required minimum tree density, the *applicant* shall protect *trees* within the *net buildable area* as described in KMC 18.57.060(B)(1), in the following order of priority. *Trees* to be preserved and protected must be healthy and vigorous, *wind-firm*, and not in conflict with utilities.

1. *Groves*.
2. Individual *trees* which provide wildlife habitat as identified through environmental review.
3. Individual *trees* and *groves* which occur within required *setbacks*.
4. Trees that protect against windthrow, including ~~t~~ *Trees* sheltering interior *trees* or *trees* on adjacent property from strong winds that could otherwise cause them to blow down.
5. *Trees* which provide a buffer and separate incompatible *uses* or reduce sound and wind levels.

...

ATTACHMENT B

ADD A NEW DEFINITION AS FOLLOWS:

18.20.3090 Tree windthrow.

"Tree windthrow" means the process of uprooting, breaking, and overthrowing of a *tree* by force of wind during a storm event.

ADD A NEW SECTION AS FOLLOWS:

18.57.085 Tree windthrow evaluation and prevention.

- A. Increased *tree windthrow* potential as a result of impacts to *trees* on a site shall be evaluated based on the following risk factors:
 - 1. Root system disruption that will extend within an area 1 to 2.5 times the radius of the canopy;
 - 2. Topography of the site;
 - 3. Whether the *tree* is deciduous or evergreen;
 - 4. Height of the *tree* relative to the neighboring *trees*;
 - 5. Whether the *tree* is part of a *grove*.
- B. The windthrow evaluation shall be conducted as part of the preparation of the tree protection plan (see KMC Section 18.57.050) based on the aforementioned risk factors. The assessment shall be conducted by a *qualified tree protection professional*. This assessment also shall evaluate increased windthrow potential for *trees* on neighboring lots that are within 50 feet of the closest *trees* being removed on the site, including *trees* that share a root system with *tree(s)* on the site.
- C. Tree protection plan.
 - 1. When significant windthrow potential is identified for *trees* that could impact neighboring properties or are on neighboring properties, the *applicant* shall identify measures to minimize windthrow as part of the tree protection plan. Measures could include but are not limited to demonstrating that the *critical root zone (CRZ)* fencing is adequate to

prevent root disruption or that the *CRZ* is expanded to provide root protection; saving *groves* when applicable; taking steps to preserve existing grades around *trees*; and/or tunneling rather than trenching for utilities. The City may deny a request to remove a *tree(s)* if mitigation measures are inadequate to minimize windthrow.

2. If potential windthrow damage is for the *site* itself, the *applicant* shall identify measures to reduce impacts to future *structures* on the *site*.



**City Council Business Agenda Item
City of Kenmore, WA**

Subject/Topic: Resolution 15-266 adopting Volume 1 of the Regional Hazard Mitigation Plan Update (RHMP) and the Introduction, Appendices and City of Kenmore Annex to the RHMP in Volume 2. Proposed Council Action/Motion: Approve Resolution 15-266.	For Council Meeting Agenda of: 11/23/15 Department: <u>Community Development</u> Prepared by: <u>Lauri Anderson, Senior Planner</u> Initial & Date Approved by Department Head: <u>OS 11/9/15</u> Approved by City Attorney: <u>D. Reitan email 11/6/15</u> Approved by Finance Director: <u>[Signature] 11/10/15</u> Approved by City Manager: <u>[Signature]</u> Exhibits/Attachments: 1. King County Regional Hazard Mitigation Plan Update (RHMP), Volume 1 2. Introduction and Appendices from RHMP Volume 2 3. Kenmore Annex to the RHMP (to be incorporated into Volume 2) 4. Draft resolution			
<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">Expenditure Required \$0</td> <td style="width: 33%;">Amount Budgeted: \$0</td> <td style="width: 33%;">Appropriation Required \$0</td> </tr> </table> In October 2014, the City of Kenmore agreed to work with King County to update the City's Hazard Mitigation Plan. The City's Plan must be updated by the end of this year to ensure continued opportunities for grant funding. The County's Regional Hazard Mitigation Plan Update (RHMP, Volume 1) was prepared in 2014. Staff from the City and the County worked together to prepare the Kenmore Annex (portion of the plan specifically addressing Kenmore) in 2014/2015. In April 2015, staff submitted the draft Kenmore Annex to the County. After the County's review, the Kenmore Annex was sent to Washington State and then on to the Federal Emergency Management Agency (FEMA) which tentatively approved the annex on October 29. The final step in putting Kenmore's plan in place is City Council approval of a resolution adopting the King County Regional Hazard Mitigation Plan Update (to which the Kenmore information is attached) as well as the Kenmore Annex. BACKGROUND: In January of 2013, a partnership of King County cities and special purpose districts embarked on a planning process to prepare for and lessen the impacts of specified natural hazards by updating the King County Regional Hazard Mitigation Plan. Responding to federal mandates in the Disaster Mitigation Act of 2000 (Public Law 106-390), the partnership was formed to pool resources and to create a uniform hazard mitigation strategy that could be consistently applied to the defined planning area and used to ensure eligibility for specified grant funding success. The planning partnership involved in this program included King County and multiple city and town governments and special purpose districts. The planning area for the hazard mitigation plan was defined as all incorporated and unincorporated areas of King County as well as the incorporated areas of cities that cross County boundaries: Auburn, Bothell, Milton and Pacific. While not part of the initial planning efforts, both the City of Kenmore and the City of Lake Forest Park agreed to join the partnership in late 2014 when a hazard mitigation plan update effort organized by ESCA through Snohomish County was abandoned.		Expenditure Required \$0	Amount Budgeted: \$0	Appropriation Required \$0
Expenditure Required \$0	Amount Budgeted: \$0	Appropriation Required \$0		

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Mitigation is defined in this context as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event. Mitigation planning is the systematic process of learning about the hazards that can affect the community, setting clear goals, identifying appropriate actions and following through with an effective mitigation strategy. Mitigation encourages long-term reduction of hazard vulnerability and can reduce the enormous cost of disasters to property owners and all levels of government. Mitigation can also protect critical community facilities, reduce exposure to liability, and minimize post-disaster community disruption.

The hazard identification and profiling in the hazard mitigation plan addresses the following hazards of concern within the planning area:

1. Avalanche
2. Dam failure
3. Earthquake
4. Flood
5. Landslide
6. Severe weather
7. Severe winter weather
8. Tsunami
9. Volcano
10. Fire

With the exception of dam failure, this plan does not provide a full risk assessment of technological and human-caused hazards. However, brief, qualitative discussions of the following hazards of interest are included: health hazards, cybersecurity and terrorism.

The King County Office of Emergency Management has been the lead agency in developing the hazard mitigation plan. All participating local jurisdictions have been responsible for assisting in the development of the hazard and vulnerability assessments and the mitigation action strategies for their respective jurisdictions and organizations. The Plan presents the accumulated information in a unified framework to ensure a comprehensive and coordinated plan covering the entire King County planning area. Each jurisdiction has been responsible for the review and approval of their individual sections of the Plan. In Kenmore, staff from all departments contributed to preparation of the Kenmore Annex.

Public involvement in the County process was solicited via a multi-media campaign that included two rounds of public meetings, web-based information, a questionnaire and progress updates via the news media. Residents were asked to contribute by sharing local knowledge of their individual area's vulnerability to natural hazards based on past occurrences. Kenmore staff conducted a public survey on hazard mitigation in December 2014, receiving 50 responses. A three-week public comment period in May 2015 was advertised once the draft annex was complete. One comment was received.

Upon adoption of Volume 1 and Kenmore's portion of Volume 2 of the King County Regional Hazard Mitigation Plan Update (RHMP) and subsequent final approval of the plan by FEMA, the City of Kenmore will be eligible to apply for specified grants. The grant funds are made available to states and local governments and can be used to implement the long-term hazard mitigation measures specified within the City's portion of the RHMP before and after a major disaster declaration. The RHMP is considered a living document given that, as awareness of additional hazards develops and new strategies and projects are conceived to offset or prevent losses due to natural disasters, the RHMP is evaluated and revised on a continual 5-year time frame.

FISCAL CONSIDERATION:

None at this time.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

City of Kenmore Vision Statement: In 2035, we see Kenmore as a fun, vibrant waterfront community that supports the safety, health, and welfare of all of its citizens.

Kenmore Mission Statement: With integrity as its cornerstone, Kenmore is a city that will meet its obligations by providing public safety.

Comprehensive Plan Objective PS-3.3: Establish an emergency management office and system.

- Policy PS-3.3.1 Establish emergency management procedures for the City in consultation with the Northshore Utility District, the Northshore Fire Department, adjacent jurisdictions, King County, Snohomish County, and the State.
- Policy PS-3.3.2 Participate in regional emergency management programs.
- Policy PS-3.3.3 Work with the community to educate citizens about emergency preparedness and encourage citizens to be prepared for natural disasters.

Attachment 3**Executive Summary**

The City of Kenmore has submitted an application to King County Office of Emergency Management to become a fully vested planning partner in the King County Regional Hazard Mitigation Plan, approved by FEMA on May 1, 2015. This jurisdictional annex is the result of the City of Kenmore adhering to all linkage procedures prescribed in appendix B, of volume 2 of the King County Regional Hazard Mitigation Plan. These “linkage” procedures define the requirements established by the Planning Team for dealing with an increase or decrease in the number of planning partners linked to the regional plan during the plan performance period. Any review of this jurisdictional annex must clearly understand that is not to be interpreted as a stand-alone hazard mitigation plan for the City of Kenmore. This jurisdictional annex is now a functional component of the King County Regional Hazard Mitigation plan and should be viewed in context with elements of the regional plan.

As described in section 1.3 of volume 1 of the Regional Plan, this plan has been set up in two volumes so that elements that are jurisdiction-specific can easily be distinguished from those that apply to the whole planning area:

- Volume 1—Volume 1 includes all federally required elements of a disaster mitigation plan that apply to the entire planning area. This includes the description of the planning process, public involvement strategy, goals and objectives, countywide hazard risk assessment, countywide mitigation actions, and a plan maintenance strategy. The following appendices provided at the end of Volume 1 include information or explanations to support the main content of the plan:
 - Appendix A—A glossary of acronyms and definitions
 - Appendix B—A 5-year progress report on actions identified in prior hazard plans
 - Appendix C—Planning partner bulletins
 - Appendix D—Hazard mitigation questionnaire and summary of results.
 - Appendix E—Concepts and methods used for hazard mapping
 - Appendix F—Plan adoption resolutions from Planning Partners
 - Appendix G—A template for progress reports to be completed as this plan is implemented.
- Volume 2—Volume 2 includes all federally required jurisdiction-specific elements, in annexes for each participating jurisdiction. It includes a description of the participation requirements established by the Steering Committee, as well as instructions and templates that the partners used to complete their annexes. Volume 2 also includes “linkage” procedures for eligible jurisdictions that did not participate in development of this plan but wish to adopt it in the future.

All planning partners have adopted Volume 1 in its entirety and at least the following parts of Volume 2: Part 1; each partner’s jurisdiction-specific annex; and the appendices.

As a linking partner, the City of Kenmore implemented components of the planning process prescribed by the linkage procedures that gave the citizens of the City of Kenmore to participate in the development of the jurisdictional annex and is described therein. The City is fully committed to the plan maintenance strategy identified in section 21.5 of the King County Regional Plan. Like all planning partners, the City will process annual progress reports requested by King County Office of Emergency Management and actively participate in future updates to this plan.

CHAPTER 1. CITY OF KENMORE UPDATE ANNEX

1.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

Lauri Anderson, Senior Planner
18120 68th Ave NE
Kenmore, WA 98028
Telephone: 425-398-8900
e-mail Address: landerson@kenmorewa.gov

Alternate Point of Contact

Debbie Bent, Community Development Director
18120 68th Ave NE
Kenmore, WA 98028
Telephone: 425-398-8900
e-mail Address: dbent@kenmorewa.gov

1.2 JURISDICTION PROFILE

The following is a summary of key information about the jurisdiction and its history:

- **Date of Incorporation**—August 31, 1998
- **Current Population**—21,370 as of April 1, 2014
- **Population Growth**—Since 2008, the City of Kenmore has grown by 1,170 people—an increase of almost 6%. It is anticipated that by 2035, the City will have a population of 28,473.
- **Location and Description**— Kenmore is located in the northern portion of King County commonly known as the “Northshore” area, between the cities of Bothell and Lake Forest Park. The City extends along the northeastern shoreline of Lake Washington and is bisected from east to west by the Sammamish River, which connects Lake Sammamish to Lake Washington. Swamp Creek and its extensive wetlands divide the northern portion of the city. Kenmore is about 6 square miles in size and is primarily developed with single-family neighborhoods. Most commercial development stretches along SR-522 which crosses the City from east to west.

Brief History— Native Americans who lived in the Sammamish River Valley Area were known as the Simump Tribe. White settlers, who arrived in the 1860s, called them the Squaks, a corruption of the word “Squowh.” The forest-covered hills of Kenmore were acquired by investors in Washington timber lands, including Philo Remington (inventor of Remington guns). Remington later sold most of his property in the Kenmore area to Watson C. Squire (his son-in-law). Squire was the last territorial governor of Washington state and one of the state’s first United States Senators. Squire platted his land in 1892.

Kenmore was named by John McMasters. He and his wife, Annie, were originally from the small town of Kenmore, Canada - 40 miles south of Ottawa. They arrived in Puget Sound in 1889 and leased land at Kenmore from Squire and named the area after his old home town. McMasters operated McMasters’ Shingle Mill from 1900 to 1920. At first Kenmore was only the mill, its cookhouse, manager’s house, bunkhouse and a few worker shacks. The mill was just at the edge of Lake Washington, where logs were floated to the area to be made into shingles for roofs and the sides of houses.

In 1913-1914, the brick road between Lake Forest Park and Bothell was opened and restaurants sprang up in the Kenmore portion of the road. The first school was built in 1914. In about 1918 a bridge across the Sammamish River was constructed.

After the end of logging and in the days after the first World War, the Puget Mill Company (Pope & Talbot) offered small tracts of land for residential use in Kenmore. Kenmore's immediate proximity to Seattle—just two miles (3 km) north of modern Seattle city limits—made it an early target of post-war housing development. The first plats in the new Uplake neighborhood were sold in 1954. Homes were built north of the highway and between the main intersection and Swamp Creek. Development of the southern part of the city started about the same time.

During the second half of the 20th Century, the population of Kenmore grew quickly. On August, 31, 1998, the City incorporated.

- **Climate**—Kenmore's climate is typical of the Seattle area, with temperatures varying from an average high of 75 degrees in August to an average low of 36 degrees in January.
- **Governing Body Format**—The seven member City Council is the legislative branch of the city government and serves as the policymaking body. The Council selects one of its members as Mayor and one of its members as Deputy Mayor, both to two-year terms. The Council appoints a City Manager to provide management direction of all City departments and activities in accordance with City Council policies and direction. The Kenmore City Council assumes responsibility for the adoption of this plan; the City Manager will oversee its implementation.
- **Development Trends**—In the 10 years between 2000 and 2010, 1,081 new housing units were built in Kenmore. It is anticipated that an additional 3,667 units will be built over the 25 years between 2010 and the 2035 planning horizon. This averages to an additional 147 new units annually. Jobs actually were lost in the City during the decade between 2000 and 2010, reflecting impacts of the Great Recession. Over the 25 years between 2010 and 2035, it is anticipated that an additional 3,079 jobs will come to Kenmore—an average of 123 new jobs per year. Regional policy documents designate Kenmore as a "Larger City"—expected to become an important subregional job, service, cultural, and housing center over time, with strong links to the regional transportation system. Creating a Downtown "central place" is an important community focus, as are advancing the public's access to and connection to the waterfront and protecting existing single-family neighborhoods. Zoning changes to allow clean light manufacturing throughout much of the commercial area outside of the Downtown core may support the growth of primary jobs in the City.

1.3 PUBLIC INVOLVEMENT STRATEGY

Early in development of this Hazard Mitigation Plan, the City conducted a public survey about hazard mitigation issues. The survey was announced by a story in the Bothell-Kenmore Reporter, on the city's website, and through social media. Fifty people responded to the survey. Most (70%) were Kenmore residents. An additional 25% were Kenmore residents who also work in the City. Two percent of the surveyed work in Kenmore but were not residents. Survey questions included: what hazards are you most concerned about affecting Kenmore; how prepared does your household feel post-disaster; what actions can the city take to mitigate these hazards; and following a disaster, from whom would you expect to receive help?

Respondents were least concerned about avalanches and dam failures.¹ They were slightly concerned by seiches (lake waves) and volcanic eruptions. The most concerning hazards were earthquakes, floods, severe weather, and landslides.

Ninety-two percent of respondents were prepared in some way to deal with a natural disaster. Of that 92%, 60% felt somewhat prepared, 16% felt adequately prepared, 12% felt well prepared and 4% felt very well prepared. Only 8% of respondents felt not prepared at all. In the first day following a disaster, over 70% of respondents stated that they expect help from family and neighbors in the affected area. Only 16% believed that local government would assist them in recovery.

Respondents supported the retrofitting of power infrastructure—in conjunction with Northshore Utility District and Puget Sound Energy-- as the highest mitigation priority. This was followed by retrofitting of City-owned infrastructure, including roads and bridges. More than 50% of respondents believed that partnering with Northshore Fire Department, the Northshore School District, and hospital districts to retrofit fire stations, schools and hospitals was a priority mitigation measure. Nearly 50% focused on education about risk and natural hazards that affect Kenmore as a means to reduce damage and disruption following a disaster.

Updating city laws and regulations for hazard areas such as floodplains and steep slopes was viewed as a medium priority. Acquisition of properties in high hazard areas or in areas that are repeatedly damaged was viewed as a low priority.

When asked how information about what to do and how to help should be distributed, 36% of respondents preferred local broadcast media such as TV and radio. A close 34% prefer city government email and alerts for information. Other less popular modes of information include the city government website, community information bulletin boards, and social media networks like Facebook and Twitter.

After completion of the draft plan, a three-week public comment period was held (from May 1, 2015 through May 22, 2015). Information about the draft plan and the comment period was emailed to all of the survey respondents who provided contact information. A press release was issued and information was included on the cover page of the City's website. One comment was received, suggesting that a Cascadia Subduction Zone earthquake would dwarf any of the other hazards covered in the Plan, particularly if it were to occur in the winter. As the Plan already addresses earthquake hazards, no further amendments were necessary to respond to this comment.

1.4 CAPABILITY ASSESSMENT

The assessment of the jurisdiction's legal and regulatory capabilities is presented in Table 1-1. The assessment of the jurisdiction's fiscal capabilities is presented in Table 1-2. The assessment of the jurisdiction's administrative and technical capabilities is presented in Table 1-3. Information on the community's National Flood Insurance Program (NFIP) compliance is presented in Table 1-4. Classifications under various community mitigation programs are presented in Table 1-5.

¹ A weir is located on the Sammamish River.

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TABLE 1-1. LEGAL AND REGULATORY CAPABILITY					
	Local Authority	State or Federal Prohibitions	Other Jurisdictional Authority	State Mandated	Comments
Codes, Ordinances & Requirements					
Building Code	Yes	No	No	Yes	KMC Title 15, updated 2013
Zonings	Yes	No	No	Yes	KMC Title 18, updated 2014
Subdivisions	Yes	No	Yes	Yes	KMC Title 17, updated 2011
Stormwater Management	Yes	No	Yes	Yes	KMC Title 13, updated 2010
Post Disaster Recovery	Yes	No	No	Yes	Comprehensive Emergency Management Plan (CEMP), updated 2013
Real Estate Disclosure	No	No	Yes	Yes	
Growth Management	Yes	No	Yes	Yes	Comprehensive Plan, updates ongoing
Site Plan Review	Yes	No	No	No	KMC Chapter 18.105, updated 2011
Public Health and Safety	Yes	No	Yes	Yes	KMC Title 8, 1998 and 2003
Environmental Protection	Yes	No	Yes	Yes	KMC Titles 16 and 18, updated 2012
Planning Documents					
General or Comprehensive Plan	Yes	No	Yes	Yes	Comprehensive Plan, updates ongoing
	<i>Is the plan equipped to provide linkage to this mitigation plan?</i>				No
Floodplain or Basin Plan	Yes	No	No	No	Swamp Creek Basin Study, 2014
Stormwater Plan	Yes	No	Yes	Yes	Comprehensive Plan, 2014
Capital Improvement Plan	Yes	No	Yes	Yes	Updated 2014
	<i>What types of capital facilities does the plan address?</i>				Transportation, parks, surface water
	<i>How often is the plan revised/updated?</i>				Annually
Habitat Conservation Plan	Yes	No	Yes	No	Comprehensive Plan, 2006
Economic Development Plan	Yes	No	No	Yes	Comprehensive Plan and Economic Development Strategy, 2009
Shoreline Management Plan	Yes	No	Yes	Yes	Updated 2012
Community Wildfire Protection Plan	No	No	No	No	

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Response/Recovery Planning					
Comprehensive Emergency Management Plan	Yes	No	No	Yes	Updated 2013
Threat and Hazard Identification and Risk Assessment	Yes	No	Yes	No	Hazard Mitigation Plan, ongoing
Terrorism Plan	Yes	No	No	No	CEMP, 2013
Post-Disaster Recovery Plan	Yes	No	No	No	CEMP, 2013
Continuity of Operations Plan	Yes	No	No	No	CEMP, 2013
Public Health Plans	Yes	No	Yes	No	CEMP, 2013, and County Health plans

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**TABLE 1-2.
FISCAL CAPABILITY**

Financial Resources	Accessible or Eligible to Use?
Community Development Block Grants	Yes – through King County Consortium
Capital Improvements Project Funding	Yes
Authority to Levy Taxes for Specific Purposes	Yes
User Fees for Water, Sewer, Gas or Electric Service	No
Incur Debt through General Obligation Bonds	Yes
Incur Debt through Special Tax Bonds	Yes
Incur Debt through Private Activity Bonds	Unknown
Withhold Public Expenditures in Hazard-Prone Areas	Yes
State Sponsored Grant Programs	Yes
Development Impact Fees for Homebuyers or Developers	Yes
Other	Surface water utility fee; Real Estate Excise Tax

**TABLE 1-3.
ADMINISTRATIVE AND TECHNICAL CAPABILITY**

Staff/Personnel Resources	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices	Yes	Development Services/Assistant and Associate Planners Community Development/ Director and Senior Planner Public Works/Director, Senior Engineer and Civil Engineer
Engineers or professionals trained in building or infrastructure construction practices	Yes	Development Services/Director, Building Inspectors Public Works/Director, Senior Engineer, Civil Engineer and Surface Water Program Manager
Planners or engineers with an understanding of natural hazards	Yes	Development Services/Assistant and Associate Planners Community Development/Director and Senior Planner Public Works/Director, Senior Engineer, Civil Engineer, and Surface Water Program Manager
Staff with training in benefit/cost analysis	Yes	Finance and Administration/Director and Accountant
Surveyors	No	

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Personnel skilled or trained in GIS applications	Yes	Development Services/Associate Planner Public Works/Surface Water Program Manager and Surface Water Technician
Scientist familiar with natural hazards in local area	Yes	Public Works/Surface Water Program Manager
Emergency manager	Yes	Development Services Director
Grant writers	Yes	Community Development/Director, Senior Planner and Parks Project Manager Public Works/Director, Senior Engineer, Civil Engineer, Surface Water Program Manager City Manager's Office/Management Analyst, Volunteer & Events Coordinator

**TABLE 1-4.
NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE**

What department is responsible for floodplain management in your community?	Development Services
Who is your community's floodplain administrator? (department/position)	Development Services Director
Do you have any certified floodplain managers on staff in your community?	No
What is the date of adoption of your flood damage prevention ordinance?	1998 (Flood Damage Prevention); 2006 (Critical Areas); 2012 (Shoreline Management)
When was the most recent Community Assistance Visit or Community Assistance Contact?	2012
To the best of your knowledge, does your community have any outstanding NFIP compliance violations that need to be addressed? If so, please state what they are.	No
Do your flood hazard maps adequately address the flood risk within your community? (If no, please state why)	No. FIRM Panel 63 of 1725 is out of date and needs to be updated by FEMA.
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	Yes. Better floodplain maps are needed.
Does your community participate in the Community Rating System (CRS)? If so, is your community seeking to improve its CRS Classification? If not, is your community interested in joining the CRS program?	No

**TABLE 1-5.
COMMUNITY CLASSIFICATIONS**

	Participating?	Classification	Date Classified
Community Rating System	No		
Building Code Effectiveness Grading Schedule	No		
Public Protection	No		
Storm Ready	No		
Firewise	No		
Tsunami Ready (if applicable)	No		

1.5 JURISDICTION-SPECIFIC NATURAL HAZARD EVENT HISTORY

Table 1-6 lists all past occurrences of natural hazards within the jurisdiction. Repetitive flood loss records are as follows:

- Number of FEMA-Identified Repetitive Loss Properties: 2
- Number of FEMA-Identified Severe Repetitive Loss Properties: None

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- Number of Repetitive Flood Loss/Severe Repetitive Loss Properties That Have Been Mitigated: None
- Property Type of Repetitive Flood Loss/Severe Repetitive Loss Properties: Residential

For more information on FEMA-Identified Repetitive Loss properties, please refer to the King County Regional Hazard Mitigation Basic Plan, Vol. 1, Part 2, Chapter 11, Section 5.2.

TABLE 1-6. NATURAL HAZARD EVENTS			
Type of Event	FEMA Disaster # (if applicable)	Date	Preliminary Damage Assessment
Landslide (62 nd Ave. NE and NE 150 th St.)	N/A	4/2013	\$5,000
Severe Winter Weather (Citywide snow and ice control)	4056	1/2012	\$56,000
Landslide (15209 61 st Ave. NE)	N/A	3/2011	\$100,000
Landslide (61 st Ave. NE and NE 184 th St.)	N/A	12/2010	\$5,000
Landslide (15219 61 st Ave. NE)	N/A	12/2010	\$186,000
Severe Winter Weather (Citywide snow and ice control)	1825	12/12/08-1/5/09	\$50,000
Flooding	1734	12/1/07-12/17/07	\$380,000
Landslide (15021 61 st Ave. NE)	N/A	1996 and 2006	\$250,000
Severe Winter Weather (Hanukkah Eve Windstorm)	1682	12/14/06-12/15/06	Unknown. One fatality in Kenmore (carbon monoxide poisoning)
Earthquake (Nisqually)	1361	2/28/01	Unknown
Landslide (north side of SR-522, west of 61 st Ave. NE)	N/A	Almost annually	Unknown. Series of small slumps and slides.
Sammamish River Flooding	Unknown	1998/1999	Unknown

1.6 HAZARD RISK RANKING

Table 1-7 presents the ranking of the hazards of concern. Initial rankings were prepared by Kenmore's Senior Planner in conjunction with King County staff. The rankings then were reviewed and adjusted by an interdepartmental team of Kenmore staff members. Ranking factors included probability of a hazard event and potential impacts on people, property and the economy. Ranking scores could range from a high of 54 to a low of 0.

Hazard area extent and location maps are included at the end of this chapter. These maps are based on the best available data at the time of the preparation of this plan, and are considered to be adequate for planning purposes.

For more information on specific hazards and probability, refer to the King County Regional Hazard Mitigation Base Plan, Vol.1, Part2, Chapters 8-19.

TABLE 1-7. HAZARD RISK RANKING		
Rank	Hazard Type	Risk Rating Score (Probability x Impact)
1	Earthquake	48
2	Severe Weather	39
3	Severe Winter Weather	39
4	Flood	15
5	Landslide	15
6	Wildfire	9
7	Tsunami	6
8	Volcano	6
9	Dam Failure	0
10	Avalanche	0

For more information on the Hazard Risk Ranking Methodology, please refer to the King County Regional Hazard Mitigation Base Plan, Vol. 1, Part 2, Chapter 19.

1.7 METHODOLOGY FOR DEVELOPMENT OF ACTION PLAN MATRIX

To develop the Action Plan, the risk ranking was reviewed along with the list of historical hazard events and actions from the previous plan (Annex to the North King and South Snohomish Counties Regional Mitigation Plan, 2010 Update, formally adopted by Kenmore's City Council on February 14, 2011 by Resolution No. 11-185). Previously uncompleted initiatives were carried forward to this Plan, if feasible, and new initiatives were identified in response to current information and concerns.

After a first draft of the Action Plan Matrix was prepared, a staff working group was convened to review the draft and make final recommendations. This working group included: the Community Development Director and Senior Planner; the Development Services Director; the Engineering and Environmental Services Director; and a representative from the Finance and Administration Department. After the meeting, information was reviewed with the Public Works Operations Manager, the Surface Water

Program Manager, and the Assistant City Manager. The City Manager gave final review and approval to the Action Plan.

1.8 STATUS OF PREVIOUS PLAN INITIATIVES

Table 1-8 summarizes the initiatives that were recommended in the previous version of the hazard mitigation plan and their implementation status at the time this update was prepared.

TABLE 1-8. PREVIOUS ACTION PLAN IMPLEMENTATION STATUS				
Action #	Action Status			Comments
	Completed	Carry Over to Plan Update	Removed; No Longer Feasible	
KM-01-MH-ST	X			Incorporate the full emergency management cycle – including Planning, Response, Recovery and Mitigation – into Kenmore’s planning, policy, and financial processes. CEMP updated in 2013
KM-02-MH-ST		X		Identify equipment necessary for safety and operations. Carried over as new action KM-10
KM-03-MH-ST		X		Continue and enhance hazard education programs. Carried over as new action KM-11
KM-04-MH-ST		X		Enhance public safety strategies for debris avoidance and management for natural hazards events. Carried over as new action KM-18
KM-05-MH-LT	X			Develop mapping capabilities to better identify hazard areas and assess potential damage. Activities are ongoing (Kenmore Public Works)
KM-06-D-ST	X			Work with Northshore Utility District to educate consumers about drought impacts and ways to minimize water waste. Activities are ongoing (Northshore Utility District)
KM-07-E-ST		X		Conduct non-structural retrofit activities. Carried over as new action KM-12
KM-080E-ST		X		Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices. Carried over as new action KM-13
KM-09-E-ST		X		Identify city-owned buildings and infrastructure that require structural retrofiting. Carried over as new action KM-14

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KM-10-E-LT	X			Identify funding sources for structural and nonstructural retrofitting of structures that are identified as seismically vulnerable. Completed for infrastructure, 2014, Kenmore Public Works.
KM-11-F-ST	X			Incorporate Flood Reduction Management Plan and Surface Water Management Plan recommendations into the City of Kenmore's Capital Improvement Schedule. 2014, Kenmore Public Works
KM-12-F-ST	X			Identify surface water drainage obstructions within the City of Kenmore 2014, Kenmore Public Works
KM-13-F-LT	X			Enhance data and mapping for floodplain information within the city, and identify and map flood-prone areas outside of designated floodplains. 2012-2014, Kenmore Public Works and Development Services
KM-14-F-LT	X			Develop acquisition and management strategies to preserve open space for flood mitigation, fish habitat, and water quality in the floodplain. Activities are ongoing (Kenmore Public Works)
KM-15-L-ST		X		Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard prone areas. Carried over, with more specificity, as new action KM-9
KM-16-L-ST	X			Encourage construction and subdivision design that can be applied to steep slopes to reduce the potential adverse impacts from development. 2006 and 2011, Kenmore Community Development
KM-17-S-ST	X			Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe storms. Activities are ongoing (Kenmore Public Works)
KM-18-S-ST	X			Increase public awareness of severe storm mitigation activities. Activities are ongoing (City Manager's Office)
KM-19-S-ST			X	Develop and implement programs to keep trees from threatening lives, property, and public infrastructure during severe storm events. Trees of concern are on private property and not under City control
KM-20-T-ST		X		Develop public information to educate citizens on this type [tsunami/seiche] of hazard. Carried over as new action KM-15

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KM-21-V-ST		X		Collaborate to develop ash fall models that are specific to the north King and south Snohomish Counties area. Carried over as new action KM-16
KM-22-V-ST			X	Develop and implement policy for maintaining stock of filters for key vehicles and pieces of equipment. Action not financially feasible considering cost/benefit analysis, given the low risk of a volcanic event with local impact
KM-23-W-LT		X		Increase communication, coordination, and collaboration between wildland-urban interface property owners, city planners, fire prevention crews, and city officials to address risks, existing mitigation measures, and federal assistance programs. Carried over as new action KM-17

HAZARD MITIGATION ACTION PLAN AND EVALUATION OF RECOMMENDED INITIATIVES

Table 1-9 lists the initiatives that make up the jurisdiction's hazard mitigation plan. Table 1-10 identifies the priority for each initiative. Table 1-11 summarizes the mitigation initiatives by hazard of concern and the six mitigation types:

TABLE 1-9. HAZARD MITIGATION ACTION PLAN MATRIX							
Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
KM-1 — Continue to maintain compliance and good standing under the National Flood Insurance Program. This will be accomplished through the implementation of floodplain management programs that, at a minimum, will meet the minimum requirements of the NFIP, which include the following: • Enforcement of the adopted flood damage prevention ordinance, • Participating in floodplain identification and mapping updates, and • Providing public assistance/information on floodplain requirements and impacts							
New and existing	Urban Flooding	2,4,10,12	Kenmore Development Services	Low	General Fund	Ongoing	No
KM-2 — Consider evaluation of the City's building code enforcement program under the Building Code Effectiveness Grading Schedule, administered by the WA Survey and Rating Bureau.							
New	All Hazards	5,10	Kenmore Development Services	Low	General Fund	Short-term	No
KM-3 — Integrate the hazard mitigation plan into other plans, ordinances or programs to dictate land uses within the jurisdiction.							
New	All Hazards	2,4,8,10	Kenmore Community Development	Low	General Fund	Short-term	No
KM-4 — Consider participation in incentive based programs such as the CRS, Firewise and StormReady.							
New and existing	Flood, Severe Weather, Wildfire	2,3,4,6,10, 13	Kenmore Development Services	Low	General Fund	Long-term	No
KM-5 — Where appropriate, support retrofitting, purchase, or relocation of structures located in hazard-prone areas to protect structures from future damage, with properties with exposure to repetitive losses as a priority.							
Existing	All Hazards	5,9,13	Kenmore Public Works	High	FEMA grants	Long-term	No

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Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
KM-6 — Continue to support the county-wide initiatives identified in this plan.							
New and existing	All Hazards	4,6,11,12, 13, 14, 15	Kenmore Development Services	Low	General Fund	Ongoing	No
KM-7 — Actively participate in the plan maintenance strategy identified in this plan.							
New and existing	All Hazards	4,6,11,12, 13, 14, 15	Kenmore Community Development	Low	General Fund	Ongoing	No
KM-8 — Strive to capture perishable data (i.e. high water marks, preliminary damage estimates, and damage photos) after significant hazard events to support future updates to the risk assessment of this plan.							
New and existing	All Hazards	1,2,4	Kenmore Public Works and Building Inspectors in Development Services	Medium	General Fund, FEMA Grants	Short-term	No
KM-9 — Investigate and improve mapping of landslide hazard areas. Increase understanding of vulnerability and risk to life and property in hazard prone areas. Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard prone areas, particularly near 84th Ave. NE and 88th Ave. NE between NE 157th Street and NE 169th Street, and in areas of previous landslides.							
New and existing	Landslide	2,4,10, 12,13	Kenmore Development Services	Medium	Partnership with King County	Short-term	Yes
KM-10 — Identify and begin acquisition of City equipment necessary for safety and operations during a natural hazard event.							
New and existing	All Hazards	1,3	Kenmore Public Works	Medium	General Fund, Surface Water Management Fund and Street Fund	Ongoing	Yes
KM-11 — Continue to facilitate and support hazard education programs, such as CERT training or providing educational materials for family disaster preparedness.							
New and existing	All Hazards	3,4,6,7,11, 13,14,15	Kenmore City Manager's Office	Low	General Fund	Ongoing	Yes

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Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
KM-12 — Conduct non-structural retrofit activities in City facilities, such as strapping down and securing computers and other office equipment and machinery, securing shelves and heavy furniture to walls, ensuring that heavy items are not stored overhead, mounting computer servers on seismic isolation platforms, etc.							
Existing	Earthquake	1,3,5,12	Kenmore Public Works	Medium	General Fund FEMA Grants	Medium-term	Yes
KM-13 — Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and other government offices.							
Existing	Earthquake	1,3,4,5,7,8,9,11,12,13,14,15	Kenmore City Manager's Office	Low	General Fund FEMA Grants	Ongoing	Yes
KM-14 — Identify city-owned buildings and infrastructure that require structural retrofiting.							
Existing	Earthquake	1,3,4,9,12	Kenmore Public Works	Low	General Fund, FEMA Grants	Short-term	Yes
KM-15 — Develop public information to educate citizens on tsunamis/seiches.							
New and existing	Seiche	3,4,6,7,8,11,12,13,14,15	Kenmore Development Services	Low	General Fund	Medium-term	Yes
KM-16 — Encourage King County to develop ash fall models that are specific to the north King and south Snohomish Counties area.							
New and existing	Volcano	2,4,12	Kenmore Development Services	High	FEMA Grants	Long-term	Yes
KM-17 — Increase communication, coordination, and collaboration between wildland-urban interface property owners, city planners, fire prevention crews, and city officials to address risks, existing mitigation measures, and federal assistance programs related to wildfire.							
New and existing	Wildfire	1,2,3,4,6,7,8,10,11,12,13,14,15	Kenmore Development Services	Low	General Fund FEMA Grants	Ongoing	Yes

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Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
KM-18 — Enhance public safety strategies for debris avoidance and management for natural hazards events. Implementation measures include developing and enhancing right-of-way maintenance programs, educating property owners about tree maintenance near roadways, and developing coordinated management strategies for public safety issues such as clearing debris from public and private property.							
New and existing	All Hazards	1,3,6,7,8, 11,12,13, 14,15	Kenmore Public Works	Low	General Fund	Ongoing	Yes

**TABLE 1-10.
MITIGATION STRATEGY PRIORITY SCHEDULE**

Initiative #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is Project Grant-Eligible?	Can Project Be Funded Under Existing Programs/ Budgets?	Priority ^a
KM-1	4	High	Low	Yes	No	Yes	High
KM-2	2	Medium	Low	Yes	No	Yes	High
KM-3	4	Medium	Low	Yes	No	Yes	High
KM-4	6	High	Low	Yes	No	Yes	High
KM-5	3	High	High	Yes	Yes	No	Medium
KM-6	7	Medium	Low	Yes	No	Yes	High
KM-7	7	Medium	Low	Yes	Yes	Yes	High
KM-8	3	Medium	Medium	Yes	Yes	No	Medium
KM-9	5	High	Medium	Yes	No	No	Medium
KM-10	2	High	Medium	Yes	No	No	Medium
KM-11	8	High	Low	Yes	No	Yes	High
KM-12	4	High	Medium	Yes	Yes	No	Medium
KM-13	12	High	Low	Yes	Yes	Yes	High
KM-14	5	Medium	Low	Yes	Yes	Yes	High
KM-15	10	High	Low	Yes	No	No	Medium
KM-16	3	Medium	High	No	No	No	Low
KM-17	13	Medium	Low	Yes	Yes	Yes	High
KM-18	10	High	Low	Yes	No	Yes	High
a. See Chapter 1 for explanation of priorities.							

**TABLE 1-11.
ANALYSIS OF MITIGATION INITIATIVES**

Hazard Type	Initiative Addressing Hazard, by Mitigation Type ^a					
	1. Prevention	2. Property Protection	3. Public Education and Awareness	4. Natural Resource Protection	5. Emergency Services	6. Structural Projects
Avalanche	6,7		6,7			
Dam Failure	6,7		6,7			
Drought	6,7,8		4,6,7,8,11			
Earthquake	2,3,6,7,8,9,10,14,18	5,13	3,4,6,7,8,11,13,18	3	6,10,12	
Flood	1,3,6,7,8,9,10,18	1,5	1,3,4,6,7,8,11,18	1,3	6,10	
Landslide	2,3,6,7,8,9,10,18	5	3,4,6,7,8,9,11,18	3	6,10	
Severe Weather	2,6,7,8,9,10,14,18	5	3,4,6,7,8,11,18		6,10,12	
Tsunami/Seiche	3,6,7,8,18	5	3,4,6,7,8,11,15,18		6,10	
Volcano	6,7,8,10,16,18		4,6,7,8,11,16,18		6,10	
Wildfire	2,3,6,7,8,10,17,18	5	3,4,6,7,8,11,17,18		6,10	

a. See Chapter 1 for explanation of mitigation types.

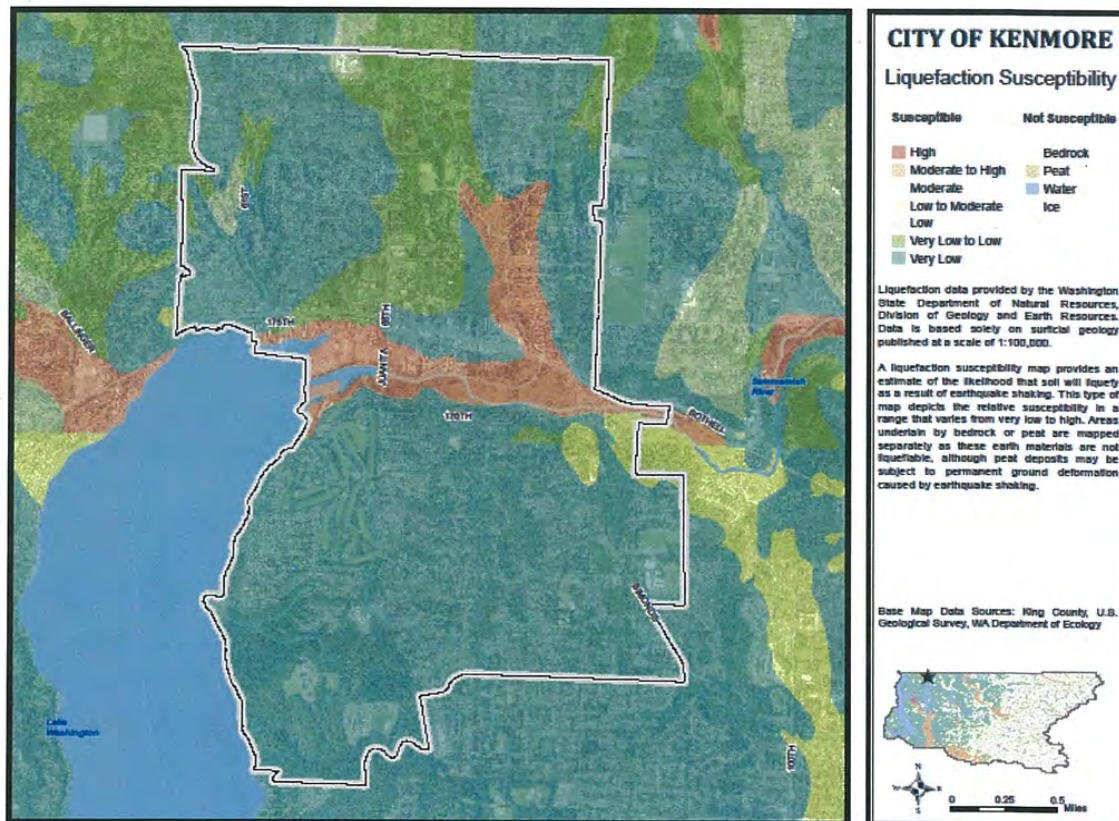
1.9 FUTURE NEEDS TO BETTER UNDERSTAND RISK/ VULNERABILITY

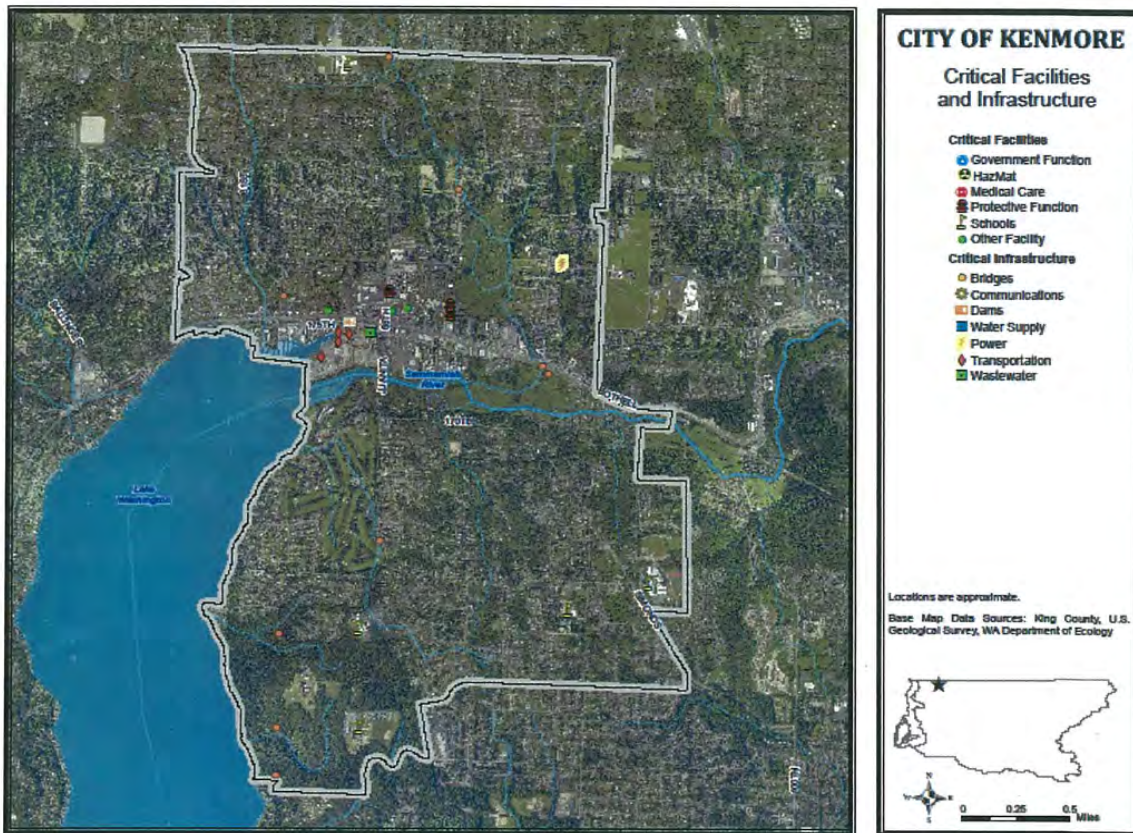
Enhanced mapping of landslide hazard areas and floodplains would greatly improve the City's understanding of vulnerability and risks.

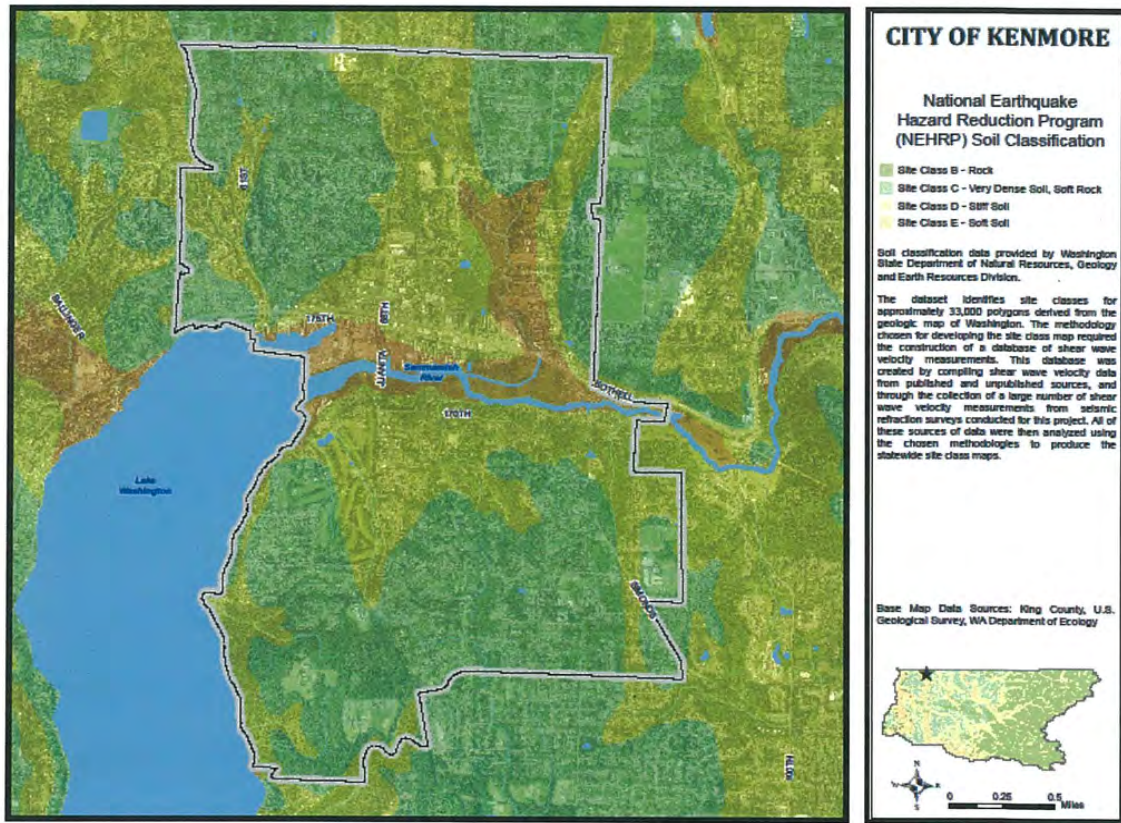
1.10 ANNEX DEVELOPMENT CHRONOLOGY/MILESTONES

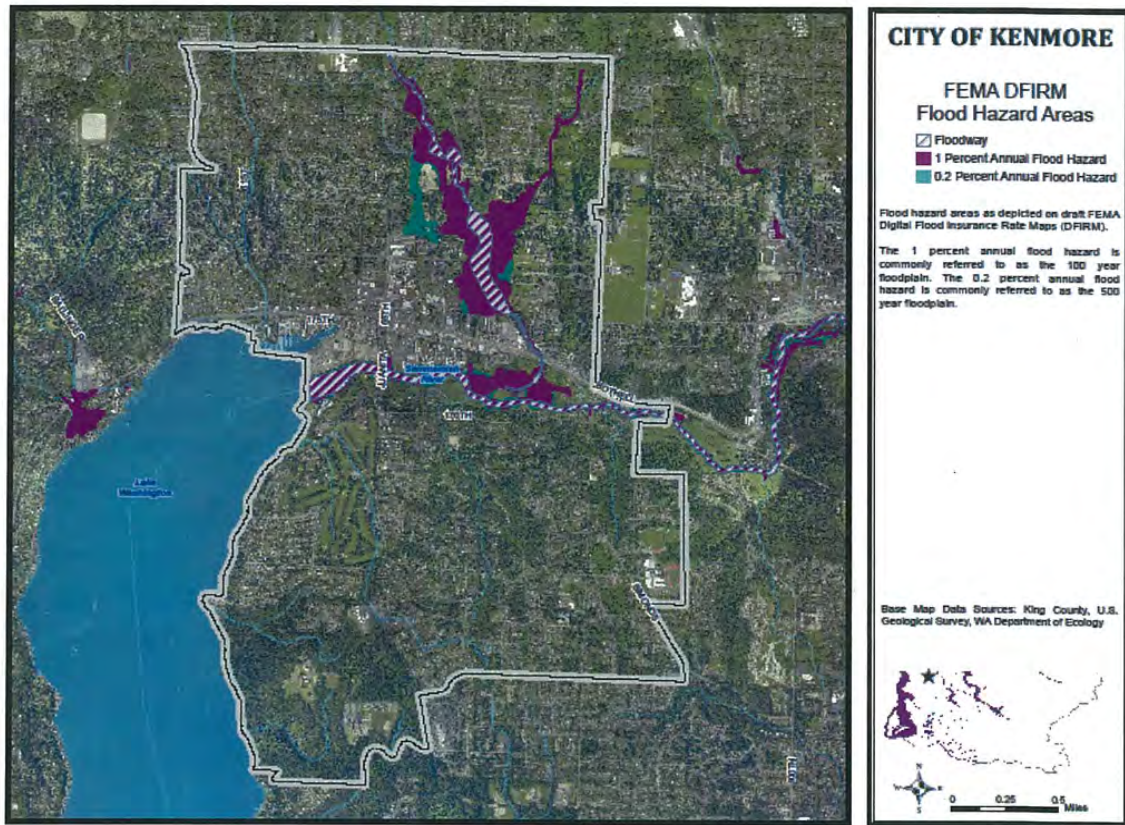
Table 1-12 summarizes important milestones in the development of Kenmore's Annex. Additional documentation of the planning process is available upon request.

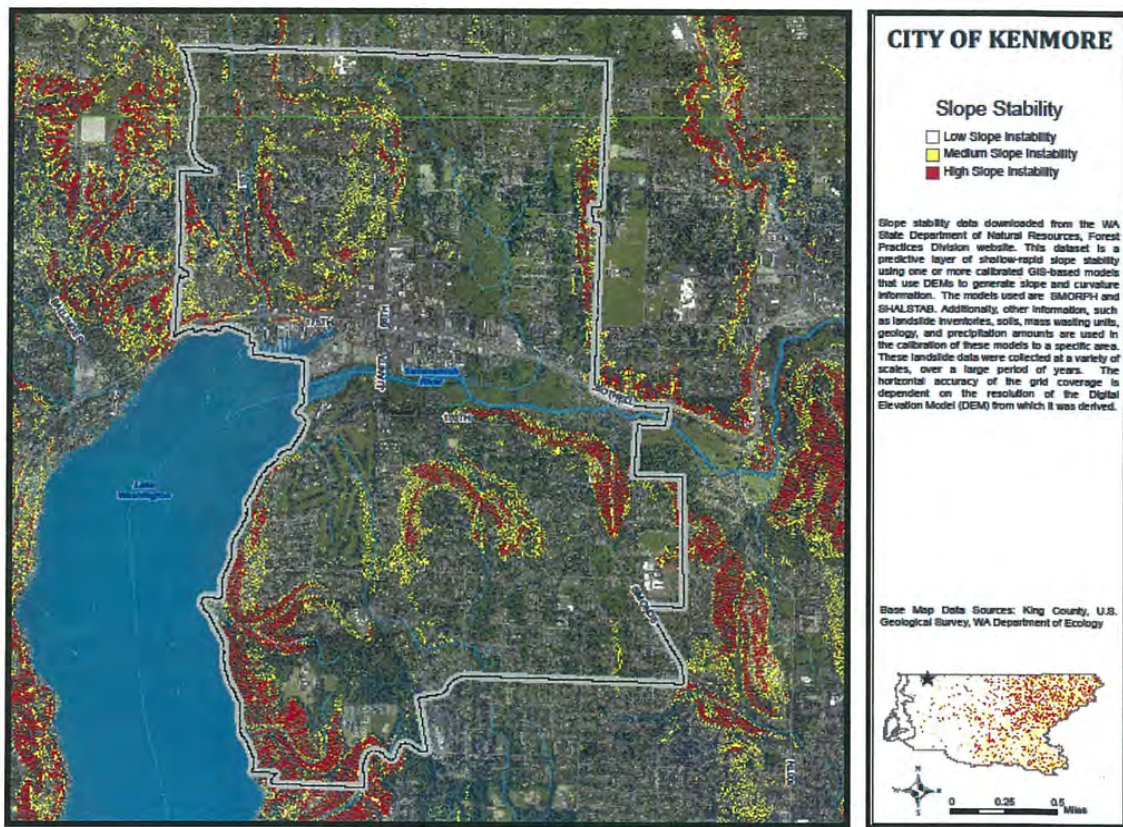
TABLE 1-12. ANNEX DEVELOPMENT MILESTONES			
Date	Event	Description	Attendance
10/3/14	Meeting with KCOEM	Overview of RHMP, received "Linkage Package" of instructions and templates.	6
11/13/14	Meeting with KCOEM	In-depth discussion of annex template and linkage procedure.	3
12/12/14	Public Outreach	Press release announcing Kenmore's participation in King County's Hazard Mitigation Plan including a link to a public survey.	N/A
12/17/14	Meeting with KCOEM	In-depth discussion of annex template and linkage procedure.	3
02/19/15	Internal Planning Meeting	Discussion of draft annex and information to be provided by City departments.	5
4/27/15	Meeting with City Manager	Review and discussion of draft annex.	2
4/28/15	Draft to KCOEM	Draft annex submitted to KCOEM (and their consultant) for review and comment.	N/A
5/4/15	Public Outreach	Announcement of public comment period and opportunity for citizens to participate.	N/A
5/26/15	Final to KCOEM	Final draft annex submitted to KCOEM. KCOEM submits plan to WA EMD who forwards to FEMA.	N/A
X/X/XX	Pre-adoption Approval	Received pre-adoption approval from FEMA.	N/A
X/X/XX	Adoption	Kenmore City Council adopts the plan.	N/A
X/X/XX	Plan Approval	Final approval granted by FEMA.	N/A

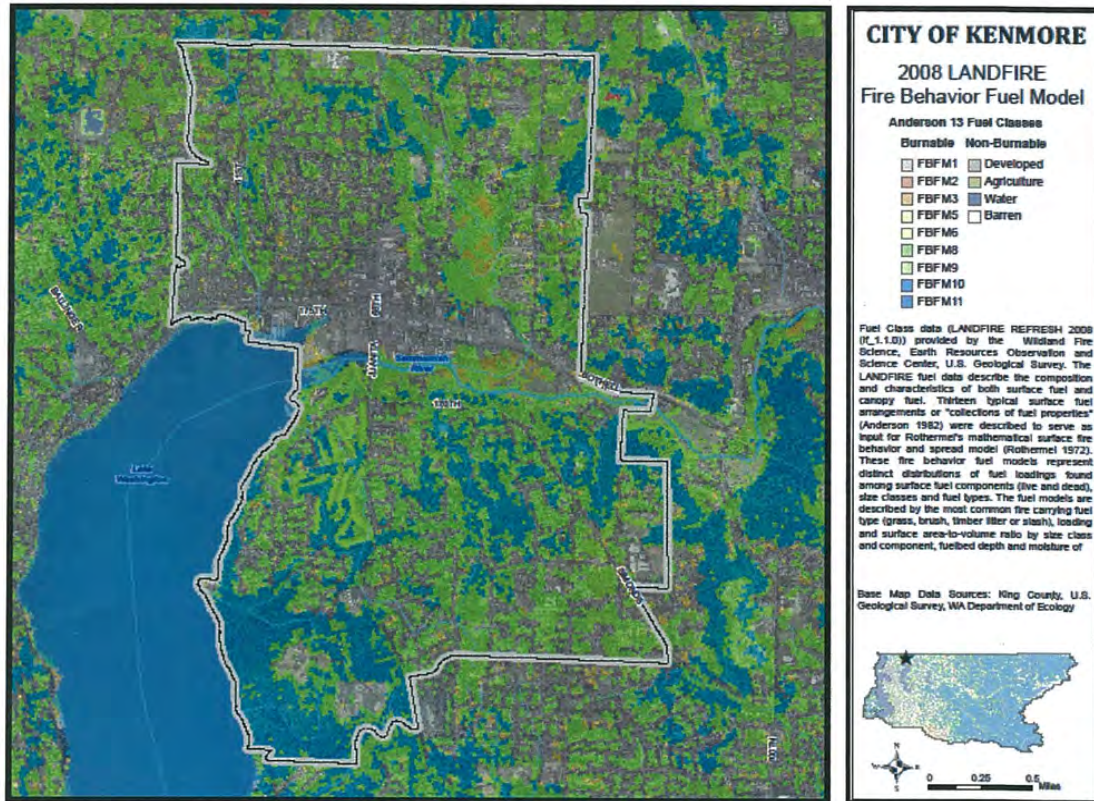


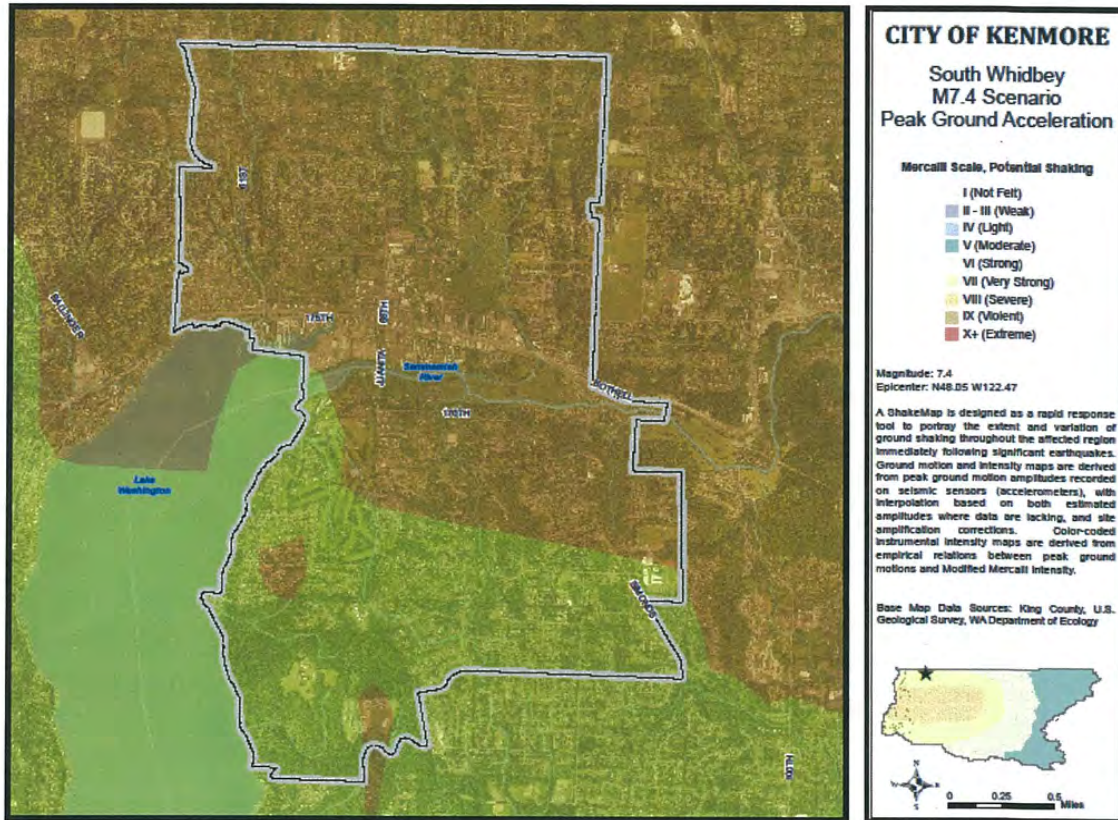




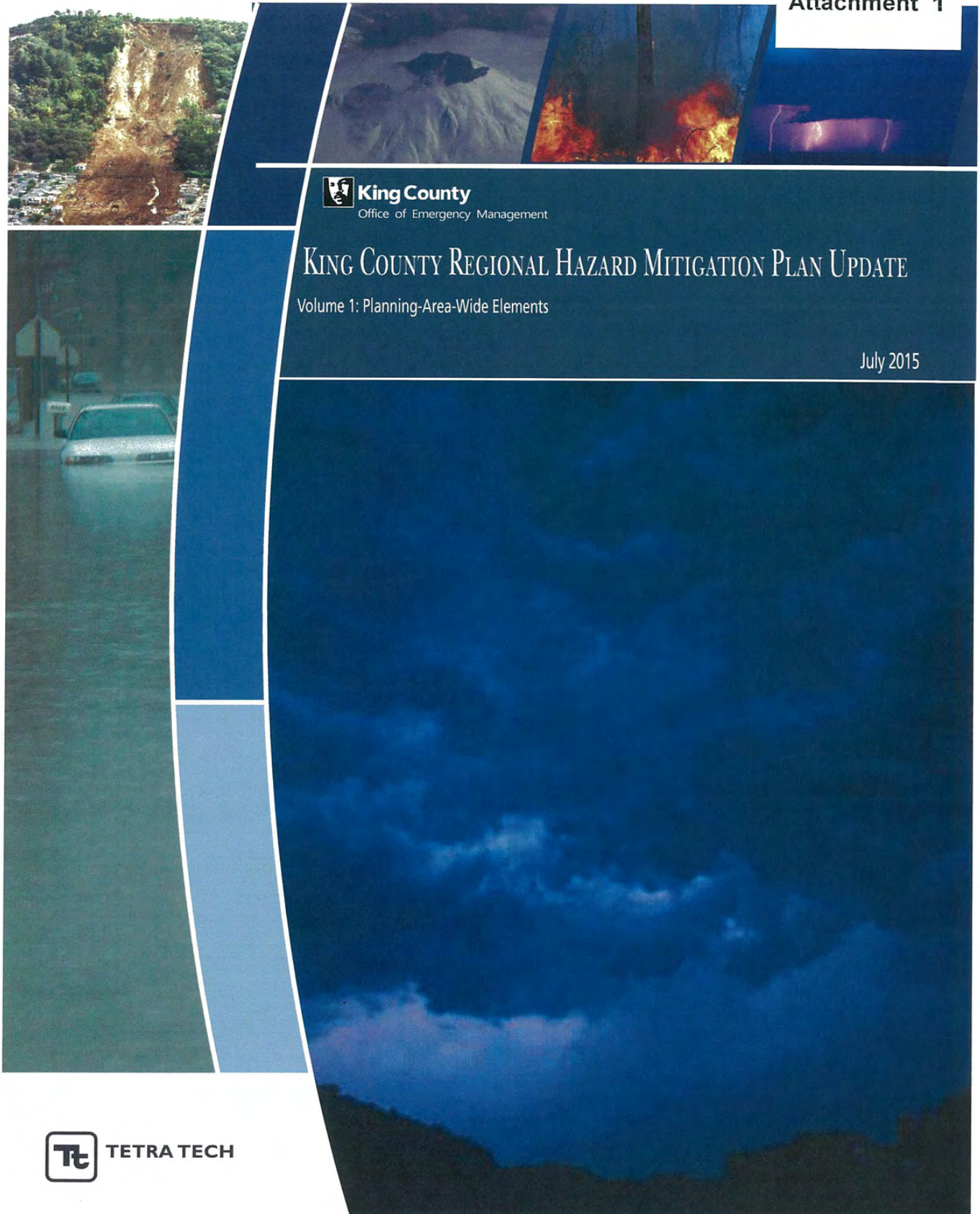








Attachment 1



King County
REGIONAL HAZARD MITIGATION PLAN UPDATE
VOLUME 1: PLANNING-AREA-WIDE ELEMENTS

JULY 2015

Prepared for:
King County
Office of Emergency Management
3511 NE 2nd Street
Renton, WA 98056

Prepared by:



TETRA TECH

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Project #103S2548

King County
Regional Hazard Mitigation Plan Update;
Volume 1—Planning-Area-Wide Elements

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- F. Plan Adoption Resolutions from Planning Partners
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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Hazard mitigation is the use of long-term and short-term policies, programs, projects, and other activities to alleviate the death, injury, and property damage that can result from a disaster. King County and a partnership of local governments within the County have developed and maintained a regional hazard mitigation plan to reduce risks from natural disasters. The plan complies with hazard mitigation planning requirements to maintain eligibility for funding under Federal Emergency Management Agency grant programs.

PREVIOUS HAZARD MITIGATION PLANNING IN KING COUNTY

Federal regulations require periodic updates of hazard mitigation plans to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. A jurisdiction covered by a plan that has expired is no longer in compliance with the federal requirements for hazard mitigation planning.

King County and a coalition of 39 planning partners prepared an initial hazard mitigation plan that was approved by the Federal Emergency Management Agency in November 2004. This document represents the second comprehensive update (the first update was made in 2009). The 2009 plan update process was truncated after back-to-back disasters in 2009—January flooding and March snowstorms—and the emergence of a significant flooding threat in the Green River Valley due to problems at Howard Hanson Dam. The truncated process resulted in a significant decrease in planning partners covered by the regional plan (12 local governments). Many of the original planning partners developed their own plans or let their plans expire. This 2014 update is a return to a truly regional planning effort. Fifty-four local governments are covered by this plan update, including King County, 26 city and town governments, and 27 special purpose districts, as listed in Tables ES-1 and ES-2.

The team that prepared the current update also prepared a five-year progress report of actions completed by all planning partners whose existing plan is replaced by this update. In the reporting period covered by the report, the partners started or completed 165 of 283 initiatives, 58 percent.

**TABLE ES-1.
MUNICIPAL PLANNING PARTNERS**

King County	City of Issaquah	City of Renton
City of Algona	City of Kent	City of SeaTac
City of Auburn	City of Kirkland	City of Shoreline
City of Bothell	City of Maple Valley	City of Snoqualmie
City of Burien	City of Medina	City of Tukwila
City of Carnation	City of Mercer Island	City of Woodinville
City of Clyde Hill	City of North Bend	Town of Beaux Arts Village
City of Duvall	City of Pacific	Town of Hunts Point
City of Federal Way	City of Redmond	Town of Skykomish

**TABLE ES-2.
SPECIAL PURPOSE DISTRICT PLANNING PARTNERS**

Coal Creek Utility District	Shoreline Fire
Covington Water District	Skyway Water & Sewer District
Highline Water District	Soos Creek Water & Sewer District
Kent Fire	Southwest Suburban Sewer District
Kent School District	Valley Regional Fire Authority
King County Fire District No. 2	Valley View Sewer District
King County Fire District No. 45	Vashon Island Fire & Rescue
King County Hospital District No. 2 (EvergreenHealth)	Water District 111
Midway Sewer District	Water District 125
North City Water District	Water District 19
Public Hospital District No. 1 (Valley Medical)	Water District 20
Riverview School District	Water District 90
Ronald Wastewater District	Woodinville Water District
Sammamish Plateau Water & Sewer District	

PLAN UPDATE PROCESS

Updating the plan consisted of the following phases:

- **Phase 1, Organize and Review**—A planning team was assembled for the plan update, consisting of staff from the King County Office of Emergency Management and a technical consultant. The team conducted outreach to establish the planning partnership. A 19-member steering committee was assembled to oversee the plan update, consisting of planning partner staff, citizens, and other stakeholders in the planning area. Coordination with other county, state and federal agencies involved in hazard mitigation occurred throughout the plan update process. This phase included a review of the existing plan, the Washington State Hazard Mitigation Plan, and existing programs that may support hazard mitigation actions.

Phase 2, Update the Risk Assessment—Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards. This process assesses the vulnerability of people, buildings and infrastructure to natural hazards. Risk assessment models were enhanced with new data and technologies that have become available since 2009. The risk assessment included the following:

- Hazard identification and profiling
- Assessment of the impact of hazards on physical, social and economic assets
- Vulnerability identification
- Estimates of the cost of potential damage.

Planning partners used the risk assessment to rank risk and to gauge the potential impacts of each hazard of concern on their jurisdiction. The mitigation actions recommended in this plan include some that address limitations in the modeling caused by insufficient data. For example, in light of the Oso landslide, King County has initiated an effort identified as an action item in this plan to better characterize landslide risks in the County.

EXECUTIVE SUMMARY

- **Phase 3, Engage the Public**—The planning team implemented a public involvement strategy developed by the Steering Committee. The strategy included public meetings to present the risk assessment and the draft plan, a hazard mitigation survey, a County-sponsored website, and multiple media releases.
- **Phase 4, Assemble the Updated Plan**—The planning team and Steering Committee assembled a document to meet federal hazard mitigation planning requirements for all partners. The updated plan contains two volumes. Volume 1 contains components that apply to all partners and the broader planning area. Volume 2 contains all components that are jurisdiction-specific. Each planning partner has a dedicated annex in Volume 2.
- **Phase 5, Plan Adoption/Implementation**—Once pre-adoption approval has been granted by Washington State's Emergency Management Division and FEMA Region X, the final adoption phase will begin. Each planning partner will individually adopt the updated plan. The plan maintenance process includes a schedule for monitoring and evaluating the plan's progress periodically and producing a plan revision every 5 years. This plan maintenance strategy also includes processes for continuing public involvement and integration with other programs that can support or enhance hazard mitigation.

RISK ASSESSMENT RESULTS

Based on the risk assessment, hazards were ranked as follows for the risk they pose to the overall planning area:

1. Earthquake (High)
2. Severe Weather (High)
3. Severe Winter Weather (High)
4. Flood (Medium)
5. Landslide (Medium)
6. Wildfire (Medium)
7. Dam Failure (Low)
8. Avalanche (Low)
9. Volcano (Low)
10. Tsunami (Low).

Each planning partner also ranked hazards for its own area. Table ES-3 summarizes the categories of high, medium and low (relative to other rankings) based on the numerical ratings that each jurisdiction assigned each hazard. The results indicate the following general patterns:

- Earthquake, severe weather and severe winter weather generally ranked as the highest risks.
- Tsunami and avalanche were not ranked by most jurisdictions.
- Tsunami, volcano and wildfire tended to receive medium or low rankings based on the geographic location of each jurisdiction. Tsunami was ranked as a higher risk for coastal communities; wildfire was ranked higher for jurisdictions located farther from the highly developed areas near Puget Sound. Volcano was ranked higher for jurisdictions in the southwestern portion of the County near lahar hazard areas.
- Dam failure, volcano and wildland fire tended to have low ratings.

TABLE ES-3. SUMMARY OF HAZARD RANKING RESULTS				
	Number of Jurisdictions Assigning Ranking to Hazard			
	High	Medium	Low	Not Ranked
Avalanche	0	0	6	48
Dam Failure	1	8	20	25
Earthquake	49	5	0	0
Flood	10	25	17	2
Landslide	5	28	17	4
Severe Weather	40	13	1	0
Severe Winter Weather	44	9	1	0
Tsunami	0	3	11	40
Volcano	0	11	34	9
Wildland Fire	3	5	26	10

MITIGATION GUIDING PRINCIPLE, GOALS AND OBJECTIVES

The following principle guided the Steering Committee and the planning partnership in selecting the initiatives contained in this plan update:

King County is a region that promotes community resilience by eliminating or reducing risks and adverse impacts from hazards, while encouraging hazard mitigation activities by all sectors.

The Steering Committee and the planning partnership established the following goals for the plan update:

1. Protect life and property.
2. Increase public awareness of hazards and mitigation opportunities.
3. Protect, restore and enhance environmental quality.
4. Leverage partnering opportunities.
5. Enhance planning activities.
6. Develop and implement cost-effective mitigation strategies.
7. Promote a sustainable economy.

The following objectives were identified that meet multiple goals, helping to establish priorities for recommended mitigation actions:

1. Increase the resilience of critical facilities, infrastructure and government operations to ensure continuity of operations during and after a hazard event.
2. Consider the impacts of hazards in all planning mechanisms that address current and future land uses and integrate hazard mitigation goals and objectives into other existing plans and programs within the planning area.

EXECUTIVE SUMMARY

3. Develop, improve and protect systems that provide early warnings, emergency response communications and evacuation procedures.
4. Use the best available data, science and technologies to improve understanding and stakeholder awareness of the location and potential impacts of hazards, the vulnerability of building types and community development patterns, and the measures needed to mitigate hazards.
5. Seek feasible mitigation projects that provide the highest degree of hazard protection with the best benefit-cost ratio.
6. Emphasize the hazard mitigation message in and promote the value of public outreach and education programs, such as Take Winter By Storm and What to Do to Make it Through.
7. Improve coordination among all sectors to mitigate hazards.
8. Reduce hazard-related risks and vulnerability to potentially isolated populations within the planning area.
9. Retrofit, purchase or relocate structures in high hazard areas, including those known to be repetitively damaged.
10. Strengthen codes to improve the hazard resilience of new construction.
11. Leverage social networks and other social capital mechanisms to educate the public and stakeholders and promote resilience.
12. Seek actions that protect or improve the environment for future environmental conditions.
13. Form private/public partnerships to leverage and share resources.
14. Partner with the private sector, including small businesses, to promote hazard mitigation as part of standard business practice.
15. Educate businesses about contingency planning countywide, targeting small businesses and those located in high risk areas, and promote employee education about disaster preparedness while on the job and at home.

MITIGATION ACTIONS

Mitigation actions presented in this update are activities designed to reduce or eliminate losses resulting from natural hazards. The update process resulted in the identification of nearly 700 mitigation actions for implementation by individual planning partners, as presented in Volume 2 of this plan. In addition, the steering committee and planning partnership identified seven countywide initiatives benefiting the whole partnership, as listed in Table ES-4.

IMPLEMENTATION

Full implementation of the recommendations of this plan will require time and resources. The measure of the plan's success will be its ability to adapt to changing conditions. King County and its planning partners will assume responsibility for adopting the recommendations of this plan and committing resources toward implementation. The framework established by this plan commits all planning partners to pursue initiatives when the benefits of a project exceed its costs. The planning partnership developed this plan with extensive public input, and public support of the actions identified in this plan will help ensure the plan's success.

King County Regional Hazard Mitigation Plan Update; Volume 1—Planning-Area-Wide Elements

TABLE ES-4. ACTION PLAN—COUNTYWIDE MITIGATION ACTIONS				
Hazards Addressed	Lead Agency	Possible Funding Sources or Resources	Time Line ^a	Objectives
CW-1—Continue to participate in and support the “Resilient King County” initiative.				
All hazards	King County Office of Emergency Management (OEM)	Local, possible grant funding (FEMA, DHS)	Ongoing	1, 3, 4, 7, 13, 14, 15
CW-2—Continue to maintain a website that will house the regional hazard mitigation plan, its progress reports and all components of the plan’s maintenance strategy to provide the planning partners and public ongoing access to the plan and its implementation.				
All Hazards	King County OEM	King County OEM operating budget	Ongoing	4, 6, 7, 11, 15
CW-3—Continue to leverage/support/enhance ongoing, regional public education and awareness programs (such as “Take Winter by Storm and “Make it Through”) as a method to educate the public on risk, risk reduction and community resilience.				
All Hazards	King County and all planning partners	Local	Ongoing	4, 6, 7, 11, 13, 14, 15
CW-4—Continue to support the use, development and enhancement of a regional alert and notification system.				
All Hazards	King County OEM	Local, possible grant funding (FEMA, DHS, NWS, NOAA)	Ongoing	3, 4, 7, 13
CW-5—Strive to capture time-sensitive, perishable data—such as high water marks, extent and location of hazard, and loss information—following hazard events to support future updates to the risk assessment.				
All hazards	All Planning partners	Local, FEMA (PA)	Short-term	4, 7
CW-6—Encourage signatories for the regional coordination framework for disasters and planned events.				
All Hazards	King County OEM	Local	Ongoing	3, 7, 13, 14
CW-7—Continue ongoing communication and coordination in the implementation of the King County Regional Hazard Mitigation Plan and the 2013 King County Flood Hazard Management Plan.				
Flood	King County OEM, King County Department of Natural Resources & Parks, King County Flood Control District	Local	Ongoing	2, 4, 5, 7, 10, 12

King County
Regional Hazard Mitigation Plan Update

APPENDIX A.
ACRONYMS AND DEFINITIONS

APPENDIX A. ACRONYMS AND DEFINITIONS

ACRONYMS

ASHRAE—American Society of Heating, Refrigerating, and Air-Conditioning Engineers
CFR—Code of Federal Regulations
cfs—cubic feet per second
CIP—Capital Improvement Plan
CRS—Community Rating System
DHS—Department of Homeland Security
DMA—Disaster Mitigation Act
EMD—Washington Emergency Management Division
EPA—U.S. Environmental Protection Agency
ESA—Endangered Species Act
FBFM—Fire behavior fuel model
FCAAP—Flood Control Assistance Account Program
FEMA—Federal Emergency Management Agency
FERC—Federal Energy Regulatory Commission
FIRM—Flood Insurance Rate Map
GIS—Geographic Information System
Hazardus-MH—Hazards, United States-Multi Hazard
HMGP—Hazard Mitigation Grant Program
IBC—International Building Code
IRC—International Residential Code
LiDAR—Light Detection and Ranging
MM—Modified Mercalli Scale
NEHRP—National Earthquake Hazards Reduction Program
NFIP—National Flood Insurance Program
NOAA—National Oceanic and Atmospheric Administration
NWS—National Weather Service
PDM—Pre-Disaster Mitigation Grant Program
PGA—Peak Ground Acceleration
RCW—Revised Code of Washington

SFHA—Special Flood Hazard Area

SHELDUS—Spatial Hazard Events and Losses Database for the US

USGS—U.S. Geological Survey

WUI—Wildland Urban Interface

DEFINITIONS

100-Year Flood: The term “100-year flood” can be misleading. The 100-year flood does not necessarily occur once every 100 years. Rather, it is the flood that has a 1 percent chance of being equaled or exceeded in any given year. Thus, the 100-year flood could occur more than once in a relatively short period of time. The Federal Emergency Management Agency (FEMA) defines it as the 1 percent annual chance flood, which is now the standard definition used by most federal and state agencies and by the National Flood Insurance Program.

Acre-Foot: An acre-foot is the amount of water it takes to cover 1 acre to a depth of 1 foot. This measure is used to describe the quantity of storage in a water reservoir. An acre-foot is a unit of volume. One acre foot equals 7,758 barrels; 325,829 gallons; or 43,560 cubic feet. An average household of four will use approximately 1 acre-foot of water per year.

Asset: An asset is any man-made or natural feature that has value, including, but not limited to, people; buildings; infrastructure, such as bridges, roads, sewers, and water systems; lifelines, such as electricity and communication resources; and environmental, cultural, or recreational features such as parks, wetlands, and landmarks.

Base Flood: The flood having a 1% chance of being equaled or exceeded in any given year, also known as the “100-year” or “1% chance” flood. The base flood is a statistical concept used to ensure that all properties subject to the National Flood Insurance Program are protected to the same degree against flooding.

Basin: A basin is the area within which all surface water—whether from rainfall, snowmelt, springs, or other sources—flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains, and ridges. Basins are also referred to as “watersheds” and “drainage basins.”

Benefit: A benefit is a net project outcome and is usually defined in monetary terms. Benefits may include direct and indirect effects. For the purposes of benefit-cost analysis of proposed mitigation measures, benefits are limited to specific, measurable, risk reduction factors, including reduction in expected property losses (buildings, contents, and functions) and protection of human life.

Benefit/Cost Analysis: A benefit/cost analysis is a systematic, quantitative method of comparing projected benefits to projected costs of a project or policy. It is used as a measure of cost effectiveness.

Building: A building is defined as a structure that is walled and roofed, principally aboveground, and permanently fixed to a site. The term includes manufactured homes on permanent foundations on which the wheels and axles carry no weight.

Capability Assessment: A capability assessment provides a description and analysis of a community’s current capacity to address threats associated with hazards. The assessment includes two components: an inventory of an agency’s mission, programs, and policies, and an analysis of its capacity to carry them

...APPENDIX A. ACRONYMS AND DEFINITIONS

out. A capability assessment is an integral part of the planning process in which a community's actions to reduce losses are identified, reviewed, and analyzed, and the framework for implementation is identified. The following capabilities were reviewed under this assessment:

- Legal and regulatory capability
- Administrative and technical capability
- Fiscal capability

Community Rating System (CRS): The CRS is a voluntary program under the NFIP that rewards participating communities (provides incentives) for exceeding the minimum requirements of the NFIP and completing activities that reduce flood hazard risk by providing flood insurance premium discounts.

Critical Area: An area defined by state or local regulations as deserving special protection because of unique natural features or its value as habitat for a wide range of species of flora and fauna. A sensitive/critical area is usually subject to more restrictive development regulations.

Critical Facility: Facilities and infrastructure that are critical to the health and welfare of the population. These become especially important after any hazard event occurs. For the purposes of this plan, critical facilities include:

- Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic and/or water reactive materials;
- Hospitals, nursing homes, and housing likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a hazard event.
- Police stations, fire stations, vehicle and equipment storage facilities, and emergency operations centers that are needed for disaster response before, during, and after hazard events, and
- Public and private utilities, facilities and infrastructure that are vital to maintaining or restoring normal services to areas damaged by hazard events.
- Government facilities.

Cubic Feet per Second (cfs): Discharge or river flow is commonly measured in cfs. One cubic foot is about 7.5 gallons of liquid.

Dam: Any artificial barrier or controlling mechanism that can or does impound 10 acre-feet or more of water.

Dam Failure: Dam failure refers to a partial or complete breach in a dam (or levee) that impacts its integrity. Dam failures occur for a number of reasons, such as flash flooding, inadequate spillway size, mechanical failure of valves or other equipment, freezing and thawing cycles, earthquakes, and intentional destruction.

Debris Avalanche: Volcanoes are prone to debris and mountain rock avalanches that can approach speeds of 100 mph.

Debris Flow: Dense mixtures of water-saturated debris that move down-valley; looking and behaving much like flowing concrete. They form when loose masses of unconsolidated material are saturated, become unstable, and move down slope. The source of water varies but includes rainfall, melting snow or ice, and glacial outburst floods.

Debris Slide: Debris slides consist of unconsolidated rock or soil that has moved rapidly down slope. They occur on slopes greater than 65 percent.

Disaster Mitigation Act of 2000 (DMA); The DMA is Public Law 106-390 and is the latest federal legislation enacted to encourage and promote proactive, pre-disaster planning as a condition of receiving financial assistance under the Robert T. Stafford Act. The DMA emphasizes planning for disasters before they occur. Under the DMA, a pre-disaster hazard mitigation program and new requirements for the national post-disaster hazard mitigation grant program (HMGP) were established.

Drainage Basin: A basin is the area within which all surface water- whether from rainfall, snowmelt, springs or other sources- flows to a single water body or watercourse. The boundary of a river basin is defined by natural topography, such as hills, mountains and ridges. Drainage basins are also referred to as **watersheds or basins**.

Drought: Drought is a period of time without substantial rainfall or snowfall from one year to the next. Drought can also be defined as the cumulative impacts of several dry years or a deficiency of precipitation over an extended period of time, which in turn results in water shortages for some activity, group, or environmental function. A hydrological drought is caused by deficiencies in surface and subsurface water supplies. A socioeconomic drought impacts the health, well-being, and quality of life or starts to have an adverse impact on a region. Drought is a normal, recurrent feature of climate and occurs almost everywhere.

Earthquake: An earthquake is defined as a sudden slip on a fault, volcanic or magmatic activity, and sudden stress changes in the earth that result in ground shaking and radiated seismic energy. Earthquakes can last from a few seconds to over 5 minutes, and have been known to occur as a series of tremors over a period of several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties may result from falling objects and debris as shocks shake, damage, or demolish buildings and other structures.

Exposure: Exposure is defined as the number and dollar value of assets considered to be at risk during the occurrence of a specific hazard.

Extent: The extent is the size of an area affected by a hazard.

Extreme Heat Event/Heat Wave: Summertime weather that is substantially hotter and/or more humid than average for a location at that time of year. Typically a heat wave lasts two or more days.

Fire Behavior: Fire behavior refers to the physical characteristics of a fire and is a function of the interaction between the fuel characteristics (such as type of vegetation and structures that could burn), topography, and weather. Variables that affect fire behavior include the rate of spread, intensity, fuel consumption, and fire type (such as underbrush versus crown fire).

Fire Frequency: Fire frequency is the broad measure of the rate of fire occurrence in a particular area. An estimate of the areas most likely to burn is based on past fire history or fire rotation in the area, fuel conditions, weather, ignition sources (such as human or lightning), fire suppression response, and other factors.

Flash Flood: A flash flood occurs with little or no warning when water levels rise at an extremely fast rate

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Flood Insurance Rate Map (FIRM): FIRMs are the official maps on which the Federal Emergency Management Agency (FEMA) has delineated the Special Flood Hazard Area.

Flood Insurance Study: A report published by the Federal Insurance and Mitigation Administration for a community in conjunction with the community's Flood Insurance rate Map. The study contains such background data as the base flood discharges and water surface elevations that were used to prepare the FIRM. In most cases, a community FIRM with detailed mapping will have a corresponding flood insurance study.

Floodplain: Any land area susceptible to being inundated by flood waters from any source. A flood insurance rate map identifies most, but not necessarily all, of a community's floodplain as the Special Flood Hazard Area.

Floodway: Floodways are areas within a floodplain that are reserved for the purpose of conveying flood discharge without increasing the base flood elevation more than 1 foot. Generally speaking, no development is allowed in floodways, as any structures located there would block the flow of floodwaters.

Floodway Fringe: Floodway fringe areas are located in the floodplain but outside of the floodway. Some development is generally allowed in these areas, with a variety of restrictions. On maps that have identified and delineated a floodway, this would be the area beyond the floodway boundary that can be subject to different regulations.

Fog: Fog refers to a cloud (or condensed water droplets) near the ground. Fog forms when air close to the ground can no longer hold all the moisture it contains. Fog occurs either when air is cooled to its dew point or the amount of moisture in the air increases. Heavy fog is particularly hazardous because it can restrict surface visibility. Severe fog incidents can close roads, cause vehicle accidents, cause airport delays, and impair the effectiveness of emergency response. Financial losses associated with transportation delays caused by fog have not been calculated in the United States but are known to be substantial.

Freeboard: Freeboard is the margin of safety added to the base flood elevation.

Frequency: For the purposes of this plan, frequency refers to how often a hazard of specific magnitude, duration, and/or extent is expected to occur on average. Statistically, a hazard with a 100-year frequency is expected to occur about once every 100 years on average and has a 1 percent chance of occurring any given year. Frequency reliability varies depending on the type of hazard considered.

Fujita Scale of Tornado Intensity: Tornado wind speeds are sometimes estimated on the basis of wind speed and damage sustained using the Fujita Scale. The scale rates the intensity or severity of tornado events using numeric values from F0 to F5 based on tornado wind speed and damage. An F0 tornado (wind speed less than 73 miles per hour (mph)) indicates minimal damage (such as broken tree limbs), and an F5 tornado (wind speeds of 261 to 318 mph) indicates severe damage.

Goal: A goal is a general guideline that explains what is to be achieved. Goals are usually broad-based, long-term, policy-type statements and represent global visions. Goals help define the benefits that a plan is trying to achieve. The success of a hazard mitigation plan is measured by the degree to which its goals have been met (that is, by the actual benefits in terms of actual hazard mitigation).

Geographic Information System (GIS): GIS is a computer software application that relates data regarding physical and other features on the earth to a database for mapping and analysis.

Hazard: A hazard is a source of potential danger or adverse condition that could harm people and/or cause property damage.

Hazard Mitigation Grant Program (HMGP): Authorized under Section 202 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, the HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to disasters and to enable mitigation activities to be implemented as a community recovers from a disaster

Hazards U.S. Multi-Hazard (Hazardus-MH) Loss Estimation Program: Hazardus-MH is a GIS-based program used to support the development of risk assessments as required under the DMA. The Hazardus-MH software program assesses risk in a quantitative manner to estimate damages and losses associated with natural hazards. Hazardus-MH is FEMA's nationally applicable, standardized methodology and software program and contains modules for estimating potential losses from earthquakes, floods, and wind hazards. Hazardus-MH has also been used to assess vulnerability (exposure) for other hazards.

Hydraulics: Hydraulics is the branch of science or engineering that addresses fluids (especially water) in motion in rivers or canals, works and machinery for conducting or raising water, the use of water as a prime mover, and other fluid-related areas.

Hydrology: Hydrology is the analysis of waters of the earth. For example, a flood discharge estimate is developed by conducting a hydrologic study.

Intensity: For the purposes of this plan, intensity refers to the measure of the effects of a hazard.

Inventory: The assets identified in a study region comprise an inventory. Inventories include assets that could be lost when a disaster occurs and community resources are at risk. Assets include people, buildings, transportation, and other valued community resources.

Landslide: Landslides can be described as the sliding movement of masses of loosened rock and soil down a hillside or slope. Fundamentally, slope failures occur when the strength of the soils forming the slope exceeds the pressure, such as weight or saturation, acting upon them.

LiDAR: A remote sensing technology that measures distance by illuminating a target with a laser and analyzing the reflected light.

Lightning: Lightning is an electrical discharge resulting from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt," usually within or between clouds and the ground. A bolt of lightning instantaneously reaches temperatures approaching 50,000°F. The rapid heating and cooling of air near lightning causes thunder. Lightning is a major threat during thunderstorms. In the United States, 75 to 100 Americans are struck and killed by lightning each year (see <http://www.fema.gov/hazard/thunderstorms/thunder.shtml>).

Liquefaction: Liquefaction is the complete failure of soils, occurring when soils lose shear strength and flow horizontally. It is most likely to occur in fine grain sands and silts, which behave like viscous fluids when liquefaction occurs. This situation is extremely hazardous to development on the soils that liquefy, and generally results in extreme property damage and threats to life and safety.

Local Government: Any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate

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government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

Magnitude: Magnitude is the measure of the strength of an earthquake, and is typically measured by the Richter scale. As an estimate of energy, each whole number step in the magnitude scale corresponds to the release of about 31 times more energy than the amount associated with the preceding whole number value.

Mass movement: A collective term for landslides, mudflows, debris flows, sinkholes and lahars.

Mitigation: A preventive action that can be taken in advance of an event that will reduce or eliminate the risk to life or property.

Mitigation Actions: Mitigation actions are specific actions to achieve goals and objectives that minimize the effects from a disaster and reduce the loss of life and property.

Objective: For the purposes of this plan, an objective is defined as a short-term aim that, when combined with other objectives, forms a strategy or course of action to meet a goal. Unlike goals, objectives are specific and measurable.

Peak Ground Acceleration: Peak Ground Acceleration (PGA) is a measure of the highest amplitude of ground shaking that accompanies an earthquake, based on a percentage of the force of gravity.

Preparedness: Preparedness refers to actions that strengthen the capability of government, citizens, and communities to respond to disasters.

Presidential Disaster Declaration: These declarations are typically made for events that cause more damage than state and local governments and resources can handle without federal government assistance. Generally, no specific dollar loss threshold has been established for such declarations. A Presidential Disaster Declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, designed to help disaster victims, businesses, and public entities.

Probability of Occurrence: The probability of occurrence is a statistical measure or estimate of the likelihood that a hazard will occur. This probability is generally based on past hazard events in the area and a forecast of events that could occur in the future. A probability factor based on yearly values of occurrence is used to estimate probability of occurrence.

Repetitive Loss Property: Any NFIP-insured property that, since 1978 and regardless of any changes of ownership during that period, has experienced:

- Four or more paid flood losses in excess of \$1000.00; or
- Two paid flood losses in excess of \$1000.00 within any 10-year period since 1978 or
- Three or more paid losses that equal or exceed the current value of the insured property.

Return Period (or Mean Return Period): This term refers to the average period of time in years between occurrences of a particular hazard (equal to the inverse of the annual frequency of occurrence).

Riverine: Of or produced by a river. Riverine floodplains have readily identifiable channels. Floodway maps can only be prepared for riverine floodplains.

Risk: Risk is the estimated impact that a hazard would have on people, services, facilities, and structures in a community. Risk measures the likelihood of a hazard occurring and resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate, or low likelihood of sustaining damage above a particular threshold due to occurrence of a specific type of hazard. Risk also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Risk Assessment: Risk assessment is the process of measuring potential loss of life, personal injury, economic injury, and property damage resulting from hazards. This process assesses the vulnerability of people, buildings, and infrastructure to hazards and focuses on (1) hazard identification; (2) impacts of hazards on physical, social, and economic assets; (3) vulnerability identification; and (4) estimates of the cost of damage or costs that could be avoided through mitigation.

Risk Ranking: This ranking serves two purposes, first to describe the probability that a hazard will occur, and second to describe the impact a hazard will have on people, property, and the economy. Risk estimates for the City are based on the methodology that the City used to prepare the risk assessment for this plan. The following equation shows the risk ranking calculation:

$$\text{Risk Ranking} = \text{Probability} + \text{Impact (people + property + economy)}$$

Robert T. Stafford Act: The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 100-107, was signed into law on November 23, 1988. This law amended the Disaster Relief Act of 1974, Public Law 93-288. The Stafford Act is the statutory authority for most federal disaster response activities, especially as they pertain to FEMA and its programs.

Sinkhole: A collapse depression in the ground with no visible outlet. Its drainage is subterranean. It is commonly vertical-sided or funnel-shaped.

Special Flood Hazard Area: The base floodplain delineated on a Flood Insurance Rate Map. The SFHA is mapped as a Zone A in riverine situations and zone V in coastal situations. The SFHA may or may not encompass all of a community's flood problems

Stakeholder: Business leaders, civic groups, academia, non-profit organizations, major employers, managers of critical facilities, farmers, developers, special purpose districts, and others whose actions could impact hazard mitigation.

Stream Bank Erosion: Stream bank erosion is common along rivers, streams and drains where banks have been eroded, sloughed or undercut. However, it is important to remember that a stream is a dynamic and constantly changing system. It is natural for a stream to want to meander, so not all eroding banks are "bad" and in need of repair. Generally, stream bank erosion becomes a problem where development has limited the meandering nature of streams, where streams have been channelized, or where stream bank structures (like bridges, culverts, etc.) are located in places where they can actually cause damage to downstream areas. Stabilizing these areas can help protect watercourses from continued sedimentation, damage to adjacent land uses, control unwanted meander, and improvement of habitat for fish and wildlife.

Steep Slope: Different communities and agencies define it differently, depending on what it is being applied to, but generally a steep slope is a slope in which the percent slope equals or exceeds 25%. For this study, steep slope is defined as slopes greater than 33%.

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Sustainable Hazard Mitigation: This concept includes the sound management of natural resources, local economic and social resiliency, and the recognition that hazards and mitigation must be understood in the largest possible social and economic context.

Thunderstorm: A thunderstorm is a storm with lightning and thunder produced by cumulonimbus clouds. Thunderstorms usually produce gusty winds, heavy rains, and sometimes hail. Thunderstorms are usually short in duration (seldom more than 2 hours). Heavy rains associated with thunderstorms can lead to flash flooding during the wet or dry seasons.

Tornado: A tornado is a violently rotating column of air extending between and in contact with a cloud and the surface of the earth. Tornadoes are often (but not always) visible as funnel clouds. On a local scale, tornadoes are the most intense of all atmospheric circulations, and winds can reach destructive speeds of more than 300 mph. A tornado's vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long.

Vulnerability: Vulnerability describes how exposed or susceptible an asset is to damage. Vulnerability depends on an asset's construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power. Flooding of an electric substation would affect not only the substation itself but businesses as well. Often, indirect effects can be much more widespread and damaging than direct effects.

Watershed: A watershed is an area that drains downgradient from areas of higher land to areas of lower land to the lowest point, a common drainage basin.

Wildfire: These terms refer to any uncontrolled fire occurring on undeveloped land that requires fire suppression. The potential for wildfire is influenced by three factors: the presence of fuel, topography, and air mass. Fuel can include living and dead vegetation on the ground, along the surface as brush and small trees, and in the air such as tree canopies. Topography includes both slope and elevation. Air mass includes temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount, duration, and the stability of the atmosphere at the time of the fire. Wildfires can be ignited by lightning and, most frequently, by human activity including smoking, campfires, equipment use, and arson.

Windstorm: Windstorms are generally short-duration events involving straight-line winds or gusts exceeding 50 mph. These gusts can produce winds of sufficient strength to cause property damage. Windstorms are especially dangerous in areas with significant tree stands, exposed property, poorly constructed buildings, mobile homes (manufactured housing units), major infrastructure, and aboveground utility lines. A windstorm can topple trees and power lines; cause damage to residential, commercial, critical facilities; and leave tons of debris in its wake.

Zoning Ordinance: The zoning ordinance designates allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.

King County
Regional Hazard Mitigation Plan Update

APPENDIX B.
5-YEAR PROGRESS REPORT ON PREVIOUS PLANS

APPENDIX B. 5-YEAR PROGRESS REPORT ON PREVIOUS PLANS

REPORTING PERIOD

November 2009 through September 2013

BACKGROUND

King County has developed and maintained a regional hazard mitigation plan since 2004, most recently updated in 2009. The King County Regional Hazard Mitigation Plan identifies resources, information, and strategies for reducing risk associated with natural hazards in the county. The plan was adopted by the King County Council in November 2009 and approved by FEMA Region X on December 2, 2009. Several King County cities and special-purpose districts in the county created annexes to link their jurisdictions to the 2009 King County plan. The plan and annexes are available to the public online at the following website:

<http://www.kingcounty.gov/safety/prepare/EmergencyManagementProfessionals/Plans/RegionalHazardMitigationPlan/2009HazardMitigationPlan.aspx>

A new update of the regional hazard mitigation plan is underway, with participation by most of the jurisdictions that participated in the 2009 plan, as well as additional municipalities and special districts in the county. The new update will be adopted before the end of 2014. The following jurisdictions participating in the current update either were participants in King County's 2009 regional plan or have their own current adopted hazard mitigation plans:

- City of Auburn
- City of Bothell
- City of Federal Way
- City of Issaquah
- City of Kent (including annex for Kent Fire Department/King County Fire District 37)
- City of Mercer Island
- City of Pacific
- City of Redmond
- City of Renton
- City of Shoreline (including annex for Shoreline Fire Department /King County Fire District 4)
- City of Snoqualmie
- City of Tukwila
- City of Woodinville (an annex to the North King and South Snohomish Counties Regional Mitigation Plan for Natural Hazards)
- Covington Water District
- Highline Water District

- King County Water District 19
- King County Water District 111
- Soos Creek Water District
- Sammamish Plateau Water and Sewer District
- Southwest Suburban Sewer District
- South King Fire and Rescue.

Purpose

This progress report provides an update on implementation of the action plans for all jurisdictions participating in the 2014 regional plan update. It was prepared by the 2014 update planning team and reviewed by the 2014 update steering committee. The objective is to ensure that there is a continuous planning process that keeps the regional hazard mitigation plan responsive to stakeholder needs and capabilities. The contents of this progress report are as follows:

- Summary overview of action plan progress
- Recent natural hazard events
- Changes in risk exposure within the planning area
- Mitigation success stories
- Itemized review of the action plan
- Changes in capability in the planning area that could impact plan implementation
- Recommendations for changes/enhancement.

The Steering Committee

The update steering committee holds an evolving role in plan implementation, based on the hazard mitigation needs of the region. At a minimum, the steering committee provides technical review and oversight on development of implementation progress reports. Table 1 lists current steering committee membership.

SUMMARY OVERVIEW OF ACTION PLAN PROGRESS

The 2009 King County regional hazard mitigation plan, associated jurisdictional annexes, and other previous hazard mitigation plans by participants in the 2014 update all include action plans that identify specific mitigation actions. Table 2 summarizes the number of initiatives in each action plan and current progress as of the time of this progress report.

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TABLE 1 2013 STEERING COMMITTEE MEMBERS		
Name	Title	Jurisdiction or Agency
Janice Rahman	Emergency Management Program Manager	King County Office of Emergency Management
Barnaby Dow	Emergency Management Program Manager	King County Office of Emergency Management
Bob Freitag	Director of the Institute for Hazard Mitigation Planning and Research	University of Washington
Denis Uhler	Director of Supply Chain Management	Overlake Hospital
Dominic Maranzo	Emergency Manager	City of Kent
Ed Reed	Zone 3 Coordinator	King County
Gail Harris	Emergency Manager	City of Shoreline
James Kraman	Event Manager	Century Link Field
James Tritten	Emergency Preparedness Manager	Valley Medical Center
Kimberly Behymer	Program Coordinator	City of Kent
Lee Gaskill	Police Lieutenant	City of Algona
Mark Chubb	Fire Chief	King County Fire District No. 20
Mike Ryan	Zone 1 Coordinator	King County
Milton Guerreiro	Fire Lieutenant	King County Fire District No. 2 – Burien Fire
Monica Walker	Project/Program Manager	King County Water and Land Resources Division
Rick Wallace	President	Vashon Be Prepared
Robert Taylor	Water Resources Manager	Covington Water District
Sarah Miller	Emergency Preparedness Manager	City of Auburn
Scott Emry	Risk Management Manager	Lake Washington School District

**TABLE 2.
SUMMARY OVERVIEW OF ACTION PLAN PROGRESS**

Plan	Adoption Date	Total Number of Mitigation Initiatives	Mitigation Initiatives Started or Completed		Mitigation Initiatives Not Started	
			Number of Initiatives	Percent of Total	Number of Initiatives	Percent of Total
2009 King County Regional Plan	November 2009	36	29	81%	7	19%
City of Auburn Annex	February 2013	12	NA	NA	NA	NA
City of Bothell Hazard Mitigation Plan	June 2010	25	19	76%	6	24%
City of Federal Way Annex	February 2010	6	5	83%	1	17%
City of Issaquah Annex	January 2010	5	4	80%	1	20%
City of Kent Local Hazard Mitigation Plan	September 2004	11	6	55%	5	45%
City of Mercer Island Hazard Mitigation Plan Update	December 2010	11	10	91%	1	9%
City of Pacific Annex	July 2009	9	NA	NA	NA	NA
City of Redmond Hazards Mitigation Plan	December 2009	6	6	100%	0	0%
City of Renton Hazard Mitigation Plan	April 2012	50	40	80%	10	20%
City of Shoreline Multijurisdictional Hazard Mitigation Plan Update	November 2009	8	8	100%	0	0%
City of Snoqualmie Hazard Mitigation Plan Update	March 2010	41	NA	NA	NA	NA
City of Tukwila Hazard Mitigation Plan	April 2010	4	4	100%	0	0%
City of Woodinville Annex to North King and South Snohomish Counties Regional Mitigation Plan for Natural Hazards	September 2010	13	9	69%	4	31%
Covington Water District Annex	June 2009	7	6	86%	1	14%
Highline Water District Annex	October 2010	3	3	100%	0	0%
King County Water District 19 Annex	June 2009	3	3	100%	0	0%
King County Water District 111 Hazard Mitigation Plan	December 2009	10	1	11%	9	89%
Sammamish Plateau Water and Sewer District Annex	June 2009	1	1	100%	0	0%
Soos Creek Water District Hazard Mitigation Plan	February 2010	7	4	57%	3	43%
Southwest Suburban Sewer District Annex	September 2009	5	NA	NA	NA	NA

...APPENDIX B. 5-YEAR PROGRESS REPORT ON PREVIOUS PLANS

TABLE 2.
SUMMARY OVERVIEW OF ACTION PLAN PROGRESS

Plan	Adoption Date	Total Number of Mitigation Initiatives	Mitigation Initiatives Started or Completed		Mitigation Initiatives Not Started	
			Number of Initiatives	Percent of Total	Number of Initiatives	Percent of Total
King County Fire District 4 (Shoreline Fire Department) Annex to City of Shoreline Multijurisdictional Hazard Mitigation Plan Update	July 2009	5	5	100%	0	0%
King County Fire District 37 (Kent Fire Department) Annex to City of Kent Local Hazard Mitigation Plan	September 2004	2	2	100%	0	0%
South King Fire & Rescue Annex	June 2009	3	NA	NA	NA	NA

RECENT NATURAL HAZARD EVENTS IN THE PLANNING AREA

The following hazard events occurred within the planning area during the performance period:

Declared Emergencies:

- **January 11, 2011 (DR-1963)** —Severe winter storm, flooding, landslides and mudslides
 - According to NOAA’S National Climatic Data Center, “A cold easterly wind through the Columbia River Gorge was keeping cold air trapped in the Gorge as a strong Pacific frontal system moved inland. This system spread precipitation over the Gorge starting as snow and changing over to freezing rain as the air mass warmed.” The preliminary damage assessment for the seven counties affected by the storm was estimated at \$8.7 million in damages.
- **January 14, 2012 (DR-4056)**—Severe winter storm, flooding, landslides and mudslides
 - According to the National Climatic Data Center, “arctic air moved into the region followed by a series of moderate to strong upper level storm systems riding on a moist subtropical jet stream. The result was widespread heavy snow and local high winds.” The preliminary damage assessment for the 11 counties affected by the storm was estimated at \$32 million in damages.

Additionally, the following notable events were recorded in the County between 2010 and 2013 accounting for 6 reported fatalities and an estimated \$5.4 million in damages:

- **Avalanche**
 - **2012 Tunnel Creek**—3 fatalities
 - **2013 Snoqualmie Pass**—2 fatalities in one day from two separate events
- **Severe Weather**
 - **June 2010 Funnel cloud in Rainier Valley**—very minor property damage
 - **December 2010 Heavy Rain**—estimated \$3 million in damages

- *December 2010 Thunderstorm and Wind*—estimated \$25,000 in damages
- *January 2011 Heavy Rain*—1 fatality and estimated \$20,000 in damages
- *July 2012 Lightning*—1 injury and estimated \$100,000 in damages
- *January 2013 Debris Flow*—estimated \$5,000 in damages
- *May 2013 Thunderstorm and Wind*—estimated \$25,000 in damages
- *July 2013 Lightning*—estimated \$5,000 in damages
- *July 2013 Lightning*—estimated \$10,000 in damages
- *September 2013 Heavy Rain*—estimated \$10,000 in damages
- **Severe Winter Weather**
 - *January 2011 Winter Weather and Ice Storm*—estimated \$2 million in damages
 - *January 2012 Winter Weather and Ice Storm*—estimated \$267,000 in damages
 - *December 2012 Winter Weather and Heavy Snow*—no reported damage

CHANGES IN RISK EXPOSURE IN THE PLANNING AREA

The population in the planning area has increased 3.8 percent since 2009 to an estimated 1,981,900 people as of April of 2013. Property exposure has also increased during the same time period. The planning area is estimated to have over 565,000 buildings representing over \$556 billion in exposed structure and contents.

The 2009 Hazard Mitigation Plan addressed the probable impacts of the following natural hazard events in the planning area:

- Avalanche
- Dams/Dam Safety
- Drought
- Earthquake
- Fire
- Flooding
- Severe Weather
- Landslide
- Tsunami & Seiches.

No natural hazard event occurred in the planning area during the performance period that would alter or change the probability of occurrence or ranking of risk for the natural hazards addressed by the Hazard Mitigation plan; however, the completion of upgrades to the Howard Hanson Dam in the Green River Valley has likely decreased the probability of an event in this area.

REVIEW OF THE ACTION PLAN

This section reviews the action plans and lists the status of each initiative from the hazard mitigation plans, grouped by jurisdiction. The action plan initiative summary in Table 3 provides the following information:

- Brief summary of initiative; note that initiatives from the 2009 King County Regional Hazard Mitigation Plan Update are coded based on responsible County agency, as follows:
 - KCSO = King County Sheriff's Office

...APPENDIX B. 5-YEAR PROGRESS REPORT ON PREVIOUS PLANS

- SWD = Solid Waste Division
- PH = Public Health
- ITS = Information and Technology Services
- MKCT = Metro King County Transit
- FMD = Facilities Management Division
- FMO = Fire Marshall's Office
- DNRP = Department of Natural Resources and Parks
- Indication of whether any action has been taken
- Current timeline
- Indication of whether the project priority has changed
- Status (complete, ongoing or no progress)
- Comments, including the following information:
 - Was any element of the initiative carried out during the reporting period?
 - If no action was completed, why?
 - Is the timeline for implementation for the initiative still appropriate?

If the initiative was completed, does it need to be changed or removed from the action plan?

**TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES**

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
2009 King County Regional Plan				
KCSO-1 —Enhance homeland security, mitigation, and response capabilities by acquiring dedicated staff for training, planning, response, and intelligence sharing and analysis				
No	Long Term	No	Due to King County General Fund budget deficits, the Sheriff's Office has not been able to enhance its homeland security mission to include both mitigation and response capabilities by acquiring additional staffing. Current staffing levels do not allow for this work to proceed and, in fact, the Sheriff's Office is experiencing staffing shortages at all levels. We attempt to support the mission with limited personnel on an ad hoc basis. Unless FTE funding is supported through the greater King County budget process it is not anticipated that this action will occur in the near to medium term.	No Progress
SWD-1 — <i>Grid 2 & 3 repairs</i> . Structural seismic retrofit of the Enumclaw transfer station. This initiative sets steel plating to the roof repairs increasing the resistance of the structure to strong earthquakes.				
Yes	Short Term	No	Completed in April 2009	Complete
SWD-2 — <i>Perimeter Wall</i> . Phase 2 of the structural seismic retrofit to the Enumclaw transfer station. This initiative sets steel plating to the perimeter wall increasing the resistance of the structure to strong earthquakes.				
Yes	Short Term	No	Completed in April 2009	Complete
SWD-3 — <i>Panel to Panel joint connections</i> . Phase 3 of the structural seismic retrofit to the Enumclaw transfer station. This initiative sets connecting the panels with joint connectors increasing the resistance of the structure to strong earthquakes				
Yes	Short Term	No	Completed in April 2009	Complete
SWD-4 — <i>Roof parapet bracing</i> . Phase 4 of the structural seismic retrofit to the Enumclaw transfer station. This initiative sets connecting the roof parapet with steel bracing increasing the resistance of the structure to strong earthquakes				
Yes	Short Term	No	Completed in April 2009	Complete
SWD-5 — <i>Sheer wall connections</i> . Phase 5 of the structural seismic retrofit to the Enumclaw transfer station. This initiative sets sheer wall bracing for increasing the resistance of the structure to strong earthquakes				
Yes	Short Term	No	Completed in April 2009	Complete
PH-1 —Support the general public's health and safety by educating Public Health staff in emergency and disaster response				
Yes	Long Term	No	Continually provide orientations and trainings to PH staff serving on emergency response teams.	Ongoing
PH-2 —Enhance communication of Public Health sites internally (both within and between PH sites) as well as with other regional agencies through amateur and short-range radio programs				
Yes	Short Term	No	Completed outfitting PH sites with radio capability.	Complete

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TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
PH-3—Develop an infectious disease outbreak response team program				
Yes	Long Term	No	Recruiting and training Epis to serve on an outbreak response team.	Ongoing
PH-4—Educate the public in disaster response activities				
Yes	Long Term	No	Provided training and education to community based organizations and healthcare facilities on continuity planning.	Ongoing
PH-5—Support and enhance first responder disaster reporting and regional emergency electronic data collection				
No	Long Term	No	RIMS or common operating procedure for KC to support regional, multidisciplinary reporting.	No Progress
PH-6a—Mitigate structural damage at Public Health sites. This initiative also involves training to determine structural damage during and after hazard events				
No	Long Term	No	Determined to be role of KC FMD, not Public Health	No Progress
PH-6b—Mitigate non-structural damage at Public Health sites. This initiative also involves training to determine non- structural damage during and after hazard events				
No	Long Term	No	Determined to be role of KC FMD, not Public Health	No Progress
PH-7—Enhance syndromic surveillance program to support public health during emergencies and disasters				
Yes	Short Term	No	Incorporated all school districts into surveillance system.	Complete
PH-8—Enhance environmental health response programs for terrorist acts involving chemical and radioactive events, threats to food and water supply and airborne illnesses				
Yes	Long Term	No	Developed environmental health response team.	Ongoing
ITS-1—Provide alternative sites and communication paths for County's information and communication infrastructure. This initiative also seeks to retrofit existing facilities to improve disaster resistance.				
Yes	Long Term	No	KCIT has upgraded the external connections into the King County Wide Area Network (KCWAN) establishing 2 redundant connections at each of the entry points, King County Data Center and at the Seattle location. The redundant connections are provided by two separate Internet Service Providers (ISP) on diverse paths. The King County Firewalls have been upgraded; KCIT has installed 4 redundant firewalls in 2 separate locations. Upgraded all network routers and switches within the KCWAN infrastructure establishing an equipment replacement fund, and schedule to ensure all KCWAN infrastructure remains current and supported by the vendor. KCIT is in the process of replacing the current telecommunications systems and utilizing Voice Over IP technology. KCIT has an established Alternate Data Center designated specifically for Disaster Recovery of essential systems and applications. KCIT is also in the process of establishing additional alternatives for Disaster Recovery by utilizing Virtual and Cloud technology.	Ongoing

**TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES**

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
MKCT-1 —Construct downtown Seattle transit tunnel positive ventilation system to allow for decontamination and recovery following chemical, gas, or fire event.				
Yes	Short Term	No		Complete
MKCT-2 —Install security cameras on public buses to deter crime associated with civil unrest and terrorist acts				
Yes	Long Term	No	All new coaches procured will be camera equipped.	Ongoing
FMD-1 —Structural seismic retrofit of county buildings to improve resistance to earthquakes				
Yes	Short Term	No	All county buildings that FMD is responsible for have been seismically upgraded.	Complete
FMD-2 —Administration Building 401-403 Security Additions. Install motion detector, duress buttons, camera and monitoring system				
Yes	Short Term	No	Added camera and duress	Complete
FMD-3 —Administration Building 5th floor - Elections Security Upgrade. Install card access control, duress buttons, camera and video monitoring system				
Yes	Short Term	No	Added camera, readers and duress	Complete
FMD-4 —Administration Building 6th floor - Finance Security Upgrade. Install card access control, duress buttons, camera and video monitoring system				
Yes	Short Term	No	Added readers and duress	Complete
FMD-5 —Elections 1st Ave MBOS Security Upgrade. Install card access control, duress buttons, camera and video monitoring system				
No	Short Term	Yes	Leased space- No longer occupied by Elections.	No Progress
FMO-1 —Continue inspection of existing and new construction				
Yes	Long Term	Yes	New construction permits – no change. Annual inspection permits – priority reduced and some work contracted to local fire districts.	Ongoing
FMO-2 —Provide plan reviews for noted construction				
Yes	Long Term	No		Ongoing
FMO-3 —Support education, training and information programs				
No	Long Term	No	Ongoing outreach not currently in our business plan. Some information maintained on Department's website.	No Progress
FMO-4 —Work with schools and fire service public educators to deliver public safety messages				
Yes	Long Term	No	Conduct annual fire safety inspection and collect fire drill reports.	Ongoing

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**TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES**

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
DNRP-1 —Snoqualmie 205 (Fund 318F). Cooperative project between King County, City of Snoqualmie and Corps of Engineers to improve flood hazard conditions above Snoqualmie Falls through major channel excavation improvements.				
Yes	Short Term	No	Cooperative project between City of Snoqualmie, King County, and Army Corps of Engineers completed. Monitoring for sediment retention at site.	Complete
DNRP-2 —North Bend 205 (Fund 318F and 318U). This project is a cooperative flood damage reduction project between the Corps of Engineers (Corps), King County and the City of North Bend. The project will evaluate cost effective flood reduction options along the South and Middle Fork Snoqualmie Rivers in and around the City.				
No	Long Term	Yes	Feasibility study conducted by U.S. Army Corps of Engineers determines project to be unfeasible. Addressing highest priority needs through implementation of South Fork Levee Improvement Project and the Upper Snoqualmie valley Residential Mitigation Project.	No Progress
DNRP-3 —Rivers Major Maintenance (Fund 318F and 318U). Major rivers maintenance project includes funds to repair damaged structural elements of King County's extensive inventory of flood protection facilities.				
Yes	Long Term	No	Ongoing action, implemented annual by King County Water and Land Resources Division and the Flood Control District.	Ongoing
DNRP-4 —Floodway Corridor Restoration (FUND 318F and 318U). Floodway corridor restoration projects include the removal, slope-back or setback of County-owned flood protection facilities and other structural features to allow for improved riparian habitat, greater channel diversity and migration, reclaimed flood storage and enhanced open space or recreational/-interpretive uses.				
Yes	Long Term	No	Ongoing action, implemented annual by King County Water and Land Resources Division and the Flood Control District.	Ongoing
DNRP-5 —Flood Hazard Mitigation (FUND 318F and 318U). Flood hazard mitigation projects include the acquisition of repetitively damaged homes, purchase of underdeveloped land to prevent future development in flood prone areas, and where cost-effective and feasible, the elevation of residential homes that sustain recurring deep, low- velocity flooding.				
Yes	Long Term	No	Ongoing action implemented annual by the King County Water and Land Resources Division and the Flood Control District.	Ongoing
DNRP-6 —Critical Facility Retrofit. Currently, the fuel supply tanks for King County flood facilities cannot withstand a moderate to major quake. This project would retrofit the Black River Pump Station.				
Yes	Short Term	Yes	Construction in progress, June 2013-February 2014. Project is updating fuel pumps to double wall containment, the statutory containment, and is designed to meet seismic requirements.	Ongoing
DNRP-7 —Critical Facility Relocation. Relocate the Flood Warning Center from its current location that is subject to severe seismic exposure, to a location that is not subject to any natural hazard risk exposure.				
Yes	Short Term	Yes	Moved to King Street Center in 2006	Complete

TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
DNRP-8 —Critical Facility Upgrade. Update the flood warning telemetry and gauging, computers, software applications, emergency power and other response facilities.				
Yes	Ongoing	Yes	Telemetry and gaging in primarily done by USGS through an agreement with King County. Other systems have been improved overtime.	Ongoing
DNRP-9 —Flood Hazard Reduction Programs. This initiative includes elements such as hazard identification, warning, information dissemination and public outreach are vital to the mitigation of the natural hazards impacting King County.				
Yes	Long Term	No	Ongoing action, implemented annually by the King County Water and Land Resources Division and the Flood Control District.	Ongoing
City of Auburn Annex				
Retrofit M&O facility to reduce susceptibility to earthquake damage.				
No progress reported.				
Installation of seismic protection valves on City reservoirs to provide for automatic shutoff in event of an earthquake.				
No progress reported.				
Upgrade computer server racks throughout City to reduce susceptibility to earthquake damage.				
No progress reported.				
Purchase and implement software and hardware to comply with the State certification requirements for early destruction of source documents after digitization in compliance with the State of Washington Records Retention laws. This will safeguard records in case of disaster.				
No progress reported.				
Expand and reconfigure stormwater detention ponds on West Hill along S. 296th St. to reduce wintertime flooding along the valley floor below.				
No progress reported.				
Prepare and adopt a new optional Comprehensive Plan element for Natural Hazard Reduction.				
No progress reported.				
Measures to prevent acts of terrorism from occurring at key City facilities (Justice Center, Emergency Operations Center, City Hall, etc.)				
No progress reported.				
Develop and adopt changes to City Code to limit tree removal within certain sloped or landslide hazard susceptible areas.				
No progress reported.				
Create part or full-time FTE position to conduct disaster related public education throughout the City.				
No progress reported.				

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**TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES**

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Ability to produce own stats and data capability.				
No progress reported.				
Create, fund, and administer a grant or low interest loan program that allows homeowners to retrofit single-family homes to protect against earthquakes.				
No progress reported.				
Conduct community education campaign to addresses pandemic flu issues (See Public Education also).				
No progress reported.				
City of Bothell Hazard Mitigation Plan				
To provide seismic valves, security barriers and improve notification and response to Morningside Reservoir and Booster Station.				
Yes	Long Term	Yes	Developing a plan to install additional motion sensor alarms and Mach security cameras at other critical facilities/sites.	Ongoing
To rehabilitate City bridges for preservation and maintaining the existing integrity for safe use. Rehabs may include seismic and safety improvements.				
Yes	Long Term	No	Received grant funds to perform seismic retrofits on 195 th St. Bridge. Anticipated for 2015 construction. 240 th Bridge replaced. Seeking funding for Sammamish River Bridge. Minor maintenance & regular inspections ongoing.	Ongoing
Installations of backup power supply and alarm system at Maywood water pump station.				
Yes	Long Term	Yes	In the process of upgrading the SCADA communications for this site (phase 2 of SCADA upgrades)	Ongoing
Will increase lane capacity at the NE 195th St/N Creek Pkwy intersection and will increase the number of westbound lanes from two to three through lanes along the section of NE 195th St between N Creek Pkwy and the I-405 northbound onramp.				
Yes		No		Complete
This project realigns SR 522 one block to the south to create a new streamlined "T" intersection at SR 527. SR 527 and 98th Avenue NE are extended south from Main Street to the new SR 522 realignment. The roadway provides two lanes in each direction with left turn lanes as necessary, sidewalks, intersection improvements, traffic signals, utilities, lighting, and landscaping.				
Yes	Short Term	No	Traffic shifted to new roadway August 12, 2013. Project scheduled to be complete by mid-2014.	Ongoing
Replace the existing bridge on 240th St SE in the North Creek Valley area.				
Yes		No	Project completed in February 2012.	Complete
Construct booster pump station modification equipped with increase capacity and backup pumping facilities.				
No	Long Term	No		Ongoing

**TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES**

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Reconstruct and widen SR 522 Wayne Curve; increase intersection capacity by adding left turn lanes; enhance transit operations by adding Business Access and Transit lanes; transit priority improvements; raised median; widen 96th approaches to extend northbound left turn lane; street lighting and reconstruction of traffic signals.				
Yes		No	Project completed in June 2012.	Complete
To construct the missing link of the north-south arterial corridor of the 35th/39th corridor between 240th Street SE and 228th St SE.				
No	Long Term	No		No Progress
Raze and rebuild entire firehouse and add training tower and ground props.				
Yes	Short Term	Yes	Station was remodeled in 2009. No further action is to be taken on this.	Complete
Consolidate four critical facilities into one facility that enhances the ability to better service the general public and businesses within the community.				
Yes	Long Term	No	Location was determined and properties were purchased. Ongoing Demolition of unneeded structures was completed September 2013. City Council is anticipated to make decision regarding construction schedule in first quarter 2014.	
Provide disaster preparedness and awareness education to the general public and businesses within the community.				
Yes	Long Term	No	This is an on-going project to continue to bring disaster preparedness and awareness to the public.	Ongoing
To provide funding for immediate action to address landslides, erosion, deterioration, vandalism and spot hazardous locations.				
No	Long Term	No		Ongoing
Provide funding for safety improvements to the infrastructure other than street overlays and replacement. Such projects include guardrails, signing, crosswalks, minor curb replacement, and handicapped (ADA) ramps.				
Yes	Long Term	No	Grants received in June 2012 for safety improvements - 228 th /Bothell-Everett Highway Intersection, 228 th Corridor and citywide improvements. Projects are either under construction or in design phase and anticipated to be complete by 2015.	Ongoing
This project will provide capacity and safety improvements and include roadway widening to a five-lane roadway with intermittent median landscaping, bicycle lanes, curb, gutter, and sidewalk.				
Yes	Short Term	No	Grant funds were secured and construction is underway. Project anticipated to be complete in summer 2014.	Ongoing
Intersection improvements at SR 524 and widening the roadway in the southbound direction from two to three lanes from SR 524 to about 500 feet north of 220th St SE.				
No	Long Term	No		No Progress
Intended to address the safety and access concerns on SR 524 between SR 527 and 39th Ave SE. Access improvements will be limited to roadway widening to provide for left turn pockets and improve sight distances.				
No	Long Term	No		No Progress

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TABLE 3. CURRENT PROGRESS ON ACTION PLAN INITIATIVES				
Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
The Multiway Boulevard will consist of four travel lanes, a left turn lane, two side landscape medians, two side lanes with parking and a wide sidewalk.				
Yes	Long Term	No	The City began Phase 1 (west side access lanes, etc.) of construction in June 2013. Funding is still needed for remaining phases.	Ongoing
Rehabilitate the existing bridge to eliminate its structural deficiency rating and to complete a seismic level 1 retrofit. The bridge is currently in need of miscellaneous structural repair, including resurfacing the bridge decking with concrete cement, upgrading the reinforced concrete girders, and installing vehicle railings.				
Yes		No		Complete
Widening of the existing two-lane facility to a five-lane facility with bicycle lanes, sidewalks; reconstruct the existing 2 lane bridge over North Creek to a 5 lane bridge and reconstruct traffic signals.				
Yes		No		Complete
Identify and address piping system networks and key infrastructure improvements regarding water and sewer service, distribution and conveyance. This project is to identify and address security and seismic improvements throughout the jurisdiction.				
Yes		No		Complete
Water system piping improvements at source connection at south end of the City which is designed to include provide automatic connection with alternate water supply.				
Yes		No		Complete
Construct a two-person remote aid station in the downtown area for the placement of Medics.				
No		Yes	This is no longer priority and will be removed from the initiatives.	No Progress
Redevelopment of well field for primary self-sustaining source water, and provide seismic upgrades to tank located at well -field site.				
No		Yes	Removed from Hazard Mitigation Plan	No Progress
Facility improvements for Public Works field operations department; improvements to include security measures for key equipment, supplies and personnel.				
Yes	Short Term	No	Built a new Public Works Operations Center in 2010	No Progress
City of Federal Way Annex				
Public education related to wide-spread utility outages				
Yes	Short Term	No		Ongoing
Public awareness campaign to encourage earthquake hazard mitigation actions				
Yes	Short Term	No	Worked with local Home Depot, Lowes, and Costco to hold presentations on home mitigation projects.	Complete
Create SARA EPCRA Tier II HAZMAT Facilities map for use in Emergency Operations Center				
No	Long Term	No		No Progress

TABLE 3. CURRENT PROGRESS ON ACTION PLAN INITIATIVES				
Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Determine and complete retrofit plan to eliminate the potential of localized flooding related to 44th Avenue SW pond				
Yes	Short Term	No	Project Completed	Complete
Site-hardening of all City facilities				
Yes	Long Term	No	Continue to assess, identify, and correct areas of facilities needing safety upgrades or hardening.	Ongoing
Install GPS system to aid in resource allocation & tracking during an emergency event				
Yes	Short Term	No	Identify City vehicles equipped with GPS and monitoring system to improve real time information documentation.	Complete
City of Issaquah Annex				
Water system seismic retrofits				
Yes	Short Term	No	Highwood reservoirs received retrofitting in 2011 and the Cemetery reservoirs were retrofitted in 2012.	Ongoing
Mt. Hood Pump Station seismic rebuild				
No	Short Term	Yes	Water system priorities changed. Project remains in the Capital Facilities Plan with design scheduled for 2014 and construction in 2015.	No Progress
Flood warning gauge on Issaquah Creek north of Fifteen-Mile Creek				
Yes	Short Term	No	Project completed by Public Works in October 2011.	Complete
Flood hazard repetitive loss mitigation				
Yes	Short Term	No	Six single family homes elevated in 2011.	Complete
Promote CERT and Map Your Neighborhood programs				
Yes	Long Term	No	City sponsors at least two CERT classes annually and offers MYN facilitator training to CERT graduates and conducts ongoing MYN meetings.	Complete
City of Kent Local Hazard Mitigation Plan				
Prioritize seismic retrofit for critical facilities to meet the most current standards for new buildings to the maximum extent possible				
No	Long Term	No		No Progress
Mitigate the non-structural impacts of an earthquake on City owned critical facilities.				
Yes	Short Term	No	seismic mitigation to critical computer server room equipment seismic mitigation of several city workspaces	Ongoing
Use the Hazus computer modeling program to estimate loss				
No	Long Term	Yes	Staffing changes have pushed this priority to a long term goal	No Progress

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TABLE 3. CURRENT PROGRESS ON ACTION PLAN INITIATIVES				
Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Improve alert and notification methods to the citizens of Kent by implementing a reverse 911 system.				
Yes	Short Term	Yes	City of Kent and Kent Fire Department RFA now utilize Code Red emergency notification system	Ongoing
Enhance public notification system. Implement a public awareness campaign focused NOAA weather radios. Improve the existing Traffic Information System by increasing coverage area and adding alert beacons				
Yes	Short Term	No	Kent Emergency Management continues to provide a public education program that includes Community Emergency Response Team (CERT) training	Ongoing
Identify slope areas that threaten critical facilities due to lack of vegetation and erosion control. Prioritize and implement slope stabilization measures.				
No	Long Term	No		No Progress
Increase public education efforts toward preventing stovetop cooking fires the cause of most residential fires.				
Yes	Short Term	No	(In partnership with Kent Fire Department) Kent Fire RFA continues to provide public education programs that educate the public about kitchen fires.	Ongoing
Pre-identify lahar evacuation routes				
Yes	Short Term	Yes	Evacuation routes have been identified with an all hazard approach including flooding and lahar.	Ongoing
Identify reoccurring utility outage areas and work with utility providers to remove hazards along those areas.				
Yes	Short Term	No	Continue to improve areas by removing threats to utilities	Ongoing
Make available back-up power sources to vulnerable populations.				
No	Long Term	No	Grant funds would need to be obtained to complete this project. A grant source has not been identified.	No Progress
Construct a facility that would house a permanent Emergency Coordination Center.				
No	Long Term	No	Funds have not been identified to complete this task.	No Progress
City of Mercer Island Hazard Mitigation Plan Update				
Incorporate Hazard Mitigation policies into City Comprehensive Plan				
Yes		No		Complete
Develop/Maintain Watercourse CIP list				
Yes	Long Term	No		Ongoing
Rehabilitate damaged storm culverts				
Yes	Long Term	No		Ongoing
Large Ravine/Watercourse Projects				
Yes		No		Complete

TABLE 3. CURRENT PROGRESS ON ACTION PLAN INITIATIVES				
Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Small Ravine/Watercourse Projects				
Yes	Long Term	No		Ongoing
Replace aging water mains				
Yes	Long Term	No		Ongoing
Sewer generator replacement program				
Yes	Short Term	No		Ongoing
Sewer rehab/replace				
Yes	Long Term	No		Ongoing
Emergency program				
Yes	Long Term	No		Ongoing
IT systems continuity				
Yes	Long Term	No		Ongoing
Firewise				
Yes	Long Term	No		No Progress
City of Pacific Annex				
Encourage and facilitate the development or updating of general plans and zoning codes to limit development in hazard areas				
No progress reported.				
Enforce the building codes, the general plan and zoning ordinances of the City of Pacific, which will prevent or minimize damage to residential and commercial structures due to flooding events				
No progress reported.				
Evaluate protocols, purchase emergency containment supplies, invest in notification systems, and supply neighborhood groups with emergency training and equipment				
No progress reported.				
Inspect and retrofit the critical facilities of the City against failure from earthquake, snow and wind. Enforce the provisions of the latest edition of the Pacific building code for Pacific critical facilities, alterations and additions				
No progress reported.				
Improve capacity of arterial routes. This includes West valley highway, Butte Avenue, Valentine Avenue South, and Stewart Road				
No progress reported.				
Improve safety along arterial route of West Valley Highway				
No progress reported.				
Install berm using earthen materials along the eastern side of the Pacific City Park				
No progress reported.				

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**TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES**

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
			Work with external partners to identify dead or diseased trees for annual trimming or removal	
			No progress reported.	
			Contract to construct seismic upgrades to Pacific city hall, community center and police station	
			No progress reported.	
City of Redmond Hazards Mitigation Plan				
To mitigate impacts involved with isolation following a severe hazard event, Redmond will develop outreach activities to enable Redmond residents, businesses and visitors to survive in-place for more than three days.				
Yes	Long Term	No	Participated in a wide variety of preparedness fairs and gave dozens of preparedness talks to the public, businesses and visitors throughout the whole community. Developed the Redmond Ready basic preparedness education class for City of Redmond employees and Redmond residents. Began delivering Redmond Ready classes in July 2012. Trained approximately 200 City of Redmond employees to make them Redmond Ready. Conducted several Redmond Ready Days to train the public in basic preparedness, First Aid, and CPR. Worked with Microsoft to develop the www.redmondready.org web portal, which promotes the program and which lives in the cloud and can be updated quickly by OEM staff during a disaster. Promoted the regional Make it Through preparedness campaign. Conducted Map Your Neighborhood classes. Conducted an average of three CERT classes every year. Partnered with the Redmond Citizens Corps Council and Amateur Radio Emergency Services (ARES) regarding community outreach. Worked with many partner agencies to develop a high-quality, low-cost emergency preparedness calendar for 2013 and 2014 that is a great year-round resource.	Ongoing
To ensure provision of vital services following a hazard event, Redmond will develop alternative service centers in less hazardous areas.				
Yes	Long Term	No	Fire Station 17 was built and went into service in March 2012. The station is located on Education Hill, away from the liquefaction zone in downtown Redmond. Future development will concentrate in both the Downtown and Overlake Urban centers. Overlake is away from the liquefaction zone.	Ongoing

TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
To mitigate damage to vulnerable structures and infrastructure, Redmond will promote retrofitting with safe-to-fail mechanisms.				
Yes	Long Term	No	Emergency power generation was substantially upgraded at the Public Works Maintenance and Operations Center and at the Redmond Municipal Campus. Redundant network infrastructure has been added. Water tanks on Education Hill were seismically retrofitted. Public Works is in the process of their Buildings Facilities Condition Assessment, the outcome of which will give the city a better handle on the condition of our assets and what may need to be implemented. The Public Works construction group is looking at bridge seismic retrofits (such as 148th). Our bridges are rated for safety based on King County's bridge inventory system.	Ongoing
To mitigate against the loss of major transportation facilities in and around the City, Redmond will invest resources in building more resilient transportation networks.				
Yes	Long Term	No	1) Redmond is completing a grid network in both the Downtown and Overlake Urban Centers where most of the growth will be occurring in the future, 2) All of our bridges are inspected regularly and the existing bridges meet reasonable earthquake standards with the exception of the 148th Bridge north of Redmond Way which has funding for a seismic retrofit. All the new bridges and bridge replacements are designed to current earthquake standards, 3) City is developing a complete multi-modal transportation system to provide travel choices including bringing light rail to Overlake in 2023 and eventually to downtown, 4) Redmond has a state of the art Traffic Operations Center that has cameras at key intersections to monitor and change parking signals remotely to respond to changing traffic conditions, and 5) Redmond's R-TRIP program offers infrastructure for ride matching, transit route information, and periodic communication and incentives to encourage individuals to explore ways of getting between home and work that don't rely on driving alone and support finding a potential carpool partner or bus route that could be used in the event of an emergency. This program has nearly 29,000 registered users among employees and residents in Redmond. Further, by contract with King County Metro, we provide these services in our community.	Ongoing

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**TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES**

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
To mitigate against the functional loss of business communities, Redmond will develop and deliver business outreach programs.				
Yes	Long Term	No	Police Department conducted Critical Incident Protocol (CIP) outreach regarding crime prevention and man-made hazards. Emergency Management conducted many preparedness sessions at businesses, helping businesses prepare their employees. As part of the City's Economic Development initiatives, the City has developed close communications and relationships with businesses through its One Redmond partnership (which took the place of the former Greater Redmond Chamber of Commerce) and neighborhood level business outreach which could be deployed to assist outreach and communication about emergency planning and operations. Past outreach has included: winter time promotions via the www.GOrtrip.com to encourage winter emergency planning and partnering with the Greater Redmond Transportation Management Association in 2012 to bring in Ed Gabriel, Principal Deputy Assistant Secretary for Preparedness and Response, US Health and Services to raise awareness by businesses of all sizes about the need for emergency preparedness.	Ongoing
To mitigate impacts from expected increases in incidences of shallow flooding, Redmond will build a flood tolerant community able to accommodate increases in low impact flooding				
Yes	Long Term	No	Redmond does not allow development in the floodway and has adopted regulations for developments outside of the floodway but within the floodplain. One of those regulations requires compensating floodplain storage for these developments so we don't reduce our floodplain capacity. Redmond completed a large trunk line (storm drainage line) in the BNSF railroad right of way that will carry the 50 year storm for much of downtown. Additionally, Redmond is constructing an enormous stormwater vault in Overlake behind Sears. The vault will reduce flow rates from about 345 ac. The vault is about 1.5 ac in area and 20 feet deep. Two additional vaults are proposed in Overlake in the future including one to be constructed with the light rail station. Both the trunkline in downtown and the Overlake vaults should greatly reduce the risk of flooding in Redmond's urban centers.	Ongoing
City of Renton Hazard Mitigation Plan				
Establish a formal role for the Renton All Hazard Mitigation Planning Committee (Emergency Management Group) to develop a sustainable process to encourage, implement, monitor, and evaluate citywide mitigation actions.				
Yes	Short Term	No	EM is now represented in citywide planning efforts	Complete

TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Identify and pursue funding opportunities to implement mitigation actions.				
Yes	Short Term	No	Preparing to apply for 2014 bridge retrofit funding. Funding already secured for downtown library retrofit project.	Ongoing
Develop public and private sector partnerships to foster hazard mitigation activities.				
Yes	Short Term	No	Have increased awareness through public education activities, COAD outreach, CERT, and Citizen's Academy	Ongoing
Develop detailed inventories of at-risk buildings and infrastructure and prioritize mitigation actions				
Yes	Short Term	No	Inventory of buildings and roads/bridges complete for seismic. Need to add in other hazards and then prioritize. IT has inventory of all technology equipment and services, prioritized on basis of business need and greatest benefit. Recommend moving this project to Long Term.	Ongoing
Develop education programs aimed at mitigating the risk posed by hazards				
Yes	Long Term	No	Implemented education activities related to cyber-crime, Complete vandalism. Have incorporated mitigation component directly into other public education programs including staff education for cybersecurity.	Ongoing
Integrate the Mitigation Plan findings into planning and regulatory documents and programs.				
Yes	Long Term	No	Case-by-case basis during project review; and integrated as appropriate during updates of the Critical Areas Ordinance and Comprehensive Plan Elements.	Ongoing
Integrate hazard, vulnerability and risk Mitigation Plan findings into enhanced Emergency Operations planning.				
Yes	Long Term	No	Implemented seismic fastening project at EOC and all fire stations	Complete
Complete an inventory of structures, critical facilities and important transportation or utility system components within mapped floodplains, including elevation data and structure/facility information.				
Yes	Short Term	No	Updated GIS layers to incorporate FEMA floodplain map information to allow it to be overlaid onto utility, transportation, building, aerial and topography layers to identify critical facilities in the floodplain.	Ongoing
Identify and implement cost-effective mitigation measures for high-risk structures, with the highest priority for critical facilities, transportation and utility components.				
Yes	Long Term	Yes	Duplicates other more specific projects in plans that are included under this umbrella. Recommend removal of project and focus on more specifics.	Ongoing
Identify and implement measures and policies to increase Renton's Community Rating System score to reduce flood insurance rates.				
Yes	Long Term	No	Updated City Surface Water Design Standards GIS floodplain layers to increase potential for a better CRS rating.	Ongoing

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**TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES**

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Continue to be a member of the National Flood Insurance Program to enable property owners in Renton to purchase flood insurance from FEMA and allow the City to receive flood disaster funding to repair damages due to flooding following a federally declared disaster.				
Yes	Long Term	No	Continuing to implement NFIP requirements and programs necessary to maintain eligibility. Successfully completed a Community Assistance Visit from FEMA in 2010 and 2012 that verified City is complying with NFIP requirements and is an eligible member of the NFIP.	Ongoing
Continue to require new construction of structures in the floodplain to be constructed in accordance with FEMA standards and the National Flood Insurance Program requirements, including requiring compensatory floodplain storage for filling of the floodplain.				
Yes	Long Term	No	Evaluate permits on a case-by-case basis, and report annually to FEMA. Work that has begun on revisions to the Critical Areas Regulations (to be completed in 2015) may result in some changes in code.	Ongoing
Implement the Reasonable and Prudent Measures identified in the NOAA Fisheries Biological Opinion regarding FEMA's National Flood Insurance Program as required by FEMA.				
Yes	Long Term	No	Renton currently complies with the RPA by subscribing to Option 3, the permit-by-permit approach. A Critical Areas study or Biological Assessment is required. An update of the Critical Areas Ordinance (by 2015) will meet or exceed the RPA performance standards (Option 2).	Ongoing
Continue to enforce, maintain and update the Renton Critical Areas Regulations and Shoreline Master Program requirements.				
Yes	Long Term	No	Renton is in the process of updating the Critical Areas Regulations. An update of the Shoreline Master Program was completed and adopted on November 3, 2011.	Ongoing
Continue to perform maintenance dredging, maintenance of floodwalls and levees associated with the Army Corps of Engineers Cedar River Section 205 Flood Hazard Reduction Project.				
Yes	Long Term	No	Continued to implement sediment levels to determine need for next maintenance dredge. In 2013 initiated planning, design, and permitting work for the next maintenance dredge. Currently working with consultants and agencies to review the proposed dredging of the Cedar River, and to process necessary land use and environmental (SEPA) permits.	Ongoing

TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Continue to implement the Surface Water Utility programs related to flood hazard management, which include the Capital Improvement Program, engineering program, maintenance and operations program, public education and customer service programs.				
Yes	Long Term	No	Water Utility to review projects for compliance with storm water regulations. Public Works is also taking over maintenance of stormwater ponds and vaults in residential projects (formerly the responsibility of the HomeOwners Associations). Continuing to fund and implement all Surface Water Utility programs. 2013 Surface Water Utility CIP budget is \$10 million.	Ongoing
Adopt storm water design standards equivalent to the Ecology 2005 Stormwater Management Manual for Western Washington to better control the quantity and quality of storm water runoff from new construction and redevelopment projects and meet the requirement of the Phase II National Pollutant Discharge Elimination System permit requirements.				
Yes	Long Term	No	Have adopted local updates to the King County Surface Water Design Manual. Also completed update of City Surface Water Design Standards to meet Ecology NPDES Municipal Stormwater Permit requirements on February 10, 2010. Next update must be completed by or before December 31, 2016.	Complete
Integrate flood hazard reduction with other objectives related to water quality protection, habitat protection and habitat restoration efforts including complying with the Clean Water Act Phase II National Pollutant Discharge Elimination System permit, the Endangered Species Act and the regional salmon recovery efforts.				
Yes	Long Term	Yes	Vague language, already covered in other areas, including compliance with ecological mandates. Recommend removal of this project.	Ongoing
Continue to be consistent with the King County Flood Hazard Reduction Plan.				
Yes	Long Term	No	Continuing to work with the King County Flood Control District to implement regional flood hazard reduction projects, programs and policies.	Ongoing
Continue to participate in the King County Flood Warning System and the King County Flood Control Zone District				
Yes	Long Term	No	Continue to utilize the King County Flood Warning System for response to flooding due to storms. Attend annual pre-flood season Flood Warning coordination meetings.	Ongoing
Continue to be a member of the FEMA Community Rating System that enables property owners to obtain flood insurance at a reduced rate				
Yes	Long Term	No	Continuing membership in the FEMA CRS program. Current rating is 6. CRS Re-verification review schedule for November 7, 2013.	Ongoing

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**TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES**

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Re-evaluate future land use and zoning designations in FEMA mapped 100-year floodplain areas				
No	Long Term	No	The Comprehensive Plan Update and Critical Areas Ordinance update may involve the re-evaluation of land uses and zoning designations in the FEMA mapped 100-year floodplain areas.	No Progress
Complete an inventory of structures, critical facilities and important transportation or utility system components in locations with a history of severe or repetitive flooding.				
Yes	Short Term	No	Updated GIS layers to incorporate FEMA floodplain map information to allow it to be overlaid onto Utility, Transportation, building, aerial and topography layers to identify critical facilities in the floodplain.	Ongoing
Evaluate and improve notification, evacuation and response planning for areas within the potential inundation area for failure of the Hanson Dam.				
Yes	Short Term	No	Completed in 2011 after 2 years of operational planning across multiple departments and jurisdictions.	Complete
For locations with repetitive flooding and significant damages or road closures, determine and implement mitigation measures such as upsizing culverts or storm water drainage capacity.				
Yes	Long Term	No	Existing flooding problems and projects to solve them are identified in the Surface Water Utility CIP and that is updated as part of the City budget process.	Ongoing
Maintain copies of high-resolution maps of dam failure inundation areas and update emergency response plan, including public notification and evacuation routes.				
Yes	Short Term	No	Complete pending the map revisions of evacuation routes that were modified slightly in 2012.	Ongoing
Research seismic vulnerability assessments for Howard Hanson Dam and Chester Morse Dam and lobby dam owners to make seismic improvements as necessary.				
No	Short Term	Yes	Outside of staff's ability to influence the projects.	No Progress Recommend removal.
Enhance tree-trimming efforts especially for transmission lines and trunk distribution lines.				
No	Short Term	Yes	Tree trimming activity around power lines is done by certified persons. Staff work with PSE on their plans for large-scale projects, including tree removal per their recommendation, not tree trimming as specified in this project. Recommend removal of the project from the plan.	No Progress
Encourage property owners to trim trees near service drops to individual customers.				
No	Short Term	Yes	Outside of the city's area of responsibility, belonging to Puget Sound Energy instead. Recommend removal of project.	No Progress

TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Ensure that all critical City facilities in Renton have sufficient backup power and emergency operations plans to deal with power outages.				
Yes	Long Term	Yes	Added generator transfer switch to Renton Community Center. Recommend removal of project, however, for two reasons: 1) generators are not a true mitigation project, and 2) remaining locations are not feasible for generator placement	Complete
Consider upgrading lines and poles to improve wind/ice loading, undergrounding critical lines, and adding interconnect switches to allow alternative feed paths and disconnect switches to minimize outage areas.				
No	Long Term	Yes	Outside of the city's area of responsibility, belonging to Puget Sound Energy. Recommend removal of project from the plan.	No Progress
Encourage new developments to include underground power lines.				
Yes	Long Term	No	Implemented on a project-by-project basis. Required by RMC, however, waiver of this requirement is still possible on a case-by-case basis.	Ongoing
Evaluate the seismic vulnerability of critical city-owned buildings, utilities and infrastructure and establish priorities to retrofit or replace vulnerable facilities to ensure adequate seismic performance of critical facilities.				
Yes	Short Term	No	Engineering studies were conducted on the 200 Mill building in 2012. Other buildings have been evaluated. Bridges are evaluated every two years. Recommend moving this to a long-term project as it is taking more time and budget than initially anticipated.	Ongoing
Conduct a sidewalk survey of residential, commercial and industrial buildings in Renton using FEMA's Rapid Visual Screening to identify especially vulnerable buildings, raise awareness and encourage mitigation actions.				
No	Short Term	Yes	No available staff to carry out this work. Recommend removing it as a short term project and turning it into a long term project should staffing levels increase, or delete it altogether.	No Progress
Disseminate FEMA pamphlets to educate homeowners about structural and non-structural retrofitting of vulnerable homes and encourage retrofit.				
Yes	Short Term	No	Pamphlets are available either on-line or in the Customer Service Area at City Hall, or upon request from Emergency Management.	Ongoing
Obtain funding and retrofit important public facilities with significant seismic vulnerabilities.				
Yes	Long Term	No	Fire Station 11 seismic retrofit completed in December 2009. Contracted with District 40 and provided seismic retrofit to Fire Station 17 in early 2013. Seismic retrofit of downtown Renton library scheduled for 2014.	Ongoing
Complete the inventory of locations where buildings or infrastructure are subject to landslides.				
Yes	Short Term	No	GIS data updates clearly show landslide areas overlaid with critical infrastructure and buildings.	Complete

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TABLE 3. CURRENT PROGRESS ON ACTION PLAN INITIATIVES				
Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Consider landslide mitigation actions for slides seriously threatening buildings or infrastructure.				
No	Long Term	Yes	No currently identified building or infrastructure threats. Recommend removal of this project.	No Progress
Limit future development in high landslide potential areas.				
Yes	Long Term	No	Existing code prohibits or limits development in high landslide areas, and requires geotechnical studies and specific construction techniques in order to develop structures. The CAO update will also revisit these regulations.	Ongoing
Update public emergency notification procedures for ash fall events.				
Yes	Short Term	Yes	Public emergency notification procedures have been updated to include placement in 2011 of weather proof bulletin boards at each Renton School District school and the Golf Course should conventional communications fail.	Complete
Update emergency response planning for ash fall events.				
No	Long Term	No	Response oriented, not a true mitigation project. Recommend removing this project.	No Progress
Evaluate capability of water treatment plant to deal with high turbidity from ash falls and upgrade treatment facilities and emergency response plans to deal with ash falls.				
No	Short Term	Yes	Outside of the city's area of responsibility, belonging to METRO instead. Furthermore, city water supply comes from groundwater well system, which is not effected by volcanic ash fallout. Treatment processes are covered. Recommend removal of this project as not applicable.	No Progress
Require geological or geotechnical engineering studies before permitting new construction in identified coal mine hazard areas.				
Yes	Long Term	No	Studies are required at the time of land use permits and/or environmental review.	Complete
Ensure that first responders have readily available site-specific knowledge of hazardous chemical inventories in Renton.				
Yes	Short Term	Yes	Completed annually. Recommend removal of project for two reasons: 1) Response oriented, so not a true mitigation project, and 2) completed annually already as part of professional standards and mandates.	Complete
Enhance emergency planning, emergency response training and equipment to address hazardous materials incidents.				
Yes	Short Term	Yes	Completed annually. Recommend removal of project for two reasons: 1) Response oriented, so not a true mitigation project, and 2) completed annually already as part of professional standards and mandates.	Complete

**TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES**

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Enhance emergency planning, emergency response training and equipment to address potential incidents of terrorism.				
Yes	Long Term	Yes	Completed annually. Recommend removal of project for two reasons: 1) Response oriented, so not a true mitigation project, and 2) completed annually already as part of professional standards and mandates.	Complete
Upgrade physical security detection and response capability for critical facilities, including water system.				
Yes	Long Term	Yes	Updated security and remote telemetry systems are in place for water system. Intrusion detection already present at other critical city facilities, updated in 2012. Additional physical security detection is not deemed necessary based on current risk assessment. Recommend removal of this project.	Complete
Evaluate and implement hardening measures for highly vulnerable critical facilities.				
Yes	Long Term	Yes	Upon reevaluation of risk, there are no physical facilities owned by Renton that have not already been hardened against potential terrorism to the degree that is feasible. IT system policies already improve security against cyber-attack through password hardening, SPAM filtering, virus protection and limiting internal network to the internet, and are ongoing by city policy. Recommend removal of this project.	Complete
Identify and establish secure surveillance cameras and monitoring at all critical infrastructure.				
Yes	Long Term	Yes	Cameras installed at police entrance to City Hall, Liberty Park, the bus mall, and other locations. Based on current risk assessment, further installations are not necessary to augment existing intrusion detection systems, and not feasible since no staff are available to monitor. Recommend removal of project.	Complete
Chemical, biological, radiological, nuclear and explosives detection and security devices/elements integrated at critical city infrastructure.				
No	Long Term	Yes	Not feasible or appropriate based on current risk assessment by police. Recommend removal of project.	No Progress
City of Shoreline Multijurisdictional Hazard Mitigation Plan Update				
Target higher risk neighborhoods for specific risk reduction measures				
Yes	Long Term	No	Targeted 7 Neighborhood Associations is complete and will continue as an on-going focus due to their vulnerabilities.	Complete
Continue and expand the delivery of risk reduction outreach programs by City & Fire staff, to general populations of households and businesses				
Yes	Long Term	No	City and Fire trained a cadre of staff in ATC 20, 21, and 54. These staff members are now used to assist in Public Education of households and businesses.	Complete

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TABLE 3. CURRENT PROGRESS ON ACTION PLAN INITIATIVES				
Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Increase GIS capability through partnering with fire department				
Yes	Short Term	No	GIS capability built and now is an on-going maintenance to the data base that was developed.	Complete
The City and Fire Department will participate in the planning/assessment activities of utility service providers				
Yes	Long Term	No	During this 5 year period all of our Franchise agreements with Utility providers were negotiated and now have stronger language about how identified risks are being addressed.	Complete
Establish safe places of refuge within walking distance of residents				
Yes	Long Term	No	All schools, community centers and many of the Faith Based organizations have been inventoried and have been mapped as possible places of refuge during a disaster.	Complete
Develop and deliver business outreach program				
Yes	Long Term	No	We have delivered many Business outreach programs to our business community, to include a 4 hour workshop on Business Continuity Planning. We will continue to do so as part of as our Pub Ed outreach program.	Complete
Retrofit or replace vulnerable city owned facilities and infrastructure				
Yes	Long Term	No	We did complete the replacement of the identified bridge to an isolate community. We did sign a mutual aid agreement with the Fire District to use Fire Facilities if we were to lose to use of the non-retrofitted Police Station. We did close the two Police Store Front facilities that were located in leased non-retrofitted buildings. We did explore the grant funding for replacement of the current police facility - that is in a non-retrofitted structure. We were not eligible for grant funds. The City is in the process of trying to decide how best to fund a new facility for the police department or move them into the City Hall, which was built in 2010. While City Hall was not built to a critical facility standard, there may be away to retrofit some of it to allow for the police to move into a newer facility that is better prepared to withstand a catastrophic earthquake than its current one. It is very expensive to build a police facility and currently the city financial outlook doesn't appear to have the capability of building a new facility in the foreseeable future.	Ongoing
Reduce flood damage within Ronald Bog community				
Yes	Short Term	No	Flood mitigation project completed - reduced flooding in the impact area.	Complete

TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
City of Snoqualmie Hazard Mitigation Plan Update				
S-1—Develop a post-disaster action plan for all hazard of concern that address: debris management, historical data gathering, substantial damage assessment, and grants management. This plan would be an appendix to the City's Emergency management plan.				
			No progress reported.	
S-2—Adopt the updated City of Snoqualmie Hazard Mitigation Plan as an element of the City Comprehensive plan to assure linkage between the 2 documents				
			No progress reported.	
S-3—Continue to acquire FEMA elevation certificates for all structures within the mapped floodplain for which the city does not currently have one.				
			No progress reported.	
S-4—Continue to pursue feasible, cost effective, home elevation projects, targeting identified repetitive loss or frequently flooded properties within the Snoqualmie floodplain.				
			No progress reported.	
S-5—Consider the adoption of a "split-flow" floodway as an alternative to the regulatory floodway in effect for the City.				
			No progress reported.	
S-6—Re-map the City of Snoqualmie floodplain utilizing best available data and generating a mapped based product that will actively support hazard mitigation and land use decision making within the City				
			No progress reported.	
S-7—Consider amending the City's flood damage prevention ordinance to add language that will track substantial improvements and damages cumulatively, to leverage Increased Cost of Compliance (ICC) opportunities for flood insurance policy holders.				
			No progress reported.	
S-8—Considered adopting a higher regulatory freeboard standard above the current 1-foot standard.				
			No progress reported.	
S-9—Maintain Snoqualmie's compliance and good standing under the National Flood Insurance Program				
			No progress reported.	
S-10—Continue to maintain or enhance the City's classification under the Community Rating System				
			No progress reported.	
S-11—Adopt the City of Snoqualmie Stormwater Management plan.				
			No progress reported.	
S-12—Continue to pursue feasible, cost-effective property acquisition opportunities along the Snoqualmie River front				
			No progress reported.	

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TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
S-13—Consider regulatory prohibition on the use of wood (cedar) shingle roof covering or siding in urban-wildland interface areas, or areas deemed susceptible to wildfire exposure			No progress reported.	
S-14—Consider an increase in the building setback/spacing requirement for new construction in areas deemed susceptible to wildfire exposure			No progress reported.	
S-15—Join Firewise program by adopting Firewise programs and policies in the management of the urban/wildland interface areas within Snoqualmie			No progress reported.	
S-16—Consider planting standards in Wildland buffer areas to use only loose branching habits, non-resinous woody material, high moisture content leaves and limited seasonal dead debris and other varieties that possess fire resistive traits.			No progress reported.	
S-17—Develop a public outreach program teaming with home improvement vendors educating the public on ways to protect their property from the potential impacts of all hazards of concern.			No progress reported.	
S-18—Consider building code amendments that would harden new and existing structures from the potential impacts of earthquakes			No progress reported.	
S-19—Conduct seismic vulnerability study of critical facilities identified by City emergency managers.			No progress reported.	
S-20—Promote the structural and non-structural seismic retrofit of structures built before 1974 by a targeted outreach to the property owners of these structures.			No progress reported.	
S-21—Continue and/or enhance where feasible, the city's ongoing drainage system maintenance program to reduce or minimize the impacts from stormwater flooding within the City.			No progress reported.	
S-22—The City of Snoqualmie's North Well Field well # 6, 7 and 8 currently lack permanent back-up generation. A permanent standby generator needs to be installed to provide continuous service at this critical water service delivery facility			No progress reported.	
S-23—The Fisher Creek Booster Station currently lacks back up generation. A permanent standby generator needs to be installed to provide continuous service at this critical water service delivery facility. This site has space inside the building designed for a Generator.			No progress reported.	

**TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES**

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
S-24—To alleviate stormwater flooding problems along Railroad Avenue SE between SE Fir Street and SE King Street: Install new 12-inch diameter pipeline along Railroad Avenue SE from SE King Street to SE Fir Street. Connect to existing outfall to Snoqualmie River. Install new 12-inch diameter pipeline between Railroad Avenue SE and the Snoqualmie River.				
			No progress reported.	
S-25—Address stormwater flooding problems due to undersized storm drain system in vicinity of Doone Avenue SE and SE Newton Street.			• Replace existing storm drain pipeline on Doone Avenue SE with new 12- and 24-inch diameter pipeline. Connect to existing ditch at south end of Doone Avenue SE. • Install new 12-inch diameter pipeline along SE Newton from Olmstead Place SE to Doone Avenue SE. • Connect to new storm drain at Doone Avenue SE. • Improve existing ditch for conveyance and water quality treatment	
			No progress reported.	
S-26—Address stormwater flooding problems due to lack of storm drain system on Railroad Avenue SE between SE Delta Street and SE 90th. Install new 18-inch diameter storm drain pipeline along Railroad Avenue SE from SE Delta Street to SE 90th Street. Connect to existing storm drain system at SE 90th Street.				
			No progress reported.	
S-27—Address stormwater flooding problems due to lack of storm drain system on SE Northern Street and Railroad Place SE. Ponding on 38200 block of SE Northern Street and east side of Railroad Avenue SE for extended periods during heavy rain events. Obstruction in the existing storm drain system on west side of Railroad Place SE is blocked due to a pipe failure or and obstruction in the pipeline.				
			No progress reported.	
S-28—Address stormwater flooding problems due to lack of storm drain system on 384th Avenue SE between SE River Street and SE Newton Street and an undersized storm drain system between SE Newton Street and outfall to wetland.				
			No progress reported.	
S-29—Address stormwater flooding problems due to lack of storm drain system on SE Alder Street, SE Hemlock Street, SE Spruce Street and SE Walnut Street.			• Install new 12-inch diameter pipeline along SE Alder Street. Connect to existing storm drain at Meadowbrook Way SE. • Install new 12-inch diameter pipeline along SE Hemlock Street. Connect to existing storm drain at Meadowbrook Way SE. • Install new 12-inch diameter pipeline along SE Spruce Street. Connect to existing storm drain at Meadowbrook Way SE. • Install new 12-inch diameter pipeline along SE Walnut Street. Connect to existing storm drain at Meadowbrook Way SE.	
			No progress reported.	
S-30—Address stormwater flood problems due to lack of drainage conveyance system on SE Maple Street and Maple Avenue SE.			• Install new 18-inch diameter pipeline along SE Maple Street from Maple Avenue SE to Johnson Slough. Install new water quality treatment facility. • Install new 18-inch diameter pipeline along Maple Avenue SE from 7900 block to SE Maple Street. Connect to new pipeline at SE Maple Street.	

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**TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES**

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
			No progress reported.	
S-31—Address stormwater flood problems due to lack of drainage conveyance system on SE Beta Street, SE Delta Street, SE Epsilon Street, and Falls Avenue SE.			• Install new 12-inch diameter pipeline along SE Beta Street from Euclid Avenue SE to Schusman Avenue SE. Connect to existing storm drain at Schusman Avenue SE. • Install new 12-inch diameter pipeline along SE Delta Street from Falls Avenue SE to Schusman Avenue SE. Connect to existing storm drain at SE Schuman Avenue Street • Install new 12-inch diameter pipeline along SE Epsilon Place. Connect to existing storm drain at Schusman Avenue SE. • Install new 12-inch diameter pipeline along Falls Avenue SE. connect to new pipeline at SE Epsilon Place.	
			No progress reported.	
S-32—Address stormwater flood problems due to lack of drainage conveyance system in vicinity of SE Cedar Street, SE Fir Street, Pine Avenue SE and SE 80th Street			• Install new 18-diameter pipeline at Pickering Court SE. Outfall to wetland area. • Install new 12-diameter pipeline at SE Fir Street at SE Cedar Street. Connect to new storm drain at Pickering Court SE. • Install new 12-diameter pipeline at Pine Avenue SE. Connect to new storm drain at Pickering Court SE. • Install new 12-diameter pipeline at SE 80th Street. Connect to new storm drain at Pickering Court SE.	
			No progress reported.	
S-33—Promote realignment and increase inspections along State Route 202 within the City north of Snoqualmie Falls to reduce risk from landslides that in the past have resulted in significant economic losses to tourism. Work with Washington Department of Transportation to identify areas along State Route 202. Seek ways to improve slope stability and/or seek funding to plan for and repair future slope failures to reduce the potential for repetitive losses. And to provide for additional Citizen access				
			No progress reported.	
S-34—Develop a public outreach strategy that maximizes the City's capabilities through its ongoing programs that provide multiple messages that support all phases of emergency management				
			No progress reported.	
S-35—Conduct a vulnerability assessment of water and wastewater utilities for exposure to all identified hazards of concern.				
			No progress reported.	
S-36—Review utility designs and standards for safety and competence under natural and human caused disasters.				
			No progress reported.	
S-37—Participate in the Basin Technical Committee process of the King County Flood Control District to leverage resources for flood hazard mitigation.				
			No progress reported.	
S-38—Continue to participate/support the King County Public Outreach Strategy developed to coordinate countywide outreach programs credited under the Community Rating System.				
			No progress reported.	

**TABLE 3.
CURRENT PROGRESS ON ACTION PLAN INITIATIVES**

Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
S-39— Implement Sandy Cove high bank feasibility study to identify bank stabilization alternatives for of the king Street lot, immediately adjacent to Sandy cove Park				
No progress reported.				
S-40— Seek funding for the placement of a new stream flow gauge at the City of Snoqualmie above the falls that will accurately depict in channel flows at the City during high water events.				
No progress reported.				
S-41— Replace two small bridges that have rotting wood pilings and abutments. These facilities were damaged by the Nisqually earthquake that required repair by King County bridge crews. Recent bridge inspection records indicate repair would be as costly as complete reconstruction.				
No progress reported.				
City of Tukwila Hazard Mitigation Plan				
Construct a new City Emergency Operations Center facility to support emergency response and recovery coordination				
Yes	Long Term	Yes	Part of 2014 City Facilities Plan	Ongoing
Construct new City maintenance and operations center to support critical City functions including fleet services, facilities maintenance, water, sewer, surface water, streets and traffic control operations				
Yes	Long Term	Yes	Part of 2014 City Facilities Plan	Ongoing
Replace the existing Boeing Access Road bridge with a 340' long concrete or steel bridge structure. Bridge will be 110' wide curb to curb with sidewalks on both sides				
Yes	Short Term	Yes	Design to be completed in 2014 and 2015 construction	Ongoing
Construct a concrete containment wall (4' high by 275' long) along the west side of Interurban Avenue South				
Yes	Short Term	Yes	Design completed in 2013 and 2014 construction	Ongoing
City of Woodinville Annex to North King and South Snohomish Counties Regional Mitigation Plan for Natural Hazards				
WV-01-MH-ST — Evaluate Old Woodinville School House for reconstruction and/or replacement. Follow up with appropriate replacement or repair/retrofit activities.				
Yes	Short Term	No	Actively studying costs of rehabilitation for possible voter- approved bond measure in April 2014.	Ongoing
WV-02-MH-ST — Install emergency generator at Carol Edwards Center, Building D. (The Carol Edwards Center is designated and used as an emergency shelter as needed and appropriate.)				
No	Long Term	Yes	In light of the closure of Woodinville's Parks and Recreation Department and recent ADA rulings related to emergency shelters, the City does not view this shelter as a primary shelter and has removed this project from its 6-Year Capital Improvement Plan.	No Progress
WV-03-MH-ST — SR 202 Retaining Wall Repair.				
Yes	Short Term	No	Project completed in 2010.	Complete

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TABLE 3. CURRENT PROGRESS ON ACTION PLAN INITIATIVES				
Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
WV-04-MH-ST — 171st Street Slide Repair				
Yes	Short Term	No	Project completed in 2010.	Complete
WV-05-MH-ST — Enforce code requiring electrical utilities to use underground construction methods where possible to reduce power outages and minimize potential for injuries from downed lines.				
Yes	Long Term	No	City Council passed Ordinance No. 517 in 2010 requiring new development and redevelopment to underground utilities.	Complete
WV-06-MH-LT — Sammamish Bridge Replacement. As a primary arterial, this is a key route for emergency vehicles and public safety.				
Yes	Short Term	Yes	Project currently at 60% design; working on property acquisition matters related to the project; construction tentatively scheduled for summer 2014.	Ongoing
WV-07-E-ST — Conduct non-structural retrofit activities.				
No	Long Term	No		No Progress
WV-08-F-ST — 171st Storm Drain Installation. Reduce urban flooding by installing 3,000 linear feet of piped drainage system.				
No	Long Term	Yes	New development along 171 st Ave NE will begin construction in 2014 and will include adjustments to Woodin Creek and adjacent roadway, which will help to eliminate urban flooding.	Ongoing
WV-09-F-ST — BNRP Outfall				
Yes	Short Term	No	Project completed in 2010.	Complete
WV-10-F-ST — Surface Water Master Plan				
Yes	Short Term	No	Plan adopted in 2010.	Complete
WV-11-F-LT — Little Bear Creek 134th Culvert. Replace existing culverts.				
No	Long Term	No	Have discussed the project with various stakeholders, including Adopt-A-Stream Foundation, FEMA, and affected property owners. Have not been able to resolve technical and property acquisition challenges at this time.	No Progress
WV-12-F-LT — Woodin Creek Surface Water Improvement. Sediment from bank erosion and creek bed scour has accumulated in various areas in the Woodin Creek channel along NE 171st Street, resulting in decreased flow capacity in Woodin Creek and has caused road and private property flooding. This project will also lessen impacts on fish.				
No	Long Term	Yes	New development along NE 171 st Ave will begin construction in 2014 and will include adjustments to Woodin Creek and adjacent roadway, which will help to eliminate urban flooding.	Ongoing
WV-13-F-LT — 195th Culvert Enhancement.				
No	Long Term	No		No Progress

TABLE 3. CURRENT PROGRESS ON ACTION PLAN INITIATIVES				
Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Covington Water District Annex				
Install seismic retrofits to Tank 4				
Yes	Short Term	No	Seismic evaluation has been completed. Retrofit in 2014.	Ongoing
Conduct seismic evaluation study and install seismic retrofit to Tank 2B				
Yes	Short Term	No	Tank has been seismically retrofitted.	Complete
Conduct seismic evaluation study and install seismic retrofit to Tank 2A				
Yes	Short Term	No	Tank was demolished instead of retrofitted.	Complete
Conduct seismic evaluation study and install seismic retrofit to Tank 3				
Yes	Short Term	No	Seismic evaluation is completed. Retrofit in 2014.	Ongoing
Conduct seismic evaluation study and install seismic retrofit to Tank 1B				
Yes	Short Term	No	Seismic evaluation and retrofit will be completed in 2015.	Ongoing
Conduct seismic evaluation study and install seismic retrofit to Tank 1A				
Yes	Short Term	No	Seismic evaluation and retrofit will be completed in 2015.	Ongoing
Relocation and anchoring of approximately 2000 feet of 8 inch water main at the Soos Creek crossing				
Yes	Long Term	No	No progress to date.	No progress
Highline Water District Annex				
Install seismic activated control valves at the Crestview and Mansion Hill Reservoir sites.				
Yes	Short Term	No	Seismic control valves have been installed.	Complete
Replace the current disinfection process and equipment from gaseous chlorine to onsite sodium hypochlorite generation at the Tyee, Angle Lake and Des Moines Treatment Plants.				
Yes	Short Term	No	Design completed. Project construction scheduled for 2014.	Ongoing
Install backup power generator and appurtenances at the Des Moines Treatment Plant.				
No	Short Term	No	Project budgeted for 2016.	Ongoing
King County Water District 19 Annex				
Develop training for community emergency responders such as fire and rescue improving understanding of proper fire hydrant operation and protecting the system from transients.				
Yes	Short Term	No	Forwarded M&H Fire Hydrant Co. publication A-4.11.	Ongoing
Install emergency generators in additional designated District-owned critical facilities				
Yes	Long Term	No	Added generators to 5-year capital plan.	Ongoing
Develop additional source(s) of water to provide backup supplies				
Yes	Long Term	No	To date added one source, adding seconds in 2013.	Ongoing

...APPENDIX B. 5-YEAR PROGRESS REPORT ON PREVIOUS PLANS

TABLE 3. CURRENT PROGRESS ON ACTION PLAN INITIATIVES				
Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
King County Water District 111 Hazard Mitigation Plan				
Site Evaluation: Tank/Reservoir Site				
Yes	Short Term	No	The District completed a seismic analysis of the 2 million gallon reservoir. There are other facilities on this site that still need to be evaluated including two buildings, two reservoirs and one wall.	Ongoing
Seismic Evaluation: District Office				
No	Short Term	No		No Progress
Water Main Replacement: Facility #48				
No	Long Term	No		No Progress
Water Main Replacement: Facility #28				
No	Long Term	No		No Progress
Water Main Replacement: Facility #51				
No	Long Term	No		No Progress
Water Main Replacement: Facility #26				
No	Long Term	No		No Progress
Water Main Replacement: Facility #45				
No	Long Term	No		No Progress
Water Main Replacement: Facility #32				
No	Long Term	No		No Progress
Water Main Replacement: Facility #46				
No	Long Term	No		No Progress
Water Main Replacement: Facility #38				
No	Long Term	No		No Progress
Sammamish Plateau Water and Sewer District Annex				
Redundant repeater installation				
Yes	Short Term	No	Completed	Complete
Soos Creek Water District Hazard Mitigation Plan				
Portable Generator Receptacle Retrofit: Pump Station #2				
No	Short Term	Yes		Complete
Portable Generator Receptacle Retrofit: Pump Station #1				
No	Short Term	No		No Progress

TABLE 3. CURRENT PROGRESS ON ACTION PLAN INITIATIVES				
Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
Permanent Generator: Pump Station #2				
No	Long Term	No		No Progress
Permanent Generator: Pump Station #1				
No	Long Term	No		No Progress
Lift Station Retrofit: Lift Station #14				
Yes	Long Term	No		Complete
Lift Station Retrofit: Lift Station #12				
Yes	Long Term	No		Complete
North Force Main: Lift Station #5B				
No	Long Term	No		Ongoing
Southwest Suburban Sewer District Annex				
Salmon Creek Wastewater Treatment Plant landslide mitigation project				
No progress reported.				
Seismic feasibility study of wastewater treatment plant and collection system				
No progress reported.				
Implement projects recommended by feasibility study				
No progress reported.				
Continuity of operations plan				
No progress reported.				
Emergency fuel storage tanks				
No progress reported.				
King County Fire District 4 (Shoreline Fire Department) Annex to City of Shoreline Multijurisdictional Hazard Mitigation Plan Update				
Target higher risk neighborhoods for specific risk reduction measures				
Yes	Long Term	No	Targeted 7 Neighborhood Associations is complete and will continue as an on-going focus due to their vulnerabilities.	Complete
Continue and expand the delivery of risk reduction outreach programs by City & Fire staff, to general populations of households and businesses.				
Yes	Long Term	No	City and Fire trained a cadre of staff in ATC 20, 21, and 54. These staff members are now used to assist in Public Education of households and businesses.	Complete
Increase GIS capability through partnering with Fire Department				
Yes	Short Term	No	GIS capability built and now is an on-going maintenance to the data base that was developed.	Complete

 ...APPENDIX B. 5-YEAR PROGRESS REPORT ON PREVIOUS PLANS

TABLE 3. CURRENT PROGRESS ON ACTION PLAN INITIATIVES				
Action Taken?	Timeline	Priority Changed?	Comment (Describe progress or changed priority)	Status
The City and Fire Department will participate in the planning/assessment activities of utility service providers				
Yes	Long Term	No	During this 5 year period all of our Franchise agreements with Utility providers were negotiated and now have stronger language about how identified risks are being addressed.	Complete
Establish safe places of refuge within walking distance of residents				
Yes	Long Term	No	All schools, community centers and many of the Faith Based organizations have been inventoried and have been mapped as possible places of refuge during a disaster.	Complete
King County Fire District 37 (Kent Fire Department) Annex to City of Kent Local Hazard Mitigation Plan				
Mitigate the non-structural impacts of an earthquake on District owned critical facilities.				
Yes	Short Term	No	seismic mitigation to critical computer server room equipment seismic mitigation of several city workspaces	Ongoing
Improve alert and notification methods to the citizens of Fire District #37 by implementing a reverse 911 system.				
Yes	Short Term	Yes	City of Kent and Kent Fire Department RFA now utilize Code Red emergency notification system	Ongoing
South King Fire & Rescue Annex				
Educate the public on the risks they face from all hazards and educate them on what they can do to mitigate the impacts on their homes and families				
No progress reported.				
Mitigate the non-structural impacts of an earthquake on our fire stations				
No progress reported.				
Mitigate the structural issues found in a recent seismic survey of our fire stations				
No progress reported.				

PLANNING AREA CHANGES THAT MAY IMPACT PLAN IMPLEMENTATION

No changes to the planning area have been identified that will impact the implementation of this plan. In fact, since the coverage of this plan has significantly been increased during this update process, the opportunity for partnering and leveraging resources has been significantly enhanced.

RECOMMENDATIONS FOR CHANGES OR ENHANCEMENTS

The content and format of this plan has been significantly revised during the course of this plan update process. A crosswalk of changes to the plan are chronicled in volume 1, chapter 2 of this plan update.

Public review notice: *The contents of this report are considered to be public knowledge and have been prepared for total public disclosure. Copies of the report have been provided to local media outlets. The report is also posted on the King County Regional Hazard Mitigation Plan website. Any questions or comments regarding the contents of this report should be directed to:*

*Janice Rahman, Emergency Management Program Manager
3511 NE 2nd St
Renton, WA 98056
(206) 205-4061
Janice.Rahman@Kingcounty.goc*

King County
Regional Hazard Mitigation Plan Update

APPENDIX C.
PLANNING PARTNER BULLETINS



King County Regional Hazard Mitigation Plan

King County Office of Emergency Management with Regional Planning Partners

Informational Bulletin
October 11, 2013

Upcoming Deliverable Due Dates:

- Progress Report—October 11, 2013
- Capabilities Assessment—November 1, 2013
- Critical Facilities Update—November 1, 2013

Past Deliverable Due Dates:

- Jurisdictional Profile—October 4, 2013

Questions?

Please Contact:

Rob Flaner, CFM
208.939.4391
rob.flaner@tetrattech.com

Are your hours counting toward grant matching?

If you have not already completed, signed, and returned a grant-matching form with your hourly, unburdened rate, please do so today!

Important Note for All Planning Partners: Please track the number of hours that you or your staff members spend working on this project. These hours can be applied toward the in-kind contribution needed for our grant requirements. Partners will be asked to report these hours at the November Jurisdictional Annex Workshops.

November Jurisdictional Annex Workshops

Volume II of the King County Regional Hazard Mitigation Plan will contain the jurisdictional annexes of each member of the planning partnership. In an effort to keep Partners actively engaged in the planning process, we have chosen to complete these annexes in three phases.

Phase I consisted of the Jurisdictional Profile and, when applicable, a Progress Report on past actions. This phase was distributed in early September. Phase II consists of a Capabilities Assessment, and was deployed in early October. Phase III will be distributed in November, corresponding with the Jurisdictional Annex Workshop. In this phase we will tackle Hazard Risk Ranking and the Action Plan Matrix. All Planning

Partners are required to send a representative to one of these three-hour workshop sessions. There, Partners will receive technical assistance in completing their profiles.

In early November Planning Partners will be sent a tool kit to help prepare for these sessions. After reviewing this information, Partners will need to reach out to other departments within their jurisdictions. Such departments may include: Planning, Public Works/Engineering, or Emergency

Services. These departments are responsible for the implementation of many of the capabilities listed in the capabilities assessment and may be instrumental in helping jurisdictions to identify potential actions. As you complete your assessment this month, if you find that your jurisdiction does not have one of the capabilities identified, then ask yourself or the responsible department "why?" Remember, increasing capability is a way to reduce risk and is, therefore, a viable mitigation action.

Jurisdictional Annex Workshop Schedule

Tuesday, November 12:

Wednesday, November 13:

ti

ti

Register Here:

Municipalities tt

Districts tt

Successful Public Outreach Events in September

Thank you to all Planning Partners who were able to attend one of our four public outreach events in September. And a special thank you to those Partners who hosted these events: *City of Auburn, City of Shoreline, City of Kent, and EvergreenHealth in the City of Kirkland.*

We hope that you enjoyed the

opportunity to engage with residents on issues related to this planning effort and we hope that you learned something as well!

If you would like to review the presentation that was given by Project Manager, Rob Flaner, at these events, it is available online at the King County Regional Hazard Mitigation Planning website.



The Hazus Workstations were a big success. Residents were able to review property specific information at the events. Additionally, 20 residents signed up to have hazard information emailed to them.

October Steering Committee Meeting Agenda

The next Steering Committee meeting will be held Tuesday, October 15th from 12:00 pm to 3:00 pm at the King County Office of Emergency Management in Renton.

By the end of this meeting the Steering Committee will have taken the following actions:

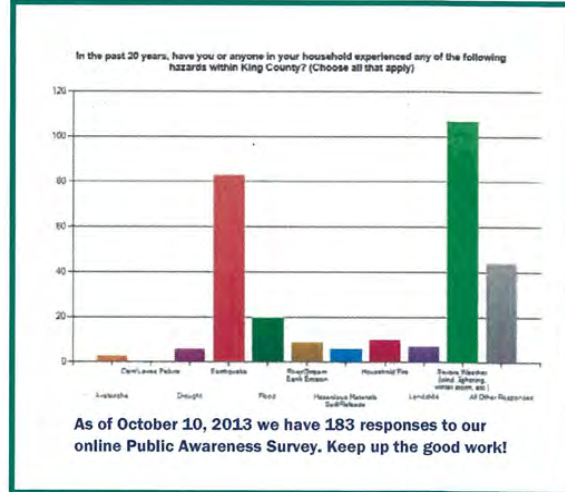
- Reviewed and approved previous month's minutes,
- Reported non-meeting hours,
- Reviewed the status of the Risk Assessment,

- Reviewed the status of Jurisdictional Annex deployment,
- Reviewed Phase 1, Public Outreach results,
- Confirmed revised Plan Maintenance Strategy, and
- Identified Strengths, Weaknesses, Obstacles and Opportunities within King County.

These meetings are open to the public and all Planning Partners are encouraged to attend.



EvergreenHealth Representative, Barb Jensen, RN CHP, reviews hazard maps with an area resident at the workshop held at an Evergreen-Health facility in Kirkland.



Rob Flaner explains the planning process and risk assessment at the public workshop held in Kent in late September.

Informational Bulletin

King County
Office of Emergency Management
3511 NE 2nd Street
Renton, WA 98056

Main Phone: 206-296-3830
Toll Free: 1-800-523-5044
Fax: 206-205-4056
Email: ecc.kc@kingcounty.gov

King County is committed to creating and sustaining communities that are more resilient to disasters. To fulfill this pledge, King County Office of Emergency Management (KCOEM) is in the process of updating the Regional Hazard Mitigation Plan (RHMP) in partnership with cities and special purpose districts throughout the County. Federal rules require this plan be updated every five years.

Representatives from 56 different cities, schools, fire districts, hospitals and utility districts are collaborating with KCOEM and Tetra Tech Incorporated - the contractor leading the hazard assessment and plan development. Decisions regarding plan elements, such as specific hazards to include, are made by a steering committee whose members include representatives from government, private business, non-profits, the public, and academia.



<http://kingcounty.gov/hazardmitigation>

Contact us: KCPubComment@KingCounty.gov



King County Regional Hazard Mitigation Plan

King County Office of Emergency Management with Regional Planning Partners

Informational Bulletin
November 22, 2013

What's Next???

January 17, 2014

Please submit:

- **Completed Annex Template**
- **Completed Risk Ranking Worksheet**

Questions???

Please Contact:

Rob Flaner, CFM
208.939.4391
rob.flaner@tetrattech.com

Finished???

Please Submit Deliverables to:

Kristen Gelino
425.482.7801
kristen.gelino@tetrattech.com

tt ti

Tuesday

February 18, 2014

1:00 pm to 3:00 pm

3511 NE 2nd Street
Renton, WA 98056

Important Note for All Planning Partners: Please track the number of hours that you or your staff members spend working on this project. These hours can be applied toward the in-kind contribution needed for our grant requirements. Partners will be asked to report these hours after turning in their completed annex.

Jurisdictional Annex Workshop Recap

Thank you to all of you who were able to attend the Jurisdictional Annex Workshops earlier this month! We hope that the information provided will help you start, continue or complete your jurisdiction's template.

You may want to review the information provided in the presentations given by Rob Flaner at each of the sessions. The power point slides are available on the CD provided for you at the workshop. Additionally, detailed instructions for each section of the template are also available in the "Template Instructions" folder.

If at any point you need help or have questions about completing your annex, please reach out to Rob Flaner or Kristen Gelino — we are here to help you!

Some key take-aways from the workshops are listed below:

- If you are unable to find requested information or are unsure about something you are submitting,

please just let us know!

You can add a comment in the template or let us know via email.

- The quantitative results you obtain in the risk ranking exercise may need to be adjusted based on local knowledge and experience. Please feel free to adjust the rankings, but please let us know what you did and why.
- Need some ideas? There are examples of completed annexes for many different kinds and sizes of jurisdictions on your CD. Want to look at a local example? Look in the folder of another jurisdiction participating in this plan for some great examples.
- The Action Items you identify are the real heart of this plan. Please ask for help from different departments in your jurisdiction to identify actions that will mitigate risk to people, property and the economy!

We made great progress on your annexes before the workshop even began!

Profiles

82%

18 of 22 submitted

Progress Reports

75%

18 of 24 submitted

Critical Facility Updates

84%

47 of 56 submitted

Capability Assessments

48%

27 of 56 submitted

Don't Forget about the King County Flood Control District's Opportunity Fund

A big THANKS! to Monica Walker from King County DNR and a member of the RHMP Steering Committee for providing information to interested jurisdictions about the King County Flood Control District Opportunity Fund. Each city or town

in the County is allocated monies that can be used for flood control, stormwater control and cooperative management projects. According to the Fund's website, the 2014 fund is estimated to be more than \$5.2 million! The 2014 application

deadline is fast approaching—January 31, 2014, so be sure to visit their website to learn more today— <http://www.kingcounty.gov/environment/waterandland/flooding/flood-control-zone-district/opportunity-fund.aspx>

Have Questions about the Template? Answers to Questions Asked at the Workshops Are Listed Below**City/Town/County Governments*****Does the Growth Management Act Require Municipalities to have a Capital Improvement Program?***

Capital Facilities Plans are a required element of the Washington State Growth Management Act; however, counties and municipalities may have differing definitions of "capital."

What does 'Prohibitions' really mean in the Capability Assessment?

'Prohibitions' refer to state or federal regulations or laws that would bar local implementation of identified initiatives. Examples are: floodway regulations, Endangered Species Act or Clean Water Act regulations, etc.

Should natural hazard event histories list events that occurred before incorporation?

If you know about events that occurred in your jurisdiction before your jurisdiction was

incorporated, please list them.

Special Purpose Districts***What is AV (assessed value) in the risk ranking worksheet referring to?***

Table 3 on the risk ranking worksheet exercise refers to percentage of AV. You should use the value you identified for the total value of all critical infrastructure, equipment and facilities in your profile as a stand in for AV.

How do we determine if a natural hazard event impacted our district?

Although you do not need to list every event that occurred within your district, you should list any hazard events that affected your ability to provide service to your district. For example, a school closure due to a severe weather event.

All Planning Partners***What does Impacts to people in the risk ranking exercise mean?***

Impact to people is referring to the potential for a person to experience injury or death from a hazard event. This is measured by the population that is exposed to a hazard.

What if I disagree with the results of the risk ranking exercise?

The risk ranking exercise should not override your subjective assessment of relative risk based on your knowledge of the history of natural hazard events in your jurisdiction. If this risk ranking exercise generates results other than what you know based on substantiated data and documentation, you may alter the ranking based on this knowledge. If this is the case, please note this fact in the comments at the end of the template.

Do I need to have an action item for each hazard of concern?

No—but you should strive to identify at least one action for each hazard that impacts your jurisdiction. You must have at least one action item that addresses the highest ranked hazard for your jurisdiction.

When reporting on the status of a previously identified action item, do I need to provide a date completed for an on-going or annual action?

No— but please do provide a brief description of the on-going program or activity.

When is the completed template due?

The completed template and risk ranking exercise are due in digital form on Friday, January 17, 2014. Please do not wait until mid-January to begin working on your template! You will need time to coordinate with other staff and identify feasible actions for your jurisdiction. Please email your completed deliverables to kristen.gelino@tetratech.com.

Still have questions? Let us know!

Informational Bulletin

King County
Office of Emergency Management
3511 NE 2nd Street
Renton, WA 98056

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Toll Free: 1-800-523-5044
Fax: 206-205-4056
Email: ecc.kc@kingcounty.gov



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Representatives from 56 different cities, schools, fire districts, hospitals and utility districts are collaborating with KCOEM and Tetra Tech Incorporated - the contractor leading the hazard assessment and plan development. Decisions regarding plan elements, such as specific hazards to include, are made by a steering committee whose members include representatives from government, private business, non-profits, the public, and academia.

<http://kingcounty.gov/hazardmitigation>

Contact us: KCPubComment@KingCounty.gov



King County Regional Hazard Mitigation Plan

King County Office of Emergency Management with Regional Planning Partners

Informational Bulletin
January 7, 2014

What's Next???

January 17, 2014

Please submit:

- **Completed Annex Template**
- **Completed Risk Ranking Worksheet**

Questions???

Please Contact:

Rob Flaner, CFM
208.939.4391
rob.flaner@tetrattech.com

Finished???

Please Submit Deliverables to:

Kristen Gelino
425.482.7801
kristen.gelino@tetrattech.com

Important Note for All Planning Partners: Please track the number of hours that you or your staff members spend working on this project. These hours can be applied toward the in-kind contribution needed for our grant requirements. Partners will be asked to report these hours after turning in their completed annex.



A VERY HAPPY NEW YEAR TO ALL OF OUR PLANNING PARTNERS!



Completed Jurisdictional Annex Due Friday, January 17, 2014! Need help? Please Ask!

The January due date for completed annexes and risk ranking worksheets is quickly approaching! We hope you all are making progress on completing these deliverables, but we know that some of you may still have questions. Please do not hesitate to contact a member of the Planning Team for assistance with any issue you may have: We are here to help you! We understand that this is a busy time of year and this is also the first time that many of you have been involved in a hazard mitigation planning process. Don't worry—there are no silly questions!

The County sincerely hopes that all Planning Partners will

We are making great progress!

*Completed
Risk Ranking Worksheets*

11

*Completed
Annex Templates*

5

Congratulations to the City of Algona, the City of Carnation, King County Fire District No. 2, Midway Sewer District and the City of Shoreline! These jurisdictions have submitted both their risk ranking worksheets and their completed annex templates!

be able to successfully complete their annexes and adopt the final plan. Please reach out to a member of the Planning Team if you have any questions or concerns about completing the template. We can work with you to finish the required deliverables, but we will not know if you need help until you ask!

We have already received and answered questions from many of you via phone and email. Additionally, we have been able to meet with three jurisdictions to provide in-person, technical assistance. **Please keep the questions coming!**

Please Don't Forget About Hours Reporting!

After you have submitted your completed risk ranking worksheet and jurisdictional annex template you will be emailed a form that asks you to report the hours that you have spent working on this project. If more than one person worked on your annex, you should be prepared to complete a form for each person.

Breaking down the hours by deliverable is not required and hours from events and meetings have already been reported and recorded.

Completed forms should be sent to Nora Jagielo (Nora.Jagielo@kingcounty.gov).

tt ti

Tuesday

February 18, 2014

1:00 pm to 3:00 pm

3511 NE 2nd Street
Renton, WA 98056

Looking Ahead—What still needs to happen before the 2014 Plan is complete?

As you are wrapping up your timeline, you may be wondering what will happen next in the RHMP planning process. After we have received completed templates from each Planning Partner, Tetra Tech will complete a technical review of the annexes (Volume II of the Plan) and the County-wide file and assessment (Volume I of the Plan). If questions arise that we are unable to find answers to, we will contact the listed primary contact for clarification. Otherwise, you will have an opportunity to review Volume I and II of the plan during the Internal Review phase in mid-March.

After comments have been received and revisions have been made to the internal review draft, there will be a Public Review Period lasting a minimum of two weeks. This review period will likely cul-

minate with a presentation to the King County Council. As Tetra Tech completes revisions and responds to the comments received during the Public Review, we will hold an opti-

ning Partners. This workshop will be an opportunity for Planning Partners to learn more about various funding streams and to ask questions about how to ensure the 2014 RHMP re-

the Final Draft will be submitted to Wash-

tion. After this approval is received, we will begin the adoption process and submit the document to FEMA Region X for Plan

Review. Each participating organization must have its governing body formally adopt the plan before final approval can be granted. More information will be provided about the adoption process in February of 2014.

Please keep in mind that this timeline may be subject to change as delays may occur during the review process. We will keep you updated on our anticipated timeline as this process progresses.

Anticipated Timeline for 2014 Plan Completion and Adoption*

Mid-March	Internal Review Draft Distributed
April	Public Review Period
Mid-April	"What's Next" Optional Workshop
Late-April	Plan Submittal to the State
May-August**	Plan Review Adoption Process

*Please note that this timeline is subject to change as delays may occur during the review process.

**We are anticipating a grant opportunity to open in June. If so, this process will be expedited.

Informational Bulletin

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Email: ecc.kc@kingcounty.gov



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Representatives from 56 different cities, schools, fire districts, hospitals and utility districts are collaborating with KCOEM and Tetra Tech Incorporated - the contractor leading the hazard assessment and plan development. Decisions regarding plan elements, such as specific hazards to include, are made by a steering committee whose members include representatives from government, private business, non-profits, the public, and academia.

<http://kingcounty.gov/hazardmitigation>

Contact us: KCPubComment@KingCounty.gov



King County Regional Hazard Mitigation Plan

King County Office of Emergency Management with Regional Planning Partners

Informational Bulletin
March 3, 2014

What's Next???

- **Internal Review**
- **Public Comment Period**
- **Adoption Process**

Questions???

Please contact

Rob Flaner, CFM
208.939.4391
rob.flaner@tetratech.com

or

Kristen Gellino
425.482.7801
kristen.gellino@tetratech.com

tt ti

Tuesday

April 15, 2014

1:00 pm to 3:00 pm

3511 NE 2nd Street
Renton, WA 98056

What's Next — Plan Review and Approval Process

Exciting news—We are now moving into the end of phase four (Plan Development) of our five part planning process! Over the next few months we will complete an internal review and a public review of the draft plan. Please see the box below for more information about the anticipated timeline.

As indicated below, the draft plan will be reviewed by the Steering Committee in two phases. Volume I includes County-wide information about the planning process, the risk assessment, and the County-wide mitigation initiatives. Volume II includes the jurisdictional annexes that Planning Partners completed in January.

The public comment period for both volumes will run from late April to late May. We would like to hold three presentations at public meetings during this time period. We anticipate distributing these meetings across the County. Currently, we are working on establishing dates, times and locations. We will provide more information as soon as we are able.

In early June the final draft will be submitted to Washington State for approval. After this approval is received, we will begin the adoption process and submit the document to FEMA Region X for Plan Review and "pre-adoption" approval.

What about SEPA Compliance?

The Washington State Environmental Policy Act (SEPA) requirements for this planning process are based on jurisdictional discretion. Jurisdictions should consult members of their staff that work on SEPA issues to determine if any action is necessary.

Each participating jurisdiction must have its governing body formally adopt the plan via resolution before final approval can be granted. To assist jurisdictions

APPROVAL PROCESS



with this process, Tetra Tech will provide a briefing packet, which can be given to your jurisdiction's governing body. This packet will include : a sample resolution, the executive summary and an explanatory cover letter.

It is important for Planning Partners to understand that the planning process for any individual jurisdiction is not complete until this approval has been received; however, the five-year life of the plan begins as soon as the first jurisdiction completes the adoption process.

Please keep in mind that these timeframes may be subject to change and delays may occur.

Anticipated Timeline for 2014 Plan Completion and Adoption*

March 31st	Volume I Internal Review Draft Distributed to Steering Committee
April 15th	Volume I Comments Due Volume II Review Draft Distributed
April 21st	Volume II Comments Due
April 28th – May 30th	Public Review Period (We will be scheduling 3 public meetings)
June - December	Plan Review Adoption Process

*Please note that this timeline is subject to change as delays may occur during the review process.



Planning Partners—Thank you for all of your hard work!

As of early March we have received 52 completed annexes. We anticipate that we will receive two more before the process is complete. Two jurisdictions dropped out of the process before the November workshops; however, one of these jurisdictions has already been in contact about timing linkage procedures with the plan. As we wrap up phase four and move into phase five, Planning Partners should be proud of all of the hard work that has gone into developing a plan to reduce risk to people and property in King County!

Thank you Planning Partners!

*Completed
Jurisdictional Annexes*

52

*Number of Actions
Identified*

497

We are still anticipating two additional annexes from Planning Partners who required a little additional assistance. We anticipate that our final partnership will include 54 King County jurisdictions.

Draft County-Wide Initiatives

1. Commit to capturing time-sensitive data after a disaster (i.e. high water marks).
2. Maintain the RHMP website where the plan will be housed.
3. Continue to provide regional public education trainings and materials (Make it Though, Take Winter by Storm).
4. Support the Resilient King County initiative.
5. Strive for a regional alert & notification system.
6. Encourage signatories for the Regional Coordination Framework for Disasters and Planned Events.

Draft County-wide initiatives were discussed and identified at the February Steering Committee (SC) Meeting. The SC was able to identify a robust-range of actions that support the vision, goals and objectives of the 2014 RHMP. Final wording will be confirmed with the SC via email.

What happened to my jurisdiction's annex?

tional annexes are internal review process. If revisions arise that we are unable to resolve, we will contact you. Volume II of the

Plan (the jurisdictional annexes) will be distributed for review in mid-April. Any revisions or corrections can be made to your annex at that time. As the annexes move

through this process, we will be adding some initiatives to the municipality action plan matrices to ensure that each Planning Partner has a robust set of actions that address

the hazards of concern in the planning area. Please see the box below for these initiatives. If a jurisdiction objects to an action, this can be resolved during the review process.

Additional Actions for Municipalities

1. Where appropriate, support retrofitting, purchase, or relocation of structures located in hazard-prone areas to protect structures from future damage, with properties with exposure to repetitive losses as a priority.
2. Integrate the hazard mitigation plan into other plans, ordinances or programs to dictate land uses within the jurisdiction.
3. Strive to capture perishable data (ie high water marks, preliminary damage estimates, and damage photos) after significant hazard events to support future updates to the risk assessment of this plan.
4. Continue to support the County-wide initiatives identified in this plan.
5. Actively participate in the plan maintenance strategy identified in this plan.
6. Continue to maintain compliance and good standing under the National Flood Insurance Program. This will be accomplished through the implementation of floodplain management programs that, at a minimum, will meet the minimum requirements of the NFIP, which include the following:
 - Enforcement of the adopted flood damage prevention ordinance,
 - Participating in floodplain identification and mapping updates, and
 - Providing public assistance/information on floodplain requirements and impacts
7. Consider the development of a post-disaster action plan, including a debris management plan. This is to be incorporated into existing emergency management plans.
8. Work with the building official to identify ways to improve the BCEGS classification for the City.
9. Consider participation in incentive-based programs such as the CRS, Firewise and Stormready

Informational Bulletin

King County
Office of Emergency Management
3511 NE 2nd Street
Renton, WA 98056

Main Phone: 206-296-3830
Toll Free: 1-800-523-5044
Fax: 206-205-4056
Email: ecc.ko@kingcounty.gov

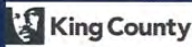


King County is committed to creating and sustaining communities that are more resilient to disasters. To fulfill this pledge, King County Office of Emergency Management (KCOEM) is in the process of updating the Regional Hazard Mitigation Plan (RHMP) in partnership with cities and special purpose districts throughout the County. Federal rules require this plan be updated every five years.

Representatives from 56 different cities, schools, fire districts, hospitals and utility districts are collaborating with KCOEM and Tetra Tech Incorporated - the contractor leading the hazard assessment and plan development. Decisions regarding plan elements, such as specific hazards to include, are made by a steering committee whose members include representatives from government, private business, non-profits, the public, and academia.

<http://kingcounty.gov/hazardmitigation>

Contact us: KCPubComment@KingCounty.gov



King County Regional Hazard Mitigation Plan

King County Office of Emergency Management with Regional Planning Partners

Informational Bulletin
May 16, 2014

What's Next???

- **Internal Review of Volume I and Volume II**
- **Public Comment Period**
- **Adoption Process**

Questions???

Please contact

Rob Flaner, CFM
208.939.4391
rob.flaner@tetrattech.com

or

Kristen Gelino
425.482.7801
kristen.gelino@tetrattech.com

tt ti

No SC meetings scheduled at this time.

3511 NE 2nd Street
Renton, WA 98056

Revisions are Underway to the Landslide Risk Assessment

Revisions are currently underway to the landslide risk assessment portion of Volume I of the plan. Data has been made available that allows for an additional methodology to be utilized for the risk analysis. A high resolution digital elevation model that has been derived from LIDAR data will be intersected with a soils layer to identify areas that may be at risk from landslide hazards. This analysis is not intended to be a precise geotechnical assessment, nor is it intended

to endorse any regulatory action on these areas. It is merely a method by which we can highlight areas of concern throughout the County that may not have been identified in previous studies.

At this point in time, the results of this analysis are unknown, but we anticipate that the total area of landslide risk in the County will increase. After the analysis is complete, we will review the exposure and loss estimates for landslide hazards for each

planning partner. If results have changed to a degree that would impact a jurisdiction, for example, action plan, we will contact that jurisdiction directly and will provide examples of actions that can be added to the jurisdiction plan. If you are not contacted directly, you will not need to make any changes. We anticipate contacting jurisdictions the week of June 9. Please feel free to contact us with questions or concerns on this issue.

More information on LIDAR: <http://oceanservice.noaa.gov/facts/lidar.html>

Volume I

Volume I of the King County RHMP is currently in the internal review phase. A draft version has been distributed to the Steering Committee. Volume I contains the planning process information, county-wide hazard profiles and risk assessments, as well as the county-wide mitigation strategy. **Steering Committee members are asked to provide comments on the draft document to kristen.gelino@tetrattech.com by Friday, May 23, 2014.** For minor comments, please provide identifying information, such as a section or page number. For major revisions, please track-changes on the word document version of the plan or contact

Kristen for additional assistance. As a reminder, Steering Committee members have been asked to keep the draft confidential during the internal review process.

Volume II

Volume II of the draft plan contains the jurisdictional annexes. **The draft Volume will be distributed to the**

planning partnership on or before Friday, May 23, 2014.

If you do not receive access to the document, please contact _____.

The document will contain all 54 annexes; however, planning partners will need to review the chapter that contains their jurisdictional annex. Revisions have been

Volume I - County-wide

- Distributed to Steering Committee April 8th
- Comments due Friday, May 23rd

Volume II- Jurisdiction Annexes

- Distributed to Planning Partners May 23rd
- Comments due Friday, June 6th

made during the editing process and we need your approval of these changes. If you would like to make changes, please turn on track changes in word and make your adjustments. If you need assistance with this, please feel free to contact Kristen. **All revisions need to be completed by Friday, June 6, 2014. We would greatly appreciate if each planning partner could send in a reply even if no changes are needed. We would also greatly appreciate it if revisions can be completed as soon as possible after receiving the document.**

Public Comment

The public comment period for both volumes of the plan is currently scheduled to run from June 20 through July . We would like to give three brief presentations at public meetings during this time period. We anticipate

ting these meetings across the County. Currently, we are working on establishing dates, times and locations. We will provide more information as soon as we are able.

Pre-Adoption Approval

In mid-July the final draft will be tted to Washington State for approval. After this approval is received, we will begin the tion process and submit the document to FEMA Region X for ti

approval.

tion

Each parti ting jurisdiction must have its governing body formally adopt the plan via resolution before final approval can be granted. To assist tions with this process, Tetra Tech will provide a briefing packet, which

can be given to your jurisdiction's governing body. This packet will include: a sample tion, the executive summary and an explanatory cover letter.

It is important for Planning Partners to understand that the planning process for any individual jurisdiction is not complete until this approval has been received; however, the five-year life of the plan begins as soon as the first

tion completes the adoption process. We anticipate that tion for jurisdictions will occur during the month of September or October.

Final Approval

As jurisdictions adopt the plan, copies of the adoption resolutions will be sent to FEMA and final approval status will be granted.

Please keep in mind that these timeframes may be subject to

change and delays may occur during the review process.



The application period for three FEMA miti tion grant programs is currently open and deadlines are quickly approaching. Letters of intent (LOI) for each grant opportunity are required

All three programs are competitive and applying jurisdictions must currently be covered by FEMA approved hazard miti

tion plans by the sub- tion deadline (July 25, 2014) and at the time of the award. **Because the King County RHMP is in the process of being updated and will be in review at the time of the stated deadline, planning partners who are not currently covered by approved plans may still apply, but final FEMA approval must be obtained**

before a grant award can be received.

The Pre-Disaster Miti tion grant program is designed for the implementation of sustained pre-disaster natural hazard miti tion programs to reduce overall risk to the population and structures from future hazard events, while also reduc-

ing reliance on Federal funding from future disasters. The cost-share for this grant is 75 percent federal funds and 25 percent local matching funds. FEMA will only consider proposals with a maximum two-year performance period. For fiscal year 2014 there are \$23 million in funds available tionally and the Washington State EMD is encouraging local

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tions to submit projects with less than \$250,000 budgets. FEMA has identified the following funding priorities: development and updating of hazard mitigation plans and cost-effective projects that do not duplicate other hazard mitigation grant programs (e.g. Flood Mitigation Assistance plans and projects).

The Flood Mitigation Assistance program funds projects that reduce or eliminate flood damage and associated insurance claims under the

tional Flood Insurance Program (NFIP). The cost-share arrangement for FMA ranges from 75 to 100 percent Federal funds, dependent on the mitigation activity. For fiscal year 2014 the grant program was allocated \$89 million statewide. Proposals must have a maximum of a 3-year performance period. FEMA has identified the following funding priorities: mitigation planning, projects that mitigate severe repetitive loss (SRL) properties and projects that mitigate repetitive flood claim (RFC) properties. Washington State EMD strongly encourages proposals include the mitigation of at least one

RL and/or one SRL:

tial properties that have had four or more paid losses of at least \$5,000 each (Combining for at least \$20,000) OR two or more paid losses totaling more

- properties that have had at least two claims within ten years, with the average of both claims being greater than or equal to 25 percent

May 31, 2014

The Hazard Mitigation Grant Program is available as a result of the April 2014 Mud-

flow and Flooding disaster in Snohomish County, also known as SR-530 Slide, and designated as DR-4168. This competitive program is open to all eligible jurisdictions statewide for projects addressing any and all natural hazards; however, priority will be given to applications from the disaster declared areas. The estimated dollar amount of the grant pool is \$3 million statewide. The cost share arrangement is 75 percent Federal funds and 25 percent non-federal. Applicants must be prepared to pay the full portion of non-federal funds requested. Each eligible jurisdiction can submit one application for funding.

Grant Program	LOI Due	Contacts
PDM and FMA	May 26, 2014	Tim Cook, State Hazard Mitigation Programs Manager, (253) 512-7467, tim.cook@mil.wa.gov Peter Tassoni, State Hazard Mitigation Programs Manager, (253) 512-7072, Peter.tassoni@mil.wa.gov
HMGP	May 31, 2014	Charles Tomala, Hazard Mitigation Grant Coordinator, (253) 512-7078, Charles.tomala@mil.wa.gov Cindy Larreau, Hazard Mitigation Grant Coordinator, (253) 512-7042, cindy.larreau@mil.wa.gov Dave Spicer, Hazard Mitigation Grant Coordinator, (253) 512-7042, david.spicer@mil.wa.gov

Informational Bulletin

King County
Office of Emergency Management

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Fax: 206-205-4056
Email: ecc.ko@kingcounty.gov



King County is committed to creating and sustaining communities that are more resilient to disasters. To fulfill this pledge, King County Office of Emergency Management (KCOEM) is in the process of updating the Regional Hazard Mitigation Plan (RHMP) in partnership with cities and special purpose districts throughout the County. Federal rules require this plan be updated every five years.

Representatives from 53 different cities, schools, fire districts, hospitals and utility districts are collaborating with KCOEM and Tetra Tech Incorporated - the contractor leading the hazard assessment and plan development. Decisions regarding plan elements, such as specific hazards to include, are made by a steering committee whose members include representatives from government, private business, non-profits, the public, and academia.

Contact us: KCPubComment@KingCounty.gov

<http://kingcounty.gov/hazardmitigation>



King County Regional Hazard Mitigation Plan

King County Office of Emergency Management with Regional Planning Partners

Informational Bulletin
June 13, 2014

What's Next???

- **Public Comment Period**
- **Adoption Process**

Questions???

Please contact

Rob Flaner, CFM
208.939.4391
rob.flaner@tetratech.com

or

Kristen Gelino
425.482.7801
kristen.gelino@tetratech.com

Please note—both Rob and Kristen will be out of the office the week of June 16—please contact the County with questions between June 16 and 22.

Next Steering Committee Meeting

No SC meetings scheduled at this time.

3511 NE 2nd Street
Renton, WA 98056

Public Comment Period Starting Soon

Later this month we will be wrapping up the internal review process and moving on to the public comment period. A big thanks to all of you who provided comments on Volume I

prompt response to Volume II!

The public comment period will run from

A press release announcing the comment period will be distributed later this month. The release will direct residents to

tion website where both Volumes of the Plan will be hosted. Comments can be sent to an email address monitored by the County (see info above). Jurisdictions may want to provide a link to the

website. Additionally, the press release will announce three presentations scheduled at public meetings during the comment period.

7th in Snoqualmie, Wednesday, July 9th in Issaquah and Thursday, July 10th in Shoreline. Brief (15 minute) presentations will be given by Rob Flaner at each of these meetings

King County RHMP 2014 Update Public Comment Period

Public Comment Period will run Friday, June 27 through Friday, July 11.

Meeting Date	Time	Location
Monday, July 7 th	6:00 pm	Snoqualmie City Hall 38625 SE River St Snoqualmie, WA 98065
Wednesday, July 9 th	7:00 pm	Issaquah City Hall (Eagle Room) 130 E. Sunset Way Issaquah, WA 98027
Thursday, July 10 th	7:00 pm	Shoreline City Hall 18050 Meridian Ave. N. Shoreline, WA 98133

Website: <http://www.kingcounty.gov/hazardmitigation>

Comments: kcPubComment@kingcounty.gov

and there will be a short question and answer session.

Attendance is not required at these meetings, but planning partners are encouraged to attend. The partnership has already met public involvement requirements for this planning process. The meetings scheduled in July are above and beyond public involvement expectations.

If anyone would like to host a meeting, there is one remaining slot open. If you have a previ-

ously scheduled meeting on Tuesday, July 8th and you would like Rob to present, please contact Nora Jagielo

(y.gov) as soon as possible.

At the close of the public comment period, Tetra Tech will coordinate responses to any comments received and will then submit the plan to the State for review.

Landslide Analysis Update

Revisions to the landslide risk analysis included an additional slope/soils analysis that was performed using a digital elevation model (DEM) constructed using LiDAR and a subsurface soil-geotechnical data set provided by King County DNRP. The additional analysis resulted in minimal changes to the risk assessment. Only small areas were added to the previously mapped hazard areas and, thus, only minimal increases in risk were seen.

As a reminder, this analysis is not intended to be a precise geotechnical assessment, nor is it intended to endorse any regulatory action on these areas. It is merely an advisory assessment intended to highlight areas of concern throughout the County that may not have been identified in previous studies.

With the advent of the public comment period, we are now moving into the final stages of this planning process. The following sections provide more information on next steps.

Public Comment

The public comment period for both volumes of the plan is currently scheduled to run from June 27 through July . Please see the front page of this bulletin for more information on this process.

Pre-Adoption Approval

In mid-to-late July the final ft will be submitted to Washington State for approval. After this approval is received, we will begin the tion process and submit the document to FEMA Region X for Plan Review and ti

Adoption

Each parti ting jurisdiction

must have its governing body formally adopt the plan via tion before final approval can be granted. To assist jurisdictions with this process, Tetra Tech will provide a briefing packet, which can be given to your jurisdiction's governing body. This packet will include: a sample tion, the executive summary and an explanatory cover letter. We will also in-

be sure to review their individual adoption processes, as they differ among jurisdictions.

t is also important for Planning Partners to understand that the planning process for any individual jurisdiction is not complete until this approval has been received; however, the five-year life of the plan begins as soon as

the first jurisdiction completes the adoption process. We anticipate that adoption for jurisdictions will occur during the month of September or October.

Final Approval

As jurisdictions adopt the plan, copies of the adoption resolutions will be sent to FEMA and final approval status will be granted.

Please keep in mind that these timeframes may be subject to change and delays may occur during the review process.



Informational Bulletin

King County
Office of Emergency Management

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Contact us: KCPubComment@KingCounty.gov

<http://kingcounty.gov/hazardmitigation>

King County
Regional Hazard Mitigation Plan Update

APPENDIX D.
HAZARD MITIGATION QUESTIONNAIRE AND SURVEY
RESULTS

King County Regional Hazard Mitigation-Public Awareness Survey

1. Survey Introduction

A partnership of local governments and regional stakeholders in King County is working together to update the King County Regional Hazard Mitigation Plan. The purpose of this plan is to help local governments reduce the exposure of County residents to risks from natural hazards, such as earthquakes and floods. By writing this plan, local governments are able to apply to Federal programs that may provide money that can be used to reduce risks before and after natural disasters. This plan was first created in 2004 and was updated in 2009.

We need your help to plan for the possibility of future disasters. We would like to find projects that will help reduce or avoid impacts from natural hazard events. The following questions will help us measure how much local citizens already know about disaster-related issues and will help us identify areas where we need to improve. The information you provide will help us organize activities and prioritize projects to reduce the risk of injury or damage to property from future hazard events.

The survey consists of about 30 questions, and there is an opportunity to provide additional comments at the end. It should take less than 10 minutes to complete the survey and it is anonymous. When you have finished the survey, please click "Done" on the final page.

The King County Hazard Mitigation Planning Partnership thanks you for taking the time to participate in this important information-gathering process.

*1. Do you live in King County?

☐ Yes

☐ No

Other (please specify)

*2. In what ZIP code is your home mailing address?

3. In the past 20 years, have you or anyone in your household experienced any of the following hazards within King County? (Choose all that apply)

☐ Avalanche

☐ Dam/Levee Failure

☐ Drought

☐ Earthquake

☐ Flood

☐ River/Stream Bank Erosion

☐ Hazardous Materials Spill/Release

☐ Other (please specify)

☐ Household Fire

☐ Landslide

☐ Severe Weather (wind, lightning, winter storm, etc.)

☐ Tsunami

☐ Wildland Fires

☐ None

King County Regional Hazard Mitigation-Public Awareness Survey

2. General Household Information

The following demographic information will help us evaluate the responses to this questionnaire. THIS INFORMATION WILL BE CONFIDENTIAL. The answers will only be used to prepare the plan and will not be provided to any other group or interest.

4. Please indicate your age range:

- ☐ Under 18
 ☐ 31 to 40
 ☐ 51 to 60
☐ 18 to 30
 ☐ 41 to 50
 ☐ 61 or older

5. Please indicate your gender:

- ☐ Female
 ☐ Male

6. Please indicate your highest level of education:

- ☐ Grade school/No schooling
 ☐ Some college/Trade school
☐ Some high school
 ☐ College degree
☐ High school graduate/GED
 ☐ Graduate degree
☐ Other (please specify)

7. How long have you lived in King County?

- ☐ Less than 1 year
 ☐ 11 to 20 years
☐ 1 to 5 years
 ☐ More than 20 years
☐ 6 to 10 years

8. What is your gross, annual household income? (Income before taxes or other deductions)

- ☐ \$20,000 or less
 ☐ \$75,000 to \$99,999
☐ \$20,001 to \$49,999
 ☐ \$100,000 or more
☐ \$50,000 to \$74,999
 ☐ I am not sure

King County Regional Hazard Mitigation-Public Awareness Survey

3. Natural Hazard Preparedness

***9. Following a disaster many services that we rely on, like grocery stores and banks, will be unavailable. How prepared is your household to deal with a natural hazard event? Preparation can include many things, such as storing a supply of perishable food, water and other necessities or learning how to shutoff utilities in your home.**

Choose one: Not at all prepared Somewhat prepared Adequately prepared Well prepared Very well prepared I am not sure

☐ ☐ ☐ ☐ ☐ ☐

10. Which of the following steps has your household taken to prepare for a hazard event? (Choose all that apply)

- | | |
|---|--|
| ☐ Received first aid/CPR training | ☐ Purchased and learned how to program a NOAA Weather Radio |
| ☐ Made a fire escape plan | ☐ Stored a battery-powered radio |
| ☐ Designated a meeting place | ☐ Stored a fire extinguisher |
| ☐ Learned how to turn off utilities, such as natural gas | ☐ Stored medical supplies (first aid kit, medications) |
| ☐ Stored sand bags | ☐ Purchased natural hazard insurance (Flood, Earthquake, Wildfire) |
| ☐ Prepared a disaster supply kit | ☐ Established a "defensible space" (area free from vegetation and combustible materials) around your home |
| ☐ Installed smoke detectors on each level of the house | ☐ Used fire resistive landscaping (the use of plants that do not catch fire easily) |
| ☐ Stored food and water | ☐ Anchored service utilities to your home (water heater, furnace, wood stove, etc.) |
| ☐ Stored flashlights and batteries | ☐ None |
|
 | |
| ☐ Other (please specify) | |
| <input type="text"/> | |

King County Regional Hazard Mitigation-Public Awareness Survey

11. Have any of the following sources provided you with useful information to help you prepare for a hazard event?

(Choose all that apply)

- | | |
|--|---|
| ☐ Emergency preparedness information from a government source
(for example, federal, state, or local emergency management) | ☐ Community Emergency Response Team Training (CERT) |
| ☐ Personal experience with one or more natural hazards/disasters | ☐ A public awareness campaign (for example, "What to Do to Make it Through" or "Take Winter by Storm") |
| ☐ Locally provided news or other media information | ☐ Places of worship or faith-based institutions |
| ☐ Schools and other academic institutions | ☐ None |
| ☐ Attendance at meetings that have dealt with disaster preparedness | |
| ☐ Other (please specify) | |

*12. Which of the following do you think are the best ways to provide information about preparing for or responding to natural hazard events?

- | | | |
|--|--|--|
| ☐ Newspaper | ☐ Website | ☐ Chamber of Commerce |
| ☐ Informational Brochures | ☐ Fire Department/Rescue | ☐ Public Library |
| ☐ City Newsletters | ☐ Law Enforcement | ☐ Red Cross Information |
| ☐ Public Meetings | ☐ Places of Worship (faith-based institutions) | ☐ Community Safety Events |
| ☐ Schools | ☐ CERT (Community Emergency Response Team Training) Classes | ☐ Word of Mouth |
| ☐ TV Based Media | ☐ Public Awareness Campaigns (for example, "What to Do to Make it Through" or "Take Winter by Storm") | ☐ Social Media (Twitter, Facebook, LinkedIn) |
| ☐ Radio Based Media | ☐ Books | ☐ Automated Phone Messages from Local Authorities |

☐ Other (please specify)

King County Regional Hazard Mitigation-Public Awareness Survey

***13. How concerned are you about the following hazards in King County?**

(Choose one response for each hazard)

	Not Concerned	Somewhat Concerned	Concerned	Very Concerned	Extremely Concerned
Avalanche	☐	☐	☐	☐	☐
Climate Change	☐	☐	☐	☐	☐
Civil Disturbance	☐	☐	☐	☐	☐
Dam/Levee Failure	☐	☐	☐	☐	☐
Disease/Epidemic	☐	☐	☐	☐	☐
Drought	☐	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐	☐
Flood	☐	☐	☐	☐	☐
River/Stream Bank Erosion	☐	☐	☐	☐	☐
Hazardous Materials	☐	☐	☐	☐	☐
Household Fire	☐	☐	☐	☐	☐
Landslide	☐	☐	☐	☐	☐
Severe Weather	☐	☐	☐	☐	☐
Tsunami	☐	☐	☐	☐	☐
Volcano (lahar/ashfall)	☐	☐	☐	☐	☐
Wild Land Fire	☐	☐	☐	☐	☐
Other	☐	☐	☐	☐	☐

(Please specify other natural hazard)

***14. To the best of your knowledge, is your home located within any of the following natural hazard areas (please choose all that apply):**

☐ Floodplain or Flood Zone	☐ Landslide Hazard Area	☐ Volcano Hazard Zone
☐ Channel Migration Zone	☐ Tsunami Evacuation Zone	☐ Dam Failure Zone
☐ Earthquake Hazard Zone	☐ Wildfire Risk Area	☐ None of the above

***15. Do you own or rent your home?**

☐ Own ☐ Rent

King County Regional Hazard Mitigation-Public Awareness Survey

4. Homeowner - Natural Hazard Preparedness

16. Do you have homeowners insurance for your property?

☐

Yes

☐

No

☐

I am not sure

17. Most homeowners insurance policies do not provide coverage for damage from natural hazards such as: floods, earthquakes, landslides or wildland fires.

Have you purchased any specialty insurance policies that will provide coverage for losses from those hazards not usually covered by homeowners insurance policies? Please choose from the choices below.

☐

No, I have not purchased specialty insurance coverage

☐

Flood Insurance

☐

Earthquake Insurance

☐

Wildland Fire Insurance

☐

I am not sure

King County Regional Hazard Mitigation-Public Awareness Survey

5. Renter - Natural Hazard Preparedness

18. Do you have renters insurance for your home?

- ☐ Yes
☐ No
☐ I am not sure

19. Most renters insurance policies do not provide coverage for damage from natural hazards such as: floods, earthquakes, landslides or wildland fires.

Have you purchased any specialty insurance policies that will provide coverage for losses from hazards not usually covered by renters insurance policies? Please choose from the choices below.

- ☐ No, I have not purchased specialty insurance coverage
☐ Flood Insurance
☐ Earthquake Insurance
☐ Wildland Fire Insurance
☐ I am not sure

King County Regional Hazard Mitigation-Public Awareness Survey

6. Homeowner - Hazard Mitigation

***20. When you moved into your home, did you consider the impact a natural disaster could have on your home?**

☐ Yes

☐ No

☐ I am not sure

***21. Did a real estate agent, seller or landlord tell you if your home was in or near a hazard risk zone before you moved into or purchased your home? (for example: dam failure zone, flood zone, tsunami evacuation zone, landslide hazard area, high fire risk area)**

☐ Yes

☐ No

☐ I am not sure

***22. If you were told this type of hazard risk information, would it influence your decision to buy or rent a home?**

☐ Yes

☐ No

☐ I am not sure

23. How much money would you be willing to spend to retrofit (add safety improvements to) your home to reduce possible risks from natural disasters? (for example: elevating a home above the flood level, performing seismic upgrades, or replacing a combustible roof with non-combustible roofing)

☐ Less than \$1,000

☐ \$10,000 or above

☐ \$1,001 to \$4,999

☐ I would not be willing to spend any money

☐ \$5,000 to \$9,999

☐ I am not sure

24. Some jurisdictions are able to participate in programs to encourage homeowners to retrofit their homes to protect against natural hazards.

If your jurisdiction was qualified for such programs, which of the following programs to encourage home retrofits would you be most likely to participate in? (Choose all that apply)

☐ Insurance premium discounts

☐ Grant funding for retrofits

☐ Mortgage discounts

☐ "Rebate" program

☐ Low interest rate loans

☐ None

☐ Other (please specify)

King County Regional Hazard Mitigation-Public Awareness Survey

7. Renter - Hazard Mitigation

***25. When you moved into your home, did you consider the impact a natural disaster could have on your home?**

☐ Yes

☐ No

☐ I am not sure

***26. Did a real estate agent, seller, or landlord tell you if your home was in or near a hazard risk zone before you moved into your home? (for example: dam failure zone, flood zone, tsunami evacuation zone, landslide hazard area, high fire risk area)**

☐ Yes

☐ No

☐ I am not sure

***27. Would being told this type of hazard risk information influence your decision to buy or rent a home?**

☐ Yes

☐ No

☐ I am not sure

King County Regional Hazard Mitigation-Public Awareness Survey

8. Hazard Mitigation

28. What types of projects do you believe the County, State or Federal agencies should be doing in order to reduce damage and disruption from hazard events within King County? Please rank each option as a low, medium or high priority.

	Low	Medium	High
Retrofit (add safety improvements) and strengthen essential facilities such as police and fire stations, schools and hospitals.	☐	☐	☐
Retrofit (add safety improvements to) infrastructure, such as roads, bridges, drainage facilities, levees, water supply systems, waste water systems and power supply facilities.	☐	☐	☐
Provide money for large projects, such as dams, levees, flood walls, drainage improvements and bank stabilization projects.	☐	☐	☐
Strengthen laws and regulations to include higher regulatory standards in hazard areas, such as floodplains.	☐	☐	☐
Purchase properties that are in danger to natural hazards and maintain them as open space or parks.	☐	☐	☐
Assist vulnerable property owners with finding funding for reducing the risk from hazards.	☐	☐	☐
Provide better public information about risk, and the exposure to hazards within the area.	☐	☐	☐
Begin projects that restore the natural environment's ability to absorb the impacts from natural hazards, such as rain gardens.	☐	☐	☐
Begin projects that lessen the potential impacts from climate change.	☐	☐	☐
Begin buyout programs where	☐	☐	☐

King County Regional Hazard Mitigation-Public Awareness Survey

homes or properties located in designated "high hazard" or areas that are repeatedly damaged are purchased from their owners.

29. Do you support laws that control what land can be used for when it is located in known high hazard areas? (for example, limiting development in frequently flooded areas)

Choose one: Very Opposed Somewhat Opposed Neutral Somewhat Supportive Very Supportive

☐ ☐ ☐ ☐ ☐

30. Please indicate how you feel about the following statement:

It is the responsibility of government (local, state and federal) to provide education and programs that help citizens take action to reduce exposure to the risks from natural hazards.

Choose one: Strongly Disagree Somewhat Disagree Neither Agree nor Disagree Somewhat Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

31. Please indicate how you feel about the following statement:

It is my responsibility to educate myself and to take actions that will reduce my exposure to the risks associated with natural hazards.

Choose one: Strongly Disagree Somewhat Disagree Neither Agree nor Disagree Somewhat Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

32. Please indicate how you feel about the following statement:

Information about the risks associated with natural hazards is readily available and easy to locate.

Choose one: Strongly Disagree Somewhat Disagree Neither Agree nor Disagree Somewhat Agree Strongly Agree

☐ ☐ ☐ ☐ ☐

King County Regional Hazard Mitigation-Public Awareness Survey

33. In the hours immediately following a natural hazard event, such as an earthquake or flood, from whom would you expect to receive help?

- ☐ Federal Government (FEMA/DHS)
- ☐ State Government (WAEMD, WA National Guard)
- ☐ Local Government (City/County)
- ☐ The people in the area affected (myself, my neighbors)

Other (please specify)

King County Regional Hazard Mitigation-Public Awareness Survey

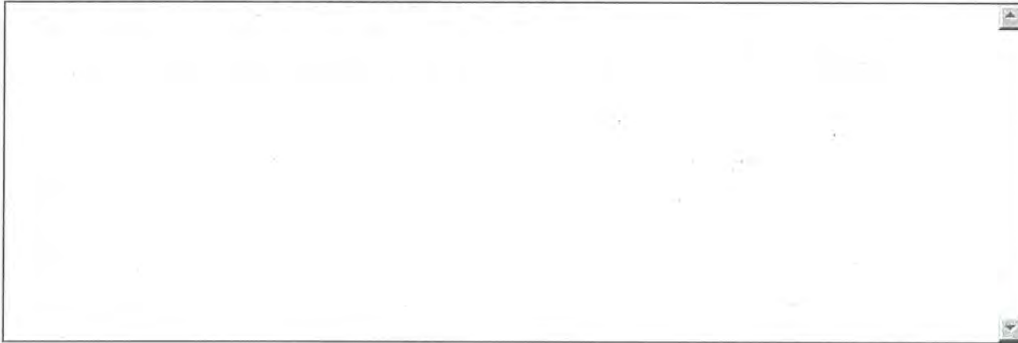
9. Comments (Optional)

For resource and information about hazard mitigation, please visit:

www.kingcounty.gov/hazardmitigation

Thank you for your time and feedback.

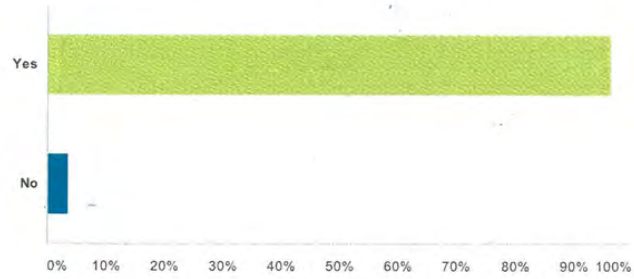
34. Please provide additional comments below.



King County Regional Hazard Mitigation-Public Awareness Survey

Q1 Do you live in King County?

Answered: 201 Skipped: 0



Answer Choices	Responses	
Yes	96.52%	194
No	3.48%	7
Total		201

King County Regional Hazard Mitigation-Public Awareness Survey

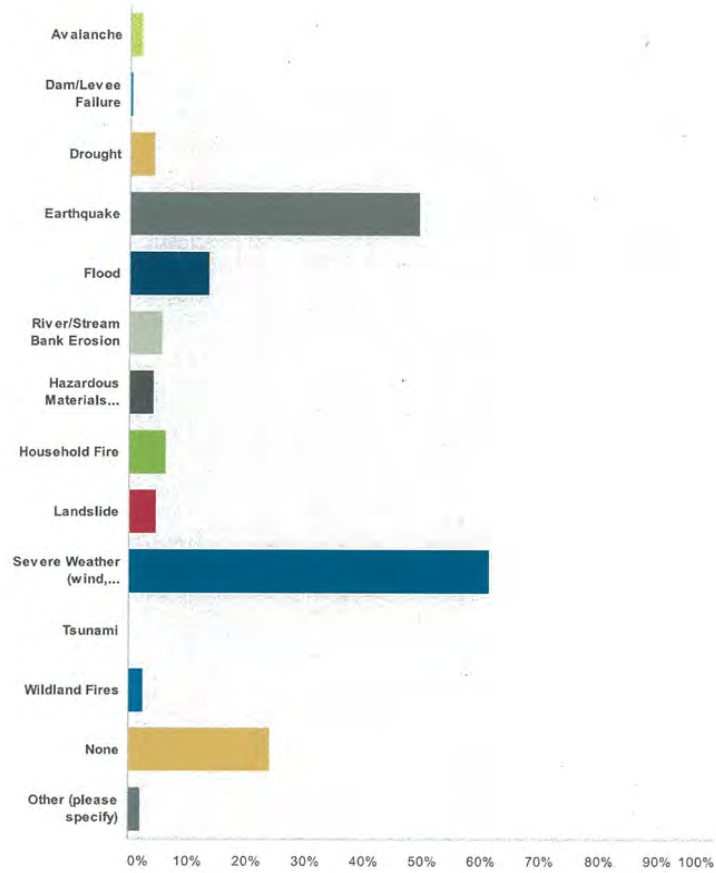
Q2 In what ZIP code is your home mailing address?

Answered: 201 Skipped: 0

King County Regional Hazard Mitigation-Public Awareness Survey

Q3 In the past 20 years, have you or anyone in your household experienced any of the following hazards within King County? (Choose all that apply)

Answered: 192 Skipped: 9



Answer Choices	Responses
Avalanche	2.08% 4
Dam/Levee Failure	0.52% 1
Drought	4.17% 8
Earthquake	49.48% 95
Flood	13.54% 26
River/Stream Bank Erosion	5.73% 11
Hazardous Materials Spill/Release	4.17% 8
Household Fire	6.25% 12
Landslide	4.69% 9
Severe Weather (wind, lightning, winter storm, etc.)	61.46% 118
Tsunami	0.00% 0
Wildland Fires	2.60% 5

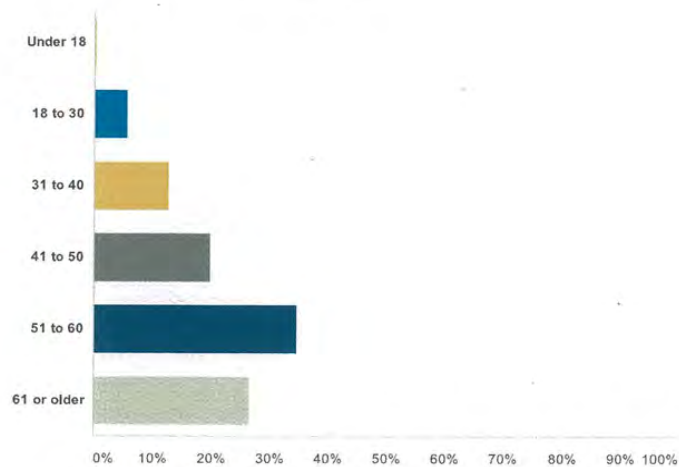
King County Regional Hazard Mitigation-Public Awareness Survey

None	23.96%	46
Other (please specify)	2.08%	4
Total Respondents: 192		

King County Regional Hazard Mitigation-Public Awareness Survey

Q4 Please indicate your age range:

Answered: 196 Skipped: 5

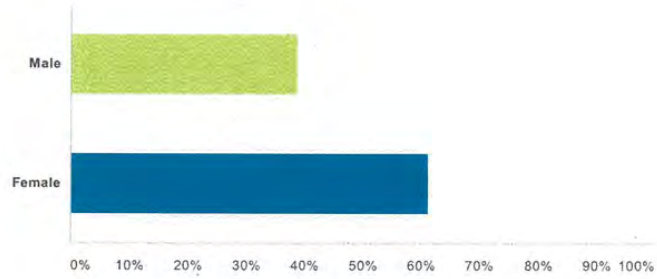


Answer Choices	Responses
Under 18	0.51% 1
18 to 30	5.61% 11
31 to 40	12.76% 25
41 to 50	19.90% 39
51 to 60	34.69% 68
61 or older	26.53% 52
Total	196

King County Regional Hazard Mitigation-Public Awareness Survey

Q5 Please indicate your gender:

Answered: 196 Skipped: 5

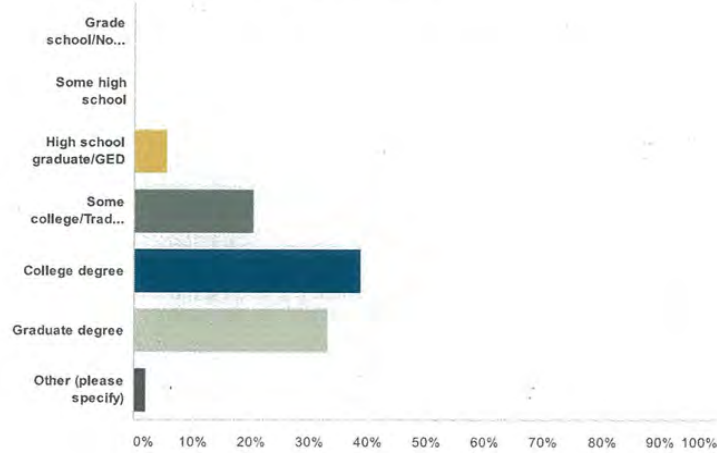


Answer Choices	Responses	
Male	38.78%	76
Female	61.22%	120
Total		196

King County Regional Hazard Mitigation-Public Awareness Survey

Q6 Please indicate your highest level of education:

Answered: 196 Skipped: 5

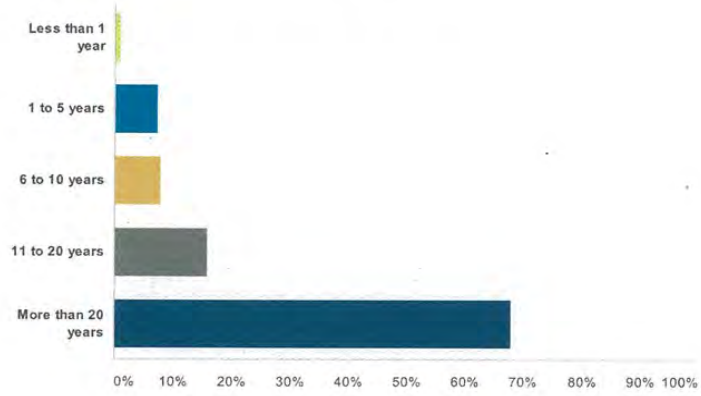


Answer Choices	Responses	
Grade school/No schooling	0.00%	0
Some high school	0.00%	0
High school graduate/GED	5.61%	11
Some college/Trade school	20.41%	40
College degree	38.78%	76
Graduate degree	33.16%	65
Other (please specify)	2.04%	4
Total		196

King County Regional Hazard Mitigation-Public Awareness Survey

Q7 How long have you lived in King County?

Answered: 190 Skipped: 11

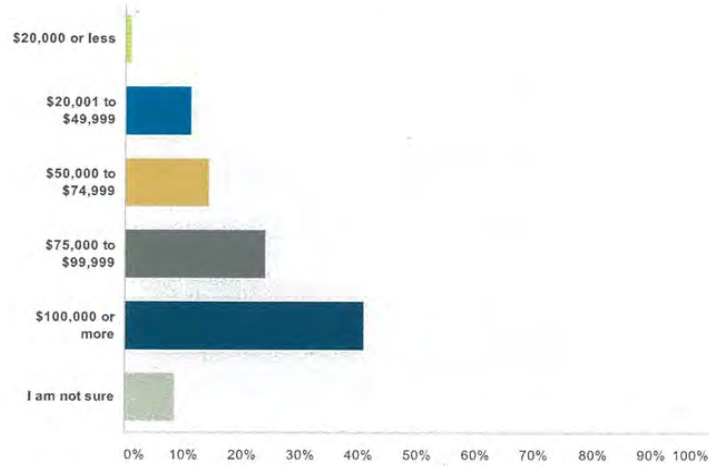


Answer Choices	Responses
Less than 1 year	1.05% 2
1 to 5 years	7.37% 14
6 to 10 years	7.89% 15
11 to 20 years	15.79% 30
More than 20 years	67.89% 129
Total	190

King County Regional Hazard Mitigation-Public Awareness Survey

Q8 What is your gross, annual household income? (Income before taxes or other deductions)

Answered: 188 Skipped: 13



Answer Choices	Responses
\$20,000 or less	1.06% 2
\$20,001 to \$49,999	11.17% 21
\$50,000 to \$74,999	14.36% 27
\$75,000 to \$99,999	23.94% 45
\$100,000 or more	40.96% 77
I am not sure	8.51% 16
Total	188

King County Regional Hazard Mitigation-Public Awareness Survey

Q9 Following a disaster many services that we rely on, like grocery stores and banks, will be unavailable. How prepared is your household to deal with a natural hazard event? Preparation can include many things, such as storing a supply of perishable food, water and other necessities or learning how to shutoff utilities in your home.

Answered: 182 Skipped: 19

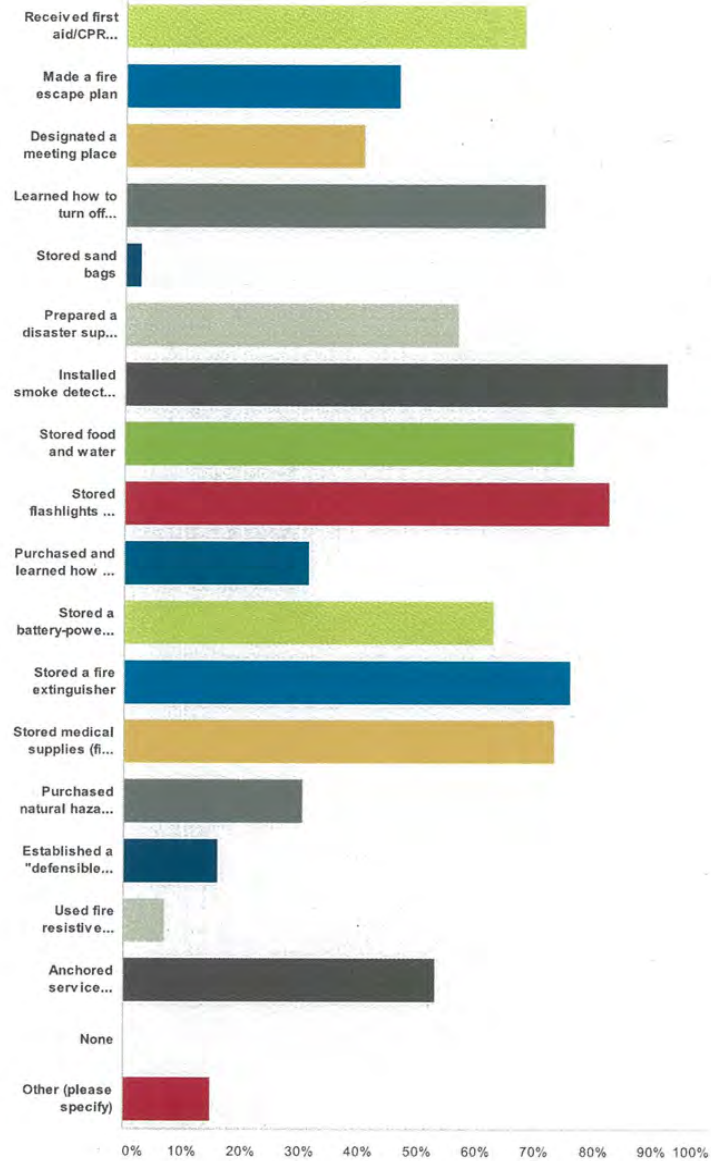


	Not at all prepared	Somewhat prepared	Adequately prepared	Well prepared	Very well prepared	I am not sure	Total	Average Rating
Choose one:	6.04% 11	41.76% 76	23.08% 42	16.48% 30	12.09% 22	0.55% 1	182	2.88

King County Regional Hazard Mitigation-Public Awareness Survey

Q10 Which of the following steps has your household taken to prepare for a hazard event? (Choose all that apply)

Answered: 181 Skipped: 20



Answer Choices	Responses	
Received first aid/CPR training	68.51%	124
Made a fire escape plan	46.96%	85
Designated a meeting place	40.88%	74
Learned how to turn off utilities, such as natural gas	71.82%	130

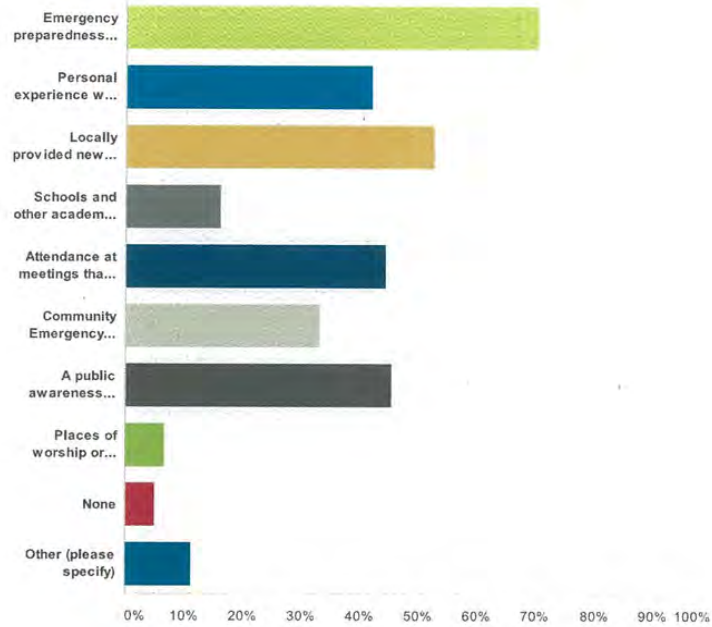
King County Regional Hazard Mitigation-Public Awareness Survey

Stored sand bags	2.76%	5
Prepared a disaster supply kit	56.91%	103
Installed smoke detectors on each level of the house	92.82%	168
Stored food and water	76.80%	139
Stored flashlights and batteries	82.87%	150
Purchased and learned how to program a NOAA Weather Radio	31.49%	57
Stored a battery-powered radio	62.98%	114
Stored a fire extinguisher	76.24%	138
Stored medical supplies (first aid kit, medications)	73.48%	133
Purchased natural hazard insurance (Flood, Earthquake, Wildfire)	30.39%	55
Established a "defensible space" (area free from vegetation and combustible materials) around your home	16.02%	29
Used fire resistive landscaping (the use of plants that do not catch fire easily)	7.18%	13
Anchored service utilities to your home (water heater, furnace, wood stove, etc.)	53.04%	96
None	0.00%	0
Other (please specify)	14.92%	27
Total Respondents: 181		

King County Regional Hazard Mitigation-Public Awareness Survey

Q11 Have any of the following sources provided you with useful information to help you prepare for a hazard event? (Choose all that apply)

Answered: 178 Skipped: 23

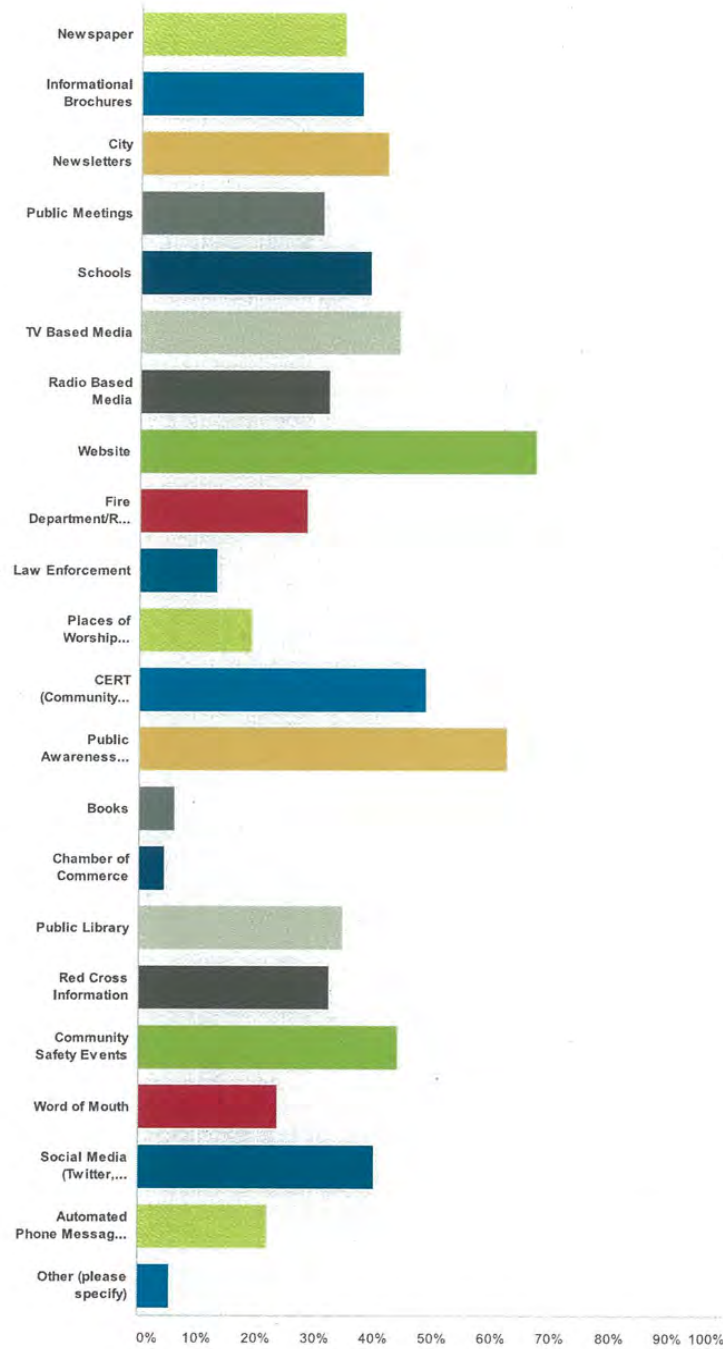


Answer Choices	Responses	
Emergency preparedness information from a government source (for example, federal, state, or local emergency management)	70.79%	126
Personal experience with one or more natural hazards/disasters	42.13%	75
Locally provided news or other media information	52.81%	94
Schools and other academic institutions	16.29%	29
Attendance at meetings that have dealt with disaster preparedness	44.38%	79
Community Emergency Response Team Training (CERT)	33.15%	59
A public awareness campaign (for example, "What to Do to Make it Through" or "Take Winter by Storm")	45.51%	81
Places of worship or faith-based institutions	6.74%	12
None	5.06%	9
Other (please specify)	11.24%	20
Total Respondents: 178		

King County Regional Hazard Mitigation-Public Awareness Survey

Q12 Which of the following do you think are the best ways to provide information about preparing for or responding to natural hazard events?

Answered: 182 Skipped: 19



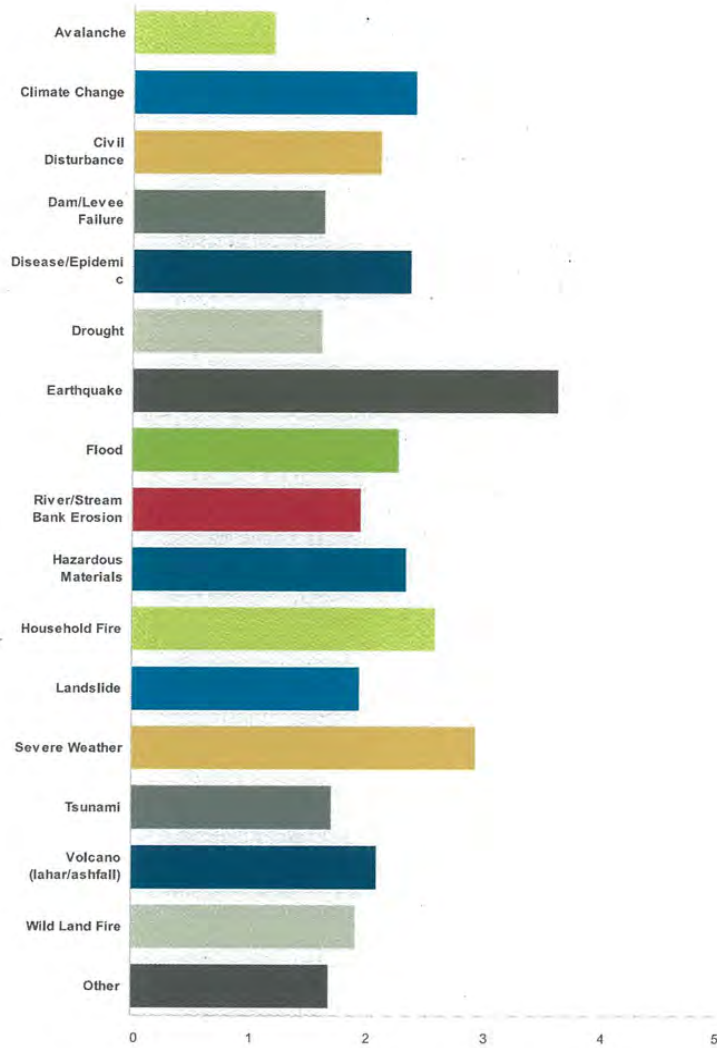
King County Regional Hazard Mitigation-Public Awareness Survey

Answer Choices	Responses	
Newspaper	35.16%	64
Informational Brochures	37.91%	69
City Newsletters	42.31%	77
Public Meetings	31.32%	57
Schools	39.56%	72
TV Based Media	44.51%	81
Radio Based Media	32.42%	59
Website	67.58%	123
Fire Department/Rescue	28.57%	52
Law Enforcement	13.19%	24
Places of Worship (faith-based institutions)	19.23%	35
CERT (Community Emergency Response Team Training) Classes	48.90%	89
Public Awareness Campaigns (for example, "What to Do to Make it Through" or "Take Winter by Storm")	62.64%	114
Books	6.04%	11
Chamber of Commerce	4.40%	8
Public Library	34.62%	63
Red Cross Information	32.42%	59
Community Safety Events	43.96%	80
Word of Mouth	23.63%	43
Social Media (Twitter, Facebook, LinkedIn)	40.11%	73
Automated Phone Messages from Local Authorities	21.98%	40
Other (please specify)	5.49%	10
Total Respondents: 182		

King County Regional Hazard Mitigation-Public Awareness Survey

Q13 How concerned are you about the following hazards in King County? (Choose one response for each hazard)

Answered: 182 Skipped: 19



	Not Concerned	Somewhat Concerned	Concerned	Very Concerned	Extremely Concerned	Total	Average Rating
Avalanche	82.35% 140	14.71% 25	2.35% 4	0.59% 1	0.00% 0	170	1.21
Climate Change	25.28% 45	34.27% 61	17.42% 31	19.10% 34	3.93% 7	178	2.42
Civil Disturbance	30.46% 53	38.51% 67	21.26% 37	6.90% 12	2.87% 5	174	2.13
Dam/Levee Failure	59.77% 104	21.84% 38	13.79% 24	4.02% 7	0.57% 1	174	1.64
Disease/Epidemic	17.82% 31	42.53% 74	27.01% 47	9.20% 16	3.45% 6	174	2.38
Drought	52.57%	34.29%	11.43%	1.71%	0.00%		

16 / 38

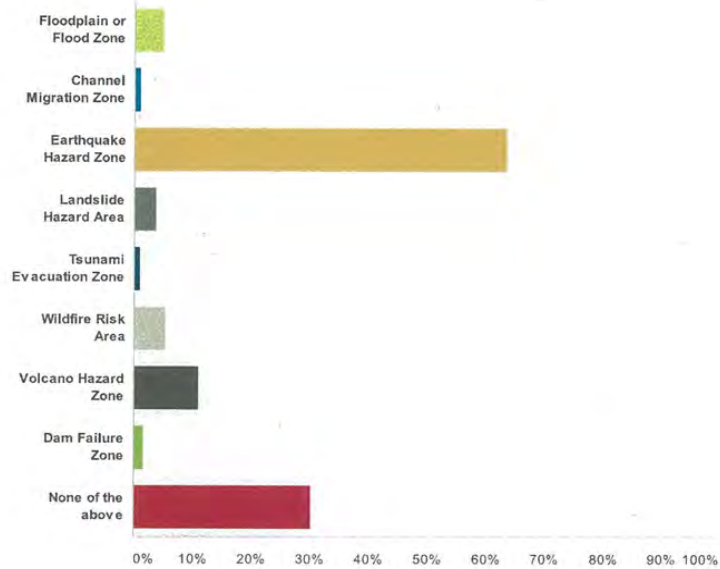
King County Regional Hazard Mitigation-Public Awareness Survey

Hazard	Severe 92	Major 60	Minor 20	Not a 3	Don't 0	Total 175	Weighted 1.62
Earthquake	1.11% 2	11.67% 21	28.33% 51	40.56% 73	18.33% 33	180	3.63
Flood	27.27% 48	35.23% 62	24.43% 43	7.95% 14	5.11% 9	176	2.28
River/Stream Bank Erosion	38.15% 66	37.57% 65	16.18% 28	6.94% 12	1.16% 2	173	1.95
Hazardous Materials	19.32% 34	42.05% 74	25.57% 45	11.93% 21	1.14% 2	176	2.34
Household Fire	9.71% 17	39.43% 69	34.29% 60	14.86% 26	1.71% 3	175	2.59
Landslide	40.46% 70	33.53% 58	19.08% 33	5.78% 10	1.16% 2	173	1.94
Severe Weather	5.03% 9	32.40% 58	32.40% 58	25.14% 45	5.03% 9	179	2.93
Tsunami	52.57% 92	30.29% 53	12.57% 22	3.43% 6	1.14% 2	175	1.70
Volcano (lahar/ashfall)	36.57% 64	32.57% 57	20.57% 36	5.71% 10	4.57% 8	175	2.09
Wild Land Fire	42.61% 75	32.95% 58	15.91% 28	7.39% 13	1.14% 2	176	1.91
Other	73.68% 28	2.63% 1	10.53% 4	7.89% 3	5.26% 2	38	1.68

King County Regional Hazard Mitigation-Public Awareness Survey

Q14 To the best of your knowledge, is your home located within any of the following natural hazard areas (please choose all that apply):

Answered: 182 Skipped: 19

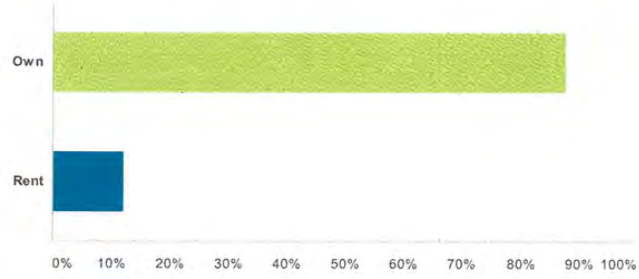


Answer Choices	Responses
Floodplain or Flood Zone	4.95% 9
Channel Migration Zone	1.10% 2
Earthquake Hazard Zone	63.74% 116
Landslide Hazard Area	3.85% 7
Tsunami Evacuation Zone	1.10% 2
Wildfire Risk Area	5.49% 10
Volcano Hazard Zone	10.99% 20
Dam Failure Zone	1.65% 3
None of the above	30.22% 55
Total Respondents: 182	

King County Regional Hazard Mitigation-Public Awareness Survey

Q15 Do you own or rent your home?

Answered: 182 Skipped: 19

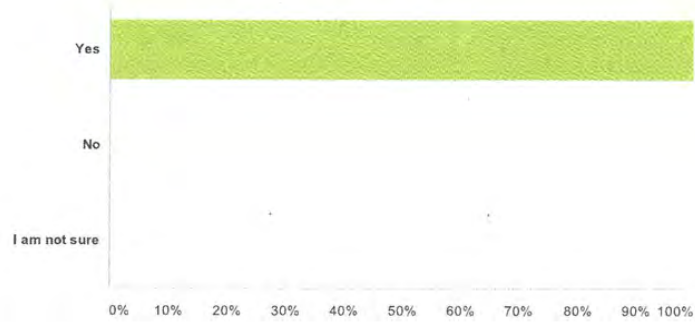


Answer Choices	Responses
Own	87.91% 160
Rent	12.09% 22
Total	182

King County Regional Hazard Mitigation-Public Awareness Survey

Q16 Do you have homeowners insurance for your property?

Answered: 159 Skipped: 42

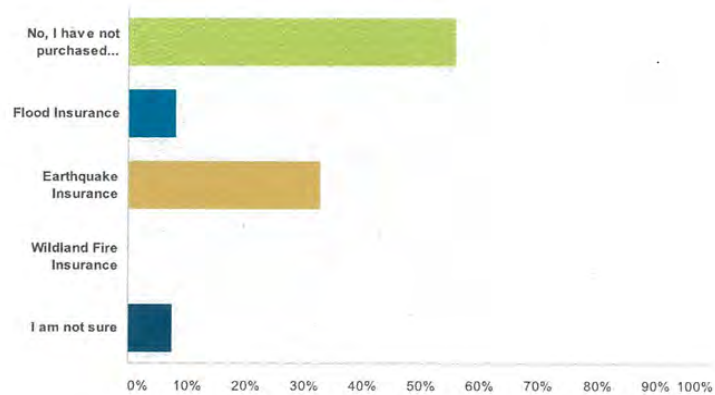


Answer Choices	Responses	
Yes	100.00%	159
No	0.00%	0
I am not sure	0.00%	0
Total		159

King County Regional Hazard Mitigation-Public Awareness Survey

Q17 Most homeowners insurance policies do not provide coverage for damage from natural hazards such as: floods, earthquakes, landslides or wildland fires. Have you purchased any specialty insurance policies that will provide coverage for losses from those hazards not usually covered by homeowners insurance policies? Please choose from the choices below.

Answered: 159 Skipped: 42

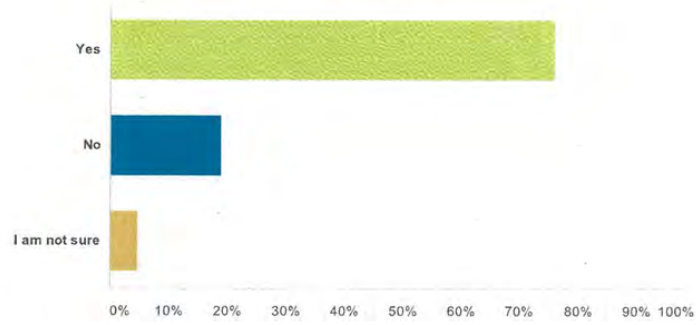


Answer Choices	Responses	
No, I have not purchased specialty insurance coverage	55.97%	89
Flood Insurance	8.18%	13
Earthquake Insurance	32.70%	52
Wildland Fire Insurance	0.00%	0
I am not sure	7.55%	12
Total Respondents: 159		

King County Regional Hazard Mitigation-Public Awareness Survey

Q18 Do you have renters insurance for your home?

Answered: 21 Skipped: 180

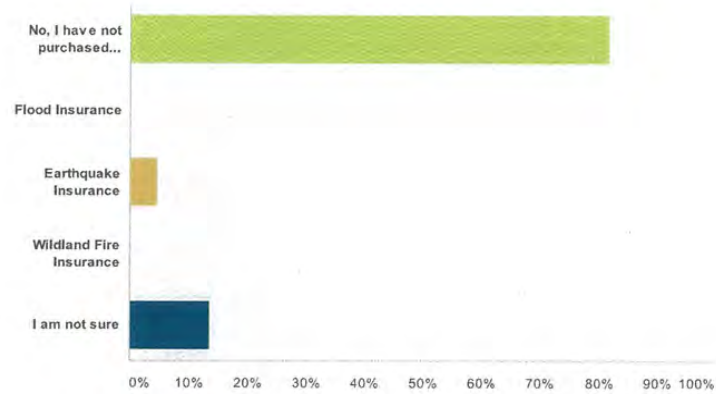


Answer Choices	Responses	
Yes	76.19%	16
No	19.05%	4
I am not sure	4.76%	1
Total		21

King County Regional Hazard Mitigation-Public Awareness Survey

Q19 Most renters insurance policies do not provide coverage for damage from natural hazards such as: floods, earthquakes, landslides or wildland fires. Have you purchased any specialty insurance policies that will provide coverage for losses from hazards not usually covered by renters insurance policies? Please choose from the choices below.

Answered: 22 Skipped: 179

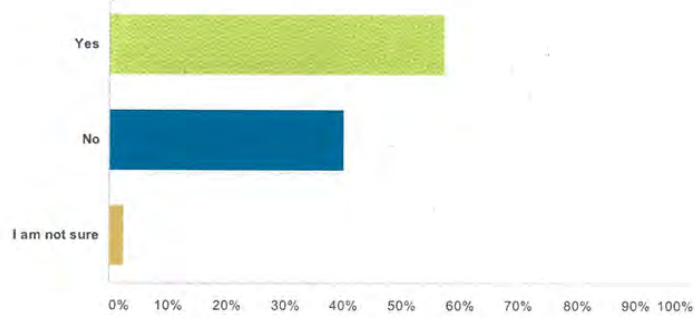


Answer Choices	Responses	
No, I have not purchased specialty insurance coverage	81.82%	18
Flood Insurance	0.00%	0
Earthquake Insurance	4.55%	1
Wildland Fire Insurance	0.00%	0
I am not sure	13.64%	3
Total Respondents: 22		

King County Regional Hazard Mitigation-Public Awareness Survey

Q20 When you moved into your home, did you consider the impact a natural disaster could have on your home?

Answered: 160 Skipped: 41

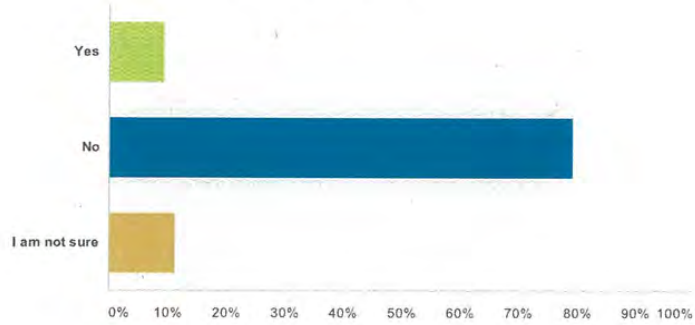


Answer Choices	Responses	
Yes	57.50%	92
No	40.00%	64
I am not sure	2.50%	4
Total		160

King County Regional Hazard Mitigation-Public Awareness Survey

Q21 Did a real estate agent, seller or landlord tell you if your home was in or near a hazard risk zone before you moved into or purchased your home? (for example: dam failure zone, flood zone, tsunami evacuation zone, landslide hazard area, high fire risk area)

Answered: 160 Skipped: 41

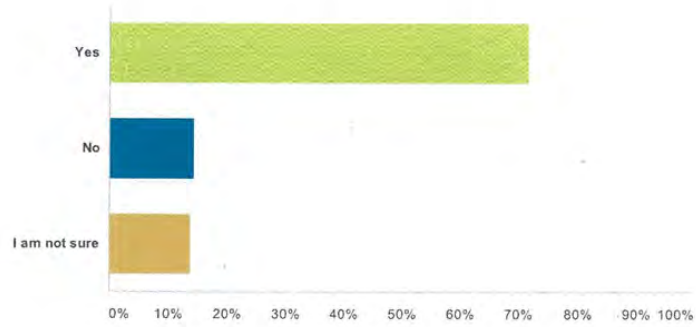


Answer Choices	Responses	
Yes	9.38%	15
No	79.38%	127
I am not sure	11.25%	18
Total		160

King County Regional Hazard Mitigation-Public Awareness Survey

Q22 If you were told this type of hazard risk information, would it influence your decision to buy or rent a home?

Answered: 160 Skipped: 41

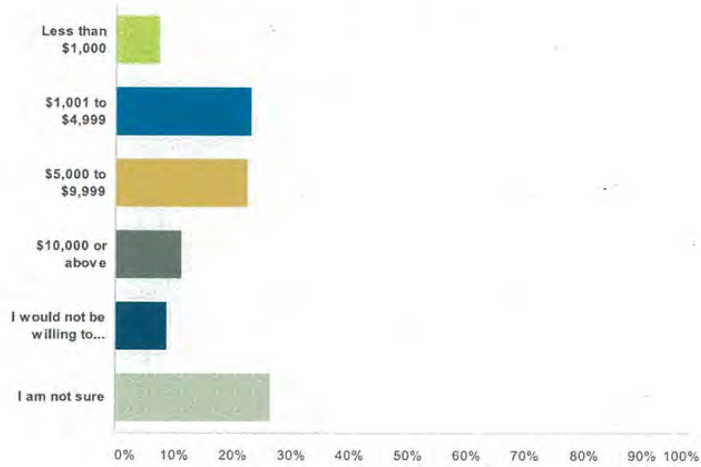


Answer Choices	Responses	
Yes	71.88%	115
No	14.37%	23
I am not sure	13.75%	22
Total		160

King County Regional Hazard Mitigation-Public Awareness Survey

Q23 How much money would you be willing to spend to retrofit (add safety improvements to) your home to reduce possible risks from natural disasters? (for example: elevating a home above the flood level, performing seismic upgrades, or replacing a combustible roof with non-combustible roofing)

Answered: 159 Skipped: 42

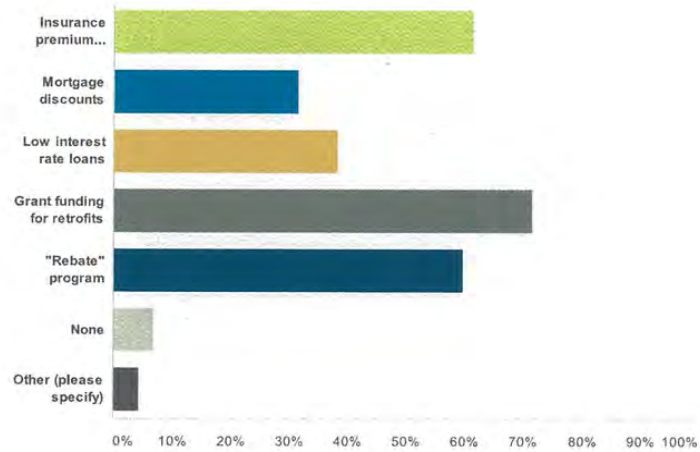


Answer Choices	Responses	
Less than \$1,000	7.55%	12
\$1,001 to \$4,999	23.27%	37
\$5,000 to \$9,999	22.64%	36
\$10,000 or above	11.32%	18
I would not be willing to spend any money	8.81%	14
I am not sure	26.42%	42
Total		159

King County Regional Hazard Mitigation-Public Awareness Survey

Q24 Some jurisdictions are able to participate in programs to encourage homeowners to retrofit their homes to protect against natural hazards. If your jurisdiction was qualified for such programs, which of the following programs to encourage home retrofits would you be most likely to participate in? (Choose all that apply)

Answered: 159 Skipped: 42

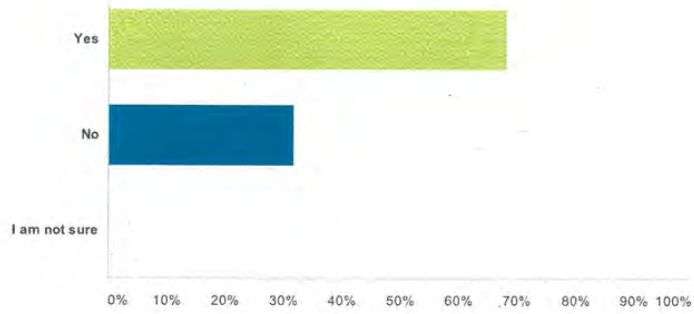


Answer Choices	Responses
Insurance premium discounts	61.64% 98
Mortgage discounts	31.45% 50
Low interest rate loans	38.36% 61
Grant funding for retrofits	71.70% 114
"Rebate" program	59.75% 95
None	6.92% 11
Other (please specify)	4.40% 7
Total Respondents: 159	

King County Regional Hazard Mitigation-Public Awareness Survey

Q25 When you moved into your home, did you consider the impact a natural disaster could have on your home?

Answered: 22 Skipped: 179

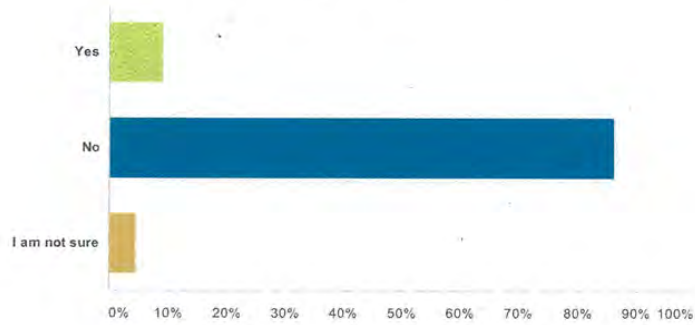


Answer Choices	Responses	
Yes	68.18%	15
No	31.82%	7
I am not sure	0.00%	0
Total		22

King County Regional Hazard Mitigation-Public Awareness Survey

Q26 Did a real estate agent, seller, or landlord tell you if your home was in or near a hazard risk zone before you moved into your home? (for example: dam failure zone, flood zone, tsunami evacuation zone, landslide hazard area, high fire risk area)

Answered: 22 Skipped: 179

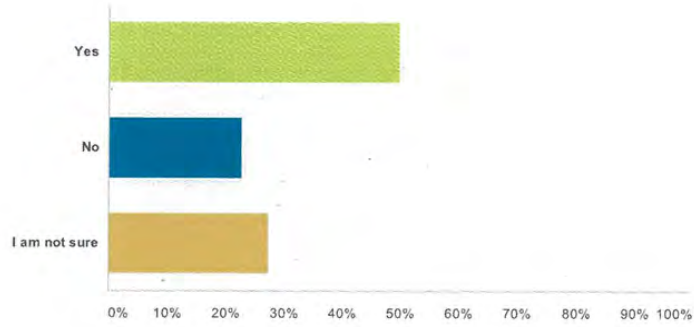


Answer Choices	Responses	
Yes	9.09%	2
No	86.36%	19
I am not sure	4.55%	1
Total		22

King County Regional Hazard Mitigation-Public Awareness Survey

Q27 Would being told this type of hazard risk information influence your decision to buy or rent a home?

Answered: 22 Skipped: 179

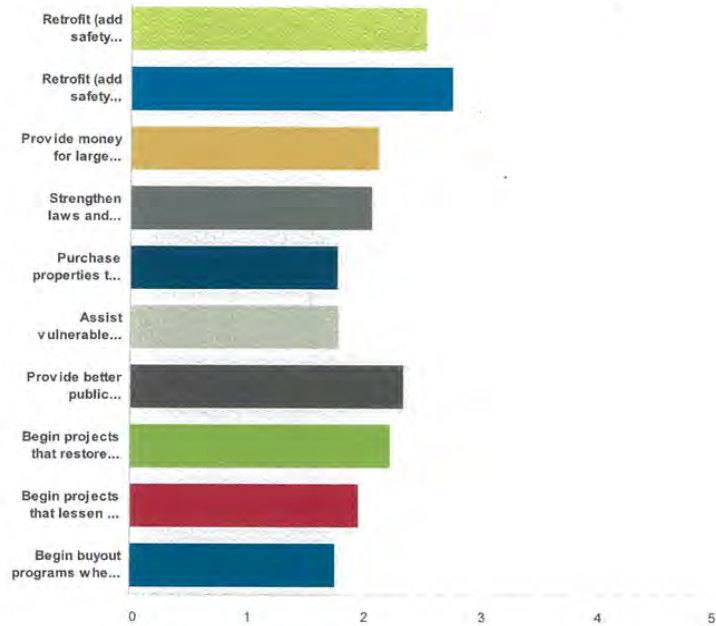


Answer Choices	Responses	
Yes	50.00%	11
No	22.73%	5
I am not sure	27.27%	6
Total		22

King County Regional Hazard Mitigation-Public Awareness Survey

Q28 What types of projects do you believe the County, State or Federal agencies should be doing in order to reduce damage and disruption from hazard events within King County? Please rank each option as a low, medium or high priority.

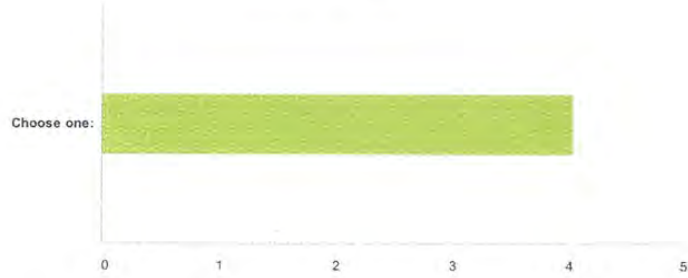
Answered: 178 Skipped: 23



King County Regional Hazard Mitigation-Public Awareness Survey

Q29 Do you support laws that control what land can be used for when it is located in known high hazard areas? (for example, limiting development in frequently flooded areas)

Answered: 178 Skipped: 23

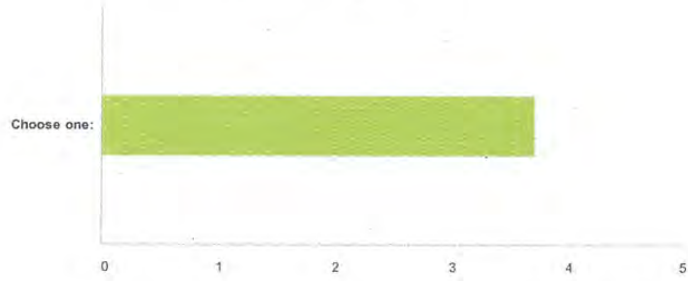


	Very Opposed	Somewhat Opposed	Neutral	Somewhat Supportive	Very Supportive	Total	Average Rating
Choose one:	5.62% 10	7.87% 14	11.24% 20	28.65% 51	46.63% 83	178	4.03

King County Regional Hazard Mitigation-Public Awareness Survey

Q30 Please indicate how you feel about the following statement: It is the responsibility of government (local, state and federal) to provide education and programs that help citizens take action to reduce exposure to the risks from natural hazards.

Answered: 177 Skipped: 24

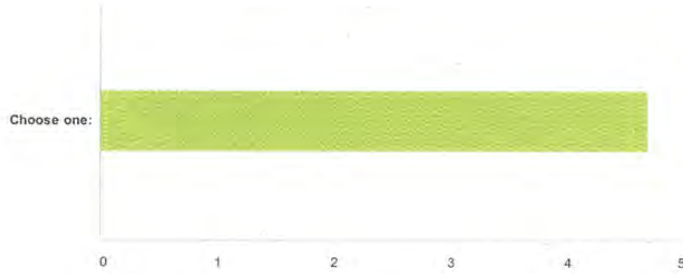


	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total	Average Rating
Choose one:	5.65% 10	9.04% 16	16.95% 30	45.20% 80	23.16% 41	177	3.71

King County Regional Hazard Mitigation-Public Awareness Survey

Q31 Please indicate how you feel about the following statement: It is my responsibility to educate myself and to take actions that will reduce my exposure to the risks associated with natural hazards.

Answered: 178 Skipped: 23

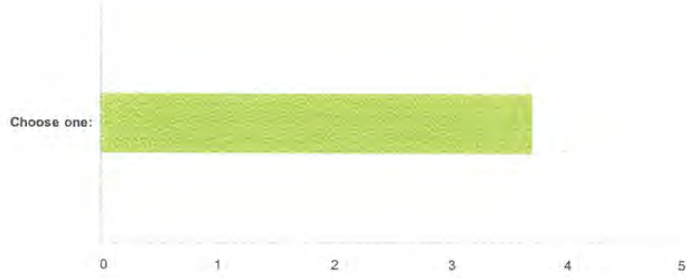


	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total	Average Rating
Choose one:	1.69% 3	1.12% 2	1.12% 2	19.10% 34	76.97% 137	178	4.69

King County Regional Hazard Mitigation-Public Awareness Survey

Q32 Please indicate how you feel about the following statement: Information about the risks associated with natural hazards is readily available and easy to locate.

Answered: 175 Skipped: 26

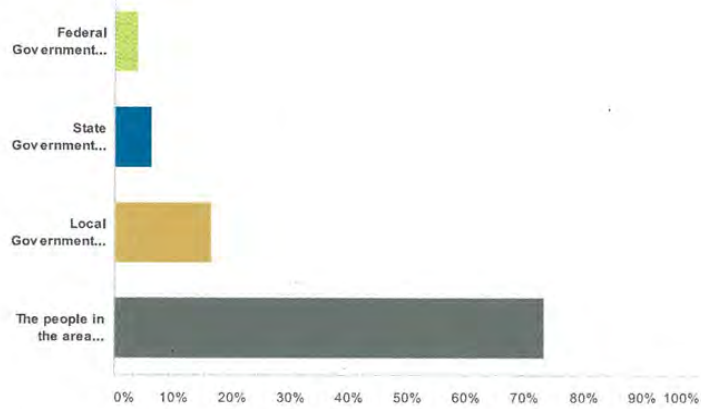


	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Total	Average Rating
Choose one:	1.14% 2	15.43% 27	20.00% 35	40.57% 71	22.86% 40	175	3.69

King County Regional Hazard Mitigation-Public Awareness Survey

Q33 In the hours immediately following a natural hazard event, such as an earthquake or flood, from whom would you expect to receive help?

Answered: 176 Skipped: 25



Answer Choices	Responses
Federal Government (FEMA/DHS)	3.98% 7
State Government (WAEMD, WA National Guard)	6.25% 11
Local Government (City/County)	16.48% 29
The people in the area affected (myself, my neighbors)	73.30% 129
Total	176

King County
Regional Hazard Mitigation Plan Update

APPENDIX E.
CONCEPTS AND METHODS USED FOR HAZARD MAPPING

APPENDIX E. CONCEPTS AND METHODS USED FOR HAZARD MAPPING

EARTHQUAKE MAPPING

Active Faults and Folds

Fault and fold data are provided by the Washington State Department of Natural Resources, Division of Geology and Earth Resources. These data contain arcs representing the location of faults and folds with known or suspected Quaternary (<1,600,000 years) activity in the state of Washington. Data were gathered from numerous sources, including the Washington State portion of the U.S. Geological Survey's 2010 *Quaternary Fault and Fold Database of the United States*. This dataset contains multiple interpretations of the same faults or fault systems by different authors, which may be only partially co-located. Differing interpretations are the result of different methods used to detect the faults and the scale of the investigation.

Liquefaction Susceptibility

Liquefaction data are provided by the Washington State Department of Natural Resources, Division of Geology and Earth Resources. Data is based solely on surficial geology published at a scale of 1:100,000.

A liquefaction susceptibility map provides an estimate of the likelihood that soil will liquefy as a result of earthquake shaking. This type of map depicts the relative susceptibility in a range that varies from very low to high. Areas underlain by bedrock or peat are mapped separately as these earth materials are not liquefiable, although peat deposits may be subject to permanent ground deformation caused by earthquake shaking. Liquefaction is a phenomenon in which strong earthquake shaking causes a soil to rapidly lose its strength and behave like quicksand. Liquefaction typically occurs in artificial fills and in areas of loose sandy soils that are saturated with water, such as low-lying coastal areas, lakeshores, and river valleys. When soil strength is lost during liquefaction, the consequences can be catastrophic. Movement of liquefied soils can rupture pipelines, move bridge abutments and road and railway alignments, and pull apart the foundations and walls of buildings.

National Earthquake Hazard Reduction Program Soil Classification

Soil classification data are provided by Washington State Department of Natural Resources, Geology and Earth Resources Division. The dataset identifies site classes for approximately 33,000 polygons derived from the geologic map of Washington. The methodology chosen for developing the site class map required the construction of a database of shear wave velocity measurements. This database was created by compiling shear wave velocity data from published and unpublished sources, and through the collection of a large number of shear wave velocity measurements from seismic refraction surveys conducted for this project. All of these sources of data were then analyzed using the chosen methodologies to produce the statewide site class maps. The polygons were classified with site classes based on criteria described in Palmer et al. 2004.

Probabilistic Peak Ground Acceleration Maps

Probabilistic Peak Ground Acceleration data are generated by Hazus-MH 2.1. In Hazus' probabilistic analysis procedure, the ground shaking demand is characterized by spectral contour maps developed by the United States Geological Survey (USGS) as part of a 2008 update of the National Seismic Hazard

Maps. USGS probabilistic seismic hazard maps are revised about every six years to reflect newly published or thoroughly reviewed earthquake science and to keep pace with regular updates of the building code. Hazus includes maps for eight probabilistic hazard levels: ranging from ground shaking with a 39% probability of being exceeded in 50 years (100-year return period) to the ground shaking with a 2% probability of being exceeded in 50 years (2,500-year return period). Earthquake mapping for this plan used the 100-year and 500-year probabilistic events.

Shake Maps

A shake map is designed as a rapid response tool to portray the extent and variation of ground shaking throughout the affected region immediately following significant earthquakes. Ground motion and intensity maps are derived from peak ground motion amplitudes recorded on seismic sensors (accelerometers), with interpolation based on both estimated amplitudes where data are lacking, and site amplification corrections. Color-coded instrumental intensity maps are derived from empirical relations between peak ground motions and Modified Mercalli intensity. For this plan, shake maps were prepared for three earthquake scenarios:

- An earthquake on the Tacoma Fault with the following characteristics:
 - Magnitude: 7.1
 - Epicenter: N47.41 W122.71
- An earthquake on the South Whidbey Island Fault with the following characteristics:
 - Magnitude: 7.4
 - Epicenter: N48.05 W122.47
- An earthquake on the Seattle Fault with the following characteristics:
 - Magnitude: 7.2
 - Epicenter: N47.52 W122.37

FLOOD MAPPING

Flood hazard areas are mapped as depicted on draft FEMA Digital Flood Insurance Rate Maps.

Repetitive flood loss data was provided by FEMA as of January 31, 2014. Property addresses were geocoded and then mapped at a county-wide scale. Not all of the addresses listed in the repetitive loss report were able to be geo-coded and, thus, these properties are not represented symbolically on the repetitive flood loss map or included in the spatial assessment.

LANDSLIDE MAPPING

The landslide hazard maps show a combination of areas drawn from three sources: Washington Department of Natural Resources, King County and a slope/soils analysis.

Landslide Areas

Washington State landslide area data are provided by the Washington State Department of Natural Resources, Division of Geology and Earth Resources. This dataset contains 1:24,000-scale polygons defining the extend of mapped landslides in the state of Washington. This dataset is compiled chiefly from pre-existing landslide databases created in different divisions of the Washington State Department of Natural Resources to meet a variety of purposes.

APPENDIX E. CONCEPTS AND METHODS USED FOR HAZARD MAPPING

King County landslide hazard area data are downloaded from the King County GIS Data Portal. Landslide areas are areas subject to severe landslide risk identified in the Sensitive Areas Ordinance as:

- A. Any area with a combination of:
 - 1. Slopes greater than 15%
 - 2. Impermeable soils (typically silt and clay) frequently interbedded with granular soils (predominantly sand and gravel)
 - 3. Springs or groundwater seepage.
- B. Any area that has shown movement during the Holocene epoch (from 10,000 years ago to present), or that is underlain by mass wastage debris of that epoch.
- C. Any area potentially unstable as a result of rapid stream incision, stream bank erosion or undercutting by wave action.
- D. Any area that shows evidence of, or is at risk from, snow avalanches.
- E. Any area located on an alluvial fan, presently subject to or potentially subject to inundation by debris flows or deposition of stream-transported deposits.

Potential Landslide Areas

Landslide hazard areas mapped for this plan are taken from three sources:

- Washington Department of Natural Resources Landslide Areas—Data defining the extent of mapped landslides in Washington provided by the Washington Department of Natural Resources Division of Geology and Earth Resources. Compiled chiefly from pre-existing databases created by different divisions of the Department of Natural Resources.
- King County Slide Areas—Areas identified as follows in the King County Sensitive Areas Ordinance:
 - Any area with a combination of:
 - Slopes greater than 15%
 - Impermeable soils frequently interbedded with granular soils
 - Springs or groundwater seepage.
 - Any area that has shown movement in the past 10,000 years or that is underlain by mass wastage debris of that timeframe.
 - Any area potentially unstable as a result of rapid stream incision, streambank erosion or undercutting by wave action.
 - Any area that shows evidence of, or is at risk from, snow avalanches.
 - Any area located on an alluvial fan, presently subject to or potentially subject to inundation by debris flows or deposition of stream-transported deposits.
- Slope/Soils Analysis—Areas defined as follows in data provided by King County DNRP:
 - Areas with slope greater than 40%, as determined from a digital elevation model generated from 2002 LiDAR data.
 - Areas with the following soil types as identified in a 2006 surface geology dataset:

- Q_f (alluvial fans, which are formed by the deposition of sediment from floods and debris flows at a point where a steep drainage course discharges onto an area of low gradient)
- Q_{ls} (areas of discrete landslides)
- Q_{mw} (colluvium and cumulative debris from small indistinct landslides accumulated on and at the base of unstable slopes).

TSUNAMI MAPPING

Tsunami inundation area data are provided by the Washington State Department of Natural Resources, Division of Geology and Earth Resources. Tsunami inundation is based on a computer model of waves generated by the Seattle Fault (Titov et al., 1997). The model used is the finite difference model of Titov and Synolakis (1998), also known as the Method of Splitting Tsunami (MOST) model (Titov and González, 1997). It uses a grid of topographic and bathymetric elevations and calculates a wave elevation and velocity at each grid point at specified time intervals to simulate the generation, propagation and inundation of tsunamis in the Elliott Bay area. In this MOST model study, the tsunami is generated by a Seattle Fault deformation model that simulates the A.D. 900-930 event as a credible worst-case scenario of magnitude 7.3. Tsunami hazard map of the Elliott Bay area, Seattle, Washington: Modeled tsunami inundation from a Seattle Fault earthquake, by Walsh et al. 2003.

WEATHER MAPPING

Wind Power Class at 50-Meter Height

Annual average wind resource potential data are provided by the National Renewable Energy Laboratory. Wind power class is an indicator of likely resource strength, with a higher wind power class representing higher wind resource levels. The classification information is for utility-scale applications at a 50 meter height.

Annual Average Precipitation (inches) 1981-2010

Precipitation data are provided by Natural Resources Conservation Service National Water and Climatic Center's PRISM project. PRISM is a hybrid statistical-geographic approach to mapping climate. This approach uses point measurements of climate data and a digital elevation model to generate estimates of annual, monthly and event-based climatic elements. These estimates are derived for a horizontal grid from which contour lines are generated.

Annual Average Maximum Temperature (F) 1981-2010

Temperature data are provided by National Water and Climatic Center's PRISM project. PRISM is a hybrid statistical-geographic approach to mapping climate. This approach uses point measurements of climate data and a digital elevation model to generate estimates of annual, monthly and event-based climatic elements. These estimates are derived for a horizontal grid from which contour lines are generated.

Annual Average Minimum Temperature (F) 1981-2010

Temperature data are provided by National Water and Climatic Center's PRISM project. PRISM is a hybrid statistical-geographic approach to mapping climate. This approach uses point measurements of climate data and a digital elevation model to generate estimates of annual, monthly and event-based climatic elements. These estimates are derived for a horizontal grid from which contour lines are generated.

APPENDIX E. CONCEPTS AND METHODS USED FOR HAZARD MAPPING

VOLCANO MAPPING

Lahar hazards data are provided by the Washington State Department of Natural Resources, Division of Geology and Earth Resources. These data were produced as part of a project to estimate the potential economic losses from future eruptions of Mount Rainier. The Puyallup Valley was chosen as the focus for the project because it is the valley most susceptible to lahars caused by flank collapse and has the most population and property at risk (Cakir and Walsh, 2012). The following conditions were analyzed:

- Case 1—Large Lahars (Recurrence Interval 500–1000 Years) Shows areas that could be affected by cohesive lahars that originate as enormous avalanches of weak, chemically altered rock from the volcano. Case 1 lahars can occur with or without eruptive activity. The time interval between Case 1 lahars on Mount Rainier is about 500 to 1,000 years.
- Case 2—Moderate Lahars (Recurrence Interval 100–500 Years) Shows areas that could be affected by relatively large non-cohesive lahars, which are commonly caused by the melting of snow and glacier ice by hot rock fragments during an eruption, but they can also have a non-eruptive origin. The time interval between Case 2 lahars from Mount Rainier is near the lower end of the 100- to 500-year range, making these flows analogous to the so-called 100-year flood commonly considered in engineering practice.
- Post-Lahar Sedimentation—Shows areas subject to post-lahar erosion and sedimentation and the ongoing potential for flooding.

FIRE MAPPING

LANDFIRE Fire Regime Groups

The Historical Fire Regime Groups data layer from LANDFIRE categorizes simulated mean fire return intervals and fire severities into five fire regimes defined in the *Interagency Fire Regime Condition Class Guidebook* (Hann et al. 2004). The classes are defined as follows:

- Fire Regime I: 0 to 35 year frequency, low to mixed severity
- Fire Regime II: 0 to 35 year frequency, replacement severity
- Fire Regime III: 35 to 200 year frequency, low to mixed severity
- Fire Regime IV: 35 to 200 year frequency, replacement severity
- Fire Regime V: 200+ year frequency, any severity

The definitions of severity used in these categories refer to the amount of impact on the upper canopy layer of the affected area:

- Low severity—6 to 25 percent of the upper canopy layer is killed by the fire
- Mixed severity—26 to 75 percent of the upper canopy layer is killed by the fire
- Replacement severity—more than 75 percent of the upper canopy layer is killed by the fire

2008 LANDFIRE Fire Behavior Fuel Model

Fuel class data are provided by the USGS Wildland Fire Science, Earth Resources Observation and Science Center. The LANDFIRE fuel data describe the composition and characteristics of both surface fuel and canopy fuel. Thirteen typical surface fuel arrangements or “collections of fuel properties” (Anderson, 1982) were described to serve as input for Rothermel’s mathematical surface fire behavior and spread model (Rothermel, 1972). These fire behavior fuel models represent distinct distributions of fuel loadings found among surface fuel components (live and dead), size classes and fuel types. The fuel

models are described by the most common fire carrying fuel type (grass, brush, timber litter or slash), loading and surface area-to-volume ratio by size class and component, fuel bed depth and moisture of extinction.

- FBFM1: Surface fires that burn fine herbaceous fuels, cured and curing fuels, little shrub or timber present, primarily grasslands and savanna.
- FBFM2: Burns fine, herbaceous fuels, stand is curing or dead, may produce fire brands on oak or pine stands.
- FBFM3: Most intense fire of grass group, spreads quickly with wind, one third of stand dead or cured, stands average 3 feet tall.
- FBFM5: Low intensity fires, young, green shrubs with little dead material, fuels consist of litter from understory.
- FBFM6: Broad range of shrubs, fire requires moderate winds to maintain flame at shrub height, or will drop to the ground with low winds.
- FBFM8: Slow, ground burning fires, closed canopy stands with short needle conifers or hardwoods, litter consist mainly of needles and leaves, with little undergrowth, occasional flares with concentrated fuels.
- FBFM9: Longer flames, quicker surface fires, closed canopy stands of long-needles or hardwoods, rolling leaves in fall can cause spotting, dead-down material can cause occasional crowning.
- FBFM10: Surface and ground fire more intense, dead-down fuels more abundant, frequent crowning and spotting causing fire control to be more difficult.
- FBFM11: Fairly active fire, fuels consist of slash and herbaceous materials, slash originates from light partial cuts or thinning projects, fire is limited by spacing of fuel load and shade from overstory.

Wildland Urban Interface Communities at Risk

Wildland Urban Interface Areas are shown as defined by the Washington State Department of Natural Resources. Published in 2004, this dataset is based on data from the current National Fire Protection Association (NFPA 299) risk assessment, and includes one or several communities with similar wildfire risks.

REFERENCES

- Anderson, H. 1982. USDA Forest Service, Intermountain Forest and Range Experiment Station. General Technical Report. INT-122. 22 pp.
- Cakir, Recep; Walsh, T. J. 2012. Loss estimation pilot project for lahar hazards from Mount Rainier, Washington: Washington Division of Geology and Earth Resources Information Circular 113, 17 p.
- Hann, W.; Shlisky, A.; Havlina, D.; Schon, K.; Barrett, S.; DeMeo, T.; Pohl, K.; Menakis, J.; Hamilton, D.; Jones, J.; Levesque, M.; Frame, C. 2004. Interagency Fire Regime Condition Class Guidebook. Last update January 2008: Version 1.3.0 [Homepage of the Interagency and The Nature Conservancy fire regime condition class website, USDA Forest Service, US Department of the Interior, The Nature Conservancy, and Systems for Environmental Management]. [Online]. Available: www.frcc.gov.

APPENDIX E. CONCEPTS AND METHODS USED FOR HAZARD MAPPING

Palmer, S. P.; Magsino, S. L.; Bilderback, E. L.; Poelstra, J. L.; Folger, D. S.; and Niggemann, R. A. 2004. Liquefaction susceptibility and site class maps of Washington State, by county: Washington Division of Geology and Earth Resources Open-file Report 2004-20, 78 sheets, with 45 p. text. Accessed at <http://www.dnr.wa.gov/geology/pubs/ofr04-20/> (1/09/08).

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Titov, V., and F.I. González. 1997. Implementation and testing of the Method of Splitting Tsunami (MOST) model. NOAA Tech. Memo. ERL PMEL-112, NTIS: PB98-122773, NOAA/Pacific Marine Environmental Laboratory, Seattle, WA, 11 pp. [PDF Version]

Walsh, T. J., V. V. Titov, A. J. Venturato, H. O. Mofjeld, and F. I. Gonzalez. 2003. 36 x 36-in. color sheet, scale 1:50,000.

King County
Regional Hazard Mitigation Plan Update

APPENDIX F.
PLAN ADOPTION RESOLUTIONS FROM PLANNING PARTNERS

PLANNING PARTNER RESOLUTIONS ADOPTING THE REGIONAL HAZARD MITIGATION PLAN

1. King County
2. City of Algona (Not Yet Available)
3. City of Auburn
4. Town of Beaux Arts Village
5. City of Bothell
6. City of Burien
7. City of Carnation
8. City of Clyde Hill
9. City of Duvall
10. City of Federal Way
11. Town of Hunts Point
12. City of Issaquah
13. City of Kent
14. City of Kirkland
15. City of Maple Valley
16. City of Medina
17. City of Mercer Island
18. City of North Bend
19. City of Pacific
20. City of Redmond
21. City of Renton
22. City of Seatac
23. City of Shoreline
24. Town of Skykomish
25. City of Snoqualmie
26. City of Tukwila (Not Yet Available)
27. City of Woodinville
28. Coal Creek Utility District
29. Covington Water District
30. Highline Water District
31. Kent Fire Department Regional Fire Authority
32. Kent School District #415 (Not Yet Available)
33. King County Fire District No. 2
34. King County Fire District No. 45
35. King County Public Hospital District No. 1 (Valley Medical Center) (Not Yet Available)
36. King County Public Hospital District No. 2
37. King County Water District No. 19
38. King County Water District No. 20
39. King County Water District No. 90
40. King County Water District No. 111
41. King County Water District No. 125
42. Midway Sewer District
43. North City Water District
44. Riverview School District
45. Ronald Wastewater District
46. Sammamish Plateau Water & Sewer
47. Shoreline Fire Department
48. Skyway Water and Sewer District
49. Soos Creek Water & Sewer District
50. Southwest Suburban Sewer District
51. Valley Regional Fire Authority
52. Valley View Sewer District
53. Vashon Island Fire & Rescue (King County Fire Protection District 13)
54. Woodinville Water District

1. King County



KING COUNTY
Signature Report

1200 King County Courthouse
516 Third Avenue
Seattle, WA 98104

March 10, 2015

Ordinance 17996

Proposed No. 2014-0471.2

Sponsors Lambert

1 AN ORDINANCE approving and adopting the updated
2 King County Regional Hazard Mitigation Plan, as approved
3 by the Federal Emergency Management Agency.

4 BE IT ORDAINED BY THE COUNCIL OF KING COUNTY:

5 **SECTION 1. Findings:**

6 A. King County supports disaster mitigation efforts and regional disaster
7 planning.

8 B. A locally adopted plan reviewed and approved by Federal Emergency
9 Management Agency ("FEMA") is required under the Disaster Mitigation Act of 2000.

10 C. Regular revisions and updates to the five year plan are required by FEMA.

11 D. In October 2004, Ordinance 15038 approved the county's initial five year
12 Regional Hazard Mitigation Plan.

13 E In December 2009, Ordinance 16715 approved the subsequent update of the
14 Regional Hazard Mitigation Plan.

15 F. An updated plan is now required to comply with the Disaster Mitigation Act of
16 2000.

17 G. King County and other jurisdictions within King County have a cooperative
18 interest in disaster mitigation planning efforts.

Ordinance 17996

19 H. Additional agencies are expected to annex to this plan following FEMA
20 approval.

21 I. FEMA approval of this plan enables the county to seek Federal mitigation
22 project funding related to potential hazards the region may experience over the next five-
23 year planning period.

24 J. Certification of the King County council's approval of this plan is required for
25 FEMA final approval.

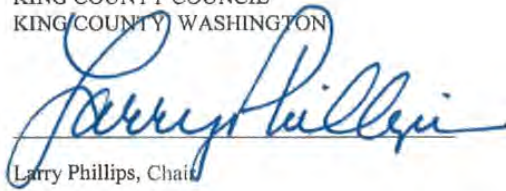
Ordinance 17996

- 26 SECTION 2. The King County council hereby approves and adopts the King
27 County Regional Hazard Mitigation Plan, Attachment A to this ordinance.
28

Ordinance 17996 was introduced on 1/20/2015 and passed by the Metropolitan King County Council on 3/9/2015, by the following vote:

Yes: 9 - Mr. Phillips, Mr. von Reichbauer, Mr. Gossett, Ms. Hague,
Ms. Lambert, Mr. Dunn, Mr. McDermott, Mr. Dembowski and Mr.
Upthegrove
No: 0
Excused: 0

KING COUNTY COUNCIL
KING COUNTY WASHINGTON

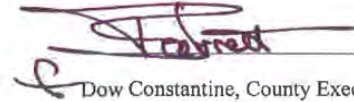


Larry Phillips, Chair

ATTEST:


Anne Noris, Clerk of the Council

APPROVED this 12th day of March, 2015.


Dow Constantine, County Executive

RECEIVED
2015 MAR 13 PM 3:34
CLERK
KING COUNTY COUNCIL

Attachments: A. King County Regional Hazard Mitigation Plan Update

2. City of Algona (Not Yet Available)

3. City of Auburn

RESOLUTION NO. 5096

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF AUBURN, WASHINGTON, AUTHORIZING THE ADOPTION OF THE 2014 KING COUNTY REGIONAL HAZARD MITIGATION PLAN INCLUDING THE CITY OF AUBURN PLAN ANNEX

WHEREAS, the City of Auburn and other jurisdictions within King County, State of Washington, have expressed a cooperative interest in disaster mitigation planning efforts; and

WHEREAS, the City supports disaster mitigation efforts and regional disaster planning; and

WHEREAS, a locally adopted plan reviewed and approved by the Federal Emergency Management Agency (FEMA) is required under the Disaster Mitigation Act of 2000, 44 CFR 201; and

WHEREAS, regular revisions and updates are required by FEMA; and

WHEREAS, FEMA has reviewed the plan proposed for adoption and approved it pending adoption by Council.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF AUBURN, WASHINGTON, HEREBY RESOLVES AS FOLLOWS:

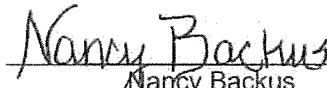
Section 1. Purpose. The City Council of the City of Auburn does hereby adopt the 2014 King County Regional Hazard Mitigation Plan including the City of Auburn plan annex.

Section 2. Implementation. The Mayor of the City of Auburn is hereby authorized to implement such administrative procedures as may be necessary to carry out the directions of this resolution.

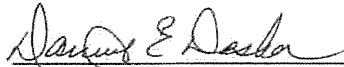
Section 3. Effective Date. This Resolution shall take effect and be in full force upon passage and signatures hereon.

DATED AND SIGNED THIS 1st DAY OF December, 2014.

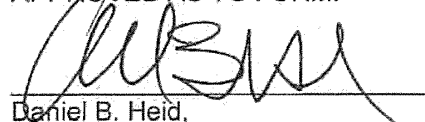
CITY OF AUBURN


Nancy Backus
MAYOR

ATTEST:


Danielle E. Daskam,
City Clerk

APPROVED AS TO FORM:


Daniel B. Heid,
City Attorney

4. Town of Beaux Arts Village

RESOLUTION NO. 293

**A RESOLUTION OF THE TOWN OF BEAUX ARTS VILLAGE
AUTHORIZING THE ADOPTION OF THE
KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE**

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS; a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy; **NOW, THEREFORE**,

**BE IT RESOLVED BY THE COUNCIL OF THE TOWN OF BEAUX ARTS VILLAGE
AS FOLLOWS:**

Section 1. The Town of Beaux Arts Village:

- a) Adopts in its entirety, Volume 1 and the Beaux Arts Village jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).
- b) Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- c) Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- d) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- e) Will help to promote and support the mitigation successes of all RHMP Planning Partners.

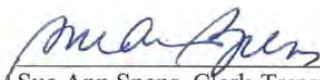
Section 2. This Resolution shall take effect immediately upon its passage.

ADOPTED by the Town Council of the Town of Beaux Arts Village this 14th day of October, 2014.

Resolution No. 293
Page 2 of 2


Richard Leider, Mayor

ATTEST:


Sue Ann Spens, Clerk-Treasurer

5. City of Bothell

RESOLUTION NO. 1322 (2014)

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BOTHELL, WASHINGTON ADOPTING THE KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE AND CITY OF BOTHELL HAZARD MITIGATION PLAN ANNEX

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF BOTHELL, WASHINGTON, DOES RESOLVE AS FOLLOWS:

Section 1. Adopts in its entirety, Volume 1 and the introduction, Chapter 5 the City of Bothell annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).

Section 2. Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.

Section 3. Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority

Section 4. Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP

Section 5. Will help to promote and support the mitigation successes of all RHMP Planning Partners

Section 6. The City Clerk is authorized to make necessary corrections to this resolution including, but not limited to, the correction of scrivener's/clerical errors, references, resolution numbering, section/subsection numbers and any references thereto.

PASSED this 21st day of October, 2014.

APPROVED:



JOSHUA FREED
MAYOR

ATTEST/AUTHENTICATED:



LAURA HATHAWAY
CITY CLERK

FILED WITH THE CITY CLERK: October 14, 2014
PASSED BY THE CITY COUNCIL: October 21, 2014
RESOLUTION NO.: 1322 (2014)

6. City of Burien

CITY OF BURIEN, WASHINGTON

RESOLUTION NO. 359

**A RESOLUTION OF THE CITY OF BURIEN, WASHINGTON,
ADOPTING THE CITY OF BURIEN'S PORTION OF THE 2014 KING
COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE**

WHEREAS, the City is vulnerable to the human and economic costs of natural, technological and societal disasters; and

WHEREAS, the City recognizes the importance of reducing or eliminating those vulnerabilities for the overall good and welfare of the community; and

WHEREAS, the City's representatives and staff have identified, justified and prioritized a number of proposed projects and programs to mitigate the vulnerabilities of Burien to the impacts of future disasters; and

WHEREAS, these proposed projects and programs have been incorporated into the initial edition of the Regional Mitigation Plan (2004) that has been prepared and issued for consideration and implementation by the communities of King County; and

WHEREAS, regular revisions and updates to the Plan are required by the Federal Emergency Management Administration.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF BURIEN, WASHINGTON, DOES RESOLVE AS FOLLOWS:

Section 1. The City Council hereby accepts and approves of the King County Planning Area-Wide Elements and the Burien's designated portion of the Regional Hazard Mitigation Plan, herein included by reference as Exhibit A, and as approved by the Federal Emergency Management Administration (FEMA).

Section 2. The City Manager is requested and instructed to pursue available funding opportunities for implementation of the proposals designated therein.

Section 3. The City of Burien will, upon receipt of such funding or other necessary resources, seek to implement the proposals contained in its section of the strategy.

Section 4. The City of Burien will continue to participate in the periodic updating and expansion of the Regional Hazard Mitigation Plan.

Section 5. The City of Burien will seek to encourage the businesses, industries and community groups operating within and/or for the benefit of the City of Burien to participate in the periodic updating and expansion of the Regional Hazard Mitigation Plan.

Section 6. Effective Date. This resolution shall take effect immediately upon passage by the Burien City Council.

Section 7. Effective Date. This resolution shall take effect immediately upon passage by the Burien City Council.

ADOPTED BY THE CITY COUNCIL OF THE CITY OF BURIEN, WASHINGTON, AT
A REGULAR MEETING THEREOF THIS 13TH DAY OF OCTOBER, 2014.

CITY OF BURIEN
/s/ Lucy Krakowiak, Mayor

ATTEST/AUTHENTICATED:
/s/ Monica Lusk, City Clerk

Approved as to form:
/s/ Craig D. Knutson, City Attorney

Filed with the City Clerk: October 9, 2014
Passed by the City Council: October 13, 2014
Resolution No. 359

7. City of Carnation

CITY OF CARNATION
KING COUNTY, WASHINGTON

RESOLUTION NO. 392

A RESOLUTION OF THE CITY COUNCIL OF THE
CITY OF CARNATION, WASHINGTON, ADOPTING
THE UPDATED KING COUNTY REGIONAL HAZARD
MITIGATION PLAN.

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS; a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy; NOW THEREFORE,

THE CITY COUNCIL OF THE CITY OF CARNATION, WASHINGTON,
HEREBY RESOLVES AS FOLLOWS:

Section 1. Adoption of the updated King County Regional Hazard Mitigation Plan.

- 1.) The City of Carnation adopts in its entirety, Volume 1 and the introduction,

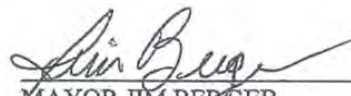
Chapter 7 the City of Carnation jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).

- 2.) The City of Carnation will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- 3.) The City of Carnation will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- 4.) The City of Carnation will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- 5.) The City of Carnation will help to promote and support the mitigation successes of all RHMP Planning Partners.

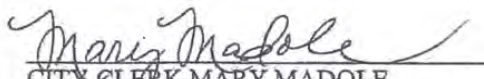
Section 2. Effective Date. This resolution shall take effect and be in full force immediately upon passage by the City Council.

ADOPTED BY THE CITY COUNCIL AT A REGULAR MEETING
THEREOF ON THE 18TH DAY OF NOVEMBER, 2014.

CITY OF CARNATION


MAYOR JIM BERGER

ATTEST/AUTHENTICATED:


CITY CLERK MARY MADOLE

FILED WITH THE CITY CLERK: 11/10/2014
PASSED BY THE CITY COUNCIL: 11/18/2014
RESOLUTION NO.: 392

8. City of Clyde Hill



RESOLUTION NO. 565

**A RESOLUTION OF THE CITY OF CLYDE HILL, WASHINGTON
AUTHORIZING THE ADOPTION OF THE
KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE**

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS; a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

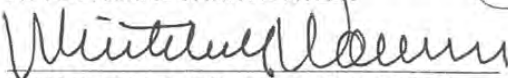
**NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF CLYDE HILL HEREBY RESOLVES
AS FOLLOWS:**

- 1.) Adopts in its entirety, Volume 1 and the introduction, the City of Clyde Hill Annex (chapter 8) and the appendices of Volume 2 of the King County Regional Hazard Mitigation Plan Update (RHMP).
- 2.) Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- 3.) Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- 4.) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- 5.) Will help to promote and support the mitigation successes of all RHMP Planning Partners.

PASSED BY AFFIRMATIVE VOTES OF A MAJORITY OF THE CITY COUNCIL ON THE 14th DAY OF OCTOBER 2014, AND SIGNED IN AUTHENTICATION OF SUCH PASSAGE ON THE SAME DAY.


MAYOR, GEORGE S. MARTIN

ATTESTED/AUTHENTICATED:


CITY CLERK, MITCHELL WASSERMAN

9. City of Duvall

**CITY OF DUVALL
WASHINGTON**

RESOLUTION NO. 14-18

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY
OF DUVALL, WASHINGTON, AUTHORIZING THE ADOPTION OF THE
KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE**

WHEREAS, all of King County including the City of Duvall has exposure to natural hazards that increase the risk to life, property, environment and the economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS; a coalition of King County, Cities, Towns and Special Purpose Districts including Duvall has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

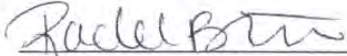
NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF DUVALL, WASHINGTON, DO RESOLVE AS FOLLOWS:

Section 1. Adoption of the 2014 King County Regional Hazard Mitigation Plan Update. The King County Regional Hazard Mitigation Plan Update, Volume 1 and Chapter I(Introduction), Chapter 9 (City of Duvall Annex), and the appendices of Volume 2, attached hereto and incorporated herein, is hereby adopted as shown in Exhibit A.

Section 2. Severability. Should any section, paragraph, sentence, clause or phrase of this Resolution, or its application to any person or circumstance, be declared unconstitutional or otherwise invalid for any reason, or should any portion of this Resolution be pre-empted by state or federal law or regulation, such decision or pre-emption shall not affect the validity of the remaining portions of this Resolution or its application to other persons or circumstances.

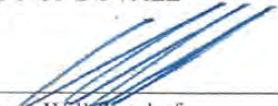
PASSED BY THE CITY COUNCIL AT A REGULAR MEETING THEREOF ON THE
23 DAY OF OCTOBER, 2014.

Approved as to form:



Rachel Turpin, City Attorney

CITY OF DUVALL



Mayor Will Ibershof

ATTEST/AUTHENTICATED:



Jodee Schwinn, City Clerk

Passed by the City Council: 10-23-14
Resolution No.: 14-18

10. City of Federal Way

COUNCIL MEETING DATE: 1/20/2015

ITEM #:

5c

**CITY OF FEDERAL WAY
CITY COUNCIL
AGENDA BILL**

SUBJECT: KING COUNTY REGIONAL HAZARD MITIGATION PLAN VOLUME 1 AND CHAPTER 10 CITY OF FEDERAL WAY UPDATE ANNEX

POLICY QUESTION: Should the City of Federal Way adopt all of volume 1 and Chapter 10 City of Federal Way Update Annex of the King County Regional Hazard Mitigation Plan?

COMMITTEE: Parks, Recreation, Human Services, and Public Safety

MEETING DATE: January 13th
2015

CATEGORY:

☒ **Consent**

☐ **Ordinance**

☐ **Public Hearing**

☐ **City Council Business**

☐ **Resolution**

☐ **Other**

STAFF REPORT BY: Ray Gross, Emergency Manager *RG*

DEPT: Emergency Management

Attachments: King County Regional Hazard Mitigation Plan Executive Summary

Chapter 10 City of Federal Way Update Annex of the King County Regional Hazard Mitigation Plan

Options Considered: Option 1. Approve the adoption of all of volume 1 and Chapter 10 City of Federal Way Update Annex of the King County Regional Hazard Mitigation Plan?

Option 2. Do not approve adoption and provide direction to staff.

MAYOR'S RECOMMENDATION: Approval of Option 1. Approve the adoption of all of volume 1 and Chapter 10 City of Federal Way Update Annex of the King County Regional Hazard Mitigation Plan.

MAYOR APPROVAL:

JF 12/15/14
Committee
Initial/Date

JF 12/15/14
Council
Initial/Date

DIRECTOR APPROVAL:

Initial/Date

CHIEF OF STAFF:

John 12/15/2014
Committee
Initial/Date

D.L.H. 12/15/2014
Council
Initial/Date

COMMITTEE RECOMMENDATION: *I move to forward the adoption of the King County Regional Hazard Mitigation Plan Volume 1 and Chapter 10 City of Federal Way Update Annex to the January 20th, 2015 City Council consent agenda for approval.*

Wesley Hord
Committee Chair

Monty Pae
Committee Member

Doni Rucker
Committee Member

PROPOSED COUNCIL MOTION: *"I move approval of the adoption of the King County Regional Hazard Mitigation Plan Volume 1 and Chapter 10 City of Federal Way Update Annex"*

(BELOW TO BE COMPLETED BY CITY CLERKS OFFICE)

COUNCIL ACTION:

☒ **APPROVED**

☐ **DENIED**

☐ **TABLED/DEFERRED/NO ACTION**

☐ **MOVED TO SECOND READING** (ordinances only)

REVISED - 08/12/2010

COUNCIL BILL #

1ST reading

Enactment reading

ORDINANCE #

RESOLUTION #

12/20/15



**CITY COUNCIL
REGULAR MEETING AGENDA
Council Chambers - City Hall
January 20, 2015 – 7:00 p.m.
www.cityoffederalway.com**

 **CALL MEETING TO ORDER**

 **PLEDGE OF ALLEGIANCE**

3. PRESENTATIONS

-  Certificate of Recognition – Robbins Family
-  One Night Count of the Homeless
- c. Mayor's Emerging Issues and Report
 -  Weyerhaeuser Property Update/Heartland Principal/Senior Managing Director Jim Reinhardtsen
 - Community Outreach Coordinator – Steve McNey
 - 30th District Annual Legislative Breakfast Recap
 - MLK Jr. Event Recap & Recognition of Decatur HS Students
 - Government Finance Officer Association Award
 - Council Retreat (January 31st)

4. CITIZEN COMMENT

PLEASE COMPLETE A PINK SLIP AND TURN IT IN TO THE CITY CLERK PRIOR TO SPEAKING. When recognized by the Mayor, come forward to the podium and state your name for the record. Please limit your comments to three minutes. The Mayor may interrupt comments that exceed three minutes, relate negatively to other individuals, or are otherwise inappropriate.

5. CONSENT AGENDA

Items listed below have been previously reviewed in their entirety by a Council Committee of three members and brought before full Council for approval; all items are enacted by one motion. Individual items may be removed by a Councilmember for separate discussion and subsequent motion.

- a. Minutes: January 6, 2015 City Council Regular and Special Meeting Minutes
- b. Grant Funding for Transportation Improvement Projects – Authorization to Accept Grant Funding
-  c. King County Regional Hazard Mitigation Plan Volume 1 and Chapter 10, City of Federal Way Update Annex
- d. 2015 Parks and Recreation Commission Work Plan
- e. First Amendment for Parking Lot Vacuuming Services
- f. Third Amendment for Tree Services

The Council may add items and take action on items not listed on the agenda.

City of Federal Way City Council Parks, Recreation, Human Services & Public Safety Committee January 13, 2015 5:30 p.m.		City Hall Hylebos Conference Room
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MEETING AGENDA

1. CALL TO ORDER
2. PUBLIC COMMENT (3 minutes)
3. COMMISSION COMMENTS
4. COMMITTEE BUSINESS

Topic	Title/Description	Presenter	Page	Action or Info	Council Date
A.	Approval of Minutes: November 10, 2014		3	Action	N/A
B.	King County Regional Hazard Mitigation Plan Volume 1 and Chapter 10 City of Federal Way Update Annex	R. Gross		Action	Consent 1/20/15
C.	2015 Parks and Recreation Commission Work Plan	S. Ikerd		Action	Consent 1/20/15
D.	First Amendment for Parking Lot Vacuuming Services	S. Ikerd		Action	Consent 1/20/15
E.	Third Amendment for Tree Services	S. Ikerd		Action	Consent 1/20/15
F.	First Amendment for Landscape Maintenance Services	S. Ikerd		Action	Consent 1/20/15
G. ✓	Washington Traffic Safety Commission (WTSC) Grant – Amendment #1	A. Hwang		Information Only	N/A
H. ✓	Amendment to FWRC 6.35.030 Related to Pedestrian Interference and Aggressive Begging	K. Sumpter		Action	Ordinance First Reading 1/20/15
I.	Puget Sound Emergency Radio Network (PSERN) Interlocal Agreement	R. Call		Action	Consent 1/20/15
5.	PENDING ITEMS				
	• Veterans Memorial • Banners • Festivals				
6.	NEXT MEETING: February 9, 2015				
7.	ADJOURNMENT				

Committee Members

Susan Honda, Chair
Dini Duclos
Martin Moore

City Staff

John Hutton, Director of Parks and Recreation
Mary Jaenicke, Administrative Assistant II

K:\PRHSPS Committee\2015\01132015 prhsp agenda.doc

11. Town of Hunts Point

RESOLUTION NO. 14-237

**A RESOLUTION OF THE TOWN OF HUNTS POINT
AUTHORIZING THE ADOPTION OF THE
KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE**

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS; a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy; **NOW, THEREFORE**,

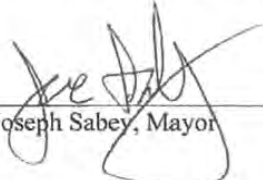
**BE IT RESOLVED BY THE COUNCIL OF THE TOWN OF HUNTS POINT AS
FOLLOWS:**

Section 1. The Town of Hunts Point:

- a) Adopts in its entirety, Volume 1 and the introduction, the Hunts Point jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).
- b) Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- c) Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- d) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- e) Will help to promote and support the mitigation successes of all RHMP Planning Partners.

Section 2. This Resolution shall take effect immediately upon its passage.

ADOPTED by the Council of the Town of Hunts Point, Washington, this 6th day of October, 2014.



Joseph Sabey, Mayor

ATTEST:



Sue Ann Spens, Clerk-Treasurer

12. City of Issaquah

RESOLUTION NO. 2014-12

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF ISSAQUAH, WASHINGTON, UPDATING THE CITY'S HAZARD MITIGATION PLAN AS AN ANNEX TO THE INTERJURISDICTIONAL REGIONAL HAZARD MITIGATION PLAN UPDATE FOR STATE AND FEDERAL ACCEPTANCE.

WHEREAS, the City of Issaquah has updated its exiting Hazard Mitigation Plan as required by Disaster Mitigation Act of 2000, and

WHEREAS, the City of Issaquah's Hazard Mitigation Plan 2014 Update is an annex to the King County Regional Hazard Mitigation Plan Update, and

WHEREAS, to maintain its current community flood hazard rating the City of Issaquah is required to adopt its Hazard Mitigation Plan 2014 Update prior October 1, 2014, and

WHEREAS, the City of Issaquah is required to adopt its Hazard Mitigation Plan 2014 Update prior to State and Federal review, and

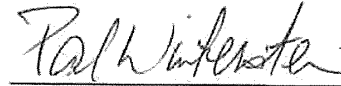
WHEREAS, the Council Services and Safety Committee has reviewed the proposed plan and recommends adoption of the City of Issaquah's Hazard Mitigation Plan 2014 Update, NOW THEREFORE,

THE CITY COUNCIL OF THE CITY OF ISSAQUAH, WASHINGTON,
DOES RESOLVE AS FOLLOWS:

Section 1. The City Council of the City of Issaquah hereby accepts and approves the King County Regional Hazard Mitigation Plan Update Volume I and the City of Issaquah Annex located in Volume IIb and authorizes the Administration to modify the plan as may be required by the Federal review process.

PASSED by the City Council this 2nd day of September, 2014.

APPROVED:



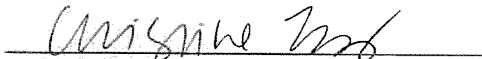
PAUL WINTERSTEIN, COUNCIL PRESIDENT

APPROVED by the Mayor this 2nd day of September, 2014.



FRED BUTLER, MAYOR

ATTEST:


CHRISTINE EGGERS, CITY CLERK

APPROVED AS TO FORM:

BY 
OFFICE OF THE CITY ATTORNEY

RESOLUTION NO. 2014-12
AGENDA BILL NO: AB 6840
DATE PASSED: 9/2/2014

13. City of Kent

RESOLUTION NO. 1898

A RESOLUTION of the City Council of the City of Kent, Washington, adopting the current form of the King County Regional Hazard Mitigation Plan, including its 2014 update, for application in the City of Kent.

RECITALS

A. The federal Disaster Mitigation Act of 2000 (42 U.S.C. § 5121, et seq.) provides that as a condition of receipt of federal funds for hazard mitigation measures, a local government must establish a mitigation plan that outlines processes for identifying natural hazards, risks, and vulnerabilities of that local government. Prior to 2000, federal disaster funding focused on disaster relief and recovery, with limited funding available for hazard mitigation planning. The Disaster Mitigation Act increased the emphasis on planning for disasters before they occur.

B. The purpose of a mitigation plan is to reduce the loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters and to provide a source of pre-disaster hazard mitigation funding that will assist the City to ensure continued functionality of critical services and facilities in the event of a natural disaster.

***King County Regional Hazard
Mitigation Plan – Adopt***

C. Sometime after the Disaster Mitigation Act was adopted, many governmental agencies within King County either adopted their own Local Hazard Mitigation Plan or coordinated with other King County local governments or special purpose districts to adopt for application in their respective jurisdictions the 2004 version of the King County Regional Hazard Mitigation Plan, which was subsequently updated in 2009. Through its enactment of Resolution No. 1689, passed on November 2, 2004, the Kent City Council chose to adopt for application in Kent a Local Hazard Mitigation Plan, as opposed to adopting the King County Regional Hazard Mitigation Plan. The City's Local Hazard Mitigation Plan has not been amended since its original adoption in 2004.

D. The King County Regional Hazard Mitigation Plan has been updated for a second time following its original 2004 enactment. Representatives from the City of Kent have been involved in creating that regional update by serving as a municipal planning partner. Having considered the King County Regional Hazard Mitigation Plan, the Kent City Council would like return to a truly regional effort by adopting the regional plan, in its present form and including the proposed 2014 update, for application in the City of Kent.

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF KENT, WASHINGTON, DOES HEREBY RESOLVE AS FOLLOWS:

RESOLUTION

SECTION 1. – *King County Regional Hazard Mitigation Plan - Adopt.*
The King County Regional Hazard Mitigation Plan, in its current form and including the proposed June 2014, is adopted for application in the City of Kent, in a form substantially similar to that attached and incorporated as Exhibit A, and as provided within this section. Volume 1 of the King County Regional Hazard Mitigation Plan, entitled "Planning-Area-Wide Elements," is

***King County Regional Hazard
Mitigation Plan – Adopt***

adopted in its entirety, including subsequent amendments or updates that may occur in the future. Volume 2 of the King County Regional Hazard Mitigation Plan is adopted to the extent applicable to the City of Kent and specifically including Chapter 13, entitled "City of Kent Update Annex," including subsequent amendments, updates, or any changes to numbering or identification that may occur in the future. The current form of the King County Regional Hazard Mitigation Plan, not including the text of the June 2014 update, is available through the City's Office of Emergency Management. The final version of the King County Regional Hazard Mitigation Plan that includes the June 2014 update, and any future amendments or updates, will also be available through the City's Office of Emergency Management once those updates or amendments are approved by both the Washington State Emergency Management Division and the Federal Emergency Management Agency.

SECTION 2. – *2004 Local Hazard Mitigation Plan - Repealed.* Upon the effective date of this resolution, the 2004 Local Hazard Mitigation Plan adopted by Resolution No. 1689 is repealed and will no longer be effective for application in the City of Kent.

SECTION 3. – *Savings.* If any section, subsection, paragraph, sentence, clause or phrase of this resolution is declared unconstitutional or invalid for any reason, such decision shall not affect the validity of the remaining portions of this resolution.

SECTION 4. – *Ratification.* Any act consistent with the authority and prior to the effective date of this resolution is hereby ratified and affirmed.

SECTION 5. – *Corrections by City Clerk.* Upon approval of the City Attorney, the City Clerk is authorized to make necessary corrections to this resolution or its exhibit, including the correction of clerical errors;

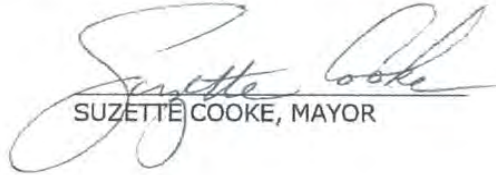
***King County Regional Hazard
Mitigation Plan – Adopt***

references to other local, state or federal laws, codes, rules, or regulations; or resolution numbering and section/subsection numbering.

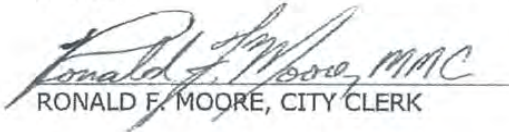
SECTION 6. – Effective Date. This resolution shall take effect and be in force immediately upon its passage

PASSED at a regular open public meeting by the City Council of the City of Kent, Washington, this 16th day of September, 2014.

CONCURRED in by the Mayor of the City of Kent this 16th day of September, 2014.


SUZETTE COOKE, MAYOR

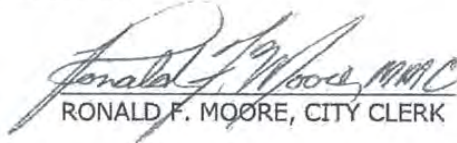
ATTEST:


RONALD F. MOORE, CITY CLERK

APPROVED AS TO FORM:


TOM BRUBAKER, CITY ATTORNEY

I hereby certify that this is a true and correct copy of Resolution No. 1898 passed by the City Council of the City of Kent, Washington, the 16th day of September, 2014.


RONALD F. MOORE, CITY CLERK

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**King County Regional Hazard
Mitigation Plan – Adopt**

14. City of Kirkland

RESOLUTION R-5095

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF KIRKLAND
ADOPTING THE 2014 REGIONAL HAZARD MITIGATION PLAN UPDATE,
INCLUDING THE COMPONENTS THAT ARE SPECIFIC TO THE CITY OF
KIRKLAND.

1 WHEREAS, hazard mitigation is the use of long-term and short-
2 term policies, programs, projects, and other activities to alleviate the
3 death, injury, and property damage that can result from a disaster; and
4

5 WHEREAS, the City of Kirkland is committed to creating and
6 sustaining a community that is more resilient in disasters; and
7

8 WHEREAS, King County and a partnership of local governments
9 within the County have developed and maintained a Regional Hazard
10 Mitigation Plan to reduce risks from natural disasters; and
11

12 WHEREAS, the Plan complies with hazard mitigation planning
13 requirements which must be met in order to maintain eligibility for
14 funding under Federal Emergency Management Grant Programs; and
15

16 WHEREAS, federal regulations require periodic updates of
17 hazard mitigation plans to reevaluate recommendations, monitor the
18 impacts of actions that have been accomplished, and determine if there
19 is a need to change the focus of mitigation strategies; and
20

21 WHEREAS, the King County Office of Emergency Management
22 and representatives from 53 different cities, schools, fire districts,
23 hospitals and utility districts ("Partners") have collaborated to develop
24 an updated Regional Hazard Mitigation Plan; and
25

26 WHEREAS, the updated Plan contains two volumes: Volume 1
27 which contains components that apply to all Partners and the broader
28 planning area; and Volume 2 which contains the components that are
29 jurisdiction-specific, with a dedicated "Annex" for each Partner; and
30

31 WHEREAS, the Council has determined the entire Regional
32 Hazard Mitigation Plan Update should be adopted, including the City of
33 Kirkland Annex.
34

35 NOW, THEREFORE, be it resolved by the City Council of the City
36 of Kirkland as follows:

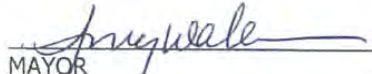
R-5095

37 Section 1. The 2014 Regional Hazard Mitigation Plan Update,
38 Volumes 1 and 2, are adopted and shall be available on file with Kirkland
39 Fire and Building Department Emergency Management Division.
40

41 Section 2. The City of Kirkland Annex to the 2014 Regional
42 Hazard Mitigation Plan Update, attached as Exhibit A and incorporated
43 by this reference, is adopted and will be available on file with the City
44 Clerk.
45

46 Passed by majority vote of the Kirkland City Council in open
47 meeting this 6th day of January, 2015.
48

49 Signed in authentication thereof this 6th day of January, 2015.
50


MAYOR

Attest:


City Clerk

15. City of Maple Valley

CITY OF MAPLE VALLEY, WASHINGTON

RESOLUTION NO. R-14-1009

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MAPLE VALLEY, WASHINGTON, ADOPTING VOLUME 1 AND PORTIONS OF VOLUME 2 OF THE KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE

WHEREAS, the City of Maple Valley has exposure to natural hazards that increase the risk to life, property, environment and the economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS; a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED THAT THE CITY COUNCIL OF THE CITY OF MAPLE VALLEY:

Section 1. Adopts the following elements of the King County Regional Hazard Mitigation Plan ("RHMP") update: all of Volume 1; the Introduction and Appendices of Volume 2; and The City of Maple Valley Annex Chapter 15 of Volume 2b of the RHMP.

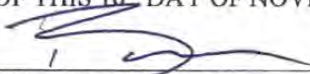
Section 2. Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.

Section 3. Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.

Section 4. Will continue to participate in the Planning Partnership as described by the RHMP.

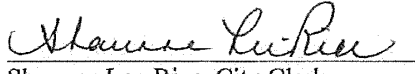
Section 5. Will help to promote and support the mitigation successes of all RHMP Planning Partners.

APPROVED BY THE CITY COUNCIL OF THE CITY OF MAPLE VALLEY, WASHINGTON,
AT A REGULAR MEETING THEREOF THIS 10th DAY OF NOVEMBER, 2014.

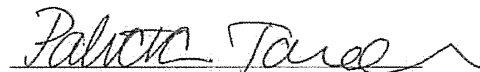


William T. Allison, Mayor

ATTEST:


Shaunna Lee-Rice, City Clerk

APPROVED AS TO FORM;


Patricia Taraday, City Attorney

16. City of Medina

CITY OF MEDINA, WASHINGTON

RESOLUTION NO. 372

**A RESOLUTION OF THE CITY OF MEDINA, WASHINGTON
AUTHORIZING THE ADOPTION OF THE KING COUNTY REGIONAL HAZARD
MITIGATION PLAN UPDATE**

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

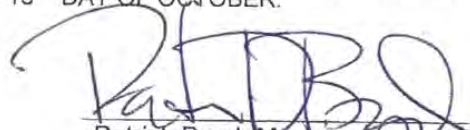
WHEREAS; a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy.

THE CITY COUNCIL OF THE CITY OF MEDINA, WA, DOES RESOLVES AS FOLLOWS:

- 1.) Adopts in its entirety, Volume 1 and the introduction, chapter 2b the Medina jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).
- 2.) Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- 3.) Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- 4.) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- 5.) Will help to promote and support the mitigation successes of all RHMP Planning Partners.

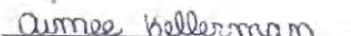
PASSED BY THE CITY COUNCIL ON THE 13TH DAY OF OCTOBER AND SIGNED IN
AUTHENTICATION OF ITS PASSAGE THE 13TH DAY OF OCTOBER.


Patrick Boyd, Mayor

Approved as to form:


Kari Sand, City Attorney
Kenyon Disend, PLLC

Attest:


Aimee Kellerman, City Clerk

17. City of Mercer Island

**CITY OF MERCER ISLAND
RESOLUTION NO. 1497**

**A RESOLUTION ADOPTING THE KING COUNTY REGIONAL 2014 HAZARD
MITIGATION PLAN AS THE OFFICIAL HAZARD MITIGATION PLAN FOR
THE CITY OF MERCER ISLAND**

WHEREAS, hazard mitigation planning is the process of determining how to reduce or eliminate the loss of life and property damage resulting from natural and human-caused hazards;

WHEREAS, the King County Regional 2014 Hazard Mitigation Plan is a plan that meets the State of Washington, Military Department, Emergency Management Division, Hazard Mitigation Section, and the Federal Emergency Management Agency requirements for compliance with the Disaster Mitigation Act of 2000 (44CFR 201.6); (Public Law 106-390)

WHEREAS, the King County Regional 2014 Hazard Mitigation Plan provides a current framework for natural hazards and selected man-made hazards for hazard reduction in the community, the framework for the plan has been reviewed through a public involvement process;

WHEREAS, all of King County has experienced hazards to its community in the past;

WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

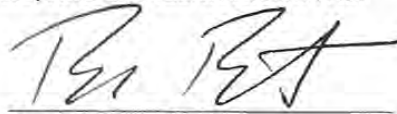
WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to impacts of natural hazards, develops a mitigation strategy with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

WHEREAS, it is concluded that the adoption of King County Regional 2014 Hazard Mitigation Plan is necessary and in the public interest.

NOW, THEREFORE, IT IS HEREBY RESOLVED THAT THE CITY OF MERCER ISLAND:

1. Adopts in its entirety, Volume 1, Volume 2b, and the appendices in Volume 2 of the King County Regional 2014 Hazard Mitigation Plan (RHMP) Update.
2. Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
3. Will help to promote and support the mitigation successes of all RHMP Planning Partners.

PASSED BY THE CITY COUNCIL OF THE CITY OF MERCER ISLAND, WASHINGTON AT ITS REGULAR MEETING ON THE 23RD DAY OF FEBRUARY 2015, AND SIGNED IN APPROVAL.


Bruce Bassett, Mayor

ATTEST:


Allison Spietz, City Clerk

18. City of North Bend

RESOLUTION 1674

A RESOLUTION OF THE CITY OF NORTH BEND, WASHINGTON, AUTHORIZING THE ADOPTION OF THE KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF NORTH BEND, WASHINGTON, DOES HEREBY RESOLVE AS FOLLOWS:

Section 1. The City of North Bend adopts in its entirety, Volume 1 and the introduction, Chapter 18, the City of North Bend jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).

Section 2. The City will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.

Section 3. The City of North Bend will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.

Section 4. The City of North Bend will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.

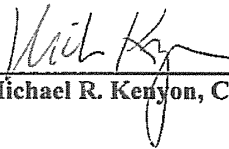
Section 5. The City of North Bend will help to promote and support the mitigation successes of all RHMP Planning Partners.

PASSED BY THE CITY COUNCIL OF THE CITY OF NORTH BEND,
WASHINGTON, AT A REGULAR MEETING THEREOF, THIS 17TH DAY OF
FEBRUARY, 2015.

CITY OF NORTH BEND:


Kenneth G. Hearing, Mayor

APPROVED AS TO FORM:


Michael R. Kenyon, City Attorney

ATTEST/AUTHENTICATED:

Effective: February 17, 2015
Posted: February 18, 2015


Susie Oppedal, City Clerk

19. City of Pacific

**CITY OF PACIFIC
ORDINANCE NO. 2014-1884**

AN ORDINANCE OF THE CITY OF PACIFIC, APPROVING AND
ADOPTING THE UPDATED KING COUNTY REGIONAL
HAZARD MITIGATION PLAN AS APPROVED BY THE FEDERAL
EMERGENCY MANAGEMENT AGENCY (FEMA).

WHEREAS, King County supports disaster mitigation efforts and regional disaster planning; and

WHEREAS, a locally adopted plan reviewed and approved by Federal Emergency Management Agency (FEMA) is required under the Disaster Mitigation Act of 2000 (Public Law 106-390), a federal act to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act to authorize a program for predisaster mitigation, to streamline the administration of disaster relief, to control the Federal costs of disaster assistance; and

WHEREAS, regular revisions and updates to the five year plan are required by FEMA; and

WHEREAS, in October 2004, the King County Council approved the County's initial five year Regional Hazard Mitigation Plan; and

WHEREAS, In December of 2009, the King County Council approved the subsequent update of the Regional Hazard Mitigation Plan; and

WHEREAS, an updated plan is now required to comply with the Disaster Mitigation Act of 2000, and

WHEREAS, the City of Pacific and other jurisdictions within King County have a cooperative interest in disaster mitigation planning efforts, and

WHEREAS, additional agencies are expected to annex to this plan following FEMA approval, and

WHEREAS, FEMA approval of this plan enables the County to seek Federal mitigation project funding related to potential hazards the region may experience over the next five year planning period; and

WHEREAS, certification of the King County Council's approval of this plan is required for FEMA final approval; Now, therefore,

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF PACIFIC,
WASHINGTON AS FOLLOWS:

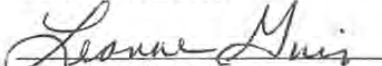
SECTION 1. The City Council of the City of Pacific hereby approves and adopts the King County Regional Hazard Mitigation Plan, which is attached to this Ordinance as "Attachment A" and incorporated herein by this reference.

SECTION 2. The Pacific City Council authorizes the King County Office of Emergency Management to make any required FEMA revisions to updated King County Regional Hazard Mitigation Plan required by FEMA final approval.

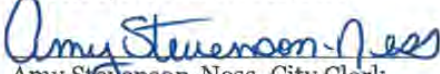
SECTION 3. This Ordinance shall be published in the official newspaper of the City of Pacific and shall take effect and be in full force five days after the date of publication.

PASSED BY THE CITY COUNCIL AT A REGULAR MEETING THEREOF ON THE 8TH DAY OF DECEMBER, 2014.

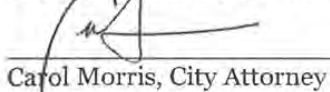
CITY OF PACIFIC


Leanne Guier, Mayor

ATTEST/AUTHENTICATED


Amy Stevenson-Ness, City Clerk

APPROVED AS TO FORM


Carol Morris, City Attorney

20. City of Redmond

**CITY OF REDMOND
RESOLUTION NO. 1421**

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF REDMOND, WASHINGTON, ADOPTING THE UPDATED KING COUNTY REGIONAL HAZARD MITIGATION PLAN, VOLUME 1 AND THE CITY OF REDMOND ANNEX TO THE PLAN, AS APPROVED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA)

WHEREAS, Section 322 of the Federal Disaster Mitigation Act of 2000 requires local government agencies to develop and submit an All-Hazards Mitigation Plan in order to receive future Hazard Mitigation Grant Program Funds; and

WHEREAS, the City has knowledge and experience that natural and man-made hazard events pose threats to lives and cause damages to property within the City of Redmond; and

WHEREAS, the City supports disaster mitigation efforts and regional disaster planning; and

WHEREAS, staff working with technical experts and the King County Office of Emergency Management have used available technologies, information, and historical documents to conduct a comprehensive risk reduction analysis process resulting in the preparation of the King County Regional Hazard Mitigation Plan (KCRHMP) and the City of Redmond Hazard Mitigation Plan (HMP) Update Annex; and

WHEREAS, the KCRHMP formalizes the County and City's comprehensive efforts to make the region safer through preventing damage in the built environment; and

WHEREAS, the Redmond HMP Update Annex builds on the objectives and actions established in the 2004 and 2009 Redmond HMPs and the City of Redmond's Comprehensive Plan; and

WHEREAS, the Redmond Update Annex has been reviewed by all relevant City departments; and

WHEREAS, the KCRHMP, including the Redmond Annex, has been reviewed by Washington State Department of Emergency Management and the Federal Emergency Management Agency Region X; and

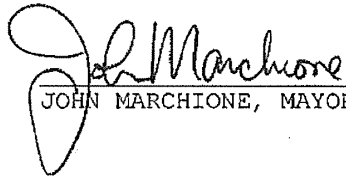
WHEREAS, the KCRHMP update was presented to Council and was available for public comment and review for the required time period; and

WHEREAS, approval of the HMP Update by FEMA constitutes formal completion of the plan and establishes eligibility for the City to pursue Hazard Mitigation funds.

NOW, THEREFORE, BE IT RESOLVED, that the Redmond City Council does hereby adopt the King County Regional Hazard Mitigation Plan and the City of Redmond Update Annex in accordance with the Federal Disaster Mitigation Act of 2000 thereby meeting the eligibility requirements for the potential receipt of Hazard Mitigation Grant Funds.

ADOPTED by the Redmond City Council this 3rd day of March,
2015.

APPROVED:


JOHN MARCHIONE, MAYOR

ATTEST:


MICHELLE M. HART, MMC, CITY CLERK

(SEAL)

FILED WITH THE CITY CLERK: February 17, 2015
PASSED BY THE CITY COUNCIL: March 3, 2015
RESOLUTION NO: 1421

YES: Allen, Carson, Flynn, Margeson, Myers, Shutz, Stilin

21. City of Renton

CITY OF RENTON, WASHINGTON

RESOLUTION NO. 4241

A RESOLUTION OF THE CITY OF RENTON, WASHINGTON, ADOPTING THE KING COUNTY REGIONAL HAZARD MITIGATION PLAN AND ANNEXING THE CITY OF RENTON TO THE PLAN.

WHEREAS, the City and the surrounding areas are subject to a wide range of natural and anthropogenic hazards, including floods, winter storms, earthquakes, landslides, hazardous material spills and more; and

WHEREAS, the City adopted the City of Renton Hazard Mitigation Plan on April 2, 2012; and

WHEREAS, the City and other jurisdictions within King County wish to participate in cooperative disaster planning efforts; and

WHEREAS, the City has the opportunity to annex as a planning partner to the King County Regional Hazard Mitigation Plan in order to join more than 50 other cities, schools, fire districts, hospitals and utility districts to collaborate with King County on disaster planning; and

WHEREAS, the City of Renton Hazard Mitigation Plan will be incorporated into the King County Regional Hazard Mitigation Plan;

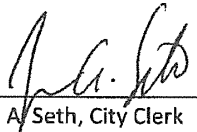
NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF RENTON, WASHINGTON, DOES RESOLVE AS FOLLOWS:

SECTION I. The above recitals are found to be true and correct in all respects.

SECTION II. The King County Hazard Mitigation Plan is hereby adopted by the City of Renton and the City of Renton is authorized to annex to the plan.

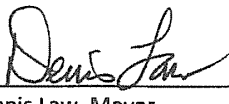
RESOLUTION NO. 4241

PASSED BY THE CITY COUNCIL this 9th day of February, 2015.



Jason A. Seth, City Clerk

APPROVED BY THE MAYOR this 9th day of February, 2015.



Denis Law, Mayor

Approved as to form:



Lawrence J. Warren, City Attorney



RES.1658:1/6/15:scr

22. City of Seatac



4800 South 188th Street
SeaTac, WA 98188-8605

City Hall: 206.973.4800

Fax: 206.973.4809

TDD: 206.973.4808

April 30, 2015

King County Office of Emergency Management
3511 NE 2nd St.
Renton, WA 98056

RE: City of SeaTac's adoption of the King County RHMP

To Whom It May Concern:

I have been asked to clarify SeaTac City Council action related to the adoption of the King County Regional Hazard Mitigation Plan (RHMP) on October 28, 2014.

The SeaTac City Council adopted the RHMP by City Council motion on October 28, 2014. The City Council also authorized the City Manager to execute the Regional Framework Agreement that is associated with the RHMP, and that the City of SeaTac will participate in the RHMP. I have included a copy of the City Council minutes for the above-referenced meeting, and a copy of the Council Agenda Bill which was the basis for the City Council action.

If you have any questions, please feel free to contact me at 206.973.4635.

Sincerely,

A handwritten signature in blue ink, appearing to read "Mark S. Johnsen".

Mark S. Johnsen
Senior Assistant City Attorney

Cc: Pat Lowery, SeaTac Office of Emergency Management

SeaTac City Council
REQUEST FOR COUNCIL ACTION
 Department Prepared by: Fire

Agenda Bill #: **3644**

TITLE: A Motion adopting the Regional Hazard Mitigation Plan Update, and authorizing the City Manager to execute a Regional Coordination Framework Agreement for Disasters and Planned Events.

☐ Ordinance ☐ Resolution ☒ Motion ☐ Info. Only ☐ Other	October 8, 2014
Date Council Action Requested: <u>RCM: 10/28/2014</u>	
Ord/Res Exhibits: _____	
Review Dates: <u>CSS: 10/14/2014</u>	
Prepared By: <u>Patrick Lowery – Emergency Management Coordinator</u>	
Director: <u><i>Tom Peto</i></u>	City Attorney: <u><i>Mary Mirante Bartolo</i></u>
Finance: <u>N/A</u>	BARS #: <u>N/A</u>
City Manager: <u><i>Tom Peto</i></u>	Applicable Fund Name: <u>N/A</u>

SUMMARY: This Motion adopts the Regional Hazard Mitigation Plan Update (RHMP), and authorizes the City Manager to execute a Regional Coordination Framework Agreement for Disasters and Planned Events.

DISCUSSION / ANALYSIS / ISSUES: Starting in 1999, a regional planning effort was initiated by a consortium of disciplines, agencies, and organizations in King County. The goal was to create a regional disaster response plan to guide such operations in the event of an emergency. In 2002 the “Regional Disaster Plan for Public and Private Organizations” was completed and by December of 2002, counted 99 signatory partners including the City of SeaTac. As time progressed, the limits of that plan were realized. These “gaps” were largely the result of newly-defined Presidential Directives, development of the Emergency Support Functions, modifications to the National Response Plan and the National Incident Management System. In 2012 a review and update of the Regional Disaster Plan was initiated by a workgroup representing the signatory agencies. The results of that effort have become the foundation for the “Regional Coordination Framework for Disasters and Planned Events.” This plan facilitates a systematic, coordinated, and effective response to multi-agency or multi-jurisdictional disasters or planned events that occur within King County. It works on the principle that having pre-identified decision-making and financial processes in place prior to an event will hasten the ability to access those resources and capabilities needed during that event. The plan was completed in February 2014 and is attached as Attachment 1. This Motion authorizes the City Manager to execute the Regional Framework Agreement (Attachment 2) which allows the City to participate in the plan.

In addition, the King County RHMP was also recently updated. In order for the City to be eligible for certain grants related to emergency management, and for compliance with the Federal Disaster Mitigation Act of 2000, the City needs to adopt a Hazard Mitigation Plan. This Motion adopts the King County RHMP. An executive summary for the RHMP is attached as Attachment 3, and the entire plan can be reviewed at the following web address:

<http://www.kingcounty.gov/safety/prepare/EmergencyManagementProfessionals/Plans/RegionalHazardMitigationPlan.aspx>

RECOMMENDATION(S): It is recommended that the Motion be carried.

FISCAL IMPACT: There is no direct fiscal impact.

Agenda Bill Form Revised: February 15, 2011

Agenda Bill # 3644
Page 2

ALTERNATIVE(S): Do not carry the Motion. However, the process of securing necessary resources and capabilities from regional public, private, tribal, and non-profit agencies may become more burdensome and time-consuming during the time of a disaster response.

ATTACHMENTS: 1) Regional Coordination Framework for Disasters and Planned Events; 2) Regional Coordination Framework Agreement; 3) Executive Summary of the King County RHMP Update.

City of SeaTac Regular Council Meeting Minutes

October 28, 2014
6:30 PM

City Hall
Council Chambers

CALL TO ORDER: The SeaTac City Council Regular Meeting was called to order by Mayor Mia Gregerson at 6:29 p.m.

COUNCIL PRESENT: Mayor Mia Gregerson, Deputy Mayor (DM) Anthony (Tony) Anderson (*participated via phone*), Councilmembers (CMs) Barry Ladenburg, Kathryn Campbell, Terry Anderson, Dave Bush, and Pam Fernald.

STAFF PRESENT: City Manager Todd Cutts, City Attorney Mary Mirante Bartolo, City Clerk Kristina Gregg, Assistant City Manager (ACM) Gwen Voelpel, Senior Assistant City Attorney Mark Johnsen, Public Works (PW) Director Tom Gut, Finance & Systems Director Aaron Antin, Community & Economic Development (CED) Director Joe Scorcio, Economic Development (ED) Manager Jeff Robinson, Planning Manager Steve Pilcher, Senior Planner Mike Scarey, Human Resources (HR) Manager Vanessa Audett, and Police Chief Lisa Mulligan.

FLAG SALUTE: Mayor Gregerson led the Council, audience, and staff in the Pledge of Allegiance.

PUBLIC COMMENTS: Matt Everett (Highline Water District) thanked the Council for removing sewer and water districts from the Utility Tax Ordinance.

The following people spoke against a Utility Tax (Agenda Bill #3648): Mike Lough, Vicki Lockwood, Roger Kaded, Kathleen Brave, Clyde Hill, Ray Overholt, Pete Daugle, Joel Wachtel, Bruce Goulet, Lonnie Goulet, and Rick Forschler.

Vicki Lockwood and Earl Gipson spoke against the 2015-2016 budget as discussed at the October 27 Council Budget Workshop 2.

PRESENTATIONS:

• **Council consideration and confirmation of Mayoral re-appointment of Cheryl Forbes and appointment of Deborah Anderson to the Human Services Advisory Committee**

MOVED BY LADENBURG, SECONDED BY CAMPBELL TO RE-APPOINT CHERYL FORBES AND APPOINT DEBORAH ANDERSON TO THE HUMAN SERVICES ADVISORY COMMITTEE.

MOTION CARRIED UNANIMOUSLY.

Ms. Forbes and Ms. Anderson were unable to attend the meeting. Their certificates will be mailed to them.

• **Combating Commercial Sexual Exploitation Proclamation**

Mayor Gregerson read the proclamation.

• **Highline Area Food Bank**

Executive Director Mike Werle reviewed services the food bank provides. The food bank is dedicated to the gathering and distribution of food for those in need in the Burien and greater Highline area. He thanked the City for its support.

Council thanked the food bank for their services.

This item was removed from the agenda. The presentation will be rescheduled.

• **King County (KC) Metro's new low-income fare program**

• **2014 General Election**

Deputy Director Designee Julie Wise shared KC Elections key messages. She encouraged voters to contact KC Elections immediately if they haven't received their ballots yet. Ballots must be postmarked by November 4 or dropped off by 8 p.m. election night. Ballot vans are around the area with one at SeaTac City Hall. The results will be posted one time on election night at 8:15 p.m. and then 4:30 p.m. each business day until certified on November 24.

KC Elections Government Relations Program Manager Rene LeBeau shared the importance of returning ballots on time. Ballot returns were forecasted at a 62% return for this election, but returns are low. Only 1,500 ballots have been received to date by SeaTac voters.

Ms. LeBeau and Ms. Wise explained the process used to verify signatures.

SeaTac City Council Regular Meeting Minutes
October 28, 2014
Page 2

CONSENT AGENDA:

- **Approval of claims vouchers** (check no. 108887 – 109045) in the amount of \$5,712,138.99 for the period ended October 20, 2014.
- **Approval of payroll vouchers** (check nos. 52468 – 52489) in the amount of \$151,025.31 for the period ended October 15, 2014.
- **Approval of payroll electronic fund transfers** (check nos. 82579 - 82713) in the amount of \$256,233.82 for the period ended October 15, 2014.
- **Approval of payroll wire transfer** (Medicare and Federal Withholding Tax) in the amount of \$53,103.06 for the period ended October 15, 2014.

Approval of Council Meeting Minutes:

- Council Study Session held June 10, 2014
- Regular Council Meeting held September 23, 2014
- Council Study Session held October 14, 2014
- Regular Council Meeting held October 14, 2014

Agenda Items reviewed at the October 14, 2014 Council Study Session and recommended for placement on this Consent Agenda:

Agenda Bill #3644; A Motion adopting the Regional Hazard Mitigation Plan Update, and authorizing the City Manager to execute a Regional Coordination Framework Agreement for Disasters and Planned Events

Agenda Bill #3640; A Motion authorizing the City Manager to amend the scope and cost of an agreement with King County related to the restoration of Des Moines Creek

MOVED BY LADENBURG, SECONDED BY BUSH TO ACCEPT THE CONSENT AGENDA AS PRESENTED.

MOTION CARRIED UNANIMOUSLY.

ACTION ITEM:

Agenda Bill #3648; Ordinance #14-1015 creating a new Chapter 3.90 of the SeaTac Municipal Code (SMC) related to the Establishment of a Tax on the Gross Revenues of Certain Utilities Operating Within the City to Provide Revenue for City Services and Capital Requirements

Summary: As part of the current budget process, staff determined that a new, stable long term funding source would be necessary in order to continue funding necessary City services. After a review of possible options, it is believed that a Utility Tax would provide such a funding source.

State law authorizes municipalities to impose a tax on the gross revenues of certain utilities operating within their corporate boundaries. This tax is commonly referred to as a "Utility Tax." In general, Utility Taxes may be levied on the gross operating revenues earned by utilities from their operations within the boundaries of a city and by a city's own municipal utilities. Utilities on which taxes may be levied include electric, water, sewer, stormwater, gas, telephone, solid waste, and cable TV. The tax is levied on the utility, not the customer, and must be paid from utility revenues. However, the utilities will likely pass the cost of the tax onto the customer.

The tax rate that may be imposed on electric, gas, and telephone utility services is limited to 6%. Cellular telephone and pager services may be taxed at the same rate as other telephone services. A City may ask the voters to approve a higher rate on these utilities. There are no restrictions on the tax rates for water, sewer, solid waste, and stormwater utilities. The tax rate that can be imposed on cable TV is governed by the Cable Communications Policy Act of 1984, which requires that the rate not be "unduly discriminatory against cable operators and subscribers." Therefore, the tax rate must be similar to that of other utilities. A Utility Tax cannot be imposed on internet service and thus the cost of internet service provided by a telephone or cable business would not be subject to the tax. Additionally, federal law prohibits the imposition of a Utility Tax on direct broadcast satellite television services (such as DirecTV and Dish Network).

This Ordinance creates a new SMC Chapter 3.90, establishing a Utility Tax within the City. The Utility Tax would be levied upon the privilege of conducting an electric energy, natural or manufactured gas, solid waste, surface water management, telephone, or cable television business within the City of SeaTac. This Ordinance sets the tax rate at 6% for all of these businesses except solid waste businesses, which are assessed a 5% tax. This Ordinance also establishes administrative provisions so that the tax can be collected; including the establishment of penalties should the tax not be paid by a business subject to the tax.

SeaTac City Council Regular Meeting Minutes
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ACTION ITEM (Continued):

Agenda Bill #3648; Ordinance #14-1015 (Continued): Since utilities subject to the Utility Tax will likely pass this cost along to the customer, this Ordinance provides for Utility Tax Relief for those that are low income [utilizing the very low income (50%) category limit published by the United States Department of Housing and Urban Development for the Seattle area] and are either disabled and unable to work or age 65 or older. Persons who qualify could submit a claim for reimbursement to the City, up to a maximum of \$100 per year for Utility Taxes that were paid directly by the customer through their utility bill. However, taxes attributable to the surface water management utility are not subject to relief because SMC 12.10.225 (C) already provides a substantial discount to qualified homeowners.

State law provides that the imposition of the Utility Tax on electric, telephone, and natural gas businesses cannot take effect until 60 days after enactment of this Ordinance. Therefore, this Ordinance would need to be adopted prior to October 30, 2014 in order for the City to begin collecting the tax on January 1, 2015.

Changes to this Ordinance since the October 14, 2014 Council Study Session (CSS).

This Ordinance has been modified subsequent to its presentation to the Council at the October 14, 2014 CSS. These substantive changes are summarized as follows:

- This Ordinance no longer applies to water and sewer utilities. Although staff believes that the City has the legal authority to impose a Utility Tax on special purpose districts, Council has directed staff to remove water and sewer utilities from this Ordinance at this time. Staff has also been directed to pursue negotiation of franchise agreements with these Districts.
- This Ordinance provides Utility Tax relief for qualified low income disabled and low income seniors.
- This Ordinance provides a lower tax rate on solid waste businesses (5% instead of 6%). In addition, franchise payments received by the City from a solid waste collection business (Recology CleanScapes) are credited towards the Utility Tax owed. Since the 5.3% franchise payment from Recology CleanScapes exceeds the amount of Utility Tax that would be owed, this Ordinance should not cause an increase in rates for Recology CleanScapes customers.
- This Ordinance provides that franchise payments received by the City from a Municipal Light and Power business (Seattle City Light) will be credited towards Utility Tax owed, and that the amount of Utility Tax owed will not exceed any payments made to the City under their franchise.

This Ordinance generates an estimated \$2.0 million per year. The revenue generated will be deposited into the City's General Fund (GF), to be used for funding general governmental services as the City Council directs through the budget process.

Should this Ordinance be adopted, staff will bring forward an Ordinance amending the Surface Water Management rates to account for the Utility Tax.

MOVED BY T. ANDERSON, SECONDED BY A. ANDERSON TO PASS AGENDA BILL #3648.*

City Manager Cutts provided background on why the City is considering a Utility Tax. He also explained measures taken to balance the 2015-2016 budget.

Mr. Cutts reviewed the proposed tax relief program.

This Ordinance was previously discussed at the October 9 Budget Workshop, October 14 CSS, and October 27 Budget Workshop.

He reviewed the agenda bill summary and changes to this Ordinance made since the October 14 CSS discussion.

City Attorney Mirante Bartolo noted that while the City chose to remove water and sewer districts, the City does have the legal authority to impose a Utility Tax on these districts.

Mr. Cutts responded to questions raised at the October 27 Budget Workshop regarding the age eligibility for the rebate.

PUBLIC COMMENTS (related to Agenda Bill #): The following people spoke against the Utility Tax: Vicki Lockwood, Kathleen Brave, Earl Gipson, Joel Wachtel, and Ray Overholt.

Council discussion ensued regarding the proposed Utility Tax with each CM presenting their opinions.

***MOTION CARRIED WITH LADENBURG, CAMPBELL, GREGERSON, A. ANDERSON AND BUSH VOTING YES AND T. ANDERSON AND FERNALD VOTING NO.**

UNFINISHED BUSINESS: There was no Unfinished Business.

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NEW BUSINESS: There was no New Business.

CITY MANAGER'S COMMENTS: City Manager Cutts commented on the following: (1) November 8 – 9 a.m., Holiday Bazaar at the SeaTac Community Center; (2) November 11 – Veteran's Day, City Hall closed; and (3) regularly scheduled November 11 CSS and Regular Council Meeting (RCM) will be held November 12 due to the holiday per Council Administrative Policies.

COMMITTEE UPDATES: CM Campbell provided an update on Food Innovation Network Facilities Workgroup.

COUNCIL COMMENTS: CM Fernald commented on the following: (1) stated that she doesn't bill costs to the taxpayers – mileage, food, internet; (2) discussed contracting options with City Manager; (3) suggested cutting \$75,000 Classification and Compensation decision card; and (4) spoke against Agenda Bill #3643 (Antenna for One America Radio).

CM Bush stated that the Tyee Bazaar is scheduled for December 6.

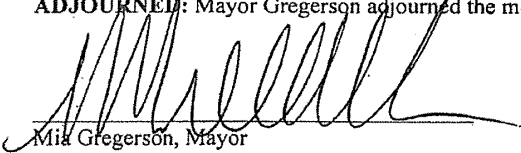
CM Campbell stated that the South Correctional Entity (SCORE) facility has been accredited by the National Commission for Correctional Healthcare. Only 8% of all jails are accredited.

CM Ladenburg stated his appreciation of the Council workgroup's efforts.

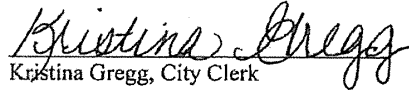
DM A. Anderson reiterated his thoughts on the Utility Tax and the budget and the difficult decisions that are being made.

Mayor Gregerson stated that the Council will need to discuss the budget more in the future because there will still be a deficit.

ADJOURNED: Mayor Gregerson adjourned the meeting at 8:21 p.m.



Mia Gregerson, Mayor



Kristina Gregg, City Clerk

23. City of Shoreline

ORIGINAL

RESOLUTION NO. 364

**A RESOLUTION OF THE CITY OF SHORELINE AUTHORIZING
THE ADOPTION OF THE KING COUNTY
REGIONAL HAZARD MITIGATION PLAN UPDATE**

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, the Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

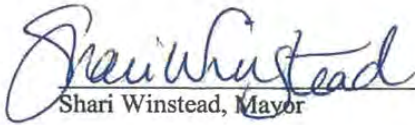
WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF SHORELINE, WASHINGTON:

- 1.) The City of Shoreline adopts in its entirety, Volume 1 and the introduction, chapter 23 the City of Shoreline jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).
- 2.) The City will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- 3.) The City will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- 4.) The City will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- 5.) The City will help to promote and support the mitigation successes of all RHMP Planning Partners.

ORIGINAL

ADOPTED BY THE CITY COUNCIL ON OCTOBER 20, 2014.


Shari Winstead, Mayor

ATTEST:


Jessica Simulcik Smith, City Clerk

24. Town of Skykomish



ORDINANCE # 452

AN ORDINANCE approving and adopting the updated
King County Regional Hazard Mitigation Plan, as
approved by the Federal Emergency Management Agency.

BE IT ORDAINED BY THE TOWN COUNCIL OF SKYKOMISH:

SECTION 1. **Findings:**

- A. The Town of Skykomish supports disaster mitigation efforts and regional disaster planning.
- B. A locally adopted plan reviewed and approved by Federal Emergency Management Agency (FEMA) is required under the Mitigation Act of 2000.
- C. Regular revisions and updates to the five year plan are required by FEMA.
- D. In October 2004, the King County council approved the county's initial five year Regional Hazard Mitigation Plan
- E. In December of 2009, the King County council approved the subsequent update of the Regional Hazard Mitigation Plan
- F. An updated plan is now required to comply with the Disaster Mitigation Act of 2000.
- H. The Town of Skykomish and other jurisdictions within King County have a cooperative interest in disaster mitigation planning efforts. The Town of Skykomish adopts all of volume 1 and the Town of Skykomish annex of volume 2.
- I. Additional agencies are expected to annex to this plan following FEMA approval.

J. FEMA approval of this plan enables the county to seek Federal mitigation project funding related to potential hazards the region may experience over the next five year planning period.

K. Certification of the Town of Skykomish council's approval of this plan is required for FEMA final approval.

SECTION 2. The Town of Skykomish hereby approves and adopts the King County Regional Hazard Mitigation Plan, Attachment A to this ordinance.

SECTION 3. The King County council authorizes the office of emergency management to make any required FEMA revisions to updated King County Regional Hazard Mitigation Plan required by FEMA final approval.

Town of Skykomish Town Council adopted this ordinance on 2-9-2015.

Mayor Allen A. Grider

Clerk/Treasurer/ Deborah Allegri

25. City of Snoqualmie

RESOLUTION 1273

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SNOQUALMIE, WASHINGTON, AUTHORIZING THE ADOPTION OF THE KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been informed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED THAT THE CITY COUNCIL OF THE OF THE CITY OF SNOQUALMIE, WASHINGTON,

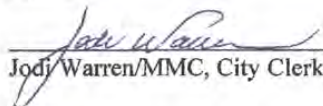
- 1) Adopts in its entirety, Volume 1 and the introduction, chapter 25 the City of Snoqualmie jurisdiction annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).
- 2) Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.

- 3) Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictions authority.
- 4) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- 5) Will help to promote and support the mitigation successes of all RHMP Planning Partners.

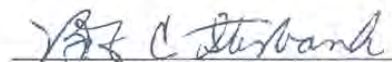
PASSED by the City Council of the City of Snoqualmie, Washington this 27th day of October, 2014.


Matthew R. Larson, Mayor

Attest:


Jodi Warren/MMC, City Clerk

Approved as to form:


Bob C. Sterbank, City Attorney

26. City of Tukwila (Not Yet Available)

27. City of Woodinville

RESOLUTION NO. 455

A RESOLUTION OF THE WOODINVILLE CITY COUNCIL TO ADOPT VOLUME 1 AND THE CITY'S PORTION OF VOLUME 2 OF THE KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE AND REPEALING RESOLUTION NO. 401.

WHEREAS, Federal Emergency Management Agency (FEMA) requires each local jurisdiction to adopt and regularly update a Mitigation Plan for Natural Disasters ("Mitigation Plan") in order to minimize loss of life and recurring property damage arising from or occurring in connection with natural disasters; and

WHEREAS, FEMA has indicated that future natural disaster mitigation grant monies will not be made available to jurisdictions without a current and adopted Mitigation Plan; and

WHEREAS, mitigation planning is a logical and reasonable step to enhance public safety and reduce the impacts of natural disasters; and

WHEREAS, the City of Woodinville ("City") recognizes the benefits and necessity of regional natural disaster planning and cooperation; and

WHEREAS, in 2013, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives was formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

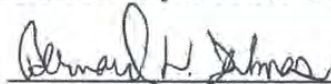
NOW, THEREFORE THE CITY COUNCIL OF THE CITY OF WOODINVILLE, WASHINGTON, HEREBY RESOLVES AS FOLLOWS:

Section 1. The City of Woodinville City Council does hereby adopt in its entirety, Volume 1; and the Introduction, Chapter 27 the City of Woodinville jurisdictional annex, and the appendices of Volume 2 of the *King County Regional Mitigation Plan Update* (RHMP).

Section 2. This resolution shall become immediately effective upon its adoption.

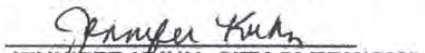
Section 3. City of Woodinville Resolution No. 401 is hereby repealed in its entirety.

RESOLVED this 21st day of October 21, 2014.



Bernard W. Talmas, MAYOR

ATTEST/AUTHENTICATED:



JENNIFER KUHN, CITY CLERK/CMC

28. Coal Creek Utility District

**COAL CREEK UTILITY DISTRICT
KING COUNTY, WASHINGTON**

RESOLUTION NO. 1806

A RESOLUTION OF THE BOARD OF COMMISSIONERS OF COAL CREEK UTILITY DISTRICT, KING COUNTY, WASHINGTON, APPROVING AND ADOPTING VOLUME 1 OF THE 2014 KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE AND THE DISTRICT'S PORTION OF THE REGIONAL HAZARD MITIGATION PLAN UPDATE AS SET FORTH IN CHAPTER 28 OF VOLUME 2d OF THE PLAN UPDATE.

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS, Coal Creek Utility District ("District") and other jurisdictions within King County have expressed a cooperative interest in disaster mitigation planning efforts; and pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, the District supports disaster mitigation efforts and regional disaster planning; and

WHEREAS, the Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, cities, towns and special purpose districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy; now, therefore,

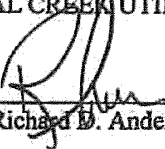
BE IT RESOLVED by the Board of Commissioners of Coal Creek Utility District as follows:

1. Volume 1 of the 2014 King County Regional Hazard Mitigation Plan Update ("RHMP Update"), the Introduction to Volume 2, Chapter 28 entitled "Coal Creek Utility District Annex" of Volume 2, Part 2d, and the appendices of Volume 2 of the RHMP Update are hereby approved and adopted.

2. The District shall use the adopted and approved portions of the RHMP Update to guide pre- and post-disaster mitigation of the hazards identified.
3. The District will coordinate the strategies identified in the RHMP Update with other planning programs and mechanisms under its jurisdictional authority.
4. The District will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described in the RHMP Update.
5. The District's General Manager, Robert Russell, the President of the District Board of Commissioners, or their designees are authorized to sign the RHMP Update and any related documents on behalf of the District if required by FEMA or the King County Office of Emergency Management to do so.
6. This resolution shall be effective the date set forth below. All District resolutions, policies and procedures, including Resolution No. 1652, are hereby amended, superseded and rescinded to be in accordance with the provisions of this resolution.

ADOPTED by the Board of Commissioners of Coal Creek Utility District at the regular open public meeting thereof held the 10th day of December, 2014.

BOARD OF COMMISSIONERS
COAL CREEK UTILITY DISTRICT

By: 
Richard D. Anderson, Commissioner

By: _____
Douglas C. Kunkel, Commissioner

By: 
Pamela A. Martin, Commissioner

29. Covington Water District

**COVINGTON WATER DISTRICT
KING COUNTY, WASHINGTON
RESOLUTION NO. 4082**

A RESOLUTION accepting all of Volume 1 and the Covington Water District's portion of Volume 2 of the 2014 King County Regional Hazard Mitigation Plan Update.

WHEREAS, the Covington Water District is required to update and amend its Regional Hazard Mitigation Plan (RHMP) once every five (5) years to remain eligible for FEMA pre-hazard mitigation funding; and

WHEREAS, the RHMP as a whole has not been updated since 2009; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

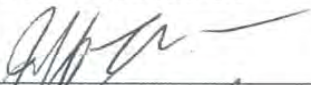
NOW, THEREFORE, BE IT RESOLVED that the Covington Water District Board of Commissioners:

- 1.) Adopts in its entirety, Volume 1 and the introduction, Chapter 29 of Volume 2d jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).

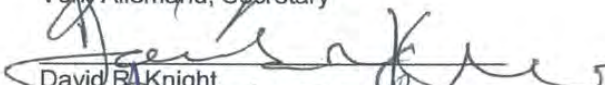
- 2.) Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- 3.) Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- 4.) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- 5.) Will help to promote and support the mitigation successes of all RHMP Planning Partners.

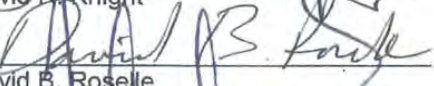
ADOPTED at a meeting of the Board of Water Commissioners held this 19th day of November, 2014.

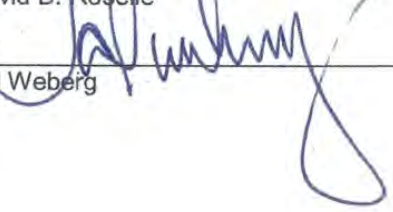
Covington Water District
Board of Commissioners



Jeff Clark, President

Vern Allemand, Secretary

David R. Knight

David B. Roselle

Tal Weberg

30. Highline Water District

**HIGHLINE WATER DISTRICT
King County, Washington**

RESOLUTION 14-9-16A

**A RESOLUTION OF THE BOARD OF COMMISSIONERS OF HIGHLINE WATER DISTRICT
AUTHORIZING THE ADOPTION OF THE KING COUNTY REGIONAL HAZARD
MITIGATION PLAN UPDATE**

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

THEREFORE, BE IT RESOLVED, BY THE BOARD OF COMMISSIONERS of Highline Water District (HWD) of King County, Washington, as follows:

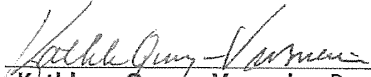
1. Adopts in its entirety, Volume 1 of the King County Regional Hazard Mitigation Plan Update (RHMP) and Highline Water District's jurisdictional annex to the RHMP (Chapter 30, Volume 2, referenced as Exhibit A and incorporated herein), and the appendices of Volume 2.
2. Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
3. Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
4. Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
5. Will help to promote and support the mitigation successes of all RHMP Planning Partners.

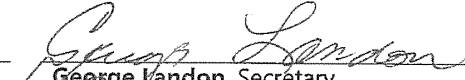
**HIGHLINE WATER DISTRICT
King County, Washington**

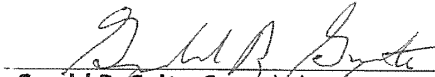
RESOLUTION 14-9-16A

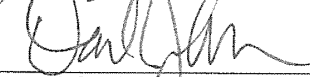
ADOPTED BY THE BOARD OF COMMISSIONERS of Highline Water District, King County, Washington, at an open public meeting held this **16th** day of **September 2014**.

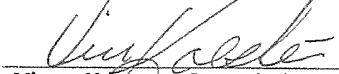
BOARD OF COMMISSIONERS


Kathleen Quong-Vermeire, President


George Landon, Secretary


Gerald R. Guite, Commissioner


Daniel Johnson, Commissioner


Vince Koester, Commissioner

31. Kent Fire Department Regional Fire Authority

**Kent Fire Department Regional Fire Authority
Governance Board Meeting Minutes
October 15, 2014 - 1730 Hours
Fire Station 78**

Professionally and Compassionately Helping People

Call Meeting to Order

The Kent Fire Department RFA Governance Board meeting was called to order by Board Vice Chairperson Dennis Higgins at 5:30 p.m. In attendance were Board Members Harry George, Sr., Bill Boyce, Les Thomas, Allan Barrie, and Board Advisory Member Margaret Harto. Board Chairperson Mike Denbo and Board Advisory Member Tony Anderson had excused absences. The following Kent Fire Department RFA staff members were in attendance: Fire Chief Jim Schneider, Deputy Chief John Willits, Deputy Chief Brian Wiwel, Division Chief Pat Pawlak, Division Chief Dominic Marzano, Division Chief Jon Napier, Attorney Brian Snure, Attorney Kinnon Williams, Captain Larry Rabel, Finance Manager Margaret Martin, IT Manager Don Gentry, and Board Secretary Jane Ogren. Several members of the department were in attendance for the Oaths of Office portion of the meeting.

Flag Salute

- The Pledge of Allegiance was recited.

Agenda Modifications

- There were two agenda modifications:
 - Move New Business items before the 2015 Budget action items.
 - Executive Session to discuss RCW 42.30.110 (1)(f) to receive and evaluate complaints or charges brought against a public officer or employee.

Announcements, Proclamations, and Presentations

- Oaths of Office were given to Captain Ron Lowe and Battalion Chief Dan Conroy.

Public Comment

- There were no public comments.

Consent Calendar

- A MOTION was made by Board Member Thomas and SECONDED by Board Member George to approve the Consent Calendar items. (MOTION CARRIED 5-0).

Committee Reports

- *Citizens Advisory Committee*
 - The next committee meeting will be November 12, 2014.

Board Member Reports

- *City of Covington*
 - Soos Creek Water will be putting a new lift station in at 156th and Covington Way/Wax Road. The lift station will take 15 months to install.
 - A ground breaking ceremony for the new Covington Medical Center will be held October 28, 2014 at 10:00 a.m.
 - The 2015 budget was presented at the Council meeting on October 14, 2014.

**Kent Fire Department Regional Fire Authority
Governance Board Meeting Minutes
October 15, 2014 - 1730 Hours
Fire Station 78**

Professionally and Compassionately Helping People

➤ **City of Kent**

- The third budget workshop was held October 14, 2014. Received a report on the finances of ShoWare Center and the B&O Tax in addition to proposals Mayor Cooke is making to change the B&O Tax rates.
- Trader Joes is open and had one of the best openings in many years.
- A Sports Authority will be coming to the same complex as Trader Joes.
- The garbage utility tax will be increased to pay for residential street repairs. The B&O tax current pays for street repairs to arterial streets.

➤ **City of SeaTac**

- No report was given.

Chief's Report

- **Board Meetings** - The Board Meeting of November 5, 2014 will need to be cancelled due to lack of quorum because of the re-accreditation peer assessor site visit. The next Board Meeting will be held November 19, 2014. The Board Meeting in December will be cancelled due to lack of a quorum.
- **Regionalization Update - Jurisdictions**
 - The City of Tukwila is working through the RFA Exploratory process. They are beginning the financial and planning processes.
 - A workshop is being held with King County EMS on the CARES Program.
- **Accreditation** - The peer assessor site visit is 2-1/2 weeks away. The peer assessors will be arriving November 1 and departing November 6, 2014.
- **Strategic Planning** - The draft Plan is close to completion.
- **SeaTac Budget** - Chief Schneider, Deputy Chief Wiwel, and Finance Manager Martin made a budget presentation to the SeaTac City Council. The Council has elected to not have Public Education services for the next two years.
- **Great Shake Out** - Division Chief Marzano discussed the Great Shake Out which is being held on October 16, 2014. A million people in Washington will be participating in the exercise.

Department Reports

➤ **Finance**

- No report was given.

➤ **Human Resources**

- In the process of conducting the Engineer promotional test.
- Entry level Firefighter interviews will be conducted November 17-21, 2014.
- The Kent Fire Department RFA/King County Fire District #37 raised \$1,925.00 in donations for the Kent Food Bank at the breakfast held on Friday, October 10, 2014.

**Accreditation —————> Continuous Quality Improvement
GOOD ENOUGH IS THE ENEMY OF EXCELLENCE**

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**Kent Fire Department Regional Fire Authority
Governance Board Meeting Minutes
October 15, 2014 - 1730 Hours
Fire Station 78**

Professionally and Compassionately Helping People

➤ **Information Technology**

- No report was given.

Attorney Report

- No report was given.

Correspondence

- Correspondence included in the agenda packet was discussed.

Unfinished Business

- Level of Service Fees
- No report was given.

New Business

- **King County/City of Kent/Kent Fire Department RFA Mitigation Plan (Division Chief Marzano)**

Hazard mitigation is the use of long-term and short-term policies, programs, projects, and other activities to alleviate the death, injury, and property damage that can result from a disaster. King County and a partnership of local governments within the County have developed and maintained a regional hazard mitigation plan to reduce risks from natural disasters. The plan complies with hazard mitigation planning requirements to maintain eligibility for funding under Federal Emergency Management Agency grant programs.

Federal regulations require periodic updates of hazard mitigation plans to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. A jurisdiction covered by a plan that has expired is no longer in compliance with the federal requirements for hazard mitigation planning.

King County and a coalition of 39 planning partners prepared an initial hazard mitigation plan that was approved by the Federal Emergency Management Agency in November 2004. This document represents the second comprehensive update (the first update was made in 2009). The 2009 plan update process was truncated after back-to-back disasters in 2009—January flooding and March snowstorms—and the emergence of a significant flooding threat in the Green River Valley due to problems at Howard Hanson Dam. The truncated process resulted in a significant decrease in planning partners covered by the regional plan (12 local governments). Many of the original planning partners developed their own plans or let their plans expire. This 2014 update is a return to a truly regional planning effort. Fifty-four local governments are covered by this plan update, including King County, 26 city and town governments, and 27 special purpose districts, as listed in Tables ES-1 and ES-2. The team that prepared the current update also prepared a five-year progress report of actions completed by all planning partners whose existing plan is replaced by this update.

A MOTION was made by Board Member Thomas and SECONDED by Board Member Boyce to adopt the King County Hazard Mitigation Update and remain a participant in the Regional Mitigation Planning effort. (MOTION CARRIED 5-0)

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➤ **Waiver of Competitive Bidding Requirements - LN Curtis & Sons (Deputy Chief Willits)**

The Kent Fire Department Regional Fire Authority needs to replace the current rescue equipment/extrication tools. These tools are 5 to 10 years past their life expectancy.

New technology has brought about significant changes in weight and capability of extrication tools. New Hurst tools are lightweight allowing one person handling, and have a greater cutting force able to cut through new materials now used in the construction of vehicles.

Maintaining compatibility of Hurst extrication tools reduces repair costs, and keeps training and use of the tools compatible throughout the department.

L. N. Curtis & Sons is the only authorized dealer, which is factory trained and certified by Hurst on operation, maintenance, and service of Hurst rescue equipment, therefore, the sole source of supply for Hurst rescue equipment.

A MOTION was made by Board Member Barrie and SECONDED by Board Member George to approve Resolution No. 75 to waive the competitive bidding requirements and authorize the Kent Fire Department RFA to purchase Hurst rescue equipment from L.N. Curtis & Sons at the cost of \$128,000. (MOTION CARRIED 5-0)

➤ **Kent Fire Department RFA, Revenue Source/Benefit Charge (FBC) Public Hearing** - The Public Hearing was opened at 6:10 p.m. by Board Vice Chairperson Higgins. Board Vice Chairperson Higgins read a prepared opening statement for the beginning of the Public Hearing.

- An overview of the FBC hearing process was given by FBC Attorney Kinnon Williams.
- Fire Chief Schneider gave a presentation and discussed that the Kent Fire Department RFA budget was created to sustain current levels of service. The 2015 Preliminary budget is a balanced budget.
- Captain Rabel gave a presentation on the Fire Benefit Charge (FBC). The FBC cannot exceed 60% of the Kent Fire Department RFA operating budget. Captain Rabel reviewed the formula used to calculate the FBC charge. Components used to apportion the FBC is: size of the structure as determined by the King County Assessor; category of the structure - residential, commercial, multi-family, mobile home; risk of the structure - an effective firefighting force; built in protections, such as sprinkler systems; and hazardous materials and uses.
- The Public Hearing was then opened for public comments.
- There were no public comments made.
- At 6:33 p.m., Board Vice Chairperson Higgins closed the Public Comment portion of the Revenue Source and Benefit Charge Hearing.

**Accreditation —————> Continuous Quality Improvement
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**Kent Fire Department Regional Fire Authority
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➤ **2015 Kent Fire Department Regional Fire Authority Preliminary Budget - Adopt - Subject to Change (Chief Schneider)**

The Kent Fire Department Regional Fire Authority has drafted our preliminary budget. The essence of a preliminary budget is to establish a benchmark for necessary revenues. The 2015 preliminary budget will indicate needed revenues of \$49,142,575 for projected expenses of \$50,422,575 which includes operating and capital expenses.

The 2015 preliminary budget is balanced at this time with cash carry over from the 2014 budget and current firefighter vacancies. The 2015 preliminary budget is a "work in progress," and will allow for adjustments as the Board sets policy direction. The 2015 preliminary budget, spending guidelines, and associated revenue requests are consistent with maintaining level of services set by the board.

Adopting by motion, the Kent Fire Department Regional Fire Authority 2015 preliminary budget is a step in the budget/FBC submittal process, which is subject to change.

A MOTION was made by Board Member Boyce and SECONDED by Board Member Thomas to adopt the 2015 Kent Fire Department Regional Fire Authority Preliminary Budget, consistent with maintaining level of services set by the Board, **subject to change.** (MOTION CARRIED 5-0)

➤ **Resolution 71 - Limit Factor Increase Resolution (Chief Schneider)**

With the adoption of Resolution Number Seventy-one (71), the Kent Fire Department Regional Fire Authority Governance Board establishes that the regular levy for 2015 shall be the maximum amount allowable pursuant to RCW 84.55.092, that being the highest amount of regular property taxes that could have been lawfully levied in Kent Fire Department Regional Fire Authority in any year since 1985.

A MOTION was made by Board Member Thomas and SECONDED by Board Member Barrie to set the limit factor for the regular levy for calendar year 2015 at the maximum allowable pursuant to RCW 84.55.092. (MOTION CARRIED 5-0)

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➤ **Resolution 72 - Property Tax Increase Resolution (Chief Schneider)**

With the adoption of Resolution Number Seventy-Two (72), the Kent Fire Department Regional Fire Authority Governance Board establishes that an increase in the regular property tax levy in addition to the increase resulting from the addition of new construction and improvements to property and any increase in the value of state-assessed property, and amounts authorized by law as a result of any annexations that have occurred and refunds made is hereby authorized for the 2015 levy in the amount of \$995,694, which is a percentage increase of 6.7% from the previous year.

A MOTION was made by Board Member George and SECONDED by Board Member Barrie to authorize an increase in the regular property tax levy for 2015 in the amount of \$995,694, which is a 6.7% increase from the previous year. (MOTION CARRIED 5-0)

➤ **Resolution Establishing 2015 Tax Levy (Chief Schneider)**

With the adoption of Resolution Number Seventy-three (73), the Kent Fire Department Regional Fire Authority Governance Board establishes the 2015 tax levy based upon the estimated assessed valuation of property within the boundaries of the Regional Fire Authority based upon information from the King County Assessor's Office.

A MOTION was made by Board Member Boyce and SECONDED by Board Member Barrie to authorize an increase in the regular property tax levy for 2015 in the amount of \$995,694, which is a 6.7% increase from the previous year. (MOTION CARRIED 5-0)

➤ **Resolution Establishing a Fire Benefit Charge on personal property and improvements to real property within the Kent Fire Department Regional Fire Authority boundaries for calendar year 2015 (Chief Schneider)**

With the adoption of Resolution Number Seventy-four (74), the Kent Fire Department Regional Fire Authority Governance Board establishes the 2015 fire benefit charge in the total amount of \$18,869,288 to be apportioned in accordance with the "Schedule for Fire Benefit Charges - Kent Fire Department Regional Fire Authority".

A MOTION was made by Board Member Barrie and SECONDED by Board Member George to adopt Resolution No. 73 establishing the 2015 tax levy for the Kent Fire Department Regional Fire Authority (MOTION CARRIED 5-0)

Executive Session

- A 5-minute Executive Session was called from 6:45 p.m. to 6:50 p.m. to discuss the following:
 - RCW 42.30.110 (1) (f) to receive and evaluate complaints or charges brought against a public officer or employee
- The Executive Session was extended an additional 3 minutes, from 6:50 p.m. to 6:53 p.m.
- The regular meeting was called back to order at 6:53 p.m.

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Professionally and Compassionately Helping People

Good of the Order

- There was no Good of the Order.

Future Meetings

- Future meetings were reviewed and discussed.

Signing of Vouchers

- Vouchers were not signed - the vouchers will be signed at the November 19, 2014 meeting.

Adjournment

- The meeting was adjourned by Board Vice Chairperson Higgins at 7:00 p.m.

32. Kent School District #415 (Not Yet Available)

33. King County Fire District No. 2



KING COUNTY FIRE PROTECTION DISTRICT NO. 2
KING COUNTY, WASHINGTON
RESOLUTION NO. 2014-01
HAZARD MITIGATION PLAN

A RESOLUTION OF KING COUNTY FIRE PROTECTION DISTRICT NO. TWO, ADOPTING THE INTER-JURISDICTIONAL REGIONAL HAZARD MITIGATION PLAN, AS APPROVED BY FEMA.

WHEREAS, King County Fire Protection District No. 2 and other jurisdictions within King County have expressed a cooperative interest in disaster mitigation planning efforts; and

WHEREAS, King County Fire Protection District No. 2 has previously adopted Resolution 08-2003, by which the District adopted its Hazard Investigation Vulnerability Analysis for submittal to federal and regional authorities as an "annex" to the Regional Plan; and

WHEREAS, King County Fire Protection District No. 2 has previously adopted Resolution No. 07-2005. By which the district accepts, adopts and approves the District No. 2 plan as annexed to the Inter- Jurisdictional Regional Hazard Mitigation Plan, as approved by FEMA on October 29, 2004.

WHEREAS, regular revisions and updates are required by FEMA; and

WHEREAS, a locally adopted plan reviewed and approved by FEMA is required under the Disaster Mitigation Act of 2000 and 44 CFR 201; and

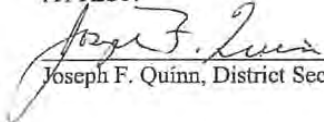
WHEREAS, FEMA has approved the Inter-Jurisdictional Regional Hazard Mitigation Plan, with the District No. 2 plan annexed;

NOW THEREFORE BE IT HEREBY RESOLVED AS FOLLOWS:

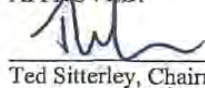
The Board of Commissioners accepts, adopts all of **Volume 1** and King County Fire District #2's portion of **Volume 2 of the King County Regional Hazard Mitigation Plan Update (RHMP)** as presented for 2014.

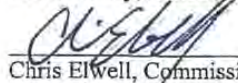
ADOPTED AND APPROVED AT A REGULAR MEETING OF THE BOARD OF FIRE COMMISSIONERS OF KING COUNTY FIRE PROTECTION DISTRICT NO. 2, THIS 4TH DAY OF NOVEMBER, 2014, THE FOLLOWING MEMBERS BEING PRESENT AND VOTING:

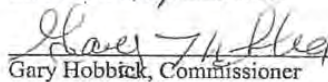
ATTEST:


Joseph F. Quinn, District Secretary

APPROVED:


Ted Sitterley, Chairman


Chris Elwell, Commissioner


Gary Hobbick, Commissioner

Resolutions/King 2/Hazard Plan
November 4, 2014

34. King County Fire District No. 45

RESOLUTION # 409

RESOLUTION of the Board of Commissioners of Fire Protection District 45, King County, Duvall, Washington authorizing the adoption of the King County Regional Hazard Mitigation Plan Update.

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy, and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property, and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs, and

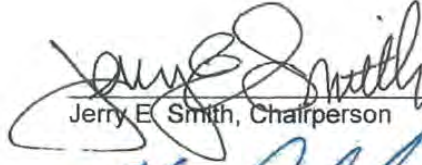
WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area, and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

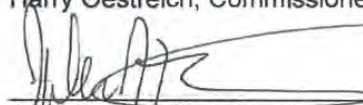
NOW, THEREFORE, it is RESOLVED, by the Board of Commissioners of King County Fire District 45:

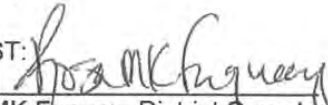
- 1.) Adopts in its entirety, Volume 1 and the introduction, chapter 34 the King County Fire District 45 jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).
- 2.) Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- 3.) Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- 4.) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- 5.) Will help to promote and support the mitigation successes of all RHMP Planning Partners.

Adopted at a regular meeting of the Board of Commissioners, King County Fire District 45, and signed this 16th day of December, 2014, the following members being present and voting:


Jerry E. Smith, Chairperson


Harry Oestreich, Commissioner


John Frazier, Commissioner

ATTEST: 
Rosa MK Fuquay, District Secretary
Board of Commissioners

35. King County Public Hospital District No. 1 (Valley Medical Center)
(Not Yet Available)

36. King County Public Hospital District No. 2

King County Public Hospital District No. 2
d/b/a EvergreenHealth
Board of Commissioners Meeting
EvergreenHealth Medical Center, Kirkland, WA
April 21, 2015
Minutes

Comms. Present: Comms. DeYoung, Hirt, and Pilcher

Medical Staff
Leadership: Scott Burks, MD; Bob Geise, MD

Excused: Comm. Greenfield

Others Present: Bob Malte; Greg Allen; Laurene Burton; Jim Fitzgerald; Jeff Friedman;
Nancee Hofmeister; Neil Johnson; Sandy Kreider; Tom Martin; Frank
Riedo, MD; Monique Ruyle; Bob Sampson; Jeff Tomlin, MD; Jamie
Trigg

Guests: Linda Seltzer (**Exhibit A**)

**PUBLIC MEETING
and
EXECUTIVE
SESSION**

Comm. DeYoung called the April 21, 2015 Regular Public Meeting of the Board of Commissioners of King County Public Hospital District No. 2 to order at 5:00 p.m. and announced that the Board would immediately adjourn into Executive Session to consider and discuss property acquisition, personnel matters and medical staff privileges. Comm. DeYoung further announced that the Executive Session would adjourn at approximately 6:30 p.m. and that the open Public Meeting would resume at approximately 6:35 p.m.

The Executive Session commenced at 5:01 p.m. The Executive Session was concluded at 6:28 p.m., at which time a short recess was taken.

Comm. DeYoung reconvened the Public Meeting, calling it to order at 6:35 p.m. and welcoming those present.

Order of Business

Comm. DeYoung announced the addition of one agenda item: Authorization to file an Interlocutory Appeal.

Public Comment Ms. Linda Seltzer introduced herself as appearing on behalf of an "indigent patient" who is unable to pay a small bill owing to EvergreenHealth and is seeking relief. Comm. DeYoung requested that she work with Laurene Burton to help resolve the matter.

PRESENTATIONS

Annual Infection Control Report Dr. Frank Riedo presented the Annual Infection Control and Prevention Report. It included (1) the Pillars of Prevention; (2) Immunizations & Healthcare Acquired Infections; (3) Surveillance and Public Reporting of Infections; (4) Infection Control and Scope of Practice; (5) Leading Edge Advanced Practice Topics (LEAPT); (6) Emergency Preparedness/Ebola; (7) Review of 2014 Goals; and (8) 2015 Goals. Dr. Riedo closed by thanking Sandy Kreider for her help in striving to keep our patients, employees and visitors safe from infection.

The Board thanked Dr. Riedo and Ms. Kreider for another excellent, informative report.

Biannual Information Technology Report Tom Martin introduced Jamie Trigg, Director of Information Technology, to present the Biannual Information Technology Report. The report included (1) a Risk Matrix for EvergreenHealth; (2) Security-related Initiatives; (3) Recent Accomplishments; (4) System Integration for 2015-2017; (5) a Review of the Cerner Ambulatory EMR; and (6) the Health Information Exchange. Mr. Trigg emphasized the importance of these IT initiatives and the positive impact they are having upon patient safety.

Puget Sound High Value Network Overview Bob Malte introduced the topic, noting that more information will be coming to the Board next month. Mr. Martin then provided the history related to the creation of the Puget Sound High Value Network and provided several models that will be considered including Governance and membership within the network.

Following the presentation, Mr. Malte and Mr. Martin answered questions from the Board.

The Board thanked Mr. Malte and Mr. Martin for a very good report, noting the work that has been performed on this initiative is highly appreciated.

ACTION ITEMS

MINUTES Regular Board Meeting of March 17, 2015; Study Session of April 7, 2015; and the Leadership Educational of April 10, 2015	<u>Comm. Pilcher made a motion to approve the meeting minutes for the March 17, 2015 Regular Board meeting; the April 7, 2015 Study Session; and the April 10, 2015 Leadership Educational.</u> <u>Comm. Kempf seconded the motion.</u> <u>The motion carried unanimously.</u>
Consent Agenda	<u>Comm. Hirt made a motion to approve the Consent Agenda.</u> <u>The Consent Agenda included:</u> A) <u>Voucher No. 516, March 2015, totaling</u> <u>\$42,231,811.06. (Exhibit B)</u> B) <u>Contractor Pay Requests</u> • <u>EHMC Radiation Oncology Remodel</u> ○ <u>Western Ventures Const. Inc.</u> <u>\$36,153.41</u> <u>TOTAL CONTRACTOR PAY REQUEST</u> <u>\$36,153.41</u> C) <u>Disposal of Surplus Equipment (as identified in Exhibit C)</u> <u>Comm. Pilcher seconded the motion.</u> <u>The motion carried unanimously.</u>
Revised Construction and Planning Committee Charter	<u>Comm. Kempf made a motion to approve the revised Board Construction and Planning Committee Charter as submitted.</u> <u>Comm. Pilcher seconded the motion.</u> <u>The motion carried unanimously.</u>
Revised Audit and Finance Committee Charter	<u>Comm. Pilcher made a motion to approve the revised Board Audit and Finance Committee Charter as revised.</u> <u>Comm. Hirt seconded the motion.</u> <u>The motion carried unanimously.</u>

**Executive
Compensation
Policy Revisions**

Comm. Pilcher made a motion to approve the revised Executive Compensation Policy as submitted.

Comm. Hirt seconded the motion.

The motion carried unanimously.

**Proposed
Acquisition of
Primary Care Clinic**

Comm. Hirt made a motion authorizing the CEO, or his designee, to complete negotiations of and execute the Asset Purchase Agreement of Sky Valley Family Medicine at a cost not to exceed \$300,945, together with the employment agreements for its practitioners.

Comm. Pilcher seconded the motion.

The motion carried unanimously.

**King County
Regional Hazard
Mitigation Plan**

Comm. Pilcher made a motion to delegate authority to the CEO, or his designee, to participate in the King County Regional Hazard Mitigation Plan and execute the Participation Agreement for that purpose.

Comm. Hirt seconded the motion.

The motion carried unanimously.

**Revised
EvergreenHealth
Auxiliary Bylaws**

Comm. Hirt made a motion to approve the revised EvergreenHealth Auxiliary Bylaws as submitted.

Comm. Pilcher seconded the motion.

The motion carried unanimously.

**Authorization to File
and Interlocutory
Appeal**

Comm. Hirt made a motion to authorize the District General Counsel to file an interlocutory appeal of the recent class certification decision of the trial court in the Pugh & Bowman v. EvergreenHealth case.

Comm. Pilcher seconded the motion.

The motion carried unanimously.

Medical Staff: New Appointments, Reappointments and Status Changes Comm. Pilcher made a motion to approve the New Appointments, Reappointments, Status Changes, Privileges and Designated Scope of Practice pertaining to the EvergreenHealth Medical Center Medical Staff and AHPs, as stated in Exhibit D.

Comm. Hirt seconded the motion.

The motion carried unanimously.

DISCUSSION ITEMS

Quarterly Vendor Report In the absence of Chrissy Yamada, Mr. Johnson presented the Quarterly Vendor Report.

2014 Annual Levy-Funded Services Report Ms. Burton presented the Annual Levy-Funded Services Report, noting tremendous services provided by the programs funded by the levy. The Commissioners expressed appreciation for the great report on how the levy funds are being utilized and the resultant benefits, which are many. They also appreciated the greater accountability demonstrated by the report and thanked Ms. Burton for excellent presentation.

Rolling Agenda: May, June and July, 2015 Ms. Burton presented the rolling agenda for the months of May, June and July, noting the Leadership Retreat would replace the Leadership Educational in May, and Master Space Planning, Version 3, would be the topic for the June Leadership Educational.

Medical Staff Report Comm. DeYoung welcomed the return of Dr. Scott Burks from a medical leave. Dr. Burks then reported on and gave notice of the following:

- Dr. Burks observed that it was good to be back. He expressed thanks to Drs. Craig McAllister and Chris Boone for doing his surgery and for the superb care he received from the staff on 7 Silver.
- EvergreenHealth Monroe – Dr. Jack Handley has recently been appointed Chief Medical Officer at EHM and is a wonderful addition to the staff there.
- Annual Medical Staff Meeting – will be on April 30th at Chateau St. Michelle, 6:00 p.m. Those present this evening are invited.
- Blood Utilization Group –under the leadership of Dr. Deborah Callahan, this group has done some great work, including tracking and coordination of blood products, better utilization of these products and creating ordering efficiencies to avoid wastage.

Executive Team Reports

Executive team members reported on and gave notice of the following:

- Mr. Allen
 - EvergreenHealth Medical Group recruitment and acquisitions are continuing apace.
 - There has been a substantial increase in primary care visits.
- Mr. Johnson

Mr. Johnson observed that Dr. Tomlin, Mr. Allen and others have greatly facilitated improved communications between General Surgery, Thoracic and Pulmonary providers. We are exploring how to assure necessary coverage for patients needs. It is impressive to observe the collaboration that is occurring.
- Mr. Friedman

Foot and Ankle Care is one of the newest members of the EvergreenHealth Medical Group and is co-located with Internal Medicine. Dr. Lallas is very collaborative and has already established connections with the Sports and Spine Clinic.
- Ms. Burton
 - There was a standing-room-only crowd for the STEM program meeting of parents and students sponsored by EvergreenHealth and great feedback on the event was received. The practitioners who spoke did an excellent job.
 - EvergreenHealth hosted a brunch for its amazing volunteers, which was well attended and greatly appreciated.

Chief Executive Officer Report

Mr. Malte expressed appreciation for and to his excellent administrative team members, who work so hard alongside the other staff here at EvergreenHealth.

Commissioner Reports

Comm. Pilcher thanked those who helped provide great care for his mother-in-law during a recent visit.

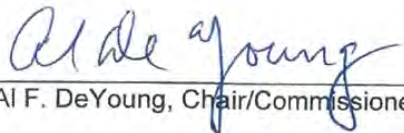
Comm. Hirt mentioned that she attended the Volunteer Brunch to celebrate Volunteer Appreciation Week and enjoyed her conversations with student volunteers from LWIT. At a recent AAUW meeting there was a lot of discussion about STEM and she was happy to report that EvergreenHealth was hosting an event that was helping awareness by students and their parents of the great STEM opportunities in healthcare.

Comm. DeYoung thanked the administrative team, staff and physicians for their hard work to make EvergreenHealth such a wonderful asset to the community. He appreciates the diligence of the team, how it "walks the talk," and for the great progress that is being made.

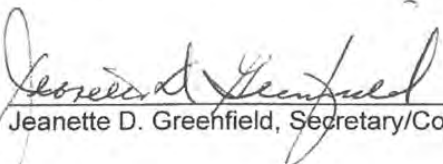
Adjourn

The April 21, 2015 Meeting of the Board of Commissioners for King County Public Hospital District No. 2 was adjourned at 8:04 p.m.

SUBMITTED:


Al F. DeYoung, Chair/Commissioner

ATTEST:

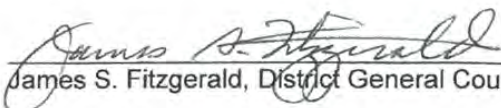

Jeanette D. Greenfield, Secretary/Commissioner


Rebecca D. Hirt, Commissioner


R. August Kempf, Commissioner


Charles A. Pilcher, MD, Commissioner

Approved as to content and form:


James S. Fitzgerald, District General Counsel

37. King County Water District No. 19

RESOLUTION NO. 1161

**A RESOLUTION OF
THE BOARD OF COMMISSIONERS OF WATER DISTRICT 19
AUTHORIZING THE ADOPTION OF
THE KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE**

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the Board of Commissioners of Water District 19:

- 1.) Adopts in its entirety, all of Volume 1 and the District's portion of Volume 2 of the Regional Plan Update of the King County Regional Hazard Mitigation Plan (RHMP).
- 2.) Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- 3.) Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- 4.) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- 5.) Will help to promote and support the mitigation successes of all RHMP Planning Partners.

PASSED AND ADOPTED on the 19th day of November, 2014, by the following vote:

ATTEST:



JEFFREY LAKIN
General Manager



BOB POWELL, Secretary
Board of Commissioners

AYE



JENNY BELL
Board of Commissioners

AYE

38. King County Water District No. 20

RESOLUTION NO. 726

A RESOLUTION OF THE BOARD OF COMMISSIONERS OF WATER DISTRICT NO. 20, KING COUNTY, WASHINGTON, AUTHORIZING THE ADOPTION OF THE KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE.

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, the Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assess the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy; now, therefore,

BE IT RESOLVED, that the Board of Commissioners of King County Water District No. 20:

1. Adopts in its entirety, Volume 1 and introduction, chapter 38 the King County Water District No. 20's jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP). The Plan Documents are attached hereto and are herein incorporated by this reference.

2. Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
3. Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
4. Will continue to support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
5. Will help to promote and support the mitigation success of all RHMP Planning Partners.

ADOPTED at a regular open public meeting of the Board of Commissioners of Water District No. 20, King County, Washington, held on the 14th day of October, 2014 and signed at a regular open public meeting of the Board of Commissioners, of Water District No. 20, King County, Washington held on the 14th day of October, 2014.

WATER COMMISSIONERS:



Gary G. Coy



Russ Pritchard



Darold P. Doell

39. King County Water District No. 90

KING COUNTY WATER DISTRICT NO. 90

KING COUNTY, WASHINGTON

RESOLUTION NO. 981

A **RESOLUTION** of the Board of Commissioners of King County Water District No. 90, King County, Washington, authorizing the adoption of the King County Regional Hazard Mitigation Plan Update.

WHEREAS, all of King County has exposure to natural hazards that increase the risk of life, property, environment and the County's economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COMMISSIONERS OF KING COUNTY WATER DISTRICT NO. 90:

Section 1: Adopts in its entirety, Volume 1 and the introduction, Chapter 39 of the King County Water District No. 90 jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).

Section 2: Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.

Section 3: Will coordinate the strategies identified in RHMP with other planning programs and mechanisms under its jurisdictional authority.

Section 4: Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.

RESOLUTION NO. 981
Adopting the King County Regional
Hazard Mitigation Plan Update
Page - 1

Section 5: Will help to promote and support the mitigation successes of all RHMP Planning Partners.

ADOPTED by the Board of Commissioners of King County Water District No. 90, King County, Washington at its regular, open public meeting thereof held on 7th day of October, 2014.

B. V. Gidner 10-7-14
Ann Clavin 10/7/14
By D. M. 10/7/14

RESOLUTION NO. 981
Adopting the King County Regional
Hazard Mitigation Plan Update
Page - 2

40. King County Water District No. 111

**KING COUNTY WATER DISTRICT NO. 111
KING COUNTY, WASHINGTON**

RESOLUTION NO. 589-12-14

A RESOLUTION OF THE BOARD OF COMMISSIONERS OF KING COUNTY WATER DISTRICT NO. 111, KING COUNTY, WASHINGTON, APPROVING AND ADOPTING VOLUME 1 OF THE 2014 KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE AND THE DISTRICT'S PORTION OF THE REGIONAL HAZARD MITIGATION PLAN UPDATE AS SET FORTH IN CHAPTER 40 OF VOLUME 2d OF THE PLAN UPDATE.

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS, King County Water District No. 111 ("District") and other jurisdictions within King County have expressed a cooperative interest in disaster mitigation planning efforts; and pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, the District supports disaster mitigation efforts and regional disaster planning; and

WHEREAS, the Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, cities, towns and special purpose districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy; now, therefore,

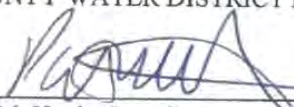
BE IT RESOLVED by the Board of Commissioners of King County Water District No. 111 as follows:

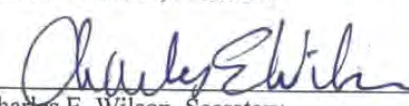
1. Volume 1 of the 2014 King County Regional Hazard Mitigation Plan Update ("RHMP Update"), the Introduction to Volume 2, Chapter 40 entitled "King County Water District No. 111 Update Annex" of Volume 2, Part 2d, and the appendices of Volume 2 of the RHMP Update are hereby approved and adopted.

2. The District shall use the adopted and approved portions of the RHMP Update to guide pre- and post-disaster mitigation of the hazards identified.
3. The District will coordinate the strategies identified in the RHMP Update with other planning programs and mechanisms under its jurisdictional authority.
4. The District will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described in the RHMP Update.
5. The District's General Manager, Christopher Hall, and the President of the District Board of Commissioners, or their designees are authorized to sign the RHMP Update and any related documents on behalf of the District if required by FEMA or the King County Office of Emergency Management to do so.
6. This resolution shall be effective the date set forth below. All District resolutions, policies and procedures, including Resolution No. 550-03-10, are hereby amended, superseded and rescinded to be in accordance with the provisions of this resolution.

ADOPTED by the Board of Commissioners of King County Water District No. 111 at the regular open public meeting thereof held the 11th day of December, 2014.

BOARD OF COMMISSIONERS
KING COUNTY WATER DISTRICT NO. 111

By: 
Patrick M. Hanis, President

By: 
Charles E. Wilson, Secretary

By: 
Gary G. Cline, Commissioner

41. King County Water District No. 125

**KING COUNTY WATER DISTRICT NO. 125
KING COUNTY, WASHINGTON**

RESOLUTION NO. 14-10-08-462

**A RESOLUTION OF THE BOARD OF COMMISSIONERS OF KING
COUNTY WATER DISTRICT NO. 125, KING COUNTY
WASHINGTON, AUTHORIZING AND APPROVING THE KING
COUNTY HAZARD MITIGATION PLAN UPDATE.**

WHEREAS, King County Water District No. 125 ("District") is a municipal corporation providing water utility services pursuant to Title 57 RCW; and

WHEREAS, The District Board of Commissioners has reviewed the King County Hazard Mitigation Plan Update Volume 1 and Volume 2 part 2d in the form attached hereto as **Exhibit A** and incorporated herein by this reference ("Hazard Mitigation Plan"), and

WHEREAS, The Board of Commissioners supports disaster mitigation efforts and regional disaster planning as a means of reducing or eliminating those vulnerabilities for the overall good and welfare of King County Water District 125 and the region; and

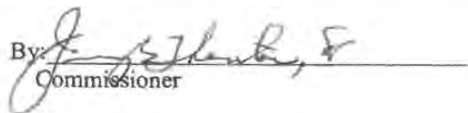
WHEREAS, a locally adopted plan reviewed and approved by FEMA is required under the Mitigation Act, 44 Code of Federal Regulations (CFR) part 201; now therefore

BE IT RESOLVED, by the Board of Commissioners of King County Water District No. 125, King County Washington, as follows:

1. The Hazard Mitigation Plan in the form attached hereto as **Exhibit A** is hereby approve.
2. King County Water District 125 will actively participate in the Regional Multi-Hazard Mitigation Plan.

ADOPTED at the regular open public meeting of the Board of Commissioners, King County Water District No. 125, King County Washington, held on the 8th of October, 2014.

BOARD OF COMMISSIONERS
KING COUNTY WATER DISTRICT NO. 125

By: 
Commissioner

By: James R. Rick
Commissioner

By: John C. Thompson
Commissioner

Certification:

The undersigned, as Secretary of the Board of Commissioners of King County Water District No. 125, hereby certifies that the foregoing is a true and accurate copy of the Resolution No. 14-10-07-462 adopted by the Board of Commissioners at the regular open public meeting on the 8th day of October, 2014.

By: James R. Rick
Secretary, Board of Commissioners

42. Midway Sewer District

RESOLUTION NO. 2014-09
A RESOLUTION OF THE MIDWAY SEWER DISTRICT
AUTHORIZING THE ADOPTION OF THE
KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

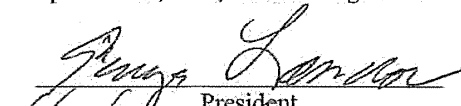
WHEREAS; a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

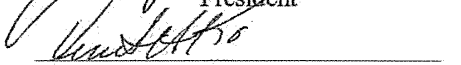
WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED that the MIDWAY SEWER DISTRICT:

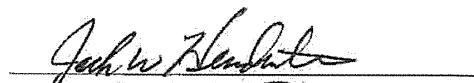
- 1.) Adopts in its entirety, Volume 1 and the introduction, chapter 42 of the Special Purpose District jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).
- 2.) Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- 3.) Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- 4.) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- 5.) Will help to promote and support the mitigation successes of all RHMP Planning Partners.

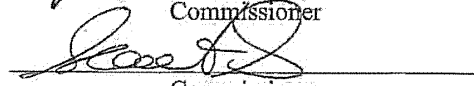
Adoption: ADOPTED at a regular meeting of the Board of Commissioners of Midway Sewer District on September 10, 2014, the following Commissioners being present and voting:

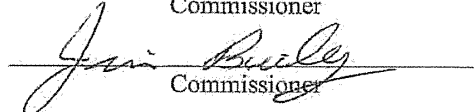


President


Secretary



Commissioner


Commissioner


Commissioner

43. North City Water District

**NORTH CITY WATER DISTRICT
RESOLUTION 2014.09.24**

**A RESOLUTION APPROVING AND ADOPTING THE UPDATED
KING COUNTY HAZARD MITIGATION PLAN, AS APPROVED BY THE FEDERAL
EMERGENCY MANAGEMENT AGENCY**

Background

A. King County and North City Water District support disaster mitigation efforts and regional disaster planning.

B. A locally adopted plan reviewed and approved by Federal Emergency Management Agency (FEMA) is required under the Mitigation Act of 2000.

C. In October 2004, the King County council approved the county's initial five year Regional Hazard Mitigation Plan. Shoreline Water District adopted this plan on August 17, 2004 by resolution 2004.08.31.

D. In December 2009, the King County council approved the update of the Regional Hazard Mitigation Plan.

E. An updated plan is now required to comply with the Disaster Mitigation Act of 2000.

F. King County and other jurisdictions within King County have a cooperative interest in disaster mitigation planning efforts. Additional agencies are expected to annex this plan following FEMA approval.

G. Staff recommends approval and adoption of the King County regional Hazard Mitigation Plan, Attachment A to this resolution.

Action

IT IS RESOLVED THAT:

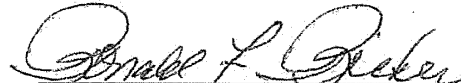
H. The Regional Hazard Mitigation Plan is hereby approved.

I. The North City Water District Board of Commissioner authorized the Office of Emergency Management to make any required FEMA revisions to update the King County Regional Hazard Mitigation Plan required by FEMA for final approval.

ADOPTED by the Board of Commissioners of North City Water District at an open public meeting the 7th day of October, 2014.

ATTEST:


Charlotte Haines, President


Ronald Ricker, Vice President

Approved as to Form:

Andrew Maron, District Attorney


Larry Schoonmaker, Secretary

44. Riverview School District

**RIVERVIEW SCHOOL DISTRICT NO. 407
KING COUNTY, DUVALL, WASHINGTON**

RESOLUTION NO. 15-01

A RESOLUTION of the Board of Directors of the Riverview School District No. 407, King County Washington, authorizing the adoption of the King County Regional Hazard Mitigation Plan.

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, Cities, Towns, School Districts, and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

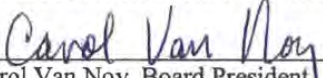
WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED, that the Riverview School District:

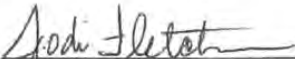
- 1.) Adopts in its entirety, Volume 1 and the introduction, chapter 44 the Riverview School District annex and the appendices of Volume 2 of the King County Regional Plan Update.
- 2.) Will use the adopted and approved portions of the Regional Hazard Mitigation Plan to guide pre- and post-disaster mitigation of the hazards identified.
- 3.) Will coordinate the strategies identified in the Regional Hazard Mitigation Plan with other planning programs and mechanisms under its jurisdictional authority.
- 4.) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the Regional Hazard Mitigation Plan.
- 5.) Will help to promote and support mitigation successes of all Regional Hazard Mitigation Plan Planning Partners.

ADOPTED BY THE RIVERVIEW SCHOOL DISTRICT NO. 407 BOARD OF DIRECTORS at its regular open public meeting on January 27, 2015.

RIVERVIEW SCHOOL DISTRICT BOARD OF DIRECTORS



Carol Van Noy, Board President



Jodi Fletcher Board Vice President



Greg Bawden, Director

ATTESTED TO:

Danny Edwards, Director



Dr. Anthony L. Smith, Superintendent
Secretary, Board of Directors



Lori Oviatt, Director

45. Ronald Wastewater District

RONALD WASTEWATER DISTRICT
A Special Purpose District Formed Pursuant to RCW Chapter 57

Resolution 14-22

**A Resolution of the Board of Commissioners of Ronald Wastewater District
Adopting the King County Regional Hazard Mitigation Plan (RHMP) as Shown
Below and Thereby Fulfilling the District's Requirement to Have a Current Hazard
Mitigation Plan.**

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment, and the County's economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, Cities, Towns, and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

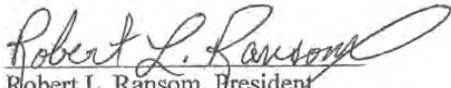
WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating, and revising this strategy.

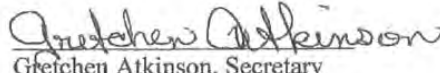
NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners of Ronald Wastewater District that the "King County Regional Hazard Mitigation Plan Update" is hereby adopted and that the Board:

1. Adopts in its entirety Volume 1: Planning Area-Wide Elements (basic plan).
2. Adopts Volume 2d, Chapter 45: Planning Partner Annexes (special purpose districts), Ronald Wastewater District Annex.
3. Adopts Appendices of Volume 2 of the King County Regional Hazard Mitigation Plan (RHMP).

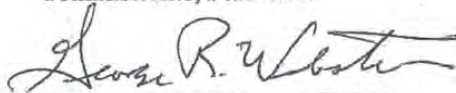
4. Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
5. Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
6. Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
7. Will help to promote and support the mitigation successes of all RHMP Planning Partners.

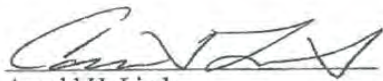
ADOPTED by the Board of Commissioners of Ronald Wastewater District on October 14, 2014 at a regular meeting held at 6:00 p.m. at the District's office.


Robert L. Ransom, President
Commissioner, Position 1


Gretchen Atkinson, Secretary
Commissioner, Position 2

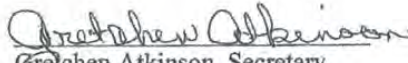

Brian T. Carroll, Vice President
Commissioner, Position 3


George Webster,
Commissioner, Position 4


Arnold H. Lind,
Commissioner, Position 5

ATTEST:

I, the undersigned Secretary of the Board of Commissioners of Ronald Wastewater District, a municipal corporation of King County, Washington, CERTIFY that the preceding document is a true and correct copy of **Resolution 14-22** of the District, duly adopted by the Board of Commissioners on October 14, 2014 at a regular meeting.


Gretchen Atkinson, Secretary
Commissioner, Position 2

46. Sammamish Plateau Water & Sewer

**SAMMAMISH PLATEAU WATER & SEWER DISTRICT
KING COUNTY, WASHINGTON**

RESOLUTION NO. 4453

RESOLUTION OF THE BOARD OF COMMISSIONERS OF SAMMAMISH PLATEAU WATER AND SEWER DISTRICT, KING COUNTY, WASHINGTON, AUTHORIZING AND APPROVING THE KING COUNTY REGIONAL MITIGATION PLAN AND THE DISTRICT'S ANNEX TO THE PLAN.

WHEREAS, Chapter 39.34 RCW authorizes water-sewer districts to enter into interlocal agreements to carry out their lawful purpose and authority to provide utility services to their customers; and

WHEREAS, the Federal government passed the Disaster Mitigation Act in 2000 requiring state, local communities and tribal governments to have mitigation plans in place by November 2004 to be eligible for mitigation funding; and

WHEREAS, King County established the King County Regional Hazard Mitigation Plan dated August 23, 2004, which included participation by individual agencies including cities, fire districts, school districts, special purpose districts and other miscellaneous small jurisdictions; and

WHEREAS, the Sammamish Plateau Water and Sewer District ("District") adopted its own standalone Hazard Mitigation Plan by Resolution 3882 in February 1, 2010 which was approved by the Federal Emergency Management Agency (FEMA); and

WHEREAS, King County and its partners intend to update the Regional Hazard Mitigation Plan on a five year basis, with the current update being developed for adoption in 2014; and

WHEREAS, the District has determined that its voluntary participation in the Regional Hazard Mitigation Plan would be beneficial to District customers; and

WHEREAS, the District has prepared a Hazard Mitigation Plan to be included as an annex to the Regional Hazard Mitigation Plan; now, therefore,

Resolution No. 4453

Page 1

BE IT RESOLVED, by the Board of Commissioners of Sammamish Plateau Water & Sewer District, King County, Washington, as follows:

1. The recitals set forth are hereby fully incorporated herein by this reference.
2. Volume 1 of the 2014 King County Regional Hazard Mitigation Plan Update ("RHMP Update"), the Introduction to Volume 2, Chapter 46 entitled "Sammamish Plateau Water & Sewer Update Annex" of Volume 2, Part 2d, and the appendices of Volume 2 of the RHMP Update are hereby approved and adopted
3. The District shall use the adopted and approved portions of the RHMP Update to guide pre- and post-disaster mitigation of the hazards identified.
4. The District will coordinate the strategies identified in the RHMP Update with other planning programs and mechanisms under its jurisdictional authority.
5. The District will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described in the RHMP Update.
6. The District's General Manager and the President of the District Board of Commissioners, or their designees are authorized to sign the RHMP Update and any related documents on behalf of the District if required by FEMA or the King County Office of Emergency Management to do so.
7. This resolution shall be effective the date set forth below. All District resolutions, policies and procedures, including Resolution No. 3825, are hereby amended, superseded and rescinded to be in accordance with the provisions of this resolution.

Resolution No. 4453

Page 2

ADOPTED by the Board of Commissioners of Sammamish Plateau Water and Sewer District, King County, Washington, at a regular open public meeting held on the 5th day of January, 2015.

**Individual Commissioner's
Vote on this Resolution:**

Approved:	<u>✓</u>
Opposed:	_____
Abstained:	_____
Absent:	_____
Approved:	<u>✓</u>
Opposed:	_____
Abstained:	_____
Absent:	_____
Approved:	<u>✓</u>
Opposed:	_____
Abstained:	_____
Absent:	_____
Approved:	<u>✓</u>
Opposed:	_____
Abstained:	_____
Absent:	_____
Approved:	_____
Opposed:	_____
Abstained:	_____
Absent:	_____

Lloyd Warren
Lloyd Warren, Commissioner

Karen Moran
Karen Moran, Commissioner

Mary Shustox
Mary Shustox, Commissioner

Tom Harman
Tom Harman, Commissioner

Mahbubul Islam
Mahbubul Islam, Commissioner

Resolution No. 4453

47. Shoreline Fire Department



Shoreline Fire Department
Dedicated to the Protection of Life and Property
Celebrating 75 Years of Service to the Shoreline Community

FIRE CHIEF
Matt Cowan

COMMISSIONERS
Ken Callahan Rod Heivilin
Kim Fischer Jon Kennison
David Harris

RESOLUTION 14-05

ADOPTION OF THE KING COUNTY REGIONAL HAZARDOUS MITIGATION PLAN (RHMP)

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment, and the County's economy;

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW THEREFORE BE IT RESOLVED that the Board of Fire Commissioners of the Shoreline Fire Department:

1. Adopts in its entirety, Volume 1 and the introduction, Volume 2, Chapter 23 of the Planning Partner Annexes, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).
2. Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
3. Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
4. Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described in the RHMP.
5. Will help promote and support the mitigation successes of all RHMP Planning partners.

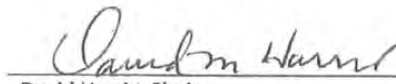
ADOPTED by the Board of Fire Commissioners of the Shoreline Fire Department, King County, Washington, at the regular Board meeting held on September 11, 2014.

Attest,

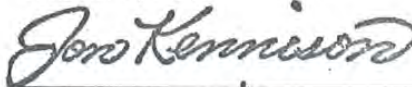


Joyce Brown
Secretary to the Board

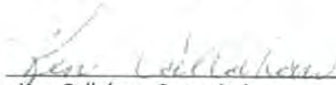
Board of Commissioners:



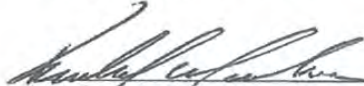
David Harris, Chair



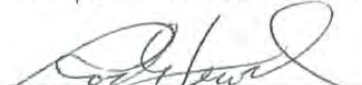
Jon Kennison, Vice Chair



Ken Callahan, Commissioner



Kimberly A. Fischer, Commissioner



Rod Heivilin, Commissioner

48. Skyway Water and Sewer District

SKYWAY WATER AND SEWER DISTRICT

RESOLUTION 15-05-515

**A RESOLUTION of the Board of Commissioners of Skyway
Water and Sewer District, authorizing the adoption of the
King County Regional Hazard Mitigation Plan Update**

WHEREAS, all of King County, which includes Skyway Water and Sewer District, has exposure to natural hazards that increase the risk to life, property, environment and the District's economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, the Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy; now therefore,

BE IT RESOLVED that the Board of Commissioners as follows:

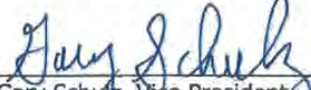
- 1.) Adopts in its entirety, Volume 1: Planning Area-Wide Elements (basic plan) of the King County Regional Hazard Mitigation Plan (RHMP) Update.
- 2.) Adopts Volume 2d, Chapter 48: Planning Partner Annexes (special purpose districts), Skyway Water and Sewer District Annex.
- 3.) Adopts the appendices of Volume 2 of the King County RHMP Update.
- 4.) Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- 5.) Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- 6.) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.

- 7.) Will help to promote and support the mitigation successes of all RHMP Planning Partners.

PASSED BY THE BOARD OF COMMISSIONERS OF SKYWAY WATER AND SEWER DISTRICT OF KING COUNTY, WASHINGTON, at its regular meeting held January 13, 2015.

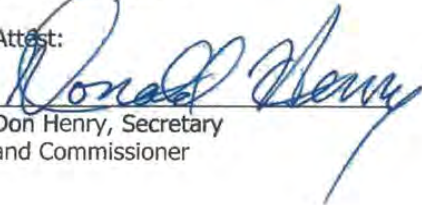


Jon Ault, President
and Commissioner



Gary Schutz, Vice President
and Commissioner

Attest:



Don Henry, Secretary
and Commissioner

49. Soos Creek Water & Sewer District



SOOS CREEK WATER AND SEWER DISTRICT

KING COUNTY, WASHINGTON

RESOLUTION NO. 3462-C

A RESOLUTION of the Board of Commissioners of Soos Creek Water and Sewer District, King County, Washington, authorizing adoption of the King County Regional Hazard Mitigation Plan Update.

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS; a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy.

NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners of Soos Creek Water and Sewer District, King County, Washington, as follows:

SECTION 1: That the District adopts in its entirety the King County Regional Hazard Mitigation Plan (RHMP) Update.

RESOLUTION NO. 3462-C

SUBJECT: Adopting King County Regional
Hazard Mitigation Plan Update

PAGE - 1

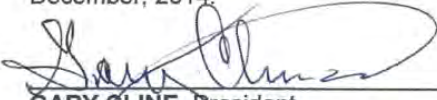
SECTION 2: That the District will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.

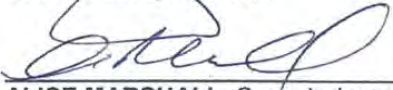
SECTION 3: That the District will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.

SECTION 4: That the District will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.

SECTION 5: That the District will help to promote and support the mitigation successes of all RHMP Planning Partners.

ADOPTED by the Board of Commissioners of Soos Creek Water and Sewer District, King County, Washington, at a regular open public meeting thereof on the 17th day of December, 2014.


GARY CLINE, President


ALICE MARSHALL, Commissioner

~~-excused-~~
STEVE PFAFF, Secretary

DAROLD STROUD, Commissioner


LARRY WEST, Commissioner

RESOLUTION NO. 3462-C

SUBJECT: Adopting King County Regional
Hazard Mitigation Plan Update

PAGE - 2

50. Southwest Suburban Sewer District

RESOLUTION 2014-15

**RESOLUTION NO. 2014-15
A RESOLUTION OF THE BOARD OF COMMISSIONERS
OF SOUTHWEST SUBURBAN SEWER DISTRICT, KING
COUNTY, WASHINGTON, AUTHORIZING THE ADOPTION OF THE
KING COUNTY REGIONAL HAZARD MITIGATION PLAN UPDATE**

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS; a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, BE IT RESOLVED by the Board of Commissioners of Southwest Suburban Sewer District, King County, Washington,

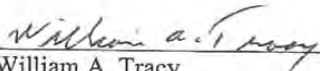
- 1.) Adopts in its entirety, Volume 1 and the introduction, chapter 53, Southwest Suburban Sewer District's jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).
- 2.) Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- 3.) Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- 4.) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- 5.) Will help to promote and support the mitigation successes of all RHMP Planning Partners.

ADOPTED by the Board of Commissioners of Southwest Suburban Sewer District, King County, Washington, at a regular meeting thereof held this October 21st, 2014

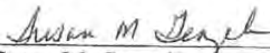
SOUTHWEST SUBURBAN SEWER DISTRICT
KING COUNTY, WASHINGTON

Individual Commissioner's
Vote on Resolution

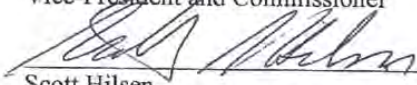
In Favor of: ☒
Opposed: ☐
Abstained: ☐


William A. Tracy,
President and Commissioner

In Favor of: ☒
Opposed: ☐
Abstained: ☐

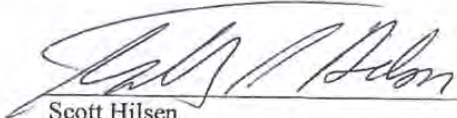

Susan M. Genzale
Vice-President and Commissioner

In Favor of: ☒
Opposed: ☐
Abstained: ☐


Scott Hilsen,
Secretary and Commissioner

CERTIFICATE

I, Scott Hilsen, Secretary of the Board of Commissioners of Southwest Suburban Sewer District, King County, Washington, DO HEREBY CERTIFY that the foregoing resolution is a true and correct copy of Resolution 2014-15 of said Board, duly adopted at a regular meeting thereof held on the 21st of October, 2014, signed by the members of such Board in attendance at such meeting and attested by myself in authentication of such adoption.


Scott Hilsen
Secretary of the Board of Commissioners
Southwest Suburban Sewer District

51. Valley Regional Fire Authority

RESOLUTION NO. 109

A RESOLUTION OF THE GOVERNING BOARD OF THE
VALLEY REGIONAL FIRE AUTHORITY (VRFA)
AUTHORIZING THE ADOPTION OF THE KING COUNTY
REGIONAL HAZARD MITIGATION PLAN INCLUDING THE
VRFA ANNEX

WHEREAS, all of King County has exposure to natural hazards that
increase the risk to life, property, environment and the County's economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster
event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390)
established new requirements for pre- and post-disaster hazard mitigation
programs; and

WHEREAS; a coalition of King County, Cities, Towns and Special
Purpose Districts with like planning objectives has been formed to pool
resources and create consistent mitigation strategies within the King County
planning area; and

Resolution 109
October 14, 2014
Page 1

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW THEREFORE, THE GOVERNING BOARD OF THE VALLEY REGIONAL FIRE AUTHORITY HEREBY RESOLVES AS FOLLOWS:

1. Adopts in its entirety, Volume 1 and the introduction, Chapter 51 of Volume 2d, the VRFA jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).
2. Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
3. Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
4. Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.

Resolution 109
October 14, 2014
Page 2

5. Will help to promote and support the mitigation successes of all RHMP Planning Partners.

DATED and SIGNED this 14 day of OCTOBER 2014.

VALLEY REGIONAL FIRE AUTHORITY

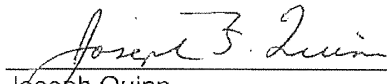


Dave Hill
Chair, Board of Governance

ATTEST:


Louise Bartol
Clerk of the Board

APPROVED AS TO FORM:


Joseph Quinn
Legal Counsel

Resolution 109
October 14, 2014
Page 3

52. Valley View Sewer District

**A RESOLUTION OF THE
VALLEY VIEW SEWER DISTRICT
RESOLUTION NO. 2014-9**

**AUTHORIZING THE ADOPTION OF THE KING
COUNTY REGIONAL HAZARD MITIGATION
PLAN UPDATE**

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

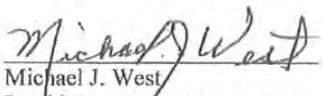
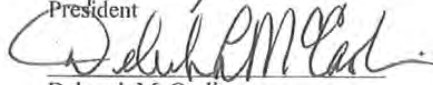
WHEREAS; a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

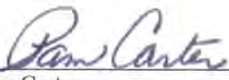
WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

NOW, THEREFORE, be it resolved by the Board of Commissioners of Valley View Sewer District as follows:

- 1.) Adopts in its entirety, Volume 1 and the introduction, chapter 54 the Valley View Sewer District jurisdictional annex, and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).
- 2.) Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- 3.) Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- 4.) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- 5.) Will help to promote and support the mitigation successes of all RHMP Planning Partners.

ADOPTED by the Board of Commissioners of Valley View Sewer District, King County, Washington, at a regular open public meeting thereof, this 7th day of October 2014.


Michael J. West
President

Deborah McCaslin
Secretary


Pam Carter
Vice-President

53. Vashon Island Fire & Rescue (King County Fire Protection District 13)

**Vashon Island Fire & Rescue
(King County Fire District #13)
RESOLUTION 14-345**

**A RESOLUTION OF THE BOARD OF FIRE
COMMISSIONERS AUTHORIZING THE ADOPTION OF
THE KING COUNTY REGIONAL HAZARD MITIGATION
PLAN UPDATE**

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS; pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

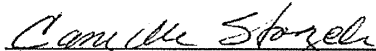
WHEREAS; a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

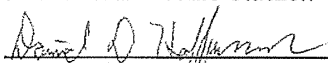
WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy;

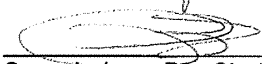
NOW, THEREFORE, BE IT RESOLVED that VASHON ISLAND FIRE & RESCUE

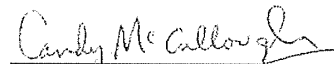
- 1.) Adopts the following portions of the King County Regional Plan Update (RHMP):
 - a. Volume 1 in its entirety;
 - b. From Volume 2, the introduction, the jurisdictional annex Chapter 53 for Vashon Island Fire & Rescue (King County Fire Protection District #13 and the appendices of Volume 2 of the King County Regional Plan Update (RHMP).
- 2.) Will use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified.
- 3.) Will coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- 4.) Will continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.
- 5.) Will help to promote and support the mitigation successes of all RHMP Planning Partners.

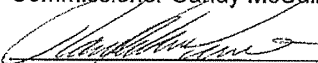
PASSED AND ADOPTED on this 30th day of December, 2014, by the Board of Fire Commissioners:


Board Chair Camille Staczek


Commissioner David Hoffmann


Commissioner Rex Stratton


Commissioner Candy McCullough


Commissioner Ron Turner


District Secretary, Susan Wolf

54. Woodinville Water District

WOODINVILLE WATER DISTRICT

KING COUNTY, WASHINGTON

RESOLUTION NO. 3806

A RESOLUTION of the Board of Commissioners of Woodinville Water District, King County, Washington, adopting of the King County Regional Hazard Mitigation Plan Update.

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, a coalition of King County and several cities, towns and special purpose districts, including Woodinville Water District ("District"), with like planning objectives has been formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the coalition has completed a planning process that engages the public, assesses the risk of and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy; and such planning process resulted in the preparation of the King County Regional Hazard Mitigation Plan Update ("RHMP"); and

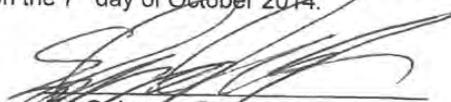
WHEREAS, the District now desires to adopt the RHMP; now, therefore,

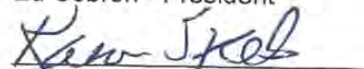
BE IT RESOLVED by the Board of Commissioners of the Woodinville Water District, King County, Washington, as follows:

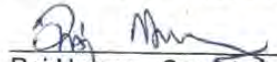
- 1.) Volume 1 and the introduction, Chapter 55 the Woodinville Water District jurisdictional annex, and the appendices of Volume 2 of the RHMP are hereby adopted in their entirety.
- 2.) The District shall use the adopted and approved portions of the RHMP to guide pre- and post-disaster mitigation of the hazards identified in the RHMP.
- 3.) The District shall coordinate the strategies identified in the RHMP with other planning programs and mechanisms under its jurisdictional authority.
- 4.) The District shall continue its support of the Steering Committee and continue to participate in the Planning Partnership as described by the RHMP.

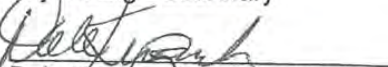
- 5.) The District will help to promote and support the mitigation successes of all RHMP Planning Partners.
- 6.) District Resolution No. 3505 is hereby repealed and superseded.

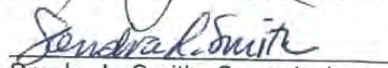
ADOPTED by the Board of Commissioners of Woodinville Water District, King County, Washington, at a regular open public meeting thereof on the 7th day of October 2014.


Ed Gebren - President


Karen Steeb - Vice President


Paj Hwang - Secretary


Dale Knapinski - Commissioner


Sandra L. Smith - Commissioner

Attest:


Paj Hwang - Secretary

King County
Regional Hazard Mitigation Plan Update

APPENDIX G.
PROGRESS REPORT TEMPLATE

APPENDIX G. PROGRESS REPORT TEMPLATE

King County Regional Hazard Mitigation Plan Update Annual Progress Report

Reporting Period: *(Insert reporting period)*

Background: King County and participating cities and special purpose districts in the county developed a hazard mitigation plan to reduce risk from all hazards by identifying resources, information, and strategies for risk reduction. The federal Disaster Mitigation Act of 2000 requires state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. To prepare the plan, the participating partners organized resources, assessed risks from natural hazards within the county, developed planning goals and objectives, reviewed mitigation alternatives, and developed an action plan to address probable impacts from natural hazards. By completing this process, these jurisdictions maintained compliance with the Disaster Mitigation Act, achieving eligibility for mitigation grant funding opportunities afforded under the Robert T. Stafford Act. The plan can be viewed on-line at:

INSERT LINK

Summary Overview of the Plan's Progress: The performance period for the Hazard Mitigation Plan became effective on , 2015, with the final approval of the plan by FEMA. The initial performance period for this plan will be 5 years, with an anticipated update to the plan to occur before , 2020. As of this reporting period, the performance period for this plan is considered to be % complete. The Hazard Mitigation Plan has targeted hazard mitigation actions to be pursued during the 5-year performance period. As of the reporting period, the following overall progress can be reported:

- out of initiatives (%) reported ongoing action toward completion.
- out of initiatives (%) were reported as being complete.
- out of initiatives (%) reported no action taken.

Purpose: The purpose of this report is to provide an annual update on the implementation of the action plan identified in the King County Regional Hazard Mitigation Plan Update. The objective is to ensure that there is a continuing and responsive planning process that will keep the Hazard Mitigation Plan dynamic and responsive to the needs and capabilities of the partner jurisdictions. This report discusses the following:

- Natural hazard events that have occurred within the last year
- Changes in risk exposure within the planning area (all of King County)
- Mitigation success stories
- Review of the action plan
- Changes in capabilities that could impact plan implementation
- Recommendations for changes/enhancement.

TABLE 1.
STEERING COMMITTEE MEMBERS

Natural Hazard Events within the Planning Area: During the reporting period, there were _____ natural hazard events in the planning area that had a measurable impact on people or property. A summary of these events is as follows:

- Changes in Risk Exposure in the Planning Area:** *(Insert brief overview of any natural hazard event in the planning area that changed the probability of occurrence or ranking of risk for the hazards addressed in the hazard mitigation plan)*

G-2

...APPENDIX G. EXAMPLE PROGRESS REPORT

Review of the Action Plan: Table 2 reviews the action plan, reporting the status of each initiative. Reviewers of this report should refer to the Hazard Mitigation Plan for more detailed descriptions of each initiative and the prioritization process.

Address the following in the "status" column of the following table:

- Was any element of the initiative carried out during the reporting period?
- If no action was completed, why?
- Is the timeline for implementation for the initiative still appropriate?
- If the initiative was completed, does it need to be changed or removed from the action plan?

TABLE 2. ACTION PLAN MATRIX				
Action Taken? (Yes or No)	Time Line	Priority	Status	Status (X, O,✓)
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	

TABLE 2. ACTION PLAN MATRIX				
Action Taken? (Yes or No)	Time Line	Priority	Status	Status (X, O,✓)
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Initiative # —			[description]	
Completion status legend: ✓ = Project Completed O = Action ongoing toward completion X = No progress at this time				

...APPENDIX G. EXAMPLE PROGRESS REPORT

Changes That May Impact Implementation of the Plan: *(Insert brief overview of any significant changes in the planning area that would have a profound impact on the implementation of the plan. Specify any changes in technical, regulatory and financial capabilities identified during the plan's development)*

Recommendations for Changes or Enhancements: Based on the review of this report by the Hazard Mitigation Plan Steering Committee, the following recommendations will be noted for future updates or revisions to the plan:

- _____
- _____
- _____
- _____
- _____
- _____

Public review notice: *The contents of this report are considered to be public knowledge and have been prepared for total public disclosure. Copies of the report have been provided to the governing boards of all planning partners and to local media outlets and the report is posted on the King County Hazard Mitigation Plan website. Any questions or comments regarding the contents of this report should be directed to:*

Insert Contact Info Here

King County Regional Hazard Mitigation Plan Update
Volume 1: Planning-Area-Wide Elements

**PART 1—
THE PLANNING PROCESS**

CHAPTER 1. INTRODUCTION TO THE PLANNING PROCESS

1.1 WHY PREPARE THIS PLAN?

1.1.1 The Big Picture

Hazard mitigation is defined as a way to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster through long- and short-term strategies. It involves strategies such as planning, policy changes, programs, projects, and other activities that can mitigate the impacts of hazards. The responsibility for hazard mitigation lies with many, including private property owners; business and industry; and local, state, and federal government.

The federal Disaster Mitigation Act (DMA) of 2000 (Public Law 106-390) required state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. Prior to 2000, federal disaster funding focused on disaster relief and recovery, with limited funding for hazard mitigation planning. The DMA increased the emphasis on planning for disasters before they occur.

The DMA encourages state and local authorities to work together on pre-disaster planning, and it promotes sustainability for disaster resistance. “Sustainable hazard mitigation” includes the sound management of natural resources and the recognition that hazards and mitigation must be understood in the largest possible social and economic context. The enhanced planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk reduction projects.

1.1.2 Local Concerns

Natural hazards impact citizens, property, the environment and the economy of King County. Avalanches, flooding, landslides, windstorms, severe winter storms, volcanoes, earthquakes and tsunamis have exposed King County residents and businesses to the financial and emotional costs of recovering after natural disasters. The risk associated with natural hazards increases as more people move to areas affected by those hazards.

The inevitability of natural hazards and the growing population and activity within King County create an urgent need to develop strategies, coordinate resources, and increase public awareness to reduce risk and prevent loss from future hazard events. Identifying risks posed by hazards and developing strategies to reduce the impact of a hazard event can assist in protecting life and property of citizens and communities. Local residents and businesses can work together with the County to create a hazard mitigation plan that addresses the potential impacts of hazard events. To accomplish these objectives, King County and a coalition of planning partners prepared a hazard mitigation plan in 2004. That initial plan was updated in 2009, and is now undergoing its second comprehensive update in accordance with federal requirements. Several factors initiated this planning effort:

- The King County area has significant exposure to numerous natural hazards that have caused millions of dollars in past damage.
- The participating partners wanted to be proactive in preparedness for the probable impacts of natural hazards.

- Local resources to undertake risk reduction initiatives are limited. Being able to leverage federal financial assistance is paramount to successful hazard mitigation.

With these factors in mind, King County is committed to maintaining this plan in accordance with federal requirements on behalf of the King County partnership that has committed to this process.

1.1.3 Purposes for Planning

This planning effort represents the second comprehensive update to the King County Regional Hazard Mitigation Plan since its initial development in 2004. This update identifies resources, information, and strategies for reducing risk from natural hazards. Elements and strategies in the plan were selected because they meet a program requirement and because they best meet the needs of the planning partners and their citizens. One of the benefits of multi-jurisdictional planning is the ability to pool resources and eliminate redundant activities within a planning area that has uniform risk exposure and vulnerabilities. The Federal Emergency Management Agency (FEMA) encourages multi-jurisdictional planning under its guidance for the DMA. The plan will help guide and coordinate mitigation activities throughout the planning area. The main purpose of this planning effort was to identify risks posed by hazards and to develop strategies to reduce the impact of hazard events on people and property in King County; however, the plan was also developed to meet the following objectives:

- Meet or exceed requirements of the DMA.
- Enable all planning partners to continue using federal grant funding to reduce risk through mitigation.
- Meet the needs of each planning partner as well as state and federal requirements.
- Create a risk assessment that focuses on King County hazards of concern.
- Create a single planning document that integrates all planning partners into a framework that supports partnerships within the county, and puts all partners on the same planning cycle for future updates.
- Meet the planning requirements of FEMA's Community Rating System (CRS), allowing planning partners that participate in the CRS program to maintain or enhance their CRS classifications.
- Coordinate existing plans and programs so that high-priority initiatives and projects to mitigate possible disaster impacts are funded and implemented.

1.2 WHO WILL BENEFIT FROM THIS PLAN?

All citizens and businesses of King County are the ultimate beneficiaries of this hazard mitigation plan update. The plan reduces risk for those who live in, work in, and visit the county. It provides a viable planning framework for all foreseeable natural hazards that may impact the county. Participation in development of the plan by key stakeholders in the county helped ensure that outcomes will be mutually beneficial. The resources and background information in the plan are applicable countywide, and the plan's goals and recommendations can lay groundwork for the development and implementation of local mitigation activities and partnerships.

1.3 HOW TO USE THIS PLAN

This plan has been set up in two volumes so that elements that are jurisdiction-specific can easily be distinguished from those that apply to the whole planning area:

INTRODUCTION TO THE PLANNING PROCESS

- **Volume 1**—Volume 1 includes all federally required elements of a disaster mitigation plan that apply to the entire planning area. This includes the description of the planning process, public involvement strategy, goals and objectives, countywide hazard risk assessment, countywide mitigation actions, and a plan maintenance strategy. The following appendices provided at the end of Volume 1 include information or explanations to support the main content of the plan:
 - Appendix A—A glossary of acronyms and definitions
 - Appendix B—A 5-year progress report on actions identified in prior hazard plans
 - Appendix C—Planning partner bulletins
 - Appendix D—Hazard mitigation questionnaire and summary of results.
 - Appendix E—Concepts and methods used for hazard mapping
 - Appendix F—Plan adoption resolutions from Planning Partners
 - Appendix G—A template for progress reports to be completed as this plan is implemented.
- **Volume 2**—Volume 2 includes all federally required jurisdiction-specific elements, in annexes for each participating jurisdiction. It includes a description of the participation requirements established by the Steering Committee, as well as instructions and templates that the partners used to complete their annexes. Volume 2 also includes “linkage” procedures for eligible jurisdictions that did not participate in development of this plan but wish to adopt it in the future.

All planning partners will adopt Volume 1 in its entirety and at least the following parts of Volume 2: Part 1; each partner’s jurisdiction-specific annex; and the appendices.

CHAPTER 2. PLAN UPDATE—WHAT HAS CHANGED

2.1 THE PREVIOUS PLANS

King County responded to DMA by developing the initial King County Regional Hazard Mitigation Plan in 2004. This multi-jurisdictional planning effort provided DMA compliance to 39 local governments (King County, 13 cities and 25 special purpose districts). The initial plan was formally approved by FEMA Region X on December 14, 2004. It identified and prioritized over 170 actions to be implemented by the planning partnership. This initial plan included two major sections:

- Common planning provisions—Completed by King County’s Office of Emergency Management with input from individual participant agencies
- Jurisdiction annexes—Completed by each planning partner and including three parts:
 - Strategy
 - Jurisdiction annex administration
 - Initiatives/projects.

In 2009, the regional plan underwent its initial 5-year update in conformance with DMA requirements. The update process was intended to be conducted in two concurrent phases:

- Phase 1 was a King County base plan with a limited number of annexes for jurisdictions who were planning partners throughout the update process.
- Phase 2 was to incorporate the majority of remaining jurisdictions in the county.

A original planning schedule was shortened following back-to-back disasters in 2009—January flooding (federal disaster declaration DR-1817) and March snowstorms (federal disaster declaration DR-1825)—and the emergence of a significant flooding threat in the Green River Valley due to problems at Howard Hanson Dam. The planning team expedited Phase 1 to ensure King County’s DMA compliance and ability to address the impacts of the disasters in unincorporated areas. This truncated process resulted in a significant decrease in planning partners covered by the regional plan. Many of the original partners developed their own plans or let their plans expire.

The 2009 Regional Plan, approved by FEMA Region X on January 28, 2010, provided DMA compliance for King County, four cities and seven special purpose districts. It maintained the basic format of the initial plan, with some revisions, including the addition of a dam safety risk assessment. The update identified and prioritized over 85 actions to be implemented by the participating partners.

2.2 WHY UPDATE?

Title 44 of the Code of Federal Regulations (44 CFR) stipulates that hazard mitigation plans must present a schedule for monitoring, evaluating, and updating the plan. This provides an opportunity to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. A jurisdiction covered by a plan that has expired is not able to pursue elements of federal funding under the Robert T. Stafford Act for which a current hazard mitigation plan is a prerequisite.

2.3 CHANGES IN DEVELOPMENT

Hazard mitigation plan updates must be revised to reflect changes in development within the planning area during the previous performance period of the plan (44 CFR Section 201.6(d)(3)). The plan must describe changes in development in hazard-prone areas that increased or decreased vulnerability for each jurisdiction since the last plan was approved. If no changes in development impacted the jurisdiction's overall vulnerability, plan updates may validate the information in the previously approved plan. The intent of this requirement is to ensure that the mitigation strategy continues to address the risk and vulnerability of existing and potential development and takes into consideration possible future conditions that could impact vulnerability.

The King County planning area experienced a 14.6-percent increase in population between 2000 and 2013, an average annual growth rate of 1.06 percent per year. The County and its cities have adopted comprehensive plans that govern land-use decisions and policy-making in their jurisdictions as well as building codes and specialty ordinances based on state and federal mandates. This plan update assumes that some new development triggered by the increase in population occurred in hazard areas. Because all such new development would have been regulated pursuant to local programs and codes, it is assumed that vulnerability did not increase even if exposure did. This is validated by the fact that no hazard events in the planning area during the performance period caused significant losses.

The risk assessment for the initial King County regional plan was more subjective than the assessment for this update, as it used qualitative analyses and assumptions while the updated plan used a more quantitative approach. Given this difference, it is not possible to compare the results of the two assessments to see if risk has increased. Now that the planning area is equipped with a Hazus model, this type of comparative analysis will be possible for future updates to this plan.

2.4 THE 5-YEAR PROGRESS REPORT

The 2009 plan update included a plan maintenance protocol that called for annual review and updates to the plan, with a goal of facilitating linkage to the 2009 update by all the original planning partners. This did not occur during the performance period, primarily because many of the original planning partners developed their own plans to comply with the DMA.

Prior to preparing the current update with its expanded list of partners, many of whom had their own plans that this plan update will replace, the planning team prepared a five-year progress report of actions completed by all planning partners whose existing plan is replaced by this update. The progress report used the template for annual progress reporting that is described in Chapter 21 of this plan. This allowed planning partners to become familiar with the proposed process of annual progress reporting.

The five-year progress report is included in Appendix B of this volume. The reporting period for this report was 2010 through 2014. The report was completed by 24 local governments with prior plan coverage. It reports on the status of 283 initiatives. Upon completion of this report, it will be posted on the hazard mitigation plan website as the placeholder for all future progress reports completed from here on out.

2.5 THE UPDATED PLAN—WHAT IS DIFFERENT?

The King County Office of Emergency Management used the current update process to make significant changes to the format and content of the regional plan. The plan was re-packaged to better support a larger partnership and to establish a plan maintenance and implementation protocol that clearly defines the King County Office of Emergency Management's commitment to the plan's ongoing success:

PLAN UPDATE—WHAT HAS CHANGED

- The planning partnership was increased to 53 planning partners.
- The plan was developed in two volumes. Volume 1 contains all required elements that apply to the entire planning area; Volume 2 contains elements that are jurisdiction-specific.
- A comprehensive risk assessment is included for 10 hazards of concern, and an overview is provided for other hazards of interest.
- The risk assessments made robust use of FEMA’s Hazus-MH risk assessment software.
- A risk-ranking methodology was implemented that quantifies the impacts of each hazard so that they can be compared to one another.
- A new methodology was implemented for the prioritization of actions.
- A plan maintenance strategy is presented that includes a protocol and tools to support annual progress reporting, as well as a protocol for grant coordination.
- A prescribed linkage procedure will allow for future expansion of the partnership outside of the 5-year update window.
- A suite of tools and templates is provided to promote consistency of all future updates to the plan

These changes set a course to re-engage as many of the original planning partners as possible and to increase the coverage of the plan. This update represents a complete revision of the previous versions of the King County Regional Plan. Its content is different and the process used to develop it was different. The update process was conducted as if this were an initial planning effort. This approach accommodated the many planning partners who had not previously been covered by a hazard mitigation plan. Table 2-1 indicates the major changes between the two plans as they relate to 44 CFR planning requirements.

**TABLE 2-1.
PLAN CHANGES CROSSWALK**

44 CFR Requirement	2009 Plan update	Updated Plan
§201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval; (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.	The 2009 plan update was conducted through a Regional Hazard Mitigation Planning Team made up predominantly of County staff. Due to the need to expedite the process, many of the outreach techniques used in the 2004 plan were not used in this update. A website was established, press releases were disseminated and 14 public meetings were held to disclose the plan update process. Agency coordination included Washington Emergency Management Division and FEMA Region X. The response to the Howard Hanson Dam crisis provided numerous opportunities to discuss the plan update process.	The Plan update was facilitated through a Steering Committee made up of stakeholders within the planning area. The Steering Committee was responsible for : defining planning partner expectations, review of relevant plans and programs, agency coordination, identification of a vision, goals and objectives, confirmation of a public involvement strategy, development of a plan maintenance strategy and review and approval of the draft plan.
§201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.	The plan update used an existing Hazard Identification and Vulnerability Assessment as the basis for the risk assessment. This followed the format and content of the 2004 plan. The Hazard Identification and Vulnerability Assessment profiled eight natural hazards (avalanche, drought, earthquake, flood, landslide, tsunami, dam safety and) and four non-natural hazards (hazardous materials, terrorism, civil disorder and cyber-terrorism).	Part 2 of Volume 1 presents a comprehensive risk assessment for the planning area that looks at 10 natural hazards of concern: avalanche, dam failure, earthquake, flood, landslide, severe weather, severe winter weather, tsunami, volcano, wildfire, and provides a profile of other hazards of interest (non-natural hazards). This assessment used the best available data and science together with the Hazus-MH (version 2.2) risk assessment software.

PLAN UPDATE—WHAT HAS CHANGED

TABLE 2-1. PLAN CHANGES CROSSWALK		
44 CFR Requirement	2009 Plan update	Updated Plan
§201.6(c)(2)(i): [The risk assessment shall include a] description of the ... location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.	A profile was provided including maps that illustrate the extent and location of each identified hazard of concern. These profiles included information on previous occurrences of hazard events and on the probability of future hazard events.	Comprehensive risk assessments of each hazard of concern are presented in Volume 1 Chapter 8 through Chapter 17. Each chapter includes the following: • Hazard profile, including maps of extent and location, historical occurrences, frequency, severity and warning time. • Secondary hazards • Exposure of people, property, critical facilities and environment. • Vulnerability of people, property, critical facilities and environment. • Future trends in development • Scenarios • Issues Each hazard is compared to each other via a risk ranking methodology in Chapter 19.
§201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i). This description shall include an overall summary of each hazard and its impact on the community	Vulnerability was described for each hazard of concern in a subjective context. A Level-1 hazard analysis for earthquake and flood hazards summarized losses to general building stock, critical facilities and estimated casualties. Each profile included a discussion on impacts and past mitigation efforts.	Vulnerability was assessed for all hazards of concern. The Hazus-MH computer model was used for the dam failure, earthquake, flood and tsunami hazards. These were Level-2 (user-defined) analyses using planning partner and County data. Critical facilities were defined and inventoried using the Hazus Comprehensive Data Management System. Hazus outputs were generated for other hazards by applying an estimated damage function to affected assets. The asset inventory was extracted from the Hazus-MH model. Best available data was used for all analyses. Outputs were generated for each participating planning partner.
§201.6(c)(2)(ii): [The risk assessment] must also address National Flood Insurance Program insured structures that have been repetitively damaged floods	The plan describes the National Flood Insurance Program and the participation status of participating communities. This is contained in the flood hazard profile.	The repetitive loss section was enhanced to meet new DMA and CRS planning requirements. The update includes a comprehensive analysis of repetitive loss areas that includes an inventory of the number and types of structures in the repetitive loss area. Repetitive loss areas were delineated, causes of repetitive flooding was cited, and these areas were reflected on maps. National Flood Insurance Program capability is assessed in the jurisdictional annexes for each municipal planning partner.

TABLE 2-1. PLAN CHANGES CROSSWALK		
44 CFR Requirement	2009 Plan update	Updated Plan
§201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.	A detailed vulnerability analysis that includes building counts and loss estimates was provided for the flood hazard. This level of detail was not provided for the other hazards of concern.	A complete inventory of the numbers and types of buildings exposed was generated for each hazard of concern. The Steering Committee defined “critical facilities” as they pertained to the planning area, and these facilities were inventoried by exposure. Each hazard chapter provides a discussion of future development trends as they pertain to the hazard.
§201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) and a description of the methodology used to prepare the estimate.	This level of detail was provided only for the flood hazard.	Dollar loss estimations were generated for all hazards of concern. These were generated by Hazus for the dam failure, earthquake, flood and tsunami hazards. For the other hazards, loss estimates were generated by applying a regionally relevant damage function to the exposed inventory. In all cases, a damage function was applied to an asset inventory. The asset inventory was the same for all hazards and was generated in the Hazus-MH model.
§201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.	The plan includes an overall description of land use with in the planning area, but does not detail that discussion by hazard. The plan includes no discussion on future land use or development trends.	There is a discussion on future development trends as they pertain to each hazard of concern. This discussion looks predominantly at the existing land use and the current regulatory environment that dictates this land use.
§201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment must assess each jurisdiction’s risks where they vary from the risks facing the entire planning area.	Risk assessment results were reported on a countywide scale and not broken out by municipality.	Risk assessment results were generated for each planning partner to support the concept of risk ranking, which was performed by each planning partner. Risk ranking was used by each planning partner to provide vision and focus to action plan development.
§201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction’s blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.	The 2009 update carried over the same action plan protocol deployed by the 2004 plan. This included a process for prioritization of mitigation actions.	Action plans were developed for each planning partner via a facilitated process that includes: • Risk ranking • Capability assessment • Action alternative review • Action selection • Action prioritization • Action category analysis

PLAN UPDATE—WHAT HAS CHANGED

TABLE 2-1. PLAN CHANGES CROSSWALK		
44 CFR Requirement	2009 Plan update	Updated Plan
§201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.	The 2009 update carried over the mission statement, vision, 6 goals and 21 objectives from the 2004 vision statement. The objectives were listed as subsets of the goals.	The plan update identifies a guiding principle, 7 goals and 15 objectives. Goals were selected that support the guiding principle, objectives were selected that meet multiple goals, and actions were selected and prioritized based on meeting multiple objectives.
§201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.	The 2009 plan does not categorize mitigation alternatives. However, based on a review of the update, the actions identified cover the six categories of mitigation (prevention, property protection, public education, natural resource protection, emergency services and capital projects.)	A hazard mitigation catalog was developed through a facilitated process that looks at strengths, weaknesses, obstacles and opportunities in the planning area. This catalog identifies actions that manipulate the hazard, reduce exposure to the hazard, reduce vulnerability, and increase mitigation capability. The catalog further segregates actions by scale of implementation. A table in the action plan section analyzes each action by mitigation type to illustrate the range of actions selected.
§201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program, and continued compliance with the program's requirements, as appropriate.	A brief discussion on the National Flood Insurance Program is provided in the flood hazard profile. There is no jurisdiction-specific discussion on National Flood Insurance Program capability.	All municipal planning partners were asked to assess National Flood Insurance Program capability in their jurisdictional annexes. All participating communities have identified actions supporting continued compliance and good standing under the program.
§201.6(c)(3)(iii): [The mitigation strategy shall describe] how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.	All actions identified are prioritized and there is discussion on benefits and costs of each project. However, there is no direct correlation to the benefit-cost review and action prioritization specified in the plan.	Each of the recommended initiatives is prioritized using a qualitative methodology that looked at the objectives the project will meet, the timeline for completion, how the project will be funded, the impact of the project, the benefits of the project and the costs of the project. This prioritization scheme is detailed in Chapter 21.
§201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.	Section 2 of the plan identifies a plan maintenance protocol that includes an approach for continuing public involvement and annual review.	A detailed plan maintenance strategy is provided that includes the following: • Annual review and progress reporting • Defined role for Steering Committee • Plan update triggers • Plan incorporation guidelines • Strategy for continuing public involvement • Grant coordination protocol

TABLE 2-1. PLAN CHANGES CROSSWALK		
44 CFR Requirement	2009 Plan update	Updated Plan
§201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.	The plan did not include this discussion	This is included in the detailed plan maintenance strategy in Chapter 21.
§201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.	Section 2 of the plan includes detailed discussion on continuing public involvement,	This is included in the detailed plan maintenance strategy in Chapter 21
§201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commission, Tribal Council).	The plan includes discussion on plan implementation which includes plan adoption	53 planning partners will seek DMA compliance for this plan. Appendix F contains the resolutions of all planning partners that adopted this plan

CHAPTER 3. PLAN METHODOLOGY

To develop the King County Regional Hazard Mitigation Plan Update, the County followed a process that had the following primary objectives:

- Secure grant funding
- Form a planning team
- Establish a planning partnership
- Define the planning area
- Establish a steering committee
- Coordinate with other agencies
- Review existing programs
- Engage the public.

3.1 GRANT FUNDING

This planning effort was supplemented by a grant from FEMA. The King County Office of Emergency Management was the applicant agent for the grant. The grant was applied for in 2010 and funding was appropriated in 2011. It covered 75 percent of the cost for development of this plan; the County and its planning partners covered the balance through in-kind contributions.

3.2 FORMATION OF THE PLANNING TEAM

King County hired Tetra Tech, Inc. to assist with development and implementation of the plan. The Tetra Tech project manager assumed the role of the lead planner, reporting directly to a County-designated project manager. A planning team was formed to lead the planning effort, made up of the following members:

- Janice Rahman, King County Office of Emergency Management Project Manager
- Sam Ripley, King County Office of Emergency Management Project Coordinator
- Nora Jagielo, King County Office of Emergency Management Project Coordinator
- Rob Flaner, Tetra Tech, Project Manager/Lead Project Planner
- Kristen Gelino, Tetra Tech, Junior Planner
- Carol Bauman, Tetra Tech, Senior GIS Analyst and Risk Assessment Lead
- Dan Portman, Tetra Tech, Technical Editor.

3.3 ESTABLISHMENT OF THE PLANNING PARTNERSHIP

It was important to King County that this update re-engage the original planning partnership from the 2004 plan and be open to all eligible local governments. The planning team made a presentation at a stakeholder meeting on January 24, 2013 to introduce the mitigation planning process to all eligible local governments and solicit planning partners. Key meeting objectives were as follows:

King County Regional Hazard Mitigation Plan Update; Volume 1—Planning-Area-Wide Elements

- Provide an overview of the Disaster Mitigation Act.
- Describe the reasons for a plan.
- Outline the County work plan.
- Outline planning partner expectations.
- Seek commitment to the planning partnership.
- Seek volunteers for the Steering Committee.
- Explain the role of the King County Office of Emergency Management in maintaining the plan and the partnership.

Each jurisdiction wishing to join the planning partnership was asked to provide a “letter of intent to participate” that designated a point of contact for the jurisdiction and confirmed the jurisdiction’s commitment to the process and understanding of expectations. Linkage procedures have been established (see Volume 2 of this plan) for any jurisdiction wishing to link to the King County plan in the future. The municipal planning partners covered under this plan are shown in Table 3-1. The special purpose district planning partners are shown in Table 3-2.

To keep the partners engaged through the 14-month planning process, the planning team issued periodic bulletins apprising the partners of plan development milestones. Five bulletins were disseminated to all planning partners during this process. These bulletins are presented in Appendix C of this volume.

**TABLE 3-1.
MUNICIPAL PLANNING PARTNERS**

Jurisdiction	Point of Contact	Jurisdiction	Point of Contact
King County	Janice Rahman	City of Mercer Island	Jennifer Franklin
City of Algona	Chief Lee Gaskill	City of North Bend	Mark Rigos
City of Auburn	Sarah Miller	City of Pacific	Chief John Calkins
City of Bothell	Jennifer Warmke	City of Redmond	Debbie Newman
City of Burien	Nhan Nguyen	City of Renton	Deborah Needham
City of Carnation	Ken Carter	City of SeaTac	Patrick Lowery
City of Clyde Hill	Mitch Wasserman	City of Shoreline	Gail Harris
City of Duvall	Boyd Benson	City of Snoqualmie	Lauren Hollenbeck
City of Federal Way	Ray Gross	City of Tukwila	Marty Grisham
City of Issaquah	Bret Heath	City of Woodinville	Alexandra Sheeks
City of Kent	Kimberly Behmyer	Town of Beaux Arts Village	Sue Ann Spens
City of Kirkland	Pattijean Hooper	Town of Hunts Point	Sue Ann Spens
City of Maple Valley	Jeff Johnson	Town of Skykomish	Deborah Allegri
City of Medina	Kris Finnigan		

**TABLE 3-2.
SPECIAL PURPOSE DISTRICT PLANNING PARTNERS**

Jurisdiction	Point of Contact	Jurisdiction	Point of Contact
Fire Districts		Water & Sewer Districts	
Fire District No. 2	Lt. Milton Guerreiro	Coal Creek Utility District	Robert Russell
Fire District No. 45	D/C Joel Kuhnenn	Covington Water District	Robert Taylor
Kent Fire	Kimberly Behymer	Highline Water District	Mike Becker
Shoreline Fire	B/C Steve Taylor	North City Water District	Diane Pottinger
Valley Regional Fire Authority	D/C Mike Gerber	Midway Sewer District	Tim Campbell
Vashon Island Fire & Rescue	Chief Hank Lipe	Ronald Wastewater District	George Dicks
		Samunamish Plateau Water & Sewer District	Janet Sailer
Hospital Districts		Skyway Water & Sewer District	Cynthia Lamothe
King County Hospital District No. 2 (EvergreenHealth)	Barb Jensen	Soos Creek Water & Sewer District	Pamela Cobley
Public Hospital District No. 1 (Valley Medical)	Jim Tritten	Southwest Suburban Sewer District	Laura Gallez
School Districts		Valley View Sewer District	Dana Dick
Kent School District	Beth Gilbertson	Water District 19	Jeffrey Lakin
Riverview School District	William Adamo	Water District 20	Dick Swabb
		Water District 90	Tom Hoffman
		Water District 111	Pamela Cobley
		Water District 125	Mark Parsons
		Woodinville Water District	Kurt Oakland

3.4 DEFINING THE PLANNING AREA

The planning area was defined as all incorporated and unincorporated areas of King County as well as the incorporated areas of cities that cross County boundaries: Auburn, Bothell, Milton and Pacific. All partners to this plan have jurisdictional authority within this planning area.

3.5 THE STEERING COMMITTEE

Hazard mitigation planning enhances collaboration and support among diverse parties whose interests can be affected by hazard losses. A steering committee was formed to oversee all phases of the plan. The members of this committee included key planning partner staff, citizens, and other stakeholders from within the planning area. The planning team assembled a list of candidates representing interests within the planning area that could have recommendations for the plan or be impacted by its recommendations. The partnership confirmed a committee of 19 members at the kickoff meeting. Table 3-3 lists the committee members.

**TABLE 3-3.
STEERING COMMITTEE MEMBERS**

Name	Title/Jurisdiction or Agency
Janice Rahman (Chair)	Emergency Management Program Manager/King County Office of Emergency Management
Rick Wallace (Vice Chair)	President/Vashon Be Prepared (Citizen)
Barnaby Dow	Emergency Management Program Manager/King County Office of Emergency Management
Bob Freitag	Director of the Institute for Hazard Mitigation Planning and Research/University of Washington
Denis Uhler	Director of Supply Chain Management/Overlake Hospital
Dominic Maranzo	Emergency Manager/City of Kent
Ed Reed	Zone 3 Coordinator/King County
Gail Harris	Emergency Manager/City of Shoreline
James Kraman	Event Manager/Century Link Field
James Tritten	Emergency Preparedness Manager /Valley Medical Center
Kimberly Behymer	Program Coordinator/City of Kent
Lee Gaskill	Police Lieutenant/City of Algona
Mark Chubb	Fire Chief/King County Fire District No. 20
Mike Ryan	Zone 1 Coordinator/King County
Milton Guerreiro	Fire Lieutenant/King County Fire District No. 2 – Burien Fire
Monica Walker	Project/Program Manager/King County Water and Land Resources Division
Robert Taylor	Water Resources Manager/Covington Water District
Sarah Miller	Emergency Preparedness Manager/City of Auburn
Scott Emry	Risk Management Manager/Lake Washington School District

Leadership roles and ground rules were established during the Steering Committee's initial meeting on February 20, 2013. The Steering Committee agreed to meet monthly as needed throughout the course of the plan's development. The planning team facilitated each Steering Committee meeting, which addressed a set of objectives based on the work plan established for the plan. The Steering Committee met 10 times from February 2013 through March 2014. Meeting agendas, notes and attendance logs are available for review upon request. All Steering Committee meetings were open to the public, and agendas and meeting notes were posted to the hazard mitigation plan website.

3.6 COORDINATION WITH OTHER AGENCIES

Opportunities for involvement in the planning process must be provided to neighboring communities, local and regional agencies involved in hazard mitigation, agencies with authority to regulate development, businesses, academia, and other private and nonprofit interests (44 CFR, Section 201.6(b)(2)). This task was accomplished by the planning team as follows:

- **Steering Committee Involvement**—Agency representatives were invited to participate on the Steering Committee.

- **Agency Notification**—The following agencies were invited to participate in the plan development from the beginning and were kept apprised of plan development milestones:
 - Washington Emergency Management Division
 - Washington Department of Ecology
 - Washington Department of Natural Resources
 - FEMA Region X
 - Snohomish County
 - Pierce County
 - Muckleshoot Tribe.

These agencies received notices that included meeting announcements, meeting agendas, meeting minutes and bulletins by e-mail throughout the plan development process. These agencies supported the effort by attending meetings or providing feedback on issues.

- **Pre-Adoption Review**—All the agencies listed above were provided an opportunity to review and comment on this plan, primarily through the hazard mitigation plan website (see Section 3.8). Each agency was sent an e-mail message informing them that draft portions of the plan were available for review. In addition, the complete draft plan was sent to FEMA's Community Rating System contractor, the Insurance Services Office, Inc. (ISO), for a pre-adoption review to ensure CRS program compliance.

3.7 REVIEW OF EXISTING PROGRAMS

Hazard mitigation planning must include review and incorporation, if appropriate, of existing plans, studies, reports and technical information (44 CFR, Section 201.6(b)(3)). Chapter 6 of this plan provides a review of laws and ordinances in effect within the planning area that can affect hazard mitigation actions. In addition, the following programs can affect mitigation within the planning area:

- 2006 King County Flood Hazard Management Plan
- 2013 King County Flood Hazard Management Plan Update and Progress Report and Amendment to the 2006 Flood Hazard Mitigation Plan for the Community Rating System
- 2010 King County Flood Control District Hazard Mitigation Plan
- 2010 King County Strategic Plan
- The "Resilient King County" Initiative
- 2012 King County Comprehensive Plan
- The King County Shoreline Master Program
- 2007 King County Buildable Lands report
- King County Critical Areas Ordinance (Title 21.A.24)
- King County Strategic Climate Action Plan

An assessment of all planning partners' regulatory, technical and financial capabilities to implement hazard mitigation actions is presented in Chapter 21 and in the individual jurisdiction-specific annexes in Volume 2. Many of these relevant plans, studies and regulations are cited in the capability assessment.

3.8 PUBLIC INVOLVEMENT

Broad public participation in the planning process helps ensure that diverse points of view about the planning area's needs are considered and addressed. The public must have opportunities to comment on disaster mitigation plans during the drafting stages and prior to plan approval (44 CFR, Section 201.6(b)(1)). The Community Rating System expands on these requirements by making CRS credits available for optional public involvement activities.

3.8.1 Strategy

The strategy for involving the public in this plan emphasized the following elements:

- Include members of the public and other non-governmental stakeholders on the Steering Committee.
- Use a questionnaire to determine if the public's perception of risk and support of hazard mitigation has changed since the initial planning process.
- Attempt to reach as many planning area citizens as possible using multiple media.
- Identify and involve planning area stakeholders.

Stakeholders and the Steering Committee

Stakeholders are the individuals, agencies and jurisdictions that have a vested interest in the recommendations of the hazard mitigation plan, including planning partners. The effort to include stakeholders in this process included stakeholder participation on the Steering Committee. The Steering Committee consisted of a diverse group of stakeholders, including planning partner representatives, citizens, local members of the business community, members of academia, government representatives and members of the emergency management community.

Questionnaire

A hazard mitigation plan questionnaire (see Figure 3-1) was developed by the planning team with guidance from the Steering Committee. The questionnaire was used to gauge household preparedness for natural hazards and the level of knowledge of tools and techniques that assist in reducing risk and loss from natural hazards. This questionnaire was designed to help identify areas vulnerable to one or more natural hazards. The answers to its 34 questions helped guide the Steering Committee in selecting goals, objectives and mitigation strategies. Hard copies of the questionnaire were made available upon request, and a web-based version was made available through the hazard mitigation plan website. Over 200 questionnaires were completed. The complete questionnaire and a summary of its findings can be found in Appendix D of this volume.

Public Meetings

A member of the planning team staffed a public information booth at the City of Auburn Disaster Preparedness Fair on September 15, 2013. Public open houses were held in the evenings on September 24, 2013 in Shoreline City Hall, on September 25, 2013 in the Kent Senior Activity Center, and on September 26, 2013 in the Evergreen Health Auditorium in Kirkland (see Figure 3-2 through Figure 3-5). The meeting format allowed attendees to examine maps and handouts and have direct conversations with project staff. Reasons for planning and information generated for the risk assessment were shared with attendees via a PowerPoint presentation. Tables were set up for each of the primary hazards to which King County is most vulnerable.

King County

King County Regional Hazard Mitigation-Public Awareness Survey

1. Survey Introduction

A partnership of local governments and regional stakeholders in King County is working together to update the King County Regional Hazard Mitigation Plan. The purpose of this plan is to help local governments reduce the exposure of County residents to risks from natural hazards, such as earthquakes and floods. By writing this plan, local governments are able to apply to Federal programs that may provide money that can be used to reduce risks before and after natural disasters. This plan was first created in 2004 and was updated in 2009.

We need your help to plan for the possibility of future disasters. We would like to find projects that will help reduce or avoid impacts from natural hazard events. The following questions will help us measure how much local citizens already know about disaster-related issues and will help us identify areas where we need to improve. The information you provide will help us organize activities and prioritize projects to reduce the risk of injury or damage to property from future hazard events.

The survey consists of about 30 questions, and there is an opportunity to provide additional comments at the end. It should take less than 10 minutes to complete the survey and it is anonymous. When you have finished the survey, please click "Done" on the final page.

The King County Hazard Mitigation Planning Partnership thanks you for taking the time to participate in this important information-gathering process.

***1. Do you live in King County?**

☐ Yes

☐ No

Other (please specify)

***2. In what ZIP code is your home mailing address?**

3. In the past 20 years, have you or anyone in your household experienced any of the following hazards within King County? (Choose all that apply)

☐ Avalanche	☐ Household Fire
☐ Dam/Levee Failure	☐ Landslide
☐ Drought	☐ Severe Weather (wind, lightning, winter storm, etc.)
☐ Earthquake	☐ Tsunami
☐ Flood	☐ Wildland Fires
☐ River/Stream Bank Erosion	☐ None
☐ Hazardous Materials Spill/Release	
☐ Other (please specify)	

Powered by **SurveyMonkey**
Check out our [sample surveys](#) and create your own now!

Figure 3-1. Sample Web Page from Questionnaire



Figure 3-2. Attendees Listen to Presentation at Shoreline Public Meeting



Figure 3-3. Stakeholder Display at Public Open House

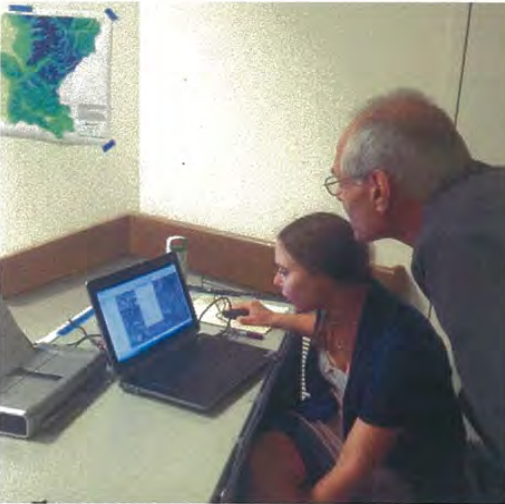


Figure 3-4. Citizen Learns about Risk at Hazus Workstation



Figure 3-5. Citizens View Hazard Maps at Public Open House

A Hazus-MH workstation allowed citizens to see information on their property, including exposure and damage estimates for earthquake and flood hazard events (Figure 3-6). Participating property owners were provided printouts of this information for their properties or could sign up to have information emailed to them. This tool was effective in illustrating risk to the public. More than 50 Hazus workstation reports were emailed to citizens following the public meetings. Planning partners and the planning team were present to answer questions. Each citizen attending the open houses was asked to complete a questionnaire, and each was given an opportunity to provide written comments to the Steering Committee. Local media outlets were informed of the open houses by a press release from the County.

PLAN METHODOLOGY

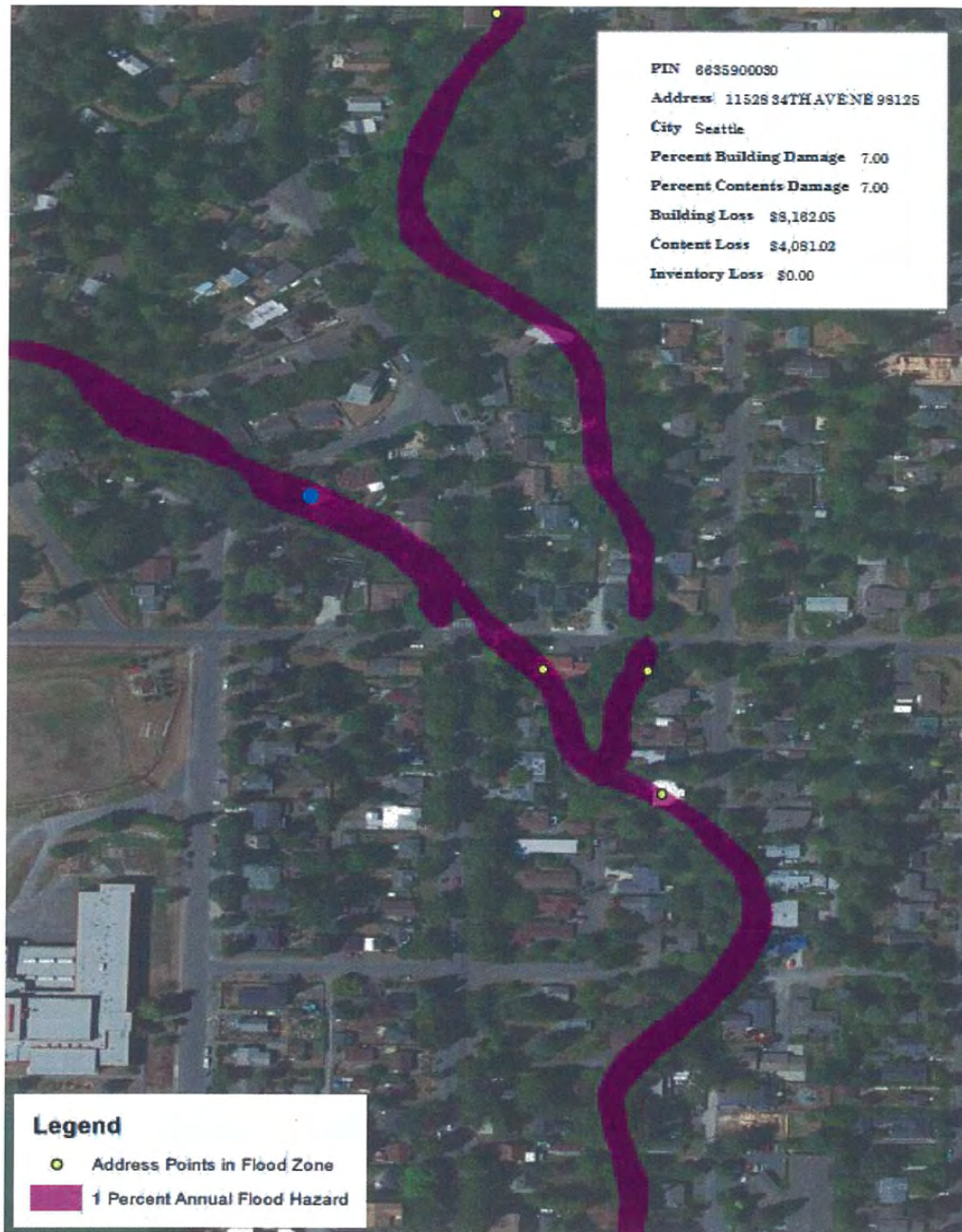


Figure 3-6. Example Hazus Workstation Output

Posters and Information Cards

To help advertise the survey and the public meetings, posters were printed that advertised both public outreach initiatives (see Figure 3-7). These posters were provided to all planning partners and were posted throughout the county. In addition, over 2000, two-sided, pocket information cards were printed and disseminated to all Steering Committee members and Planning partners (see Figure 3-8). The cards provided a QR code link to the survey and a web link to the hazard mitigation plan website, and advertised the public meetings.

DO YOU KNOW YOUR RISK?



**It is not a matter of IF we will face a disaster, but WHEN.
Are we ready?**

All residents of King County are invited to join County and City staff, as the results of King County's study on vulnerability are shared. This study will help local governments plan projects to help reduce the risk from hazards before they happen and to recover more quickly afterwards. You will learn about the hazards that we face and how vulnerable your home may be to these hazards. There are multiple ways for you to participate.

LEARN MORE ABOUT RISKS ASSOCIATED WITH THE FOLLOWING HAZARDS:

- Earthquake
- Flood
- Wildfire
- Landslide
- Tsunami
- Severe Weather
- Dam Failure
- Drought
- Other Hazards





FREE PUBLIC WORKSHOPS

Learn about our hazards and how you can help reduce the impacts. Receive potential damage estimates for your property.

Sunday, September 15th
10:00 am – 3:00 pm, Auburn Plaza Park
Main Street and Division Street, Auburn

Tuesday, September 24th
6:00 pm – 8:00 pm, Shoreline City Hall
17500 Midvale Ave N, Shoreline

Wednesday, September 25th
6:00 pm – 8:00 pm, Kent Senior Activity Center
600 E Smith Street, Kent

Thursday, September 26th
6:00 pm – 8:00 pm, Evergreen Health Auditorium
12040 NE 128th St (Red 1-551), Kirkland

Contact us at:
kcPubComment@kingcounty.gov
www.kingcounty.gov/hazardmitigation

COMPLETE OUR ON-LINE SURVEY:

www.surveymonkey.com/s/KCHazards



Figure 3-7. Poster Advertising Public Meetings and Survey



Figure 3-8. Pocket Information Card (Front and Back)

Press Releases

Press releases were distributed over the course of the plan's development as key milestones were achieved and prior to each public meeting. The planning effort received the following press coverage:

- Press release material published in the Shoreline City News on September 20, 2013
- Press release material published in the Kirkland Reporter on August 30, 2013. <http://www.kirklandreporter.com/community/221842301.html>
- Press release material published in the Bothell/Kenmore Kirkland Reporter on September 23, 2013. <http://www.bothell-reporter.com/news/224892422.html>
- Press release material published on SnoValleyStar.com on July 7, 2014. <http://snovalleystar.com/2014/07/07/public-input-wanted-on-hazard-mitigation-plan>

Internet

At the beginning of the plan development process, a website was created to keep the public posted on plan development milestones and to solicit relevant input (see Figure 3-9):

<http://www.kingcounty.gov/safety/prepare/EmergencyManagementProfessionals/Plans/RegionalHazardMitigationPlan.aspx>

The site's address was publicized in all press releases, mailings, questionnaires and public meetings. Information on the plan development process, the Steering Committee, the questionnaire and phased drafts of the plan was made available to the public on the site throughout the process. The County intends to keep a website active after the plan's completion to keep the public informed about successful mitigation projects and future plan updates.

Informational Bulletins

As a way to keep the large planning partnership and the public apprised of plan development milestones, six bulletins were distributed by the planning team over the course of the planning process. Bulletins provided to each planning partner helped to keep the large partnership involved in the process and informed them when planning partner deliverables were due. These bulletins were also posted on the hazard mitigation plan website to update the public on the planning process and its milestones. The bulletins are presented in Appendix C.

King County Regional Hazard Mitigation Plan Update; Volume 1—Planning-Area-Wide Elements

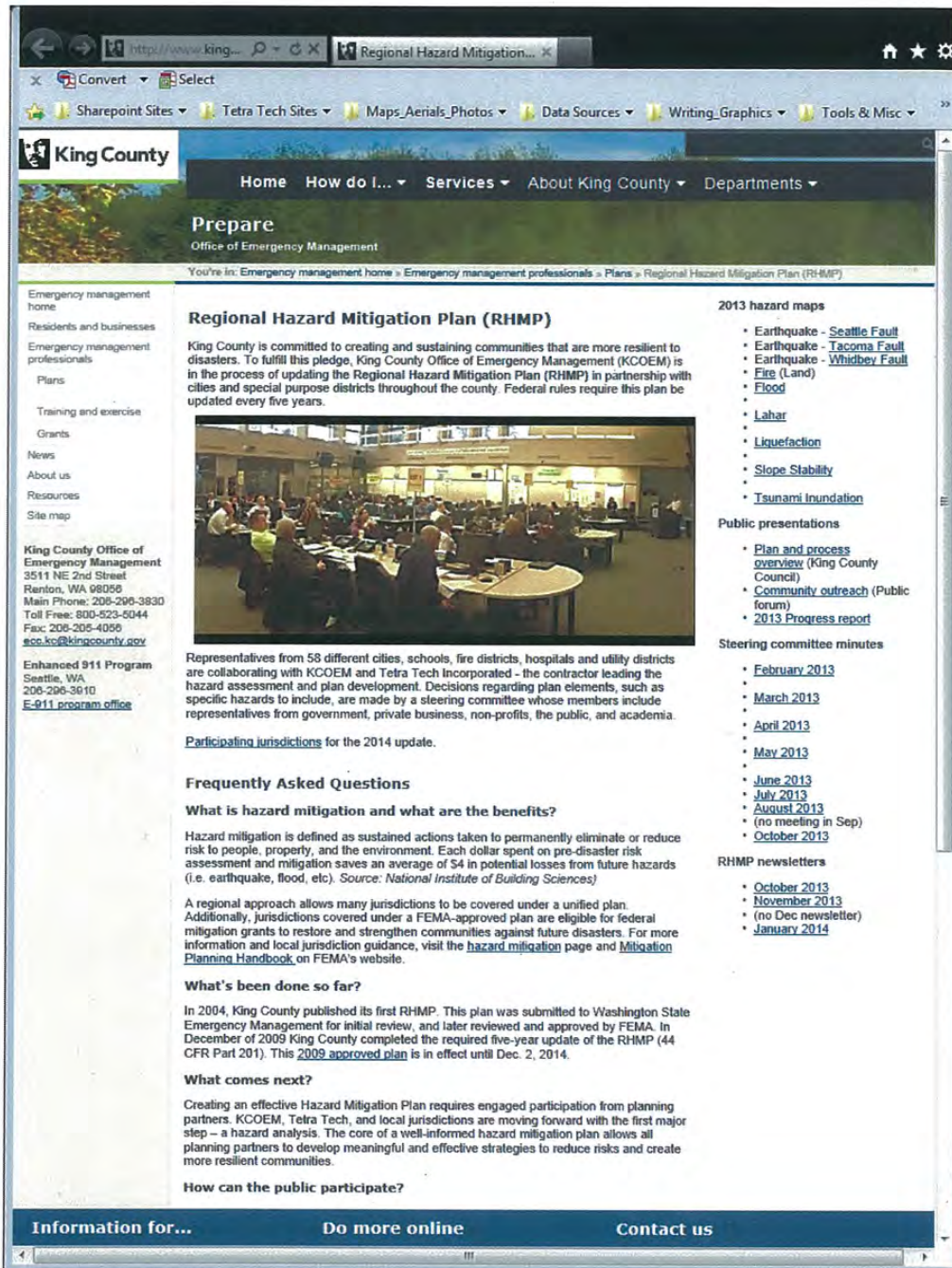


Figure 3-9. Sample Page from Hazard Mitigation Plan Web Site

3.8.2 Public Involvement Results

By engaging the public through the public involvement strategy, the concept of mitigation was introduced to the public, and the Steering Committee received feedback that was used in developing the components of the plan. Details of attendance and comments received are summarized in Table 3-4.

TABLE 3-4. SUMMARY OF PUBLIC MEETINGS				
Date	Location	Number of Citizens in Attendance	Number of Comments Received	Number of Questionnaires Received
September 24, 2013	Shoreline City Hall	38	2	6
September 25, 2013	Kent Senior Activity Center	30	1	1
September 26, 2013	Evergreen Health Auditorium	17	0	1
July 7, 2014	Snoqualmie City Hall	8	0	—
July 9, 2014	Issaquah City Hall	6	3	—
July 10, 2014	Duvall Visitor Center	2	0	—
July 10, 2014	Shoreline City Hall	25	4	—
Total		126	10	8

3.9 PLAN DEVELOPMENT CHRONOLOGY/MILESTONES

Table 3-5 summarizes important milestones in the development of the plan.

TABLE 3-5. PLAN DEVELOPMENT MILESTONES			
Date	Event	Description	Attendance
2012			
10/11	Contractor Support	County advertises solicitation for contractor support for the plan update	N/A
12/2	Select Tetra Tech to facilitate plan development	Facilitation contractor secured	N/A
12/15	Identify planning team	Formation of the planning team	N/A
2013			
1/24	Planning partner kickoff meeting	Second meeting with potential planning partners. Attendees were advised of planning partner expectations and asked to formally commit to the process. Steering Committee volunteers were solicited.	61
2/13	Steering Committee formed	Planning partners nominated potential committee members. The planning team received commitments from 14 members, finalizing the formation of the Steering Committee.	N/A

**TABLE 3-5.
PLAN DEVELOPMENT MILESTONES**

Date	Event	Description	Attendance
2/20	Steering Committee Meeting #1	- Review purposes for update - Organize Steering Committee - Plan review - Public Involvement Strategy	21
2/25	Planning partnership finalized	Deadline for submittal of letters of intent to participate in the planning effort.	N/A
3/21	Steering Committee meeting #2	- Risk assessment update - Plan review observations - Critical Facilities - Guiding Principle/Mission Statement - Public Outreach	20
4/16	Steering Committee meeting #3	- Risk assessment update “Other” Hazards of Concern - Define Critical Facilities - Guiding principle/ mission statement - Public Outreach Strategy update	12
5/21	Steering Committee meeting #4	- Reviewed and approved previous month’s minutes - Reported non-meeting hours - Reviewed current risk assessment update - Approve a Critical Facility definition - Approve a guiding principle/vision statement - Introduction to the goal setting exercise - Finalize the survey	15
6/18	Steering Committee meeting #5	- Reviewed and approved previous month’s minutes - Reported non-meeting hours - Reviewed current risk assessment update - Identified earthquake scenarios - Been introduced to the objectives exercise - Identified a plan maintenance strategy - Discussed public outreach strategy	15
7/16	Steering Committee meeting #6	- Reviewed and approved previous month’s minutes - Reported non-meeting hours - Reviewed current risk assessment update - Selected objectives - Confirmed plan maintenance strategy - Discussed public outreach strategy	12
8/20	Steering Committee meeting #7	- Reviewed and approved previous month’s minutes - Reported non-meeting hours - Previewed Maps - Confirmed objectives - Confirmed plan maintenance strategy - Discussed public outreach strategy - Discussed planning partner participation	12
9/2	Public Outreach	Press release advertising public meetings and website disseminated to all media outlets.	N/A

PLAN METHODOLOGY

**TABLE 3-5.
PLAN DEVELOPMENT MILESTONES**

Date	Event	Description	Attendance
10/15	Steering Committee meeting #8	- Reviewed and approved previous month's minutes - Reported non-meeting hours - Reviewed the status of the Risk Assessment - Reviewed Status of Jurisdictional Annex deployment - Reviewed Phase 1, Public Outreach results - Confirmed revised plan maintenance strategy - Identified Strengths, Weaknesses, Obstacles and opportunities with King County	10
11/12	Jurisdictional Annex Workshops (Round 1)	Mandatory session for planning partners. Workshop focused on how to complete the jurisdictional annex template. Two sessions were held. One for municipal governments and one for special purpose districts.	31
11/13	Jurisdictional Annex Workshops (Round 2)	Mandatory session for planning partners. Workshop focused on how to complete the jurisdictional annex template. Two sessions were held. One for municipal governments and one for special purpose districts.	37
2014			
2/25	Steering Committee meeting #9	- Reviewed and approved previous month's minutes - Reported non-meeting hours - Reviewed status of Jurisdictional Annex deployment - Confirmed revised Plan Maintenance Strategy - Identified County Wide Initiatives - Discussed next steps	13
3/19	Stakeholder Engagement	Presentation on earthquake scenarios assessed by plan given at the Resilient King County workshop #1	67
4/4	Draft Plan	Internal review draft provided by planning team to Steering Committee	N/A
4/15	Steering Committee meeting #10	Discussion and comments of Volume I internal review draft. Discussion of public comment, plan review and plan approval processes.	11
4/16	Stakeholder Engagement	Presentation on earthquake scenarios assessed by plan given at the Resilient King County workshop #2	45
6/27	Public Comment Period	Initial public comment period of draft plan opens. Draft plan posted on plan website with press release notifying public of plan availability	N/A
7/7	Public Outreach	Final public meeting on Draft Plan – City of Snoqualmie	8
7/9	Public Outreach	Final public meeting on Draft Plan – City of Issaquah	6
7/10	Public Outreach	Final public meeting on Draft Plan – City of Duvall	2
7/10	Public Outreach	Final public meeting on Draft Plan – City of Shoreline	25
7/31	Regulatory Review Submittal	Final draft plan submitted to Washington State for review and approval	N/A
8/13	Adoption	Adoption window of final plan opens	N/A
2015			
5/1	Plan Approval	Final plan approved by FEMA	N/A

CHAPTER 4. GUIDING PRINCIPLE, GOALS AND OBJECTIVES

Hazard mitigation plans must identify goals for reducing long-term vulnerabilities to identified hazards (44 CFR Section 201.6(c)(3)(i)). The Steering Committee established a guiding principle, a set of goals and measurable objectives for this plan, based on data from the preliminary risk assessment and the results of the public involvement strategy. The guiding principle, goals, objectives and actions in this plan all support each other. Goals were selected to support the guiding principle. Objectives were selected that met multiple goals. Actions were prioritized based on the action meeting multiple objectives.

4.1 GUIDING PRINCIPLE

A guiding principle focuses the range of objectives and actions to be considered. This is not a goal because it does not describe a hazard mitigation outcome, and it is broader than a hazard-specific objective. The guiding principle for the King County Regional Hazard Mitigation Plan Update is as follows:

King County is a region that promotes community resilience by eliminating or reducing risks and adverse impacts from hazards, while encouraging hazard mitigation activities by all sectors.

4.2 GOALS

The following are the mitigation goals for this plan:

1. Protect life and property.
2. Increase public awareness of hazards and mitigation opportunities.
3. Protect, restore and enhance environmental quality.
4. Leverage partnering opportunities.
5. Enhance planning activities.
6. Develop and implement cost-effective mitigation strategies.
7. Promote a sustainable economy.

The effectiveness of a mitigation strategy is assessed by determining how well these goals are achieved.

4.3 OBJECTIVES

Each selected objective meets multiple goals, serving as a stand-alone measurement of the effectiveness of a mitigation action, rather than as a subset of a goal. The objectives also are used to help establish priorities. The objectives are as follows:

1. Increase the resilience of critical facilities, infrastructure and government operations to ensure continuity of operations during and after a hazard event.
2. Consider the impacts of hazards in all planning mechanisms that address current and future land uses and integrate hazard mitigation goals and objectives into other existing plans and programs within the planning area.

3. Develop, improve and protect systems that provide early warnings, emergency response communications and evacuation procedures.
4. Use the best available data, science and technologies to improve understanding and stakeholder awareness of the location and potential impacts of hazards, the vulnerability of building types and community development patterns, and the measures needed to mitigate hazards.
5. Seek feasible mitigation projects that provide the highest degree of hazard protection with the best benefit-cost ratio.
6. Emphasize the hazard mitigation message in and promote the value of public outreach and education programs, such as Take Winter By Storm and What to Do to Make it Through.
7. Improve coordination among all sectors to mitigate hazards.
8. Reduce hazard-related risks and vulnerability to potentially isolated populations within the planning area.
9. Retrofit, purchase or relocate structures in high hazard areas, including those known to be repetitively damaged.
10. Strengthen codes to improve the hazard resilience of new construction.
11. Leverage social networks and other social capital mechanisms to educate the public and stakeholders and promote resilience.
12. Seek actions that protect or improve the environment for future environmental conditions.
13. Form private/public partnerships to leverage and share resources.
14. Partner with the private sector, including small businesses, to promote hazard mitigation as part of standard business practice.
15. Educate businesses about contingency planning countywide, targeting small businesses and those located in high risk areas, and promote employee education about disaster preparedness while on the job and at home.

King County Regional Hazard Mitigation Plan Update
Volume 1: Planning-Area-Wide Elements

**PART 2—
RISK ASSESSMENT**

CHAPTER 5. IDENTIFIED HAZARDS OF CONCERN AND RISK ASSESSMENT METHODOLOGY

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards. It allows emergency management personnel to establish early response priorities by identifying potential hazards and vulnerable assets. The process focuses on the following elements:

- Hazard identification—Use all available information to determine what types of disasters may affect a jurisdiction, how often they can occur, and their potential severity.
- Vulnerability identification—Determine the impact of natural hazard events on the people, property, environment, economy and lands of the region.
- Cost evaluation—Estimate the cost of potential damage or cost that can be avoided by mitigation.

The risk assessment for this hazard mitigation plan update evaluates the risk of natural hazards prevalent in the planning area and meets requirements of the DMA (44 CFR, Section 201.6(c)(2)).

5.1 IDENTIFIED HAZARDS OF CONCERN

For this plan, the Steering Committee considered the full range of natural hazards that could impact the planning area and then listed hazards that present the greatest concern. The process incorporated review of state and local hazard planning documents, as well as information on the frequency, magnitude and costs associated with hazards that have impacted or could impact the planning area. Anecdotal information regarding natural hazards and the perceived vulnerability of the planning area's assets to them was also used. Based on the review, this plan addresses the following hazards of concern:

- Avalanche
- Dam failure
- Earthquake
- Flood
- Landslide
- Severe weather
- Severe winter weather
- Tsunami
- Volcano
- Fire

With the exception of dam failure, this plan does not provide a full risk assessment of technological hazards and human-caused hazards. However, Chapter 18 provides a qualitative discussion of the following additional hazards, referred to in this plan as hazards of interest:

- Health hazards (epidemic, pandemic and bioterrorism)

- Cybersecurity
- Terrorism (vehicle-borne improvised explosive device).

5.2 METHODOLOGY

The risk assessments in Chapter 8 through Chapter 17 describe the risks associated with each identified hazard of concern. Each chapter describes the hazard, the planning area's vulnerabilities, and probable event scenarios. The following steps were used to define the risk of each hazard:

- Identify and profile each hazard—The following information is given for each hazard:
 - Geographic areas most affected by the hazard
 - Event frequency estimates
 - Severity estimates
 - Warning time likely to be available for response.
- Determine exposure to each hazard—Exposure was determined by overlaying hazard maps with an inventory of structures, facilities, and systems to determine which of them would be exposed to each hazard. For each identified hazard of concern, the best available existing data delineating a hazard area was selected. Data sets were evaluated based on scale, age and source. Additionally, data available in a GIS-compatible format with coverage of the full extent of the planning area were preferentially selected for use in the analysis.
- Assess the vulnerability of exposed facilities—Vulnerability of exposed structures and infrastructure was determined by interpreting the probability of occurrence of each event and assessing structures, facilities, and systems that are exposed to each hazard. Tools such as GIS and FEMA's hazard-modeling program called Hazus-MH were used to perform this assessment for the flood, dam failure and earthquake hazards. Outputs similar to those from Hazus were generated for other hazards, using maps generated by the Hazus program.

5.3 RISK ASSESSMENT TOOLS

5.3.1 Mapping

A review of national, state and county databases was performed to locate available spatially based data relevant to this planning effort. Maps were produced using GIS software to show the spatial extent and location of identified hazards when such data was available. These maps are included in the hazard profile chapters of this document and many of them are available on the King County Regional Hazard Mitigation Plan website. Information regarding the data sources and methodologies employed in these mapping efforts is located in Appendix E.

5.3.2 Dam Failure, Earthquake and Flood—Hazus-MH

Overview

In 1997, FEMA developed the standardized Hazards U.S., or Hazus, model to estimate losses caused by earthquakes and identify areas that face the highest risk and potential for loss. Hazus was later expanded into a multi-hazard methodology, Hazus-MH, with new models for estimating potential losses from hurricanes and floods.

Hazus-MH is a GIS-based software program used to support risk assessments, mitigation planning, and emergency planning and response. It provides a wide range of inventory data, such as demographics, building stock, critical facility, transportation and utility lifeline, and multiple models to estimate

IDENTIFIED HAZARDS OF CONCERN AND RISK ASSESSMENT METHODOLOGY

potential losses from natural disasters. The program maps and displays hazard data and the results of damage and economic loss estimates for buildings and infrastructure. Its advantages include the following:

- Provides a consistent methodology for assessing risk across geographic and political entities.
- Provides a way to save data so that it can readily be updated as population, inventory, and other factors change and as mitigation planning efforts evolve.
- Facilitates the review of mitigation plans because it helps to ensure that FEMA methodologies are incorporated.
- Supports grant applications by calculating benefits using FEMA definitions and terminology.
- Produces hazard data and loss estimates that can be used in communication with local stakeholders.
- Is administered by the local government and can be used to manage and update a hazard mitigation plan throughout its implementation.

Levels of Detail for Evaluation

Hazus-MH provides default data for inventory, vulnerability and hazards; this default data can be supplemented with local data to provide a more refined analysis. The model can carry out three levels of analysis, depending on the format and level of detail of information about the planning area:

- **Level 1**—All of the information needed to produce an estimate of losses is included in the software's default data. This data is derived from national databases and describes in general terms the characteristic parameters of the planning area.
- **Level 2**—More accurate estimates of losses require more detailed information about the planning area. To produce Level 2 estimates of losses, detailed information is required about local geology, hydrology, hydraulics and building inventory, as well as data about utilities and critical facilities. This information is needed in a GIS format.
- **Level 3**—This level of analysis generates the most accurate estimate of losses. It requires detailed engineering and geotechnical information to customize it for the planning area.

Application for This Plan

The Hazus model was used as follows for the hazards evaluated in this plan:

- **Flood**—A Level 2, user-defined analysis was performed for general building stock and for critical facilities and infrastructure. GIS building and assessor data (replacement cost values and detailed structure information) were loaded into Hazus-MH. An updated inventory was used in place of the Hazus-MH defaults for essential facilities, transportation and utilities. Current planning area flood mapping was used to delineate flood hazard areas and estimate potential losses from the 100- and 500-year flood events.
- **Dam Failure**—The basis for this analysis was the Lake Youngs dam failure inundation mapping. This data was imported into Hazus-MH and a Level 2 analysis was run using the flood methodology described above.
- **Earthquake**—A Level 2 analysis was performed to assess earthquake risk and exposure. Earthquake shake maps and probabilistic data prepared by the U.S. Geological Survey (USGS) were used for the analysis of this hazard. An updated general building stock inventory was developed using replacement cost values and detailed structure information from assessor tables. An updated inventory of essential facilities, transportation and utility

features was used in place of the Hazus-MH defaults. Three scenario events and two probabilistic events were modeled:

- The scenario events were a Magnitude-7.2 event on the Seattle Fault, a Magnitude-7.4 event on the South Whidbey Island Fault and a Magnitude-7.1 event on the Tacoma Fault.
- The standard Hazus analysis for the 100- and 500-year probabilistic events was run.

5.3.3 Landslide, Tsunami, Severe Weather, Severe Winter Weather, Wildfire and Volcano

For landslide, tsunami, severe weather, severe winter weather, volcano and wildfire, historical data was not adequate to model future losses. Hazus-MH has an application for the tsunami hazard, but it was not used for this plan update because available tsunami mapping of the Puget Sound region is limited. A Washington state-led effort to map this hazard in Puget Sound is incomplete. Current mapping covers only the City of Seattle, which is not participating as a planning partner in this update. A qualitative approach was used instead.

Hazus-MH is able to map hazard areas and calculate exposures if geographic information is available on the locations of the hazards and inventory data. Areas and inventory susceptible to some of the hazards of concern were mapped and exposure was evaluated. For other hazards, a qualitative analysis was conducted using the best available data and professional judgment. Locally relevant information was gathered from a variety of sources. Frequency and severity indicators include past events and the expert opinions of geologists, emergency management specialists and others. The primary data source was the King County GIS database, augmented with state and federal data sets. Additional data sources for specific hazards were as follows:

- **Landslide**—Three sources of data were utilized to approximate the extent and location of landslide hazard areas. Landslide location data was obtained from the Washington Department of Natural Resources and a landslide hazard dataset was obtained from King County. Potential landslide hazard areas dataset was created using surface geology and digital elevation model based on LiDAR data provided by King County. The combination of the three data sources were used to identify the extent and location of the landslide hazard areas. It should be noted that this level of detail is considered approximate, awareness zone mapping and is not considered to be suitable for use in a regulatory context. As of the completion of the planning process, King County was embarking on a landslide hazard identification process that will strive to generate detailed landslide hazard mapping that is suitable for use in a regulatory context. Future updates to this plan can be enhanced by this data once it becomes available.
- **Severe Weather and Severe Winter Weather**—Severe weather data was downloaded from the Natural Resources Conservation Service and the National Renewable Energy Laboratory.
- **Volcano**—Volcanic hazard data was obtained from the Washington Department of Natural Resources.
- **Wildfire**—Information on wildfire hazards areas was provided by U.S. Geological Survey and Washington Department of Natural Resources.
- **Tsunami**—Information on tsunami hazard areas was provided by Washington State Department of Natural Resources.

IDENTIFIED HAZARDS OF CONCERN AND RISK ASSESSMENT METHODOLOGY

5.3.4 Avalanche

The risk assessment methodologies used for this plan focus on damage to structures. Because there are very few structures in the county exposed to impacts from avalanches, the risk assessment was more limited and qualitative than the assessment for the other hazards of concern.

5.3.5 Limitations

Loss estimates, exposure assessments and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from the following:

- Approximations and simplifications necessary to conduct a study
- Incomplete or outdated inventory, demographic or economic parameter data
- The unique nature, geographic extent and severity of each hazard
- Mitigation measures already employed
- The amount of advance notice residents have to prepare for a specific hazard event.

These factors can affect loss estimates by a factor of two or more. Therefore, potential exposure and loss estimates are approximate and should be used only to understand relative risk. Over the long term, King County and its planning partners will collect additional data to assist in estimating potential losses associated with other hazards.

CHAPTER 6. KING COUNTY PROFILE

King County is located in Western Washington between Puget Sound and the Cascade Mountains (see Figure 6-1). It is the most populous of Washington's 39 counties and has 39 incorporated areas. Seattle is the county seat.

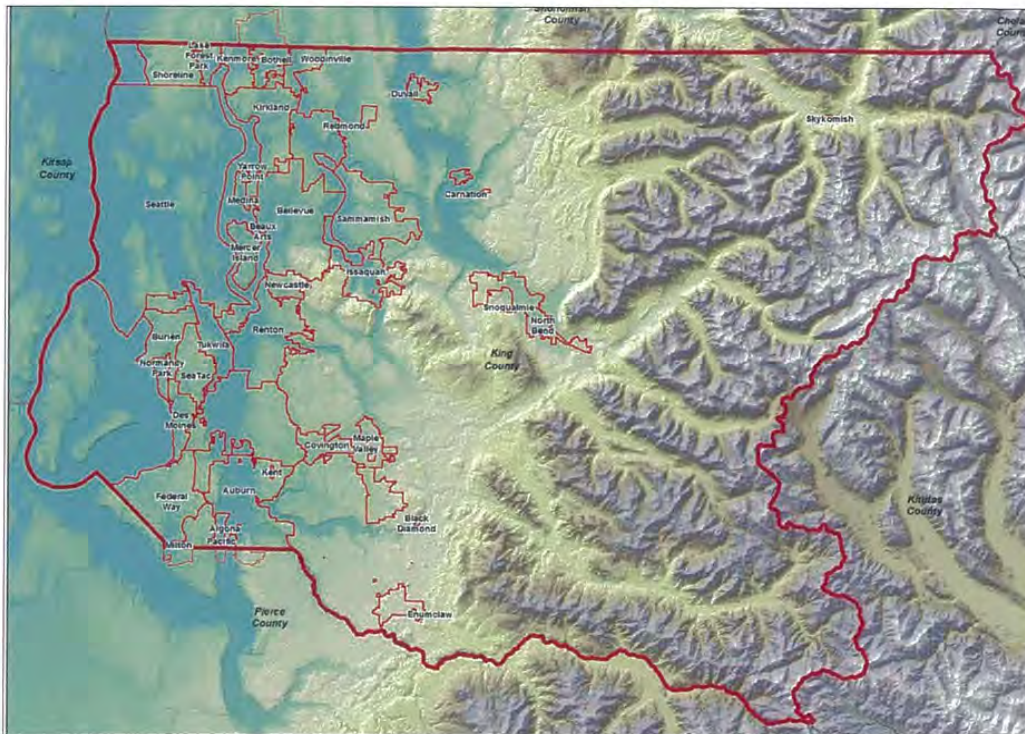


Figure 6-1. Main Features of the Planning Area

King County has more than 1.9 million residents. The major population centers are located in the western portion of the county along the shores of Puget Sound and Lake Washington. The most populous cities are Seattle with more than 600,000 residents, Bellevue and Kent with more than 100,000 residents, and Renton, Federal Way and Auburn with more than 60,000 residents (King County, 2011). Jurisdictions in the area are close together and form the Seattle-Bellevue-Everett metropolitan region. Approximately 13 percent of the county population lives in unincorporated areas (King County, 2011).

Although there is considerable development in the county, most of the land area consists of natural resource and rural lands. Incorporated areas cover 19 percent of the total land area (404 square miles) and the remaining 81 percent (1,711 square miles) is unincorporated (King County Department of Permitting and Environmental Review, 2013). The central and eastern sections have few urbanized areas.

The aerospace, export manufacturing and natural resource industries have long been the major economic drivers for the county. The importance of the high tech industry has increased in recent years, and that industry now a base industry for the county. The county is also home to several major health care facilities and educational institutions, including the University of Washington.

Elevations in the county range from sea level in the west to the almost 8,000-foot peak of Mt. Daniel in the east. The geological features of the county tend to run north-south, which makes east-west travel more complex than north-south travel. The county's physical geography includes a portion of the Cascade Mountain Range, the Issaquah Alps and the Sammamish Plateau. Water features include Puget Sound, Lake Washington, Lake Sammamish, and Lake Union. The Snoqualmie, Green, White and Cedar rivers all flow out of the Cascades toward Puget Sound. The county also includes Mercer Island in Lake Washington and Vashon-Maury Island in Puget Sound.

6.1 JURISDICTIONS AND ATTRACTIONS

The county is bounded by Puget Sound on the west, Snohomish County on the north, Chelan and Kittitas Counties on the east, and Pierce County on the south. Three of its incorporated cities (Auburn, Milton and Pacific) extend into Pierce County, and one (Bothell) extends into Snohomish County.

Jurisdictions in the county range in size from Seattle with over 600,000 residents to smaller communities such as Skykomish with approximately 500 residents. The western part of King County includes the communities of Algona, Auburn, Beaux Arts Village, Bellevue, Bothell, Burien, Clyde Hill, Covington, Des Moines, Federal Way, Hunts Point, Kenmore, Kent, Kirkland, Lake Forest Park, Medina, Mercer Island, Milton, Newcastle, Normandy Park, Pacific, Redmond, Renton, SeaTac, Seattle, Shoreline, Tukwila, Woodinville and Yarrow Point. Communities in the central area include Black Diamond, Carnation, Duvall, Enumclaw, Issaquah, Maple Valley, North Bend, Sammamish and Snoqualmie. Skykomish, located in the northeastern portion of the county is the only incorporated community in eastern King County.

Two Native American tribes have lands in the county. The Muckleshoot Reservation is located in south-central King County near Auburn. The Snoqualmie Tribe does not have a dedicated reservation, but its members have traditionally lived in the northeastern portion of the county.

King County features abundant open space and recreational opportunities abound. Municipal park systems in the county include a wide array of attractions such as Seattle's Discovery Park. King County's Parks and Recreation Division maintains over 26,000 acres of recreational areas. Cougar Mountain National Wildland Park is located in the central portion of the county, and most of the eastern portion of the county is in the Mount Baker-Snoqualmie National Forest.

6.2 HISTORICAL OVERVIEW

The following historical overview is summarized from the HistoryLink.org website (Long, 2006).

The King County area's indigenous peoples were the Duwamish Tribe living on or near the site of Seattle, the Snoqualmie Tribe in what is now eastern King County, and the Muckleshoot Tribe on the Green and White Rivers. During the late 1700s, introduced diseases affected these tribes. British Captain George Vancouver explored Puget Sound in 1792, and saw evidence of smallpox among the Indians. By the time settlers arrived in 1852, the Indian population was much reduced.

The first settlers were farmers led by Luther Collins. The Collins Party claimed land up the winding Duwamish River (later Georgetown) on September 14, 1851. A week later the Denny Party arrived on

Alki Point (future West Seattle). In the spring of 1852, most of the Denny Party moved to the shore of the deep and well-sheltered harbor of Elliott Bay, on the site of Pioneer Square in today's downtown Seattle.

The Oregon Territorial Legislature created King County on December 22, 1852. Less than three months later, in 1853, Washington Territory came into being and King County was part of it. King County was originally named for William Rufus DeVane King, who was U.S. vice president at the time. In 1986 the County changed its namesake to Martin Luther King Jr.

In eastern King County, hop-growing, logging, and coal mining developed during the 1870s. After the Great Northern Railroad chose Tacoma for its terminal over Seattle, Seattleites built the Seattle & Walla Walla, which became profitable hauling coal from Newcastle to the Seattle waterfront. By 1875 coal superseded lumber as King County's first industry. By the 1880s sawmills supported towns like Bothell, Duvall, and Enumclaw, as well as Seattle's 10 sawmills. In 1900, Frederick Weyerhaeuser purchased 1,406 square miles of Washington state timberlands. The Weyerhaeuser later incorporated and eventually absorbed smaller timber firms. Commercial canneries were located in Seattle's Belltown and in Kent. William Boeing founded the predecessor of Boeing Airplane Co. in 1917. America's entrance into World War II jump-started the economy, following the Great Depression, into wartime production of airplanes and battleships. In 1975, Bill Gates and Paul Allen founded Microsoft, which came to equal Boeing in its impact on the county.

Governance of King County has evolved. In 1968, voters approved a new Home Rule Charter eliminating several elected posts, including coroner and sheriff, and replacing the County's three commissioners with an elected county executive and a nine-member county council representing districts, while retaining an elected prosecutor and assessor. The post of sheriff became elective in 1996 and all positions are partisan except it. The King County Council expanded to 13 members in 1993 but shrank back to nine a dozen years later. Development proceeds in accordance with the Comprehensive Growth Plan (1994), which favors urban density to preserve green space.

6.3 MAJOR PAST HAZARD EVENTS

Presidential disaster declarations are typically issued for hazard events that cause more damage than state and local governments can handle without assistance from the federal government, although no specific dollar loss threshold has been established for these declarations. A presidential disaster declaration puts federal recovery programs into motion to help disaster victims, businesses and public entities. Some of the programs are matched by state programs. The planning area has experienced 31 events since 1956 for which presidential disaster declarations were issued. These events are listed in Table 6-1.

Review of these events helps identify targets for risk reduction and ways to increase a community's capability to avoid large-scale events in the future. Still, many natural hazard events do not trigger federal disaster declaration protocol but have significant impacts on their communities. These events are also important to consider in establishing recurrence intervals for hazards of concern.

6.4 PHYSICAL SETTING

6.4.1 Geology

The Pacific Northwest has a complex geological history that was shaped by geological processes over the past 200 million years. The Cascade Mountains in the eastern portion of the county were formed 4 to 7 million years ago as a result of a fold caused by the steep descent of the Juan De Fuca plate below the continental margin. The friction of this descent created two folds that formed both the Cascade and Olympic Mountain Ranges. This friction is also the source of the regional subduction-zone earthquake regime present today (Townsend and Figge, 2002).

**TABLE 6-1.
FEDERAL DISASTER DECLARATIONS FOR EVENTS AFFECTING KING COUNTY**

Disaster Number	Incident Description	Event Begin Date
DR-50	Flood	2/25/1956
DR-70	Floods	3/6/1957
DR-137	Severe storms	10/20/1962
DR-146	Floods	3/2/1963
DR-185	Heavy rains & flooding	12/29/1964
DR-196	Earthquake	5/11/1965
DR-328	Heavy rains & flooding	3/24/1972
DR-492	Severe storms & flooding	12/13/1975
DR-545	Severe storms, mudslides, & flooding	12/10/1977
DR-612	Storms, high tides, mudslides & flooding	12/31/1979
DR-623	Volcanic eruption, Mt. St. Helens	5/21/1980
DR-757	Severe storms & flooding	1/16/1986
DR-784	Severe storms & flooding	11/22/1986
DR-852	Severe storms & flooding	1/6/1990
DR-883	Severe storms & flooding	11/9/1990
DR-896	Severe storms & high tides	12/20/1990
DR-981	Severe storms & high wind	1/20/1993
DR-1079	Severe storms, high wind, and flooding	11/7/1995
DR-1100	High winds, severe storms and flooding	1/26/1996
DR-1159	Severe winter storms, land & mudslides, flooding	12/26/1996
DR-1172	Heavy rains, snow melt, flooding, land & mud slides	3/18/1997
DR-1361	Earthquake	2/28/2001
DR-1499	Severe storms and flooding	10/15/2003
EM-3227	Hurricane Katrina evacuation	8/29/2005
DR-1671	Severe storms, flooding, landslides, and mudslides	11/2/2006
DR-1682	Severe winter storm, landslides, and mudslides	12/14/2006
DR-1734	Severe storms, flooding, landslides, and mudslides	12/1/2007
DR-1817	Severe winter storm, landslides, mudslides, and flooding	1/6/2009
DR-1825	Severe winter storm and record and near record snow	12/12/2008
DR-1963	Severe winter storm, flooding, landslides, and mudslides	1/11/2011
DR-4056	Severe winter storm, flooding, landslides, and mudslides	1/14/2012

Note: Presidential disaster declarations prior to 1964 were declared for entire states. Pre-1964 events listed here are for Washington. Declarations from 1964 on are county-specific, and those listed here are for King County.

Source: (Federal Emergency Management Agency, 2012).

Active volcanoes have been present along the north-south Cascade Arc for million years, and the remnants of former volcanoes make up the bedrock of the current Cascade chain. Volcanoes in the range are still active, although their presence as a result of the fold is merely incidental to the older chain. The eruptions of Mount Rainier, located in neighboring Pierce County, have also shaped the geography of the area. Major eruptions in the past 5,000 years have resulted in substantial mudflows that reached the shores of Puget Sound. The potential for future eruptions near highly populated areas makes Mount Rainier the most dangerous volcano in North America (Townsend and Figge, 2002).

In addition to tectonic movements, repeated glacier movement across the region over the past 2 million years affected the geological features of the western portion of King County. The most recent period of glaciation was the Vashon period, which occurred during the late Pleistocene. Glaciers in this period advanced into Washington from Canada about 18,000 years ago and retreated 10,000 to 12,000 years ago. These glacial episodes carved out Puget Sound and Lake Washington and deposited glacial till across the region (Townsend and Figge, 2002).

6.4.2 Soils

The soils and land types of western King County formed during the glacial advancement and retreat during the Vashon period. Four major types of material were left by the glacier: till, recessional outwash, pro-glacial lacustrine and outwash sediments. After glaciers retreated, alluvium accumulated in the valleys and a mudflow from Mount Rainier covered a portion of the southern part of the county. No soil survey information is available for the eastern portion of the county; however, most development is concentrated within the western county, where, according to the U.S. Natural Resources Conservation Service's soil survey, there are seven soil associations (Snyder et al., 1973):

- **Alderwood Association**—Occurs on large tracts of land in the northern and southern parts of the county. These areas are moderately well drained and roll into hilly soils that have dense, very slowly permeable glacial till on uplands and terraces. This association covers 52 percent of the study area
- **Oridia-Seattle-Woodinville Association**—Occurs in southern and northern portions of the county. It is somewhat poorly drained to very poorly drained. These nearly level soils occur in major stream valleys and are the best-suited areas for crop production in the survey area. This association covers 11 percent of the survey area.
- **Buckley-Alderwood Association**—Occurs on glacial till plains and upland in the southeastern portion of the county. It is comprised of poorly drained to moderately well drained soils that are nearly level to rolling. These areas also have dense, slowly permeable and very slowly permeable glacial till. This association covers 7 percent of the study area.
- **Everett Association**—Occurs in the southeastern portion of the county and in smaller areas scattered in the northern portion. They are composed of somewhat excessively drained, gravelly, gently rolling soils underlain by sand and gravel on terraces. This association covers 14 percent of the survey area.
- **Beausite-Alderwood Association**—Occurs in the central and eastern portions of the survey area. It is characterized by well drained and moderately well drained soils that vary from gently rolling to very steep soils that have sandstone or shale or dense very slowly permeable glacial till on uplands. This association covers 9 percent of the survey area.
- **Alderwood-Kitsap-Indianola Association**—Occurs in the northern half of the county. It is characterized by moderately-well drained, nearly level to steep soils that have very slowly permeable glacial till or glacial lake deposits and somewhat excessively drained, rolling, deep sandy soils, on uplands and terraces. This association covers 5 percent of survey area.

- **Puget-Earlmont-Snohomish Association**—Occurs in three areas in the Sammamish and Snoqualmie valleys in the northern half of the county. It is poorly drained to somewhat poorly drained, nearly level soils that have layers of peat within a few feet of the surface in major stream valleys. This association covers 3 percent of the study area.

6.4.3 Seismic Features

King County is located on the Pacific Ring of Fire. This geological area is known for volcanic activity and frequent seismic activity. Washington State is located in close proximity to the convergence of several tectonic plates including the Pacific, North American, and Juan de Fuca. There are a substantial number of identified faults within the county and small earthquakes occur regularly. In general earthquakes in the area arise from three sources. The oblique subduction of the Juan de Fuca plate below the Puget Sound region can produce events as large as magnitude 7. The faults on the North American plate can produce moderate to large events on either side of the Cascades. Additionally, great earthquakes, which can have magnitudes of 9.0 or greater, can occur at the boundaries of these plates generally referred to as the Cascadia Subduction Zone (USGS, 2012).

There are a significant number of active faults and folds in the Puget Sound lowlands, including the Tacoma Fault, Seattle Fault, Darrington-Devil's Mountain Fault, Utsalady Point Fault and the Southern Whidbey Island Fault. Many of the faults run from east to west and are over 20 miles in length. An event on any of these faults would likely impact King County. The U.S. Geological Survey has estimated the probability of one or more earthquakes of Richter magnitude 7.0 or higher occurring in the Puget Sound area within the next 30 years to be 18 to 20 percent.

6.4.4 Climate

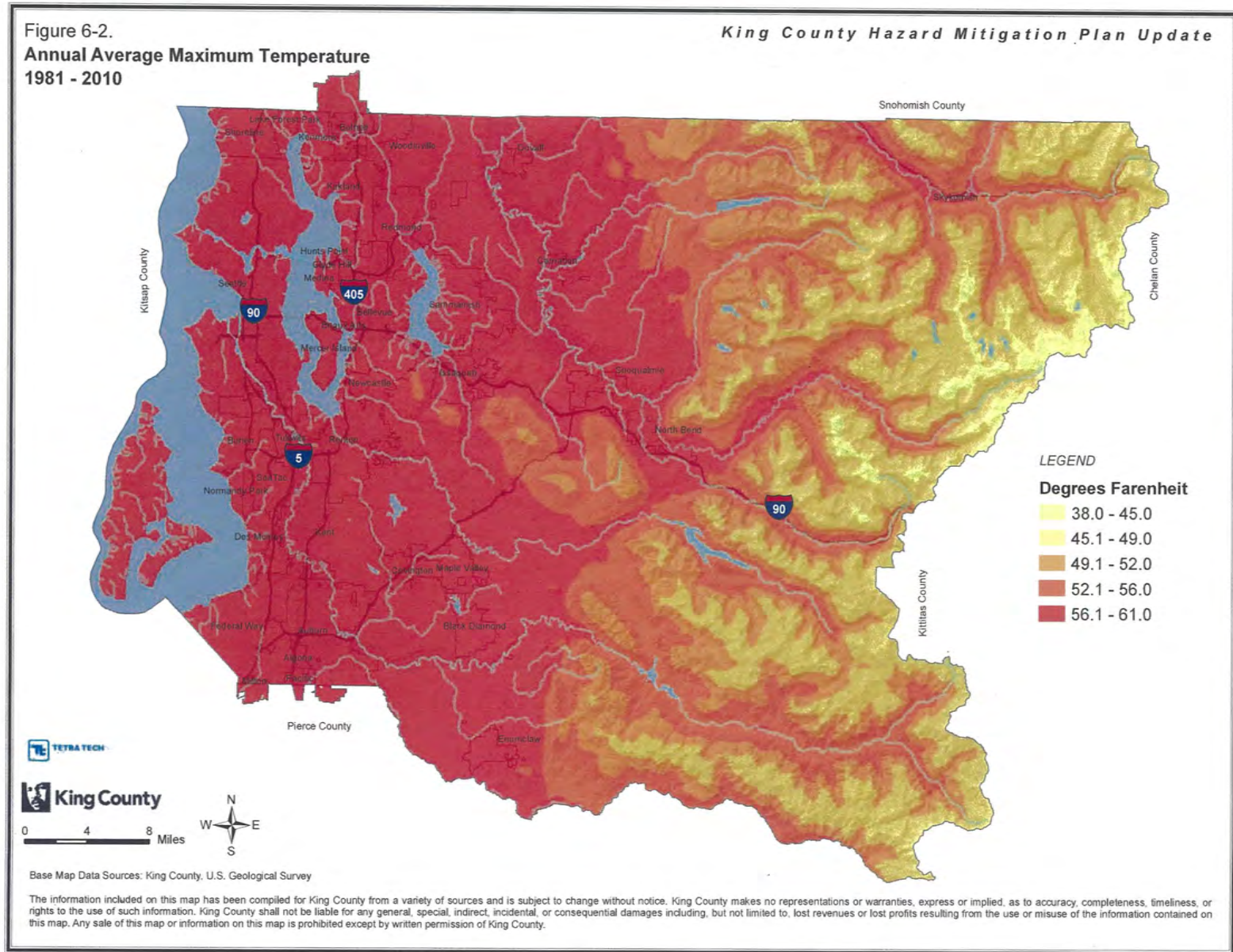
Climate across King County depends on factors such as elevation and distance from Puget Sound. Precipitation in the area is concentrated in the winter. In the Puget Sound lowlands, annual precipitation ranges from 30 to 45 inches annually. Snowfall is relatively rare, with an average of 10 to 20 inches per year. Generally, any snowfall melts within a day or two of accumulation. January average temperatures range from 28°F to 45°F, and July average temperatures range from 50°F to 78°F. Most of the lowland area is in the “rain shadow” of the Olympic Mountains. Precipitation totals and temperature variations increase from west to east across the lowlands (Western Regional Climate Center, 2014).

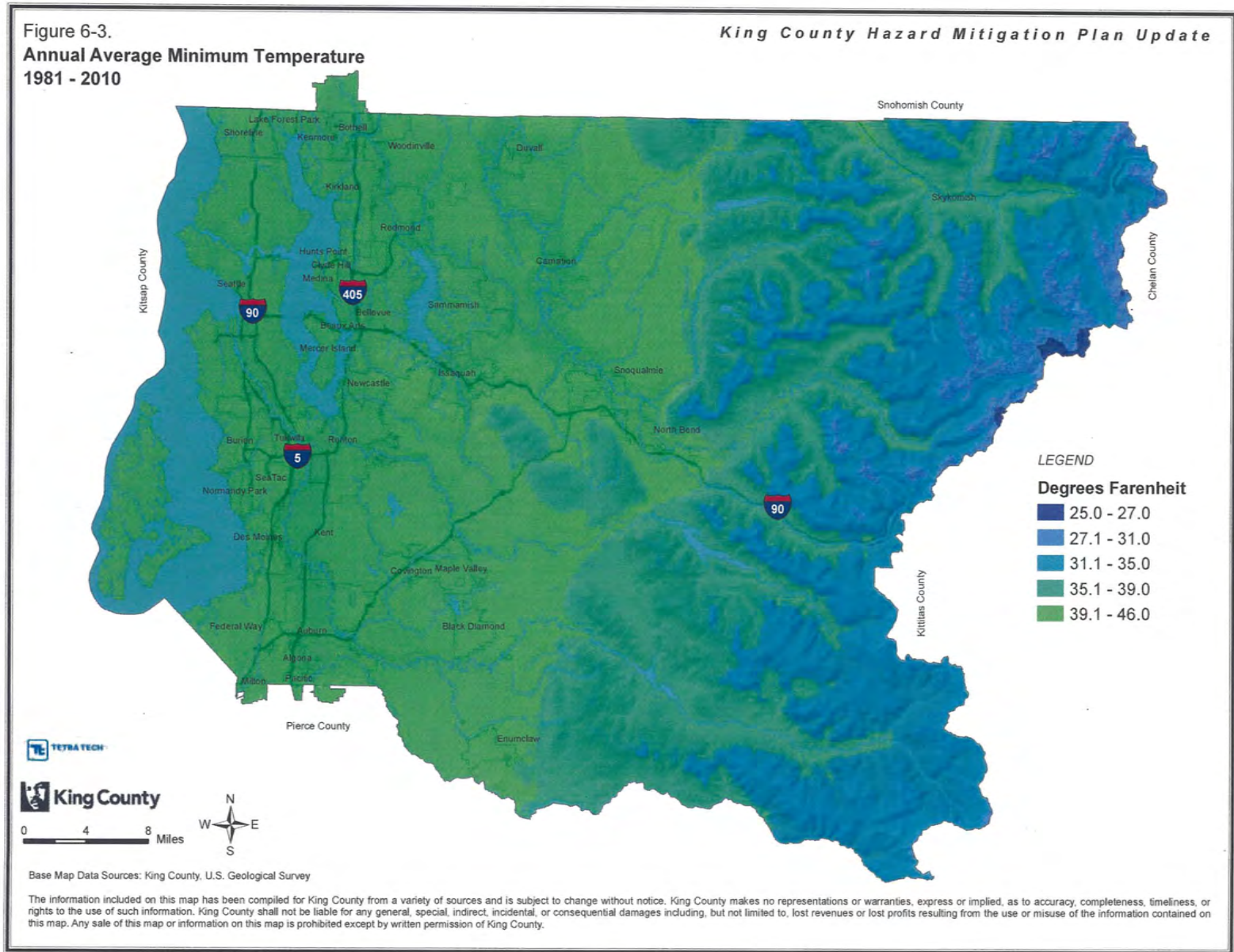
On the western slopes and foothills of the Cascade Range in the eastern portion of the county, precipitation averages 90 inches. Snowfall averages increase with elevation to 50 inches at 500 to 800 feet. Temperature ranges are similar to those of the lowlands with January ranges between 25°F and 45°F and July ranges between 50°F and 80°F. In the western Cascades, precipitation is heavy, with annual amounts ranging from 60 to 100 inches or more. Annual snowfall averages 50 to 75 inches in the lower elevations and can be as high as 600 inches between 4,000 and 5,500 feet. Peaks above 7,000 feet generally remain snowcapped throughout the summer. January temperatures range from 20°F to 40°F, dependent on elevation. Summer temperatures at these elevations are variable. Above 4,000 feet, temperatures may remain below freezing even in mid-summer. As a general rule, temperatures decreases by 3°F for every 1,000-foot increase in elevation (Western Regional Climate Center, 2014).

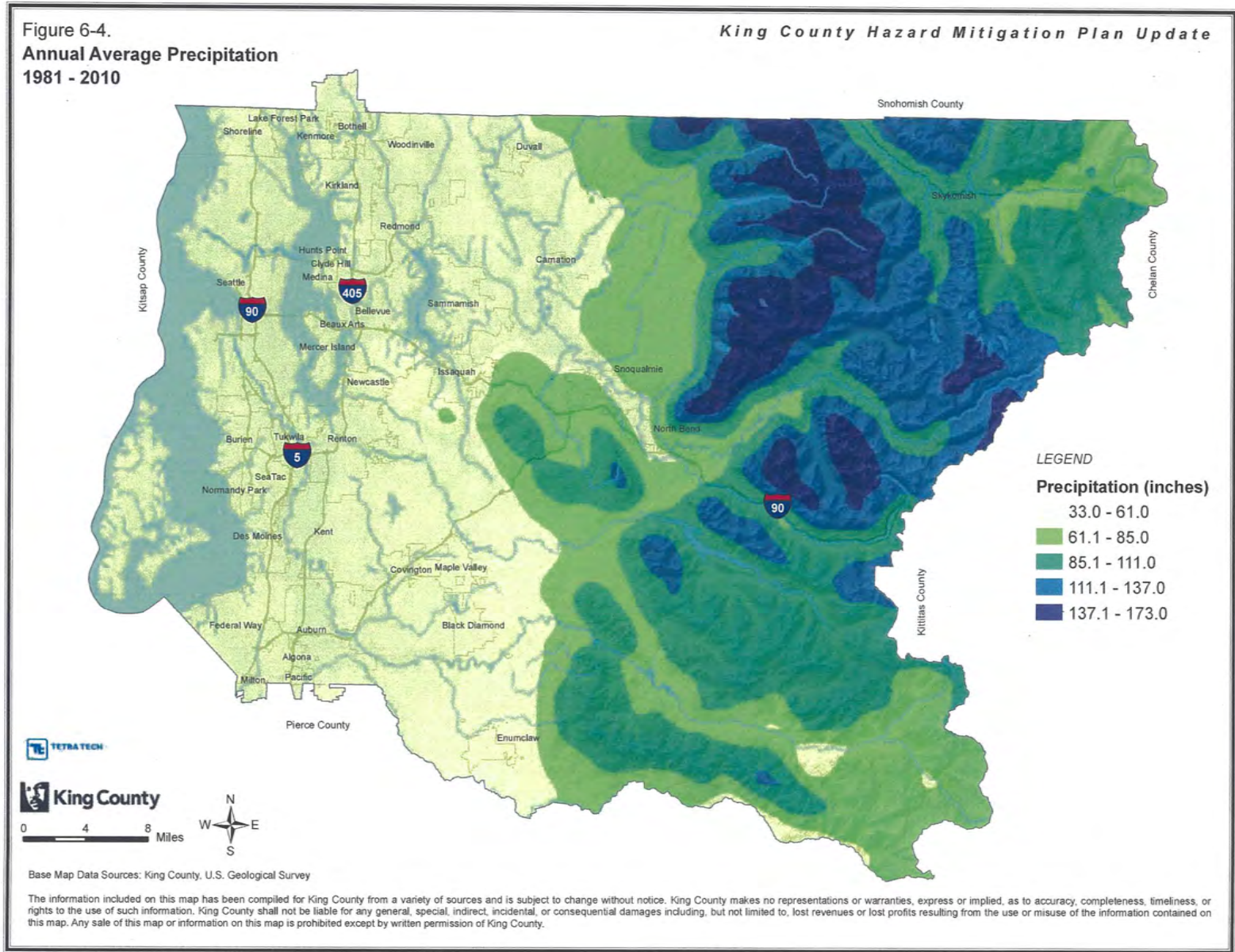
Average climate conditions across King County for temperature, precipitation and wind are shown on Figure 6-2 through Figure 6-5.

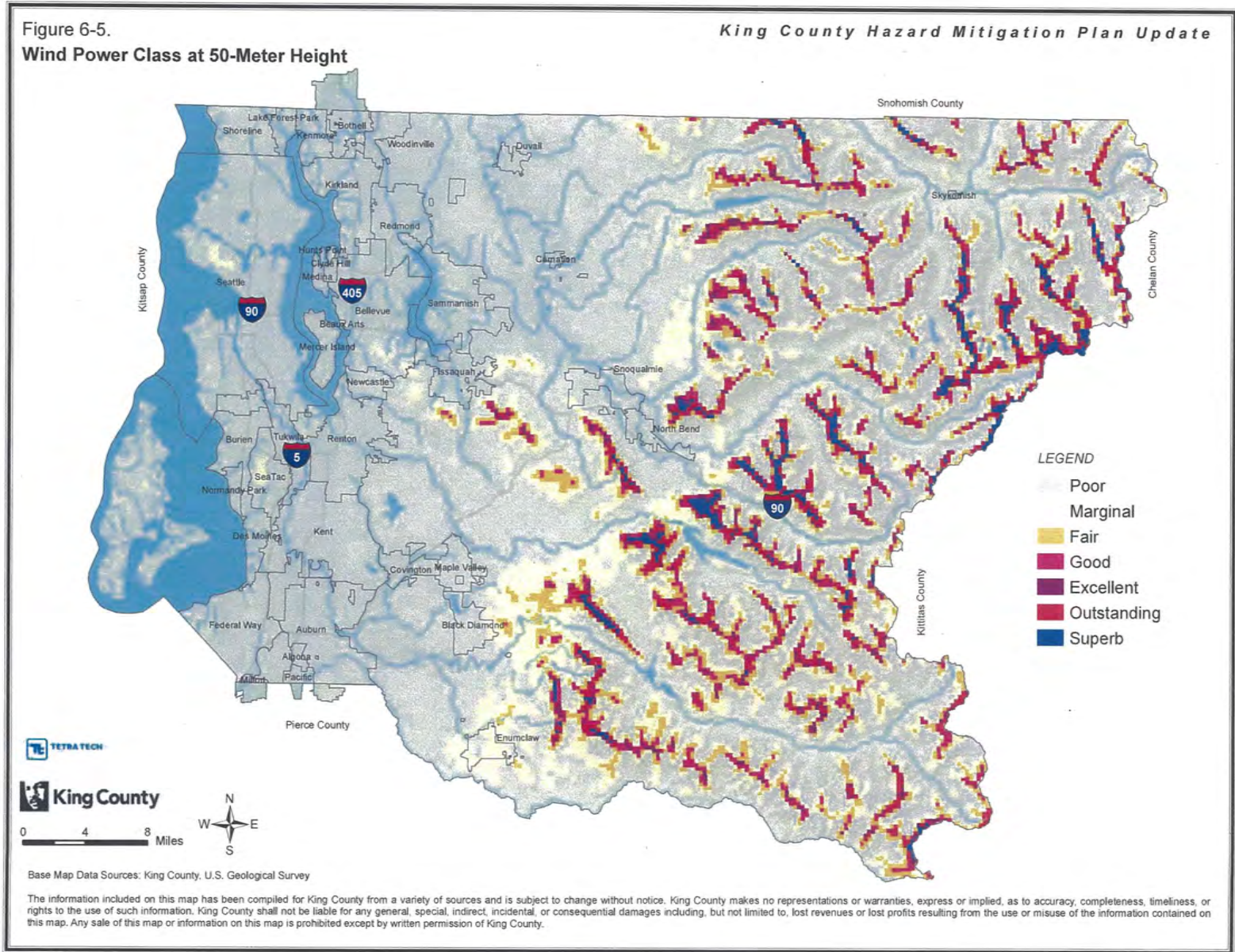
Figure 6-2.
Annual Average Maximum Temperature
1981 - 2010

King County Hazard Mitigation Plan Update









6.5 LAND USE

Table 6-2 shows current land use in the planning area based on King, Pierce and Snohomish County parcel data. Land use information is analyzed in this plan for each identified hazard that has a defined spatial extent and location. For hazards that lack this spatial reference, the following information serves as a baseline estimate of land use and exposure for the planning area. The distribution of land uses within the county will change over time.

TABLE 6-2. PRESENT LAND USE IN PLANNING AREA		
Present Use Classification	Area (acres)	% of total
Agriculture	1,260	0.09%
Church, Welfare or Religious Service	2,739	0.21%
Commercial	27,788	2.08%
Education	8,108	0.61%
Governmental Services	3,126	0.23%
Industrial/Manufacturing	9,101	0.68%
Medical/Dental Services	869	0.07%
Mixed Use Development (Residential & Commercial)	562	0.04%
Mortuary/Cemetery/Crematory	932	0.07%
Nursing Home/Retirement Facility	628	0.05%
Park/Open Space/Golf Course	29,185	2.19%
Residential	276,893	20.77%
Terminal or Marina	5,118	0.38%
Utility/Easement/Right of Way	10,840	0.81%
Water/Tideland/Wetland	558	0.04%
Uncategorized (includes vacant and resource lands)	955,666	71.67%
Total	1,333,373	100%

Note: Summarized from King, Pierce and Snohomish County parcel data. Acreage covers only mapped parcels and thus excludes many rights of way and major water features.

6.6 CRITICAL FACILITIES AND INFRASTRUCTURE

Critical facilities and infrastructure are all facilities and infrastructure, whether publicly or privately owned, that are vital to the King County planning area's ability to provide essential services and protect life and property. A short- or long-term loss of a critical facility would result in a severe economic, health and welfare, life-sustainment or other catastrophic impact. Critical facilities can be grouped in three categories:

- Facilities that are essential to the ability to respond to, mitigate and recover from the impacts of natural hazards, including those potentially used as shelters
- Facilities that need early warning to enable them to prepare for and respond to the impacts of natural hazards

- Facilities that by the nature of their operations, produce, manufacture or store materials that create an exposure to secondary hazards of concern.

Under the King County regional hazard mitigation plan definition, critical facilities include but are not limited to the following:

- Police stations, fire stations, city/county government facilities (including those that house critical information technology and communication infrastructure), vehicle and equipment storage facilities, and emergency operations centers needed for disaster response before, during, and after hazard events
- Hospitals, care facilities, and housing, including facilities likely to contain occupants who may not be sufficiently mobile to avoid death or injury during a hazard event
- Other healthcare providers such as ambulatory care, free-standing surgery centers and urgent care centers that play a role in responding to regional disasters involving casualties
- Public and private utilities and infrastructure vital to maintaining or restoring normal services to areas damaged by hazard events, including, but not limited to, the following:
 - Public and private water supply infrastructure, water and wastewater treatment facilities and infrastructure, potable water pumping, flow regulation, distribution and storage facilities and infrastructure
 - Public and private power generation (electrical and non-electrical), regulation and distribution facilities and infrastructure
 - Data and server communication facilities
 - Structures that manage or limit the impacts of natural hazards such as regional flood conveyance systems, potable water trunk main interconnect systems and redundant pipes crossing fault lines and reservoirs
 - Transportation systems that convey vital supplies and services to and throughout the community.
- Educational facilities, including K-12, universities and community college.
- Public gathering places that could be used as evacuation centers during large-scale disasters.
- Infrastructure designed to help safely convey high-water from an event source to the perimeter of the planning area.
- Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic, and/or water-reactive materials.

The default Hazus database was distributed to planning partners for review and update. Default information was used for jurisdictions not participating in the planning effort. Table 6-3 and Table 6-4 provide summaries of the general types of critical facilities and infrastructure, respectively, in each municipality and unincorporated county areas. These tables indicate the location of critical facilities and infrastructure, not jurisdictional ownership. All critical facilities/infrastructure were analyzed in Hazus to help rank risk and identify mitigation actions. The risk assessment for each hazard qualitatively discusses critical facilities with regard to that hazard.

Figure 6-6 and Figure 6-7 show the location of critical facilities and infrastructure in unincorporated areas of the county. Critical facilities within the cities participating in this plan are shown in maps for each city provided in Volume 2. Due to the sensitivity of this information, a detailed list of facilities is not provided. The list is on file with each planning partner.

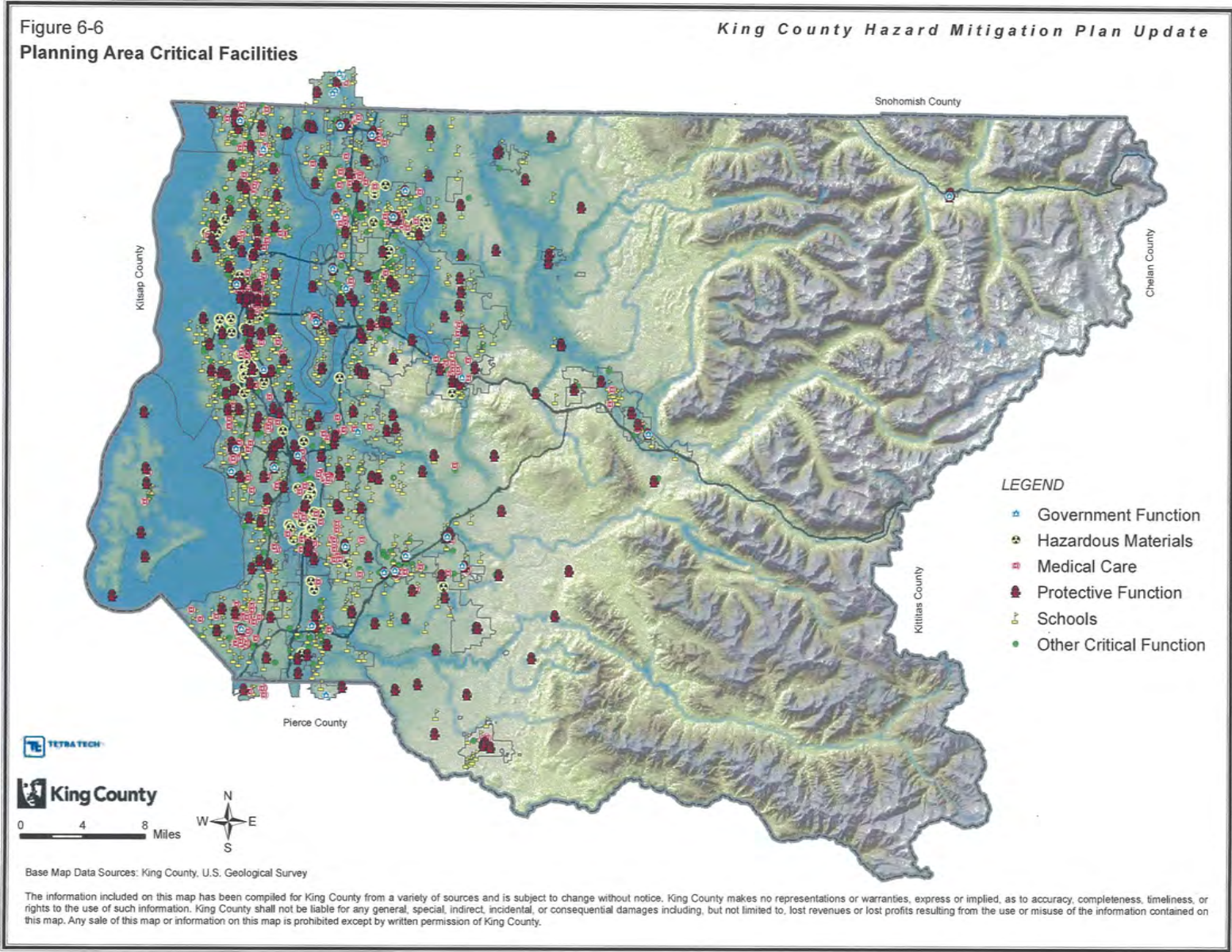
KING COUNTY PROFILE

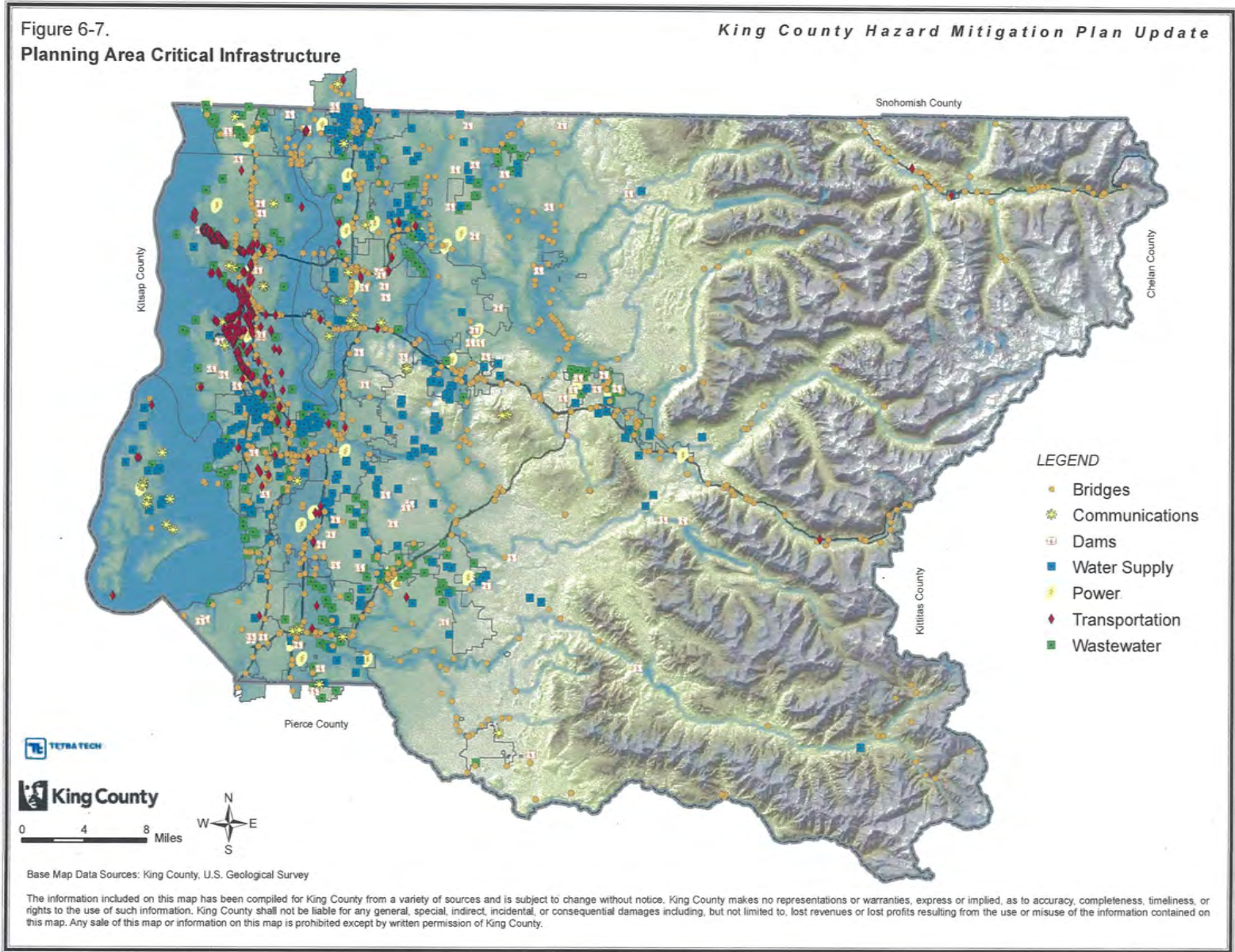
TABLE 6-3. CRITICAL FACILITIES BY JURISDICTION AND CATEGORY							
	Medical and Health	Government Functions	Protective Function	Schools	Hazmat	Other Critical Function	Total
Algona	0	0	1	1	0	1	3
Auburn	10	2	7	32	13	23	87
Beaux Arts Village	0	0	0	0	0	0	0
Bellevue	7	1	17	44	1	28	98
Black Diamond	0	0	2	1	0	0	3
Bothell	11	6	4	18	0	6	45
Burien	28	1	10	23	0	11	73
Carnation	3	0	2	4	0	0	9
Clyde Hill	0	1	2	4	0	0	7
Covington	15	3	2	7	0	20	47
Des Moines	2	0	3	11	0	5	21
Duvall	1	0	2	3	0	4	10
Enumclaw	3	0	3	11	0	5	22
Federal Way	59	1	5	35	0	19	119
Hunts Point	0	0	0	0	0	0	0
Issaquah	26	1	5	8	2	14	56
Kenmore	0	0	5	6		3	14
Kent	46	2	20	29	23	25	145
Kirkland	56	1	8	30	7	39	141
Lake Forest Park	0	0	2	2	0	1	5
Maple Valley	6	2	7	4	0	6	25
Medina	0	0	1	3	0	2	6
Mercer Island	9	1	3	34	0	4	51
Milton	4	0	1	3	0	0	8
Newcastle	1	0	2	2	0	2	7
Normandy Park	0	1	1	1	0	0	3
North Bend	7	1	3	3	0	2	16
Pacific	0	0	2	1	0	0	3
Redmond	22	2	4	28	31	31	118
Renton	41	1	8	24	9	22	105
Sammamish	3	0	6	14	0	3	26
SeaTac	9	1	5	11	0	3	29
Seattle	72	2	55	170	91	132	522
Shoreline	13	2	12	25		20	72
Skykomish	0	1	2	1	0	1	5
Snoqualmie	2	0	2	10	0	3	17
Tukwila	12	1	9	0	9	5	36
Woodinville	3	1	2	5	0	2	13
Yarrow Point	0	0	0	0	0	23	23
Unincorporated	17	0	52	88	1	0	158
Total	488	35	277	696	10	465	2,148

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TABLE 6-4.
CRITICAL INFRASTRUCTURE BY JURISDICTION AND CATEGORY

	Bridges	Transportation	Water Supply	Wastewater	Power	Communications	Dams	Total
Algona	1	0	0	27	2	0	1	31
Auburn	25	3	16	0	1	4	2	51
Beaux Arts Village	0	0	2	0	0	0	0	2
Bellevue	71	3	0	3	1	7	7	92
Black Diamond	0	0	6	1	0	0	0	7
Bothell	22	1	26	5	0	3	3	60
Burien	8	2	32	10	0	0	0	52
Carnation	0	0	0	0	0	0	0	0
Clyde Hill	0	0	6	0	0	0	0	6
Covington	11	0	3	9	2	0	0	25
Des Moines	9	0	3	29	0	0	0	41
Duvall	1	0	3	9	0	0	0	13
Enumclaw	0	0	0	1	0	0	0	1
Federal Way	15	1	2	1	0	0	5	24
Hunts Point	1	0	0	0	0	0	0	1
Issaquah	27	0	22	3	1	0	1	54
Kenmore	13	4	0	1	1	0	1	20
Kent	43	5	17	12	2	0	5	84
Kirkland	18	2	3	4	2	2	0	31
Lake Forest Park	2	0	1	0	0	0	1	4
Maple Valley	3	0	14	4	1	0	0	22
Medina	3	0	0	0	0	0	0	3
Mercer Island	10	3	0	2	0	1	0	16
Milton	3	0	0	0	0	0	0	3
Newcastle	1	0	0	0	0	0	1	2
Normandy Park	1	0	0	2	0	0	0	3
North Bend	14	0	5	2	1	0	0	22
Pacific	4	0	0	1	0	0	0	5
Redmond	18	6	16	16	2	0	0	58
Renton	41	3	10	2	1	0	0	57
Sammamish	2	0	1	1	0	0	1	5
SeaTac	19	6	15	3	0	0	2	45
Seattle	184	259	8	32	4	14	11	512
Shoreline	9	0	2	19	2	1	2	35
Skykomish	2	1	1	0	0	0	0	4
Snoqualmie	6	0	6	16	4	0	5	37
Tukwila	52	8	5	15	0	1	0	81
Woodinville	3	0	3	3	0	0	0	9
Yarrow Point	1	0	0	0	0	0	0	1
Unincorporated	418	10	126	33	5	31	28	651
Total	1,061	317	354	266	32	64	76	2,170





6.7 DEMOGRAPHICS

Some populations are at greater risk from hazard events because of decreased resources or physical abilities. Elderly people, for example, may be more likely to require additional assistance. Research has shown that people living near or below the poverty line, the elderly (especially older single men), the disabled, women, children, ethnic minorities and renters all experience, to some degree, more severe effects from disasters than the general population. These vulnerable populations may vary from the general population in risk perception, living conditions, access to information before, during and after a hazard event, capabilities during an event, and access to resources for post-disaster recovery. Indicators of vulnerability—such as disability, age, poverty, and minority race and ethnicity—often overlap spatially and often in the geographically most vulnerable locations. Detailed spatial analysis to locate areas where there are higher concentrations of vulnerable community members would assist the County in extending focused public outreach and education to these most vulnerable citizens.

6.7.1 Population Characteristics

Information about the composition of the population and how it has changed in the past and how it may change in the future is a critical part of planning because it directly relates to land needs such as housing, industry, public services, and transportation. King County is the most populous of Washington's 39 counties. The Washington Office of Financial Management estimated the total county population at 1,981,900 as of April 2013 (Washington State Office of Financial Management, 2012).

Population changes are useful socio-economic indicators. A growing population generally indicates a growing economy, while a decreasing population signifies economic decline. City annexations and incorporations of new cities have sharply reduced the unincorporated-area population of King County in recent decades. Table 6-5 shows the population of incorporated municipalities and the combined unincorporated areas in King County since 1990. In 2012, 13 percent of the planning area's residents lived outside incorporated areas, compared to 34 percent in 1990. Overall growth in incorporated area population was 71 percent from 1990 to 2012, while the unincorporated areas of the county saw a population decrease of 50 percent during the same timeframe.

Figure 6-8 shows the overall population growth rate in the planning area from 1910 to 2010 compared to that of the State of Washington. For most of that period, King County's 10-year growth rate has been slightly higher than the statewide rate; the county's population growth was lower than the state's in the 1930s and 1970s and in the past two decades.

6.7.2 Income

In the United States, individual households are expected to use private resources to prepare for, respond to and recover from disasters to some extent. This means that households living in poverty are automatically disadvantaged when confronting hazards. Additionally, the poor typically occupy more poorly built and inadequately maintained housing. Mobile or modular homes, for example, are more susceptible to damage in earthquakes and floods than other types of housing.

In urban areas, the poor often live in older houses and apartment complexes, which are more likely to be made of un-reinforced masonry, a building type that is particularly susceptible to damage during earthquakes. Furthermore, residents below the poverty level are less likely to have insurance to compensate for losses incurred from natural disasters. This means that residents below the poverty level have a great deal to lose during an event and are the least prepared to deal with potential losses. Personal household economics significantly impact people's decisions on evacuation. Individuals who cannot afford gas for their cars will likely decide not to evacuate.

TABLE 6-5. ANNUAL POPULATION DATA				
	Population			
	1990 ^a	2000 ^a	2010 ^a	2012 ^b
Algona	1,694	2,460	3,014	3,070
Auburn ^c	33,650	43,047	70,180	71,240
Beaux Arts Village	303	307	299	300
Bellevue	86,872	109,827	122,363	124,600
Black Diamond	1,422	3,970	4,153	4,170
Bothell ^c	12,345	30,084	33,505	34,000
Burien	<i>d</i>	31,881	33,313	47,730
Carnation	1,243	1,893	1,786	1,785
Clyde Hill	2,957	2,890	2,984	2,980
Covington	<i>d</i>	13,783	17,575	17,760
Des Moines	17,283	29,267	29,673	29,700
Duvall	2,770	4,616	6,695	6,900
Enumclaw	7,227	11,116	10,669	11,030
Federal Way	67,535	83,259	89,306	89,460
Hunts Point	514	443	394	390
Issaquah	7,786	11,212	30,434	31,150
Kenmore	<i>d</i>	18,678	20,460	21,020
Kent	37,960	79,524	92,411	119,100
Kirkland	40,059	45,054	48,787	81,480
Lake Forest Park	3,372	12,871	12,598	12,640
Maple Valley	<i>d</i>	14,209	22,684	23,340
Medina	2,981	3,011	2,969	2,990
Mercer Island	20,816	22,036	22,699	22,690
Milton ^c	4,995	5,795	6,968	6,985
Newcastle	<i>d</i>	7,737	10,380	10,460
Normandy Park	6,709	6,392	6,335	6,350
North Bend	2,578	4,746	5,731	5,855
Pacific ^c	4,622	5,527	6,606	6,620
Redmond	35,800	45,256	54,144	55,360
Renton	41,688	50,052	90,927	93,910
Sammamish	<i>d</i>	34,104	45,780	47,420
SeaTac	22,701	25,496	26,909	27,210
Seattle	516,259	563,376	608,660	616,500
Shoreline	<i>d</i>	53,296	53,007	53,270
Skykomish	273	214	198	200
Snoqualmie	1,546	1,631	10,670	11,320
Tukwila	11,874	17,181	19,107	19,080
Woodinville	<i>d</i>	9,809	10,938	10,960
Yarrow Point	957	1,008	1,001	1,060
Unincorporated County	513,171	349,234	325,000	255,720
King County Total	1,507,305	1,737,046	1,931,249	1,957,000
a. 1990, 2000 and 2010 populations from U.S. Census data b. 2012 population from post-census estimate developed by Washington Office of Financial Management c. Auburn, Milton and Pacific populations include parts of Pierce County. Bothell population includes part of Snohomish County d. City not yet incorporated in this year				

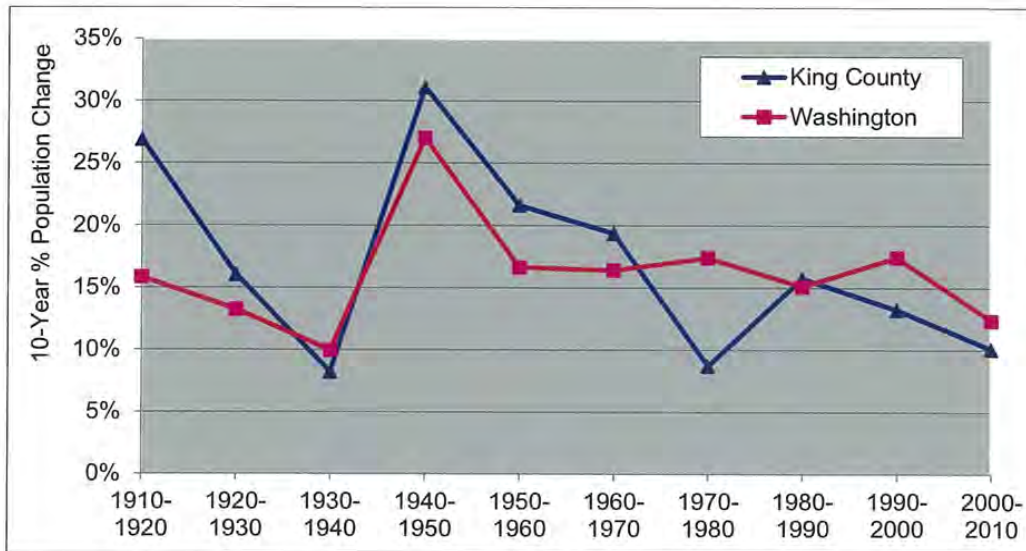


Figure 6-8. Washington and King County Population Growth

Based on U.S. Census Bureau American Community Survey estimates, per capita income in King County in 2011 was \$38,286, and the median household income was \$69,314. It is estimated that 33.0 percent of households receive an annual income of \$100,000 or more. An estimated 16.9 percent of the households in the county made less than \$25,000 per year in 2011, and 6.9 percent of families had incomes below the poverty level (U.S. Census Bureau, 2013).

6.7.3 Age Distribution

As a group, the elderly are more apt to lack the physical and economic resources necessary for response to hazard events and are more likely to suffer health-related consequences making recovery slower. They are more likely to be vision, hearing, and/or mobility impaired, and more likely to experience mental impairment or dementia. Additionally, the elderly are more likely to live in assisted-living facilities where emergency preparedness occurs at the discretion of facility operators. These facilities are typically identified as “critical facilities” by emergency managers because they require extra notice to implement evacuation. Elderly residents living in their own homes may have more difficulty evacuating their homes and could be stranded in dangerous situations. This population group is more likely to need special medical attention, which may not be readily available during natural disasters due to isolation caused by the event. Specific planning attention for the elderly is an important consideration given the current aging of the American population.

Children under 14 are vulnerable to disaster events because of their young age and dependence on others for basic necessities. Very young children may additionally be vulnerable to injury or sickness; this vulnerability can be worsened during a natural disaster because they may not understand the measures that need to be taken to protect themselves from hazards.

The overall age distribution for the planning area is illustrated in Figure 6-9. Based on 2011 U.S. Census estimates, 11.0 percent of the county’s population is 65 or older and 17.8 percent is 14 or younger. The Census also estimates that 13.9 percent of the population under age 18 and 9.0 percent of the population 65 or older lives in a household with income below the poverty line (U.S. Census Bureau, 2013).

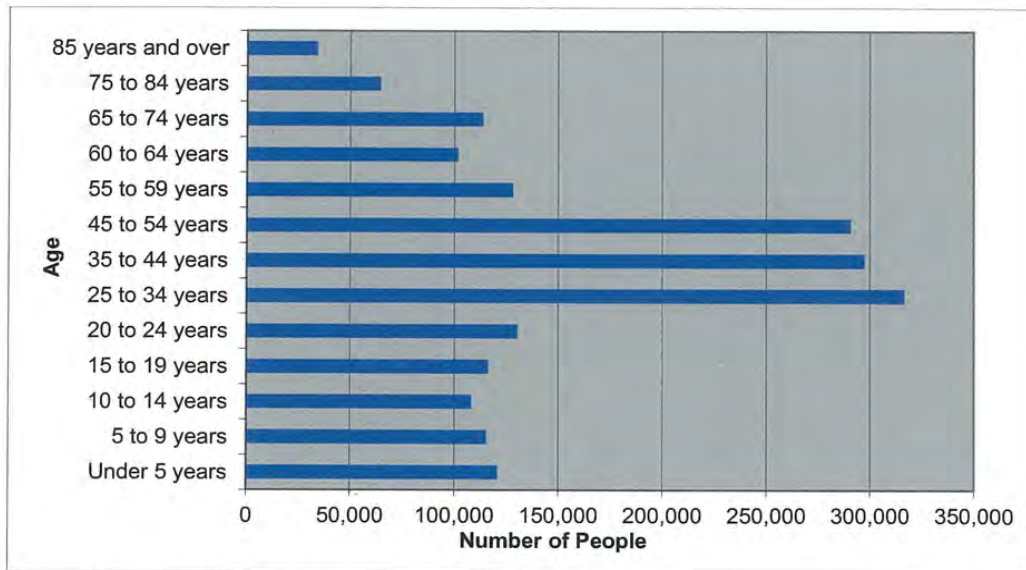


Figure 6-9. Planning Area Age Distribution

6.7.4 Race, Ethnicity and Language

Research shows that minorities are less likely to be involved in pre-disaster planning and experience higher mortality rates during a disaster event. Post-disaster recovery can be ineffective and is often characterized by cultural insensitivity. Since higher proportions of ethnic minorities live below the poverty line than the majority white population, poverty can compound vulnerability. According to the U.S. Census, the racial composition of the planning area is predominantly white, at 70.0 percent. The largest minority populations are Asian at 14.6 percent and African American at 6.2 percent. Figure 6-10 shows the racial distribution in the planning area (U.S. Census Bureau, 2013).

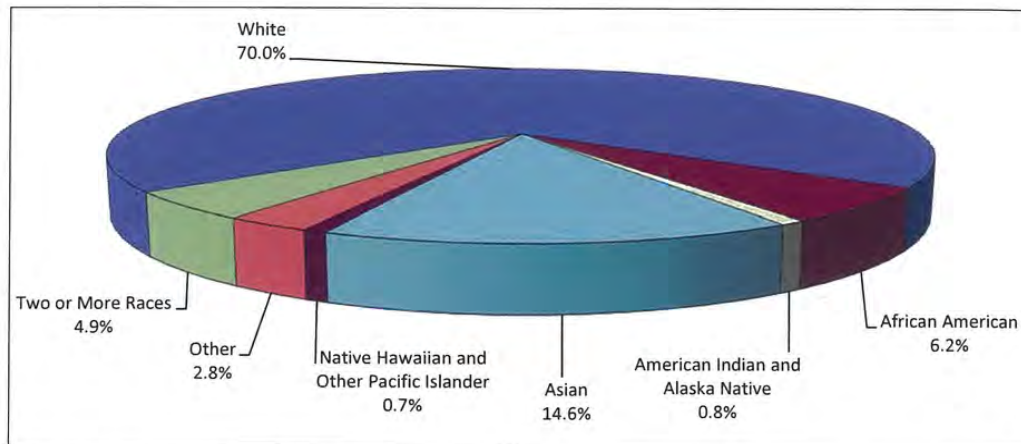


Figure 6-10. Planning Area Race Distribution

The planning area has a 20.4-percent foreign-born population. Other than English, the most commonly spoken languages in the planning area are Asian and Pacific Islander languages. The census estimates 10.9 percent of the residents speak English “less than very well” (U.S. Census Bureau, 2013).

6.7.5 Disabled Populations

The 2010 U.S. Census estimates that 54 million non-institutionalized Americans with disabilities live in the U.S. This equates to about one-in-five persons. People with disabilities are more likely to have difficulty responding to a hazard event than the general population. Local government is the first level of response to assist these individuals, and coordination of efforts to meet their access and functional needs is paramount to life safety efforts. It is important for emergency managers to distinguish between functional and medical needs in order to plan for incidents that require evacuation and sheltering. Knowing the percentage of population with a disability will allow emergency management personnel and first responders to have personnel available who can provide services needed by those with access and functional needs. According to U.S. Census estimates, 9.3 percent of the county population has some form of disability, including 35.6 percent of those 65 and older (U.S. Census Bureau, 2013).

6.8 ECONOMY

6.8.1 Industry, Businesses and Institutions

U.S. Census data for 2011 indicate that the industry with the greatest employment in King County is education, health care and social assistance (20.1 percent), followed by professional services (17.4 percent). Resource extraction (agriculture, forestry, fishing, hunting and mining) is the Census-designated industry with the least employment in the county (0.6 percent). Figure 6-11 shows the breakdown of industry types in King County (U.S. Census Bureau, 2013).

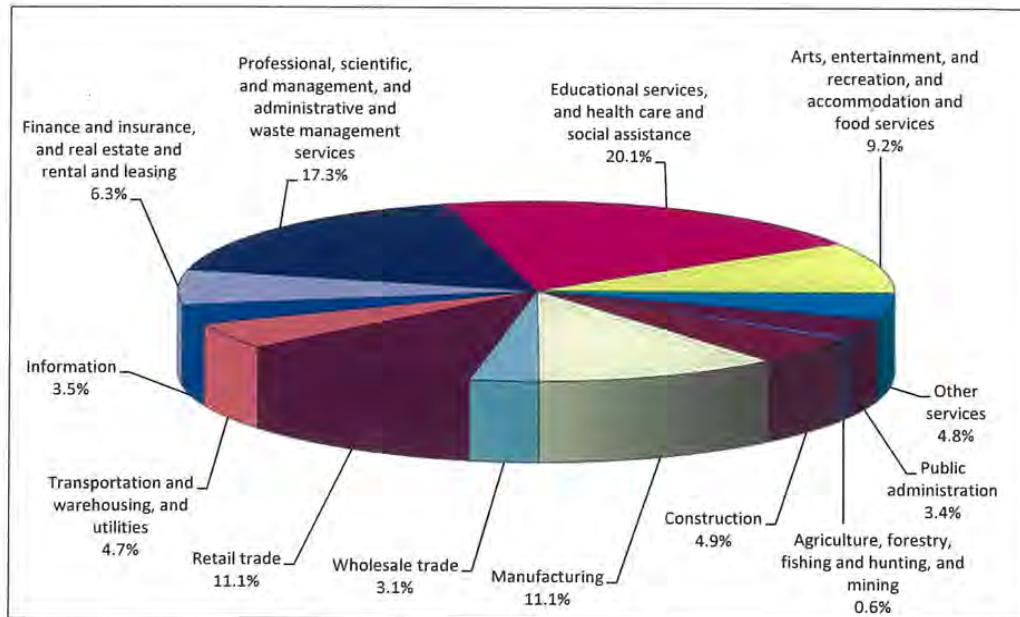


Figure 6-11. Industry in the Planning Area

King County benefits from a variety of business activity. Major businesses include the headquarters of eight Fortune 500 companies: Amazon.com, Costco Wholesale, Expeditors International of Washington, Microsoft, Nordstrom, Paccar, Starbucks and Weyerhaeuser (CNN/Money, 2013). The Boeing Company also has major operations in the county. Major educational and research institutions in the county include the University of Washington, Seattle University, Harborview Medical Center and the Fred Hutchinson Cancer Research Center.

6.8.2 Employment Trends and Occupations

According to the 2011 American Community Survey, 70.3 percent of King County's population age 16 and older is in the labor force (U.S. Census Bureau, 2013). Figure 6-12 compares Washington, King County and Seattle metropolitan area unemployment trends from 2000 through 2012 (Washington Employment Security Department, 2013). The unemployment rate in these areas was lowest in 2007, at close to 4 percent. It rose to between 9 and 10 percent in 2010 in response to the national recession, but has been falling again since then.

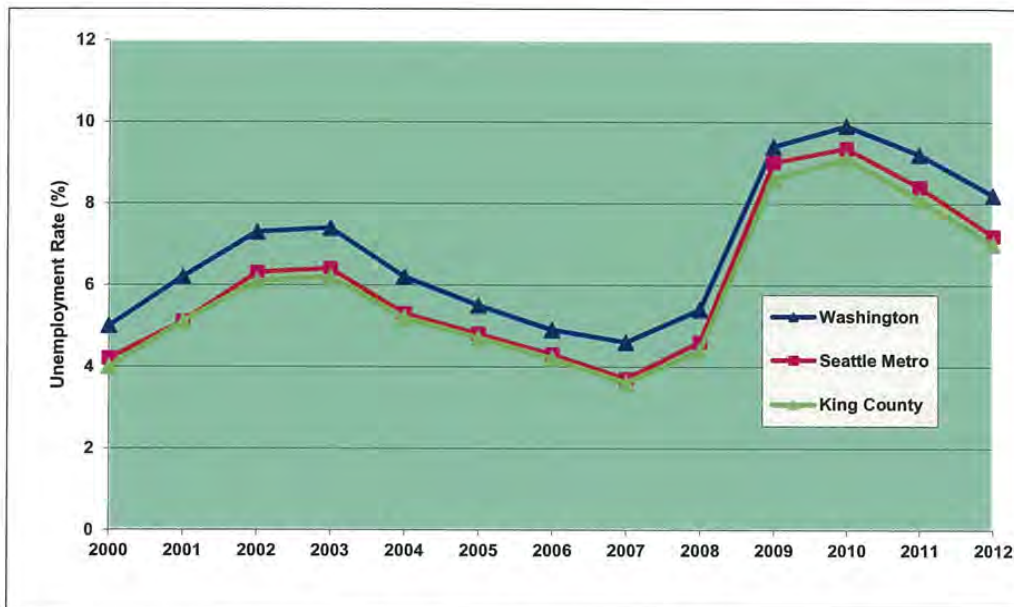


Figure 6-12. Washington, King County and Seattle Metropolitan Area Unemployment Rate

Almost half of employed workers in King County (48 percent) are in management, business science and arts occupations. Another 22 percent have sales and office jobs, and 15 percent are in service occupations (see Figure 6-13) (U.S. Census Bureau, 2013). According to the Economic Development Council of Seattle and King County, the largest employer in the county is The Boeing Company, with 76,000 employees as of 2011, followed by Microsoft, with a 2011 employment in the county of 40,000, and the University of Washington, with 28,000 (Economic Development Council of Seattle and King County, 2013).

The U.S. Census estimates that 66.1 percent of King County workers commute alone to work (by car, truck or van), and mean travel time to work is 26.4 minutes (U.S. Census Bureau, 2013).

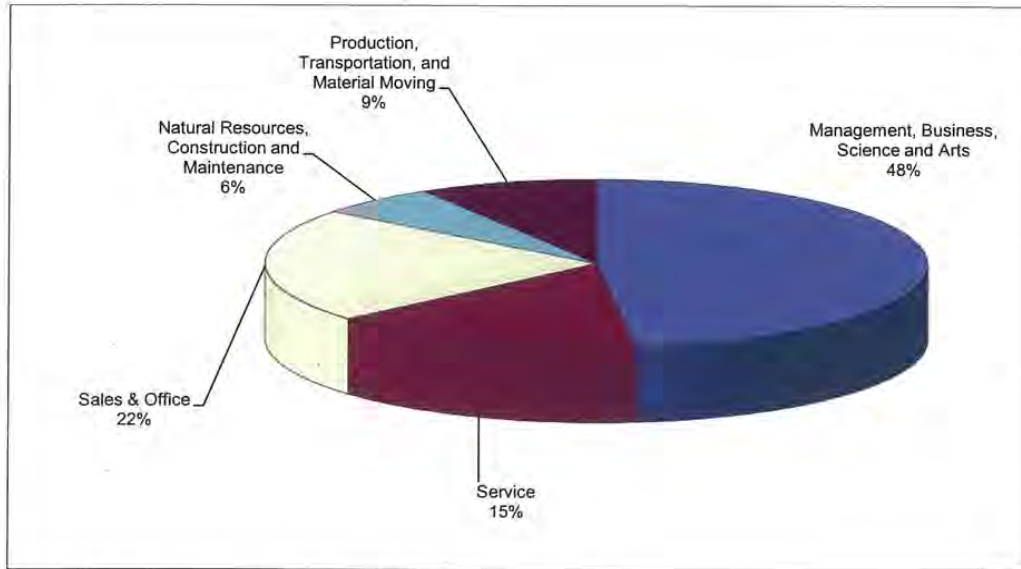


Figure 6-13. Occupations in the Planning Area

6.9 FUTURE TRENDS IN DEVELOPMENT

The municipal planning partners have adopted comprehensive plans that govern land-use decision- and policy-making in their jurisdictions. Decisions on land use are governed by these programs. This plan will work together with these programs to support wise land use in the future by providing vital information on the risk associated with natural hazards in the planning area.

All municipal planning partners will incorporate this hazard mitigation plan update in their comprehensive plans by reference. This will ensure that future development trends can be established with the benefits of the information on risk and vulnerability to natural hazards identified in this plan.

6.10 LAWS, ORDINANCES AND PROGRAMS

Existing laws, ordinances and plans at the federal, state and local level can support or impact hazard mitigation actions identified in this plan. Hazard mitigation plans are required to include a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information as part of the planning process (44 CFR, Section 201.6(b)(3)). Pertinent federal and state laws are described below. Each planning partner has individually reviewed existing local plans, studies, reports, and technical information in its jurisdictional annex, presented in Volume 2.

6.10.1 Federal

Disaster Mitigation Act

The DMA is the current federal legislation addressing hazard mitigation planning. It emphasizes planning for disasters before they occur. It specifically addresses planning at the local level, requiring plans to be in place before Hazard Mitigation Grant Program funds are available to communities. This Plan is designed to meet the requirements of DMA, improving the planning partners' eligibility for future hazard mitigation funds.

Endangered Species Act

The federal Endangered Species Act (ESA) was enacted in 1973 to conserve species facing depletion or extinction and the ecosystems that support them. The act sets forth a process for determining which species are threatened and endangered and requires the conservation of the critical habitat in which those species live. The ESA provides broad protection for species of fish, wildlife and plants that are listed as threatened or endangered. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species. The ESA outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species and contains exceptions and exemptions. It is the enabling legislation for the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Criminal and civil penalties are provided for violations of the ESA and the Convention.

Federal agencies must seek to conserve endangered and threatened species and use their authorities in furtherance of the ESA's purposes. The ESA defines three fundamental terms:

- **Endangered** means that a species of fish, animal or plant is “in danger of extinction throughout all or a significant portion of its range.” (For salmon and other vertebrate species, this may include subspecies and distinct population segments.)
- **Threatened** means that a species “is likely to become endangered within the foreseeable future.” Regulations may be less restrictive for threatened species than for endangered species.
- **Critical habitat** means “specific geographical areas that are...essential for the conservation and management of a listed species, whether occupied by the species or not.”

Five sections of the ESA are of critical importance to understanding it:

- **Section 4: Listing of a Species**—The National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) is responsible for listing marine species; the U.S. Fish and Wildlife Service is responsible for listing terrestrial and freshwater aquatic species. The agencies may initiate reviews for listings, or citizens may petition for them. A listing must be made “solely on the basis of the best scientific and commercial data available.” After a listing has been proposed, agencies receive comment and conduct further scientific reviews for 12 to 18 months, after which they must decide if the listing is warranted. Economic impacts cannot be considered in this decision, but it may include an evaluation of the adequacy of local and state protections. Critical habitat for the species may be designated at the time of listing.
- **Section 7: Consultation**—Federal agencies must ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed or proposed species or adversely modify its critical habitat. This includes private and public actions that require a federal permit. Once a final listing is made, non-federal actions are subject to the same review, termed a “consultation.” If the listing agency finds that an action will “take” a species, it must propose mitigations or “reasonable and prudent” alternatives to the action; if the proponent rejects these, the action cannot proceed.
- **Section 9: Prohibition of Take**—It is unlawful to “take” an endangered species, including killing or injuring it or modifying its habitat in a way that interferes with essential behavioral patterns, including breeding, feeding or sheltering.
- **Section 10: Permitted Take**—Through voluntary agreements with the federal government that provide protections to an endangered species, a non-federal applicant may commit a take that would otherwise be prohibited as long as it is incidental to an otherwise lawful activity (such as developing land or building a road). These agreements often take the form of a “Habitat Conservation Plan.”

- **Section 11: Citizen Lawsuits**—Civil actions initiated by any citizen can require the listing agency to enforce the ESA’s prohibition of taking or to meet the requirements of the consultation process.

With the listing of salmon and trout species as threatened or endangered, the ESA has impacted most of the Pacific Coast states. Although some of these areas have been more impacted by the ESA than others due to the known presence of listed species, the entire region has been impacted by mandates, programs and policies based on the presumption of the presence of listed species. Most West Coast jurisdictions must now take into account the impact of their programs on habitat.

The Clean Water Act

The federal Clean Water Act (CWA) employs regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation’s surface waters so that they can support “the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water.”

Evolution of CWA programs over the last decade has included a shift from a program-by-program, source-by-source, pollutant-by-pollutant approach to more holistic watershed-based strategies. Under the watershed approach, equal emphasis is placed on protecting healthy waters and restoring impaired ones. A full array of issues are addressed, not just those subject to CWA regulatory authority. Involvement of stakeholder groups in the development and implementation of strategies for achieving and maintaining water quality and other environmental goals is a hallmark of this approach.

National Flood Insurance Program

The National Flood Insurance Program (NFIP) provides federally backed flood insurance in exchange for communities enacting floodplain regulations. Participation and good standing under NFIP are prerequisites to grant funding eligibility under the Robert T. Stafford Act. The County and most of the partner cities for this plan participate in the NFIP and have adopted regulations that meet the NFIP requirements. At the time of the preparation of this plan, all participating jurisdictions in the partnership were in good standing with NFIP requirements.

6.10.2 State

Washington State Enhanced Mitigation Plan

The Washington State Enhanced Hazard Mitigation Plan approved by FEMA in 2010 provides guidance for hazard mitigation throughout Washington. The plan identifies hazard mitigation goals, objectives, actions and initiatives for state government to reduce injury and damage from natural hazards. By meeting federal requirements for an enhanced state plan (44 CFR parts 201.4 and 201.5), the plan allows the state to seek significantly higher funding from the Hazard Mitigation Grant Program following presidential declared disasters (20 percent of federal disaster expenditures vs. 15 percent with a standard plan).

Growth Management Act

The 1990 Washington State Growth Management Act (Revised Code of Washington (RCW) Chapter 36.70A) mandates that local jurisdictions adopt land use ordinances protect the following critical areas:

- Wetlands
- Critical aquifer recharge areas
- Fish and wildlife habitat conservation areas

- Frequently flooded areas
- Geologically hazardous areas.

The Growth Management Act regulates development in these areas, and therefore has the potential to affect hazard vulnerability and exposure at the local level.

Planning for natural hazards is an integral element of Washington’s statewide land use planning program under the Growth Management Act. Other related parts of the planning framework include the Shoreline Master Program rules and guidelines, which now provide for the integration of master programs and comprehensive plans. Natural Hazard Mitigation Elements are an optional element under the Growth Management Act. The continuing challenge faced by local officials and state government is to keep a network of coordinated local plans effective in responding to changing conditions and needs of communities. This is particularly true in the case of planning for natural and technological hazards, where communities must balance development pressures with detailed information on the nature and extent of hazards. Washington’s land use program has given its communities and citizens a unique opportunity to ensure that natural and technological hazards are addressed in the development and implementation of local comprehensive plans.

Shoreline Management Act

The 1971 Shoreline Management Act (RCW 90.58) was enacted to manage and protect the shorelines of the state by regulating development in the shoreline area. A major goal of the act is to prevent the “inherent harm in an uncoordinated and piecemeal development of the state’s shorelines.” Its jurisdiction includes the Pacific Ocean shoreline and the shorelines of Puget Sound, the Strait of Juan de Fuca, and rivers, streams and lakes above a certain size. It also regulates wetlands associated with these shorelines.

Washington State Building Code

The Washington State Building Code Council adopted the 2006 editions of national model codes, with some amendments. The Council also adopted changes to the Washington State Energy Code and Ventilation and Indoor Air Quality Code. Washington’s state-developed codes are mandatory statewide for residential and commercial buildings. The residential code exceeds the 2006 International Energy Conservation Code standards for most homes, and the commercial code meets or exceeds standards of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE 90.1-2004). For residential construction covered by ASHRAE 90.1-2007 (buildings with four or more stories), the state code is more stringent. The 2009 IBC went into effect as the Washington model code on July 1, 2010.

Comprehensive Emergency Management Planning

Washington’s Comprehensive Emergency Management Planning law (RCW 38.52) establishes parameters to ensure that preparations of the state will be adequate to deal with disasters, to ensure the administration of state and federal programs providing disaster relief to individuals, to ensure adequate support for search and rescue operations, to protect the public peace, health and safety, and to preserve the lives and property of the people of the state. It achieves the following:

- Provides for emergency management by the state, and authorizes the creation of local organizations for emergency management in political subdivisions of the state.
- Confers emergency powers upon the governor and upon the executive heads of political subdivisions of the state.

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- Provides for the rendering of mutual aid among political subdivisions of the state and with other states and for cooperation with the federal government with respect to the carrying out of emergency management functions.
- Provides a means of compensating emergency management workers who may suffer any injury or death, who suffer economic harm including personal property damage or loss, or who incur expenses for transportation, telephone or other methods of communication, and the use of personal supplies as a result of participation in emergency management activities.
- Provides programs, with intergovernmental cooperation, to educate and train the public to be prepared for emergencies.

It is policy under this law that emergency management functions of the state and its political subdivisions be coordinated to the maximum extent with comparable functions of the federal government and agencies of other states and localities, and of private agencies of every type, to the end that the most effective preparation and use may be made of manpower, resources, and facilities for dealing with disasters.

Washington Administrative Code 118-30-060(1)

Washington Administrative Code (WAC) 118-30-060 (1) requires each political subdivision to base its comprehensive emergency management plan on a hazard analysis, and makes the following definitions related to hazards:

- Hazards are conditions that can threaten human life as the result of three main factors:
 - Natural conditions, such as weather and seismic activity
 - Human interference with natural processes, such as a levee that displaces the natural flow of floodwaters
 - Human activity and its products, such as homes on a floodplain.
- The definitions for hazard, hazard event, hazard identification, and flood hazard include related concepts:
 - A hazard may be connected to human activity.
 - Hazards are extreme events.

Hazards generally pose a risk of damage, loss, or harm to people and/or their property

Washington State Floodplain Management Law

Washington's floodplain management law (RCW 86.16, implemented through WAC 173-158) states that prevention of flood damage is a matter of statewide public concern and places regulatory control with the Department of Ecology. RCW 86.16 is cited in floodplain management literature, including FEMA's national assessment, as one of the first and strongest in the nation. A major challenge to the law in 1978, *Maple Leaf Investors v. Ecology*, is cited in legal references to floodplain management issues. The court upheld the law, declaring that denial of a permit to build residential structures in the floodway is a valid exercise of police power and did not constitute a taking. RCW Chapter 86.12 (Flood Control by Counties) authorizes county governments to levy taxes, condemn properties and undertake flood control activities directed toward a public purpose.

Flood Control Assistance Account Program

Washington's first flood control maintenance program was passed in 1951, and was called the Flood Control Maintenance Program. In 1984, RCW 86.26 (State Participation in Flood Control Maintenance)

established the Flood Control Assistance Account Program (FCAAP), which provides funding for local flood hazard management. FCAAP rules are found in WAC 173-145. Ecology distributes FCAAP matching grants to cities, counties and other special districts responsible for flood control. This is one of the few state programs in the U.S. that provides grant funding to local governments for floodplain management. The program has been funded for \$4 million per Biennium since its establishment, with additional amounts provided after severe flooding events.

To be eligible for FCAAP assistance, flood hazard management activities must be approved by Ecology in consultation with the Washington Department of Fish and Wildlife. A comprehensive flood hazard management plan must have been completed and adopted by the appropriate local authority or be in the process of being prepared in order to receive FCAAP flood damage reduction project funds. This policy evolved through years of the Flood Control Maintenance Program and early years of FCAAP in response to the observation that poor management in one part of a watershed may cause flooding problems in another part.

Local jurisdictions must participate in the NFIP and be a member in good standing to qualify for an FCAAP grant. Grants up to 75 percent of total project cost are available for comprehensive flood hazard management planning. Flood damage reduction projects can receive grants up to 50 percent of total project cost, and must be consistent with the comprehensive flood hazard management plan. Emergency grants are available to respond to unusual flood conditions. FCAAP can also be used for the purchase of flood prone properties, for limited flood mapping and for flood warning systems. Funding currently is running about 60 percent for planning and 40 percent for projects.

6.10.3 Local Programs

Each planning partner has prepared a jurisdiction-specific annex to this plan (see Volume 2). In preparing these annexes, each partner completed a capability assessment that looked at its regulatory, technical and financial capability to carry out proactive hazard mitigation. Refer to these annexes for a review of regulatory codes and ordinances applicable to each planning partner. This section provides an overview of programs in King County that can support or enhance the initiatives identified in this plan.

King County Flood Control District

The King County Flood Control District (District) is an independent special purpose district established by King County Council Ordinance 15728. State law authorizes King County Council members to be the members of the Board of Supervisors that is the district's governing body. The Board of Supervisors oversees the district's funding, projects, policies and programs. The District Advisory Committee provides the Board of Supervisors with policy recommendations on regional flood protection and annual budgeting issues and on priorities and implementation strategies for the district's capital improvement program.

Staff from the River and Floodplain Management Section of King County's Department of Natural Resources and Parks (Water and Land Resources Division) are responsible, under an inter-local agreement between the County and the District, for developing and implementing board-approved flood protection projects and programs.

Basin Technical Committees for each major river basin (Snoqualmie/South Fork Skykomish Rivers, Cedar/Sammamish Rivers, Green/Duwamish River and White River) ensure that basin-scale issues and basin-specific technical information are considered in regional decision-making. Committee members are staff from local governments in each basin, along with District staff. Tribal governments also are invited to participate. Together, basin committee members coordinate with state and federal partners, review and guide flood hazard management projects and share information on relevant flood issues. They provide

technical advice and recommendations to the district's Advisory Committee, which in turn makes recommendations to the District's Board of Supervisors. Figure 6-14 illustrates the District's overall governance structure.

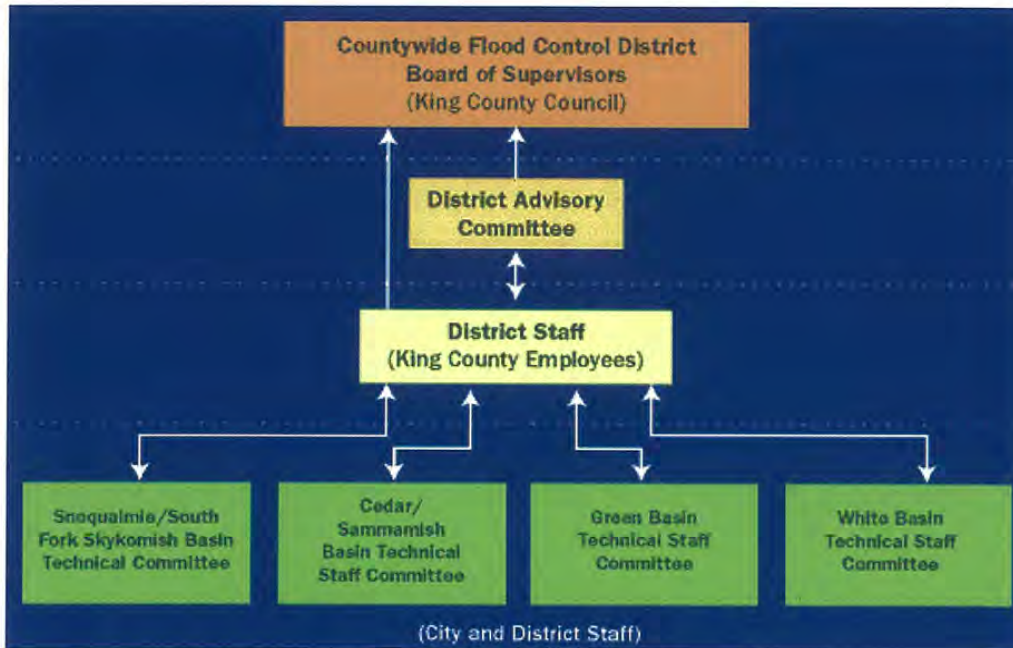


Figure 6-14. King County Flood Control District Governance Structure

The Resilient King County Initiative

In 2013, King County convened a group of leaders from the corporate and nonprofit sectors to build a comprehensive strategy for how King County will recover from a major catastrophe. The group's meeting launched the Resilient King County initiative, based on King County's Regional Capabilities Assessment, the Resilient Washington State initiative, and the National Disaster Recovery Framework. The Resilient King County initiative seeks to establish a framework to assist individuals, families, businesses and government in rebuilding the community after a disaster in a way that sustains its physical, emotional, social, and economic well-being. It defines a resilient King County as follows:

A resilient King County has the capacity to maintain the services and livelihoods that its residents rely on after a catastrophic hazard event. In the event that these services and livelihoods are disrupted, recovery within King County occurs in a systematic, defensible, and transparent manner that balances speed and opportunity.

The purpose of the Resilient King County initiative is to obtain insights and feedback from stakeholders in King County to further the development of King County's Regional Long-Term Recovery Plan. The insights and feedback will be synthesized into a report that establishes a framework for conducting tradeoffs before and during the recovery process in coordination with other King County jurisdictions and key stakeholders.

King County Strategic Plan 2010-2014

The King County Council adopted the *King County Strategic Plan, 2010–2014: Working Together for One King County*. The plan, created with input from residents and county employees in collaboration with the county’s elected officials, is a key tool in work to reform county government by focusing on customer service, partnerships and ways to bring down the cost of government.

CHAPTER 7. CLIMATE CHANGE CONSIDERATIONS FOR HAZARD MITIGATION

7.1 WHAT IS CLIMATE CHANGE?

Climate, consisting of patterns of temperature, precipitation, humidity, wind and seasons, plays a fundamental role in shaping natural ecosystems and the human economies and cultures that depend on them. “Climate change” refers to changes over a long period of time. Worldwide, average temperatures have increased more than 1.4°F over the last 100 years (NRC, 2010). Although this change may seem small, it can lead to large changes in climate and weather.

The warming trend and its related impacts are caused by increasing concentrations of carbon dioxide and other greenhouse gases in the earth’s atmosphere. Greenhouse gases are gases that trap heat in the atmosphere, resulting in a warming effect. Carbon dioxide is the most commonly known greenhouse gas; however, methane, nitrous oxide and fluorinated gases also contribute to warming. Emissions of these gases come from a variety of sources, such as the combustion of fossil fuels, agricultural production and changes in land use. According to the U.S. Environmental Protection Agency (EPA), carbon dioxide concentrations measured about 280 parts per million (ppm) before the industrial era began in the late 1700s and have risen 41 percent since then, reaching 394 ppm in 2012 (see Figure 7-1). The EPA attributes almost all of this increase to human activities (U.S. EPA, 2013f).

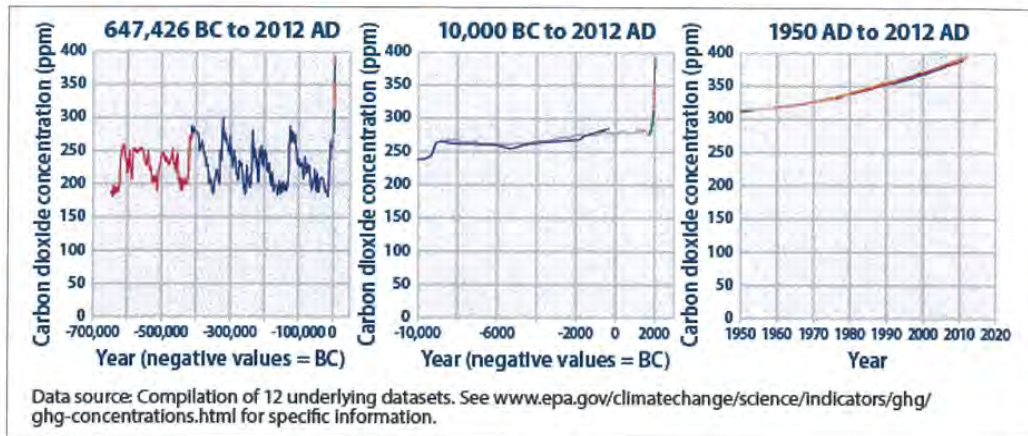


Figure 7-1. Global Carbon Dioxide Concentrations Over Time

Climate change will affect the people, property, economy and ecosystems of King County in a variety of ways. Some impacts will have negative consequences for the region and others may present opportunities. The most important effect for the development of this plan is that climate change will have a measurable impact on the occurrence and severity of natural hazards.

7.2 HOW CLIMATE CHANGE AFFECTS HAZARD MITIGATION

An essential aspect of hazard mitigation is predicting the likelihood of hazard events in a planning area. Typically, predictions are based on statistical projections from records of past events. This approach assumes that the likelihood of hazard events remains essentially unchanged over time. Thus, averages based on the past frequencies of, for example, floods are used to estimate future frequencies: if a river has flooded an average of once every five years for the past 100 years, then it can be expected to continue to flood an average of once every five years.

For hazards that are affected by climate conditions, the assumption that future behavior will be equivalent to past behavior is not valid if climate conditions are changing. As flooding is generally associated with precipitation frequency and quantity, for example, the frequency of flooding will not remain constant if broad precipitation patterns change over time. The risks of avalanche, landslide, severe weather, severe winter weather and wildfire are all affected by climate patterns as well.

For this reason, an understanding of climate change is pertinent to efforts to mitigate natural hazards. Information about how climate patterns are changing provides insight on the reliability of future hazard projections used in mitigation analysis. This chapter summarizes current understandings about climate change in order to provide a context for the recommendation and implementation of hazard mitigation measures in King County.

7.3 CURRENT INDICATIONS OF CLIMATE CHANGE

7.3.1 Global Indicators

The major scientific agencies of the United States—including the National Aeronautics and Space Administration (NASA) and the National Oceanic and Atmospheric Administration (NOAA)—agree that climate change is occurring (U.S. EPA, 2013). Multiple temperature records from all over the world have shown a warming trend (U.S. EPA, 2011). According to NOAA, the decade from 2000 to 2010 was the warmest on record, and 2010 was tied with 2005 as the warmest year on record (NOAA, 2011). Worldwide, average temperatures have increased more than 1.4°F over the last 100 years (NRC, 2010). Many of the extreme precipitation and heat events of recent years are consistent with projections based on that amount of warming (USGCRP, 2009).

Rising global temperatures have been accompanied by other changes in weather and climate. Many places have experienced changes in rainfall resulting in more intense rain, as well as more frequent and severe heat waves. The planet's oceans and glaciers have also experienced changes: oceans are warming and becoming more acidic, ice caps are melting, and sea levels are rising (U.S. EPA, 2010). Global sea level has risen approximately 9 inches, on average, in the last 140 years (U.S. EPA, 2010). This has already put some coastal homes, beaches, roads, bridges, and wildlife at risk (USGCRP, 2009).

7.3.2 Indicators Tracked by King County

Environmental changes such as increasing air and water temperatures, acidifying marine waters, increasing fall flooding, rising sea levels, decreasing snow pack, and decreasing summertime river flow have already been documented within King County (King County, 2013a). The County has been tracking a series of indicators that will provide information about local climate change impacts and help assess their severity. The County is also tracking greenhouse gas emissions for all King County residents, businesses and government operations and preparing for climate change impacts. The indicators that King County has been tracking demonstrate the following impacts to date (King County, 2013a):

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- **Stream temperatures**—During the period 2000-2011, the moving 7-day average of the daily maximum temperatures for the majority of the 63 stream and river sites in King County exceeded the 16°C temperature standard established for the protection of salmon habitat.
- **Large lake temperatures**—The trend in annual average lake temperatures, including Lake Washington and Lake Sammamish, is toward higher average water temperatures.
- **Summer Stream Flows**—Trend analysis of long-term King County river discharge records (1962-2008) in nine unregulated rivers and the naturalized flow record for the Green River at Howard Hanson Dam provide strong evidence of declining summer flow (July - September) and some evidence that severe storms and floods occur more frequently in late fall.
- **Rainfall**—Annual precipitation in the Pacific Northwest region increased 14 percent from 1930 through 1995. There is some evidence from local weather and gauging river stations that severe storms and floods are occurring more frequently. A local study indicated a general trend toward higher precipitation in November and lower precipitation during summer. In addition, results suggest increases in the magnitude, duration, frequency, and earlier timing of extreme precipitation.
- **Sea level rise**—Oceans rose approximately 8 inches from 1870 to 2008, an average of 0.06 inches per year. Recent years have shown an increase in the rate of change. At a station in Seattle, the trend of monthly mean sea level (1898 to 2006) is 2.06 mm/year (equivalent to a change of 0.68 feet in 100 years).
- **Air temperature**—In the Pacific Northwest, average annual temperatures rose 1.5°F in the last century.
- **Snowpack**—Widespread declines in spring snowpack have occurred in much of the North American west between 1925 and 2000. Between about mid-century and 2006, decreases of about 15 to 35 percent in snow water equivalent in the Cascades Mountains were observed.
- **Sea surface temperature**—Global sea surface temperatures increased over the 20th century at an average rate of 0.12°F per decade. Over the last 30 years, global surface temperatures have risen at a faster rate of change of 0.21°F per decade. Records from a station in Victoria, BC indicate a long-term warming trend of 1.7°F since 1921 and 1.8°F since 1950.
- **Ocean acidification**—Over the past 250 years, oceans have absorbed about 550 billion tons of carbon dioxide emissions, or about 30 percent of total carbon emissions created by human activity. Globally, ocean surface water pH is estimated to have fallen about 0.1 pH units since the beginning of the industrial revolution.
- **Human Health and Heat**—Data from the greater Seattle area indicate that between 1980 and 2006 the risk of death and mortality due to all non-traumatic causes and circulatory causes rose for citizens 45 years and older during the hottest summer days.
- **Air Quality**—The number of days per year with air particulates exceeding the Particulate Matter Size 2.5 daily health standard has been decreasing over the last 10 years—from about 60 days in 2000 down to fewer than 10 days in 2010.
- **County Operations**—Over the short period for which data is available (since 2007), data show a trend in increasing hours of operation of the King County Flood Warning Center.
- **FEMA disasters**—Flood, severe storm and coastal storm related FEMA disasters in King County have been occurring more frequently in the past decade.
- **Fish**—Wild juvenile chinook salmon abundance in King County watersheds has been decreasing since the early 2000s. Wild chinook salmon escapement results in 2010 were far below the recovery goals—at only 7 percent of the recovery target.

7.4 PROJECTED FUTURE IMPACTS

7.4.1 Global Projections

Scientists project that Earth's average temperatures will rise between 2°F and 12°F by 2100 (NRC, 2011a). Some research has concluded that every increase of 2°F in average global average temperature can have the following impacts (NRC, 2011b):

- 3 to 10 percent increases in the amount of rain falling during the heaviest precipitation events, which can increase flooding risks
- 200 to 400 percent increases in the area burned by wildfire in parts of the western United States
- 5 to 10 percent decreases in stream flow in some river basins
- 5 to 15 percent reductions in the yields of crops as currently grown.

The amount of sea level rise expected to occur as a result of climate change will increase the risk of coastal flooding for millions to hundreds of millions of people around the world, many of whom would have to permanently leave their homes (IPCC, 2007). By 2100, sea level is expected to rise another 1.5 to 3 feet (NRC, 2011b). Rising seas will make coastal storms and the associated storm surges more frequent and destructive. What is currently termed a once-in-a-century coastal flooding event could occur as frequently as once per decade (USGCRP, 2009).

7.4.2 Projections for Washington State

The Climate Impacts Group at the University of Washington used multiple climate models to evaluate potential climate change in Washington State and the Pacific Northwest region. The following are key findings of that study that are relevant for hazard mitigation planning (Climate Impacts Group, 2009):

- Climate models project increases in annual temperature (compared to 1970 – 1999 and averaged across all models) of 2.0°F by the 2020s, 3.2°F by the 2040s, and 5.3°F by the 2080s.
- Projected changes in annual precipitation, averaged over all models, are small (+1 to +2 percent), but some models project an enhanced seasonal precipitation cycle with changes toward wetter autumns and winters and drier summers.
- Regional climate models generally predict increases in extreme high precipitation over the next half-century, particularly around Puget Sound.
- April 1 snowpack is projected to decrease (compared with the 1916 – 2006 historical average) by 28 percent across the state by the 2020s, 40 percent by the 2040s, and 59 percent by the 2080s.
- Due to increased summer temperature and decreased summer precipitation, the area burned by fire in the U.S. portion of the Columbia River basin is projected to double by the 2040s and triple by the 2080s. The probability that more than 2 million acres in that area will burn in a given year is projected to increase from 5 percent today to 33 percent by the 2080s.
- Projected warming would likely result in 101 additional deaths during heat events in the greater Seattle area among persons 45 and older in 2025 and 156 additional deaths in 2045.
- By mid-century, King County will likely experience 132 additional deaths annually between May and September due to worsened air quality caused by climate change.

7.5 RESPONSES TO CLIMATE CHANGE

7.5.1 Mitigation and Adaptation

Communities and governments worldwide are working to address, evaluate and prepare for climate changes that are likely to impact communities in coming decades. Generally, climate change discussions encompass two separate but inter-related considerations: mitigation and adaptation. The term “mitigation” can be confusing, because its meaning changes across disciplines:

- Mitigation in restoration ecology and related fields generally refers to policies, programs or actions that are intended to reduce or to offset the negative impacts of human activities on natural systems. Generally, mitigation can be understood as avoiding, minimizing, rectifying, reducing or eliminating, or compensating for known impacts (CEQ, 1978).
- Mitigation in climate change discussions is defined as “a human intervention to reduce the impact on the climate system.” It includes strategies to reduce greenhouse gas sources and emissions and enhance greenhouse gas sinks (U.S. EPA, 2013g).
- Mitigation in emergency management is typically defined as the effort to reduce loss of life and property by lessening the impact of disasters (FEMA, 2013).

In this chapter, mitigation is used as defined by the climate change community. In the other chapters of this plan, mitigation is primarily used in an emergency management context.

Adaptation refers to adjustments in natural or human systems in response to the actual or anticipated effects of climate change and associated impacts. These adjustments may moderate harm or exploit beneficial opportunities (U.S. EPA, 2013g).

Mitigation and adaptation are related, as the world’s ability to reduce greenhouse gas emissions will affect the degree of adaptation that will be necessary. Some initiatives and actions can both reduce greenhouse gas emissions and support adaptation to likely future conditions.

Societies across the world are facing the need to adapt to changing conditions associated with natural disasters and climate change. Farmers are altering crops and agricultural methods to deal with changing rainfall and rising temperature; architects and engineers are redesigning buildings; planners are looking at managing water supplies to deal with droughts or flooding.

Most ecosystems show a remarkable ability to adapt to change and to buffer surrounding areas from the impacts of change. Forests can bind soils and hold large volumes of water during times of plenty, releasing it through the year; floodplains can absorb vast volumes of water during peak flows; coastal ecosystems can hold out against storms, attenuating waves and reducing erosion. Other ecosystem services—such as food provision, timber, materials, medicines and recreation—can provide a buffer to societies in the face of changing conditions.

Ecosystem-based adaptation is the use of biodiversity and ecosystem services as part of an overall strategy to help people adapt to the adverse effects of climate change. This includes the sustainable management, conservation and restoration of specific ecosystems that provide key services.

7.5.2 Future Modeling Efforts

Current modeling efforts are unable to assess climate change at a resolution small enough to determine specific impacts for the individual communities of King County. However, generalized assessments of larger climatic regions can be used to determine impacts that are most likely to affect these communities.

Models are currently being developed to assess the potential impacts of climate change, but none are currently available to support hazard mitigation planning. As these models are developed in the future, the risk assessment presented in this plan may be enhanced to better measure these impacts.

7.5.3 Response To Climate Change in the Northwest

King County has been a national leader in working to address climate change. The County has engaged in the following planning strategies to address greenhouse gas emissions and the expected impacts that climate change will have on people, property, economy and ecosystems:

- The King County Global Warming Action Plan
- 2007 King County Climate Plan
- The 2012 King County Strategic Climate Action Plan
- Preparing for Climate Change Guidebook in conjunction with the University of Washington's Climate Impacts Group and Local Governments for Sustainability
- Participation in the Cities Climate Collaboration
- Mandating that greenhouse gas emission information be included in the environmental review process required by the State Environmental Policy Act.

King County government is not alone in the effort to address the sources and impacts of climate change. The State of Washington has adopted greenhouse gas reduction requirements that aim to reduce emissions to 1990 levels by 2020, to 25 percent below 1990 levels by 2035 and to 50 percent below 1990 levels by 2050 (RCW 47.01.440). Additionally, as of 2012, 17 of the 39 cities in the county are signatories to the U.S. Mayors' Climate Protection greenhouse gas emissions reduction target, which was launched by Seattle Mayor Greg Nickels in 2005.

2012 King County Strategic Climate Action Plan

The most recent County effort to address climate change is the 2012 King County Strategic Climate Action Plan which "synthesizes and focuses King County's most critical goals, objectives, strategies and priority actions to reduce greenhouse gas emissions and prepare for the effects of climate change" (King County, 2012). The Action Plan identifies goals for County operations and services in five areas that align with the King County Strategic Plan: transportation and land use; energy; forests and agriculture; consumption and materials management; and preparing for climate change impacts. Many of the actions identified in support of the goal of preparing for the likely impacts of climate change are directly related to the goals of hazard mitigation planning (King County, 2012):

- Manage flood risk.
- Educate and train the public and staff.
- Develop preparedness plans.
- Integrate climate change issues into emergency management.
- Plan for impacts on public health.
- Further develop reclaimed water program.

Cities Climate Collaboration

King County and the cities of Issaquah, Kirkland, Mercer Island, Redmond, Renton, Seattle, Shoreline, Snoqualmie and Tukwila have formed a partnership to "coordinate and enhance the effectiveness of local

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government climate and sustainability efforts.” (King County, 2014) The effort focuses on developing and coordinating the following (King County, 2014):

- **Outreach**—Develop, refine and use messaging and tools for climate change outreach to engage decision makers, other cities and the general public.
- **Coordination**—Collaborate on adopting consistent standards, benchmarks, strategies and overall goal related to responding to climate change.
- **Solution**—Share local success stories, challenges, data and products that support and enhance The climate mitigation efforts by all partners.
- **Funding and resources**—Collaborate to secure grant funding and other shared resource opportunities to support climate related project and programs.

State Environmental Policy Act

In Washington State, development proposals that may have an adverse impact on the environment are subject to an environmental review that adheres to the requirements of the State Environmental Policy Act. King County was the first in the nation to take official action to add greenhouse gas emission considerations to the review of construction projects. According to the King County Sustainability Report, greenhouse gas emissions associated with development come from multiple sources:

- The extraction, processing, transportation, construction and disposal of building materials
- Landscape disturbance
- Energy demands created by the development after it is completed
- Transportation demands created by the development after it is completed.

The assessment required by the King County policy provides an estimate of all greenhouse gas emissions that will be created over the life of the building. This includes emissions associated with obtaining construction materials, fuel used during construction, energy consumed during the building’s operation, and transportation by building occupants (King County, 2013b).

King County Comprehensive Plan

King County is involved in efforts to link climate change planning to local land use decisions. The King County Comprehensive Plan identifies policies that will help the County prepare for the impacts of climate change. According to the Adaptation section of the comprehensive plan, King County can increase resiliency and adapt to climate change through actions such as the following (King County Department of Permitting and Environmental Review, 2013):

- Coordinated public health and disaster planning
- Climate-sensitive land use planning
- Investments in flood hazard management projects
- Collaborative planning with water suppliers and development of reclaimed water sources
- Comprehensive approaches to conserving biodiversity that may make habitats more resilient to climate change impacts
- Information sharing and collaboration with other local governments developing strategies for climate change adaptation
- Cooperation with farm and forest landowners to identify and address impacts of climate change

- Siting facilities and using sustainable building practices to reduce vulnerability to the impacts of climate change.

The Comprehensive Plan identifies the following examples of County efforts to implement and learn from practical preparedness steps:

- Analyzing and planning for sea level rise impacts on Vashon Island and wastewater and road infrastructure
- Assessing and reducing flood impacts in partnership with the King County Flood Control District
- Developing reclaimed water systems and markets.

In general, actions throughout the planning area that promote the reduction of greenhouse gas emissions from all sectors support both hazard mitigation and climate change objectives. These actions include reducing fossil fuel consumption through transit initiatives, implementing green building and infrastructure design, protecting and enhancing the provision of ecosystem services, and assessing emissions from local government purchasing and operating protocols.

7.6 POTENTIAL CLIMATE CHANGE IMPACT ON HAZARDS

Although no modeling is currently available to develop quantitative estimates of the effect of climate change on natural hazard risks, an understanding of the basic features of climate change allows for the following qualitative assessments of impacts on hazards of concern addressed in this hazard mitigation plan. This overview serves as a basis for evaluating how risk will change as a result of future climate change impacts. The vulnerabilities identified in this plan update will ultimately be used to inform other aspects of emergency management planning, such as the Comprehensive Emergency Management Plan.

7.6.1 Avalanche

Snow avalanches are rarely used as indicators of climate change. The effects of climate change on avalanche frequency and magnitude are uncertain and will likely be dependent on local climate change impacts, such as changes in snowfall events and temperature series. Some studies have indicated that the types of avalanche events (wet or dry) may shift as a result of changes in snow cover (Martin et al., 2001). Avalanches, however, are not influenced by snow cover alone, but by several interrelated factors including forest structure, surface energy balance, melt water routing, precipitation, air temperature and wind (Teich et al., 2012; Lazar and Williams, 2008).

Secondary and tertiary impacts of climate change may also alter avalanche events. For example, climate change may modify the distribution of tree species across mountain landscapes. Some case studies in the Swiss and French Alps indicate that climate change impacts may reduce the frequency or severity of such events, while other assessments indicate that events may occur more frequently in other mountain regions (Kohler, 2009; Teich et al. 2012). No studies assessing the relative frequency and severity of avalanches in the Cascade Range were located, but an analysis of wet avalanche hazards in an Aspen ski area indicated that such effects may occur more frequently under high-emission scenarios (Lazar and Williams, 2008). Feedback loops affecting snow cover, forest structure, meteorological averages, and land use planning decisions are all likely to influence the future frequency and severity of impacts from avalanche events.

7.6.2 Dam Failure

Dams are designed partly based on assumptions about a river's flow behavior, expressed as hydrographs. Changes in weather patterns can have significant effects on the hydrograph used for the design of a dam.

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If the hydrograph changes, it is conceivable that the dam can lose some or all of its designed margin of safety, also known as freeboard. If freeboard is reduced, dam operators may be forced to release increased volumes earlier in a storm cycle in order to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream. Throughout the west, communities downstream of dams are already experiencing increases in stream flows from earlier releases from dams.

Dams are constructed with safety features known as “spillways.” Spillways are put in place on dams as a safety measure in the event of the reservoir filling too quickly. Spillway overflow events, often referred to as “design failures,” result in increased discharges downstream and increased flooding potential. Although climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures.

7.6.3 Earthquake

The impacts of global climate change on earthquake probability are unknown. Some scientists say that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the earth’s crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity, according to research into prehistoric earthquakes and volcanic activity. NASA and USGS scientists found that retreating glaciers in southern Alaska may be opening the way for future earthquakes (NASA, 2004).

Secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms could experience liquefaction or an increased propensity for slides during seismic activity due to the increased saturation. Dams storing increased volumes of water due to changes in the hydrograph could fail during seismic events. There are currently no models available to estimate these impacts.

7.6.4 Flood

According to University of Washington scientists, global climate changes resulting in warmer, wetter winters are projected to increase flooding frequency in most Western Washington river basins. Future floods are expected to exceed the capacity and protective abilities of existing flood protection facilities, threatening lives, property, major transportation corridors, communities and regional economic centers.

Changes in Hydrology

Use of historical hydrologic data has long been the standard of practice for designing and operating water supply and flood protection projects. For example, historical data are used for flood forecasting models and to forecast snowmelt runoff for water supply. This method of forecasting assumes that the climate of the future will be similar to that of the period of historical record. However, the hydrologic record cannot be used to predict changes in frequency and severity of extreme climate events such as floods. Going forward, model calibration or statistical relation development must happen more frequently, new forecast-based tools must be developed, and a standard of practice that explicitly considers climate change must be adopted. Climate change is already impacting water resources, and resource managers have observed the following:

- Historical hydrologic patterns can no longer be solely relied upon to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply and quality, flood management and ecosystem functions.
- Extreme climatic events will become more frequent, necessitating improvement in flood protection, drought preparedness and emergency response.

The amount of snow is critical for water supply and environmental needs, but so is the timing of snowmelt runoff into rivers and streams. Rising snowlines caused by climate change will allow more mountain area to contribute to peak storm runoff. High frequency flood events (e.g. 10-year floods) in particular will likely increase with a changing climate. Along with reductions in the amount of the snowpack and accelerated snowmelt, scientists project greater storm intensity, resulting in more direct runoff and flooding. Changes in watershed vegetation and soil moisture conditions will likewise change runoff and recharge patterns. As stream flows and velocities change, erosion patterns will also change, altering channel shapes and depths, possibly increasing sedimentation behind dams, and affecting habitat and water quality. With potential increases in the frequency and intensity of wildfires due to climate change, there is potential for more floods following fire, which increase sediment loads and water quality impacts.

As hydrology changes, what is currently considered a 100-year flood may strike more often, leaving many communities at greater risk. Planners will need to factor a new level of safety into the design, operation, and regulation of flood protection facilities such as dams, bypass channels and levees, as well as the design of local sewers and storm drains.

Sea Level Rise

Sea level and temperature are interrelated (U.S. EPA, 2013e). Warmer temperatures result in the melting of glaciers and ice sheets. This melting means that less water is stored on land and, thus, there is a greater volume of water in the oceans. Water also expands as it warms, and the heat content of the world's oceans has been increasing over the last several decades. According to the EPA, there is likely to be 13 inches of sea level rise in the Puget Sound basin by 2100. According to the Washington State Department of Ecology the impacts of sea level rise could include the following: increased coastal community flooding, coastal erosion and landslides, seawater well intrusion, and lost wetlands and estuaries.

7.6.5 Landslide

Climate change may impact storm patterns, increasing the probability of more frequent, intense storms with varying duration. Increase in global temperature could affect the snowpack and its ability to hold and store water. Warming temperatures also could increase the occurrence and duration of droughts, which would increase the probability of wildfire, reducing the vegetation that helps to support steep slopes. All of these factors would increase the probability for landslide occurrences.

7.6.6 Severe Weather

Climate change presents a challenge for risk management associated with severe weather. The frequency of severe weather events has increased steadily over the last century. The number of weather-related disasters during the 1990s was four times that of the 1950s, and cost 14 times as much in economic losses. Historical data shows that the probability for severe weather events increases in a warmer climate (see Figure 7-2). According to the EPA, "Since 1901, the average surface temperature across the contiguous 48 states has risen at an average rate of 0.14°F per decade. Average temperatures have risen more quickly since the late 1970s (0.36 to 0.55°F per decade). Seven of the top 10 warmest years on record for the contiguous 48 states have occurred since 1998, and 2012 was the warmest year on record (U.S. EPA, 2013b)." This increase in average surface temperatures can also lead to more intense heat waves that can be exacerbated in urbanized areas by what is known as urban heat island effect. Additionally, the changing hydrograph caused by climate change could have a significant impact on the intensity, duration and frequency of storm events. All of these impacts could have significant economic consequences.

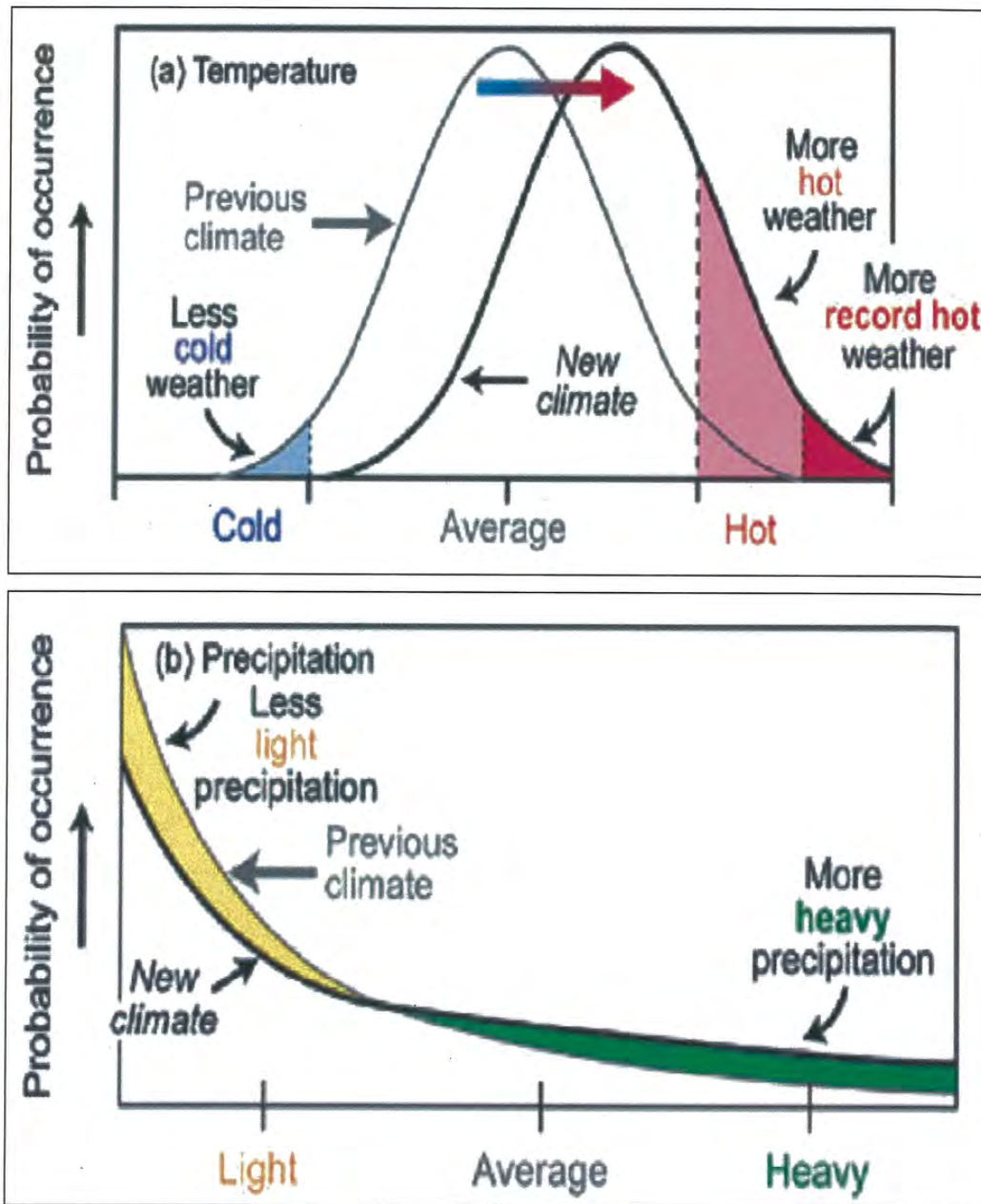


Figure 7-2. Severe Weather Probabilities in Warmer Climates

7.6.7 Severe Winter Weather

One impact of climate change is an increase in average ambient temperatures. Since the 1980s, unusually cold temperatures have become less common in the contiguous 48 states (U.S. EPA, 2013c). This trend is expected to continue and the frequency of winter cold spells will likely decrease.

As ambient temperatures increase, more water evaporates from land and water sources. The timing, frequency, duration and type of precipitation events will be affected by these changes. In general, more precipitation will fall as rain rather than snow; however, the amount of snowfall may increase where temperatures remain below freezing (U.S. EPA, 2013d). Snowfall may also change if typical storm track patterns are altered. Snowfall is already changing in the United States. According to the EPA (see Figure 7-3; U.S. EPA, 2013d):

- Total snowfall has decreased in most parts of the country since widespread observations became available in 1930, with 57 percent of stations showing a decline.
- More than three-fourths of the stations across the contiguous 48 states have experienced a decrease in the proportion of precipitation falling as snow.
- Snowfall trends vary by region. The Pacific Northwest has seen a decline in both total snowfall and the proportion of precipitation falling as snow.

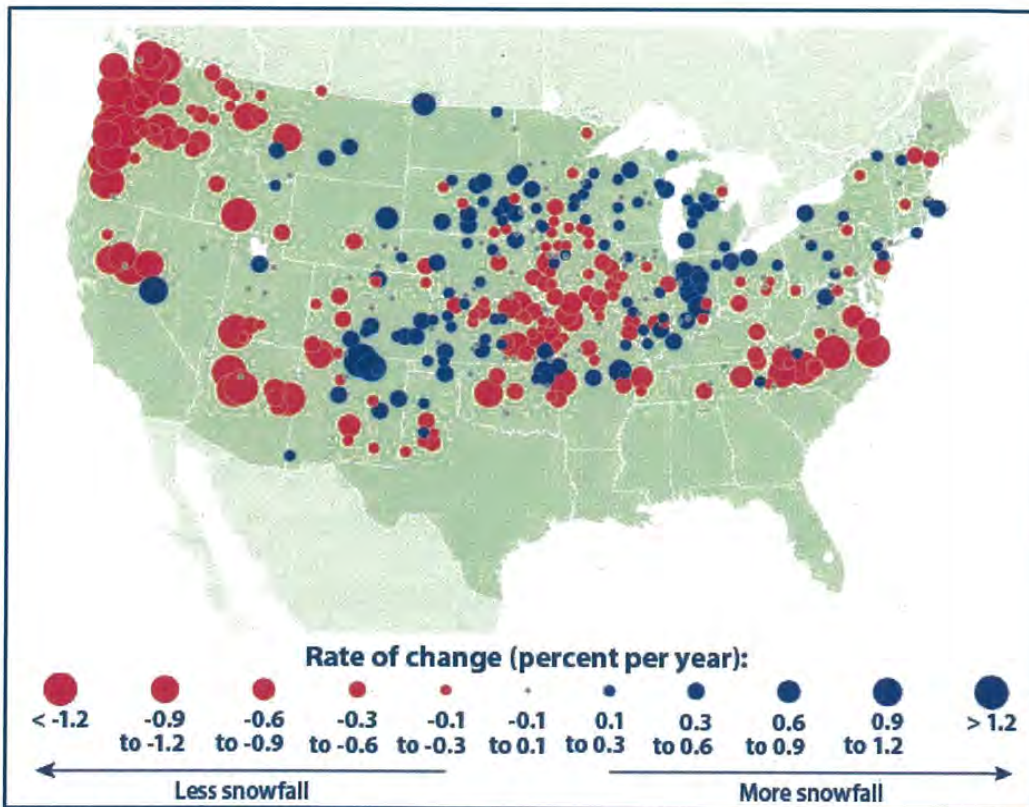


Figure 7-3. Change in snowfall, 1930-2007

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From 1950 to 2000, snowpack has declined in most of the western United States, compared to historical averages. Western Washington, western Oregon and northern California have seen the greatest declines (U.S. EPA, 2013d). These changes will impact ecosystems, recreation opportunities, the hydroelectric power supply, and drinking water systems. The timing and magnitude of flooding may also be impacted by changes in the region's hydrograph, due to a greater percentage of precipitation falling as rain and earlier spring melt times.

7.6.8 Tsunami

The impacts of climate change on the frequency and severity of tsunami events could be significant in regions with vulnerable coastline. Global sea-level rise will affect all coastal societies, especially densely populated low-lying coastal areas. Sea level rise has two effects on low-lying coastal regions: any structures located below the new level of the sea will be flooded; and the rise in sea level may lead to coastal erosion that can further threaten coastal structures.

7.6.9 Volcano

Climate change is not likely to affect the risk associated with volcanoes; however, volcanic activity can affect climate change. Volcanic clouds absorb terrestrial radiation and scatter a significant amount of incoming solar radiation. By reducing the amount of solar radiation reaching the Earth's surface, large-scale volcanic eruptions can lower temperatures in the lower atmosphere and change atmospheric circulation patterns. The massive outpouring of gases and ash can influence climate patterns for years following a volcanic eruption.

7.6.10 Wildfire

Climate change has the potential to affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot dry spells create the highest fire risk. Increased temperatures may intensify wildfire danger by warming and drying out vegetation. Climate change also may increase winds that spread fires. Forest response to increased atmospheric carbon dioxide could contribute to more tree growth and thus more fuel for fires, although the effects of carbon dioxide on mature forests are still largely unknown. In turn, increased high-elevation wildfires could release stores of carbon and further contribute to the buildup of greenhouse gases.

Wildfire in western ecosystems is determined by climate variability, local topography, and human intervention. Climate change has the potential to affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot dry spells create the highest fire risk. Increased temperatures may intensify wildfire danger by warming and drying out vegetation. When climate alters fuel loads and fuel moisture, forest susceptibility to wildfires changes. Climate change also may increase winds that spread fires. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.

Historically, drought patterns in the West are related to large-scale climate patterns in the Pacific and Atlantic oceans. The El Niño–Southern Oscillation in the Pacific varies on a 5- to 7-year cycle, the Pacific Decadal Oscillation varies on a 20- to 30-year cycle, and the Atlantic Multidecadal Oscillation varies on a 65- to 80-year cycle. As these large-scale ocean climate patterns vary in relation to each other, drought conditions in the U.S. shift from region to region. El Niño years bring drier conditions to the Pacific Northwest and more fires.

Climate scenarios project summer temperature increases between 2°C and 5°C and precipitation decreases of up to 15 percent. Such conditions would exacerbate summer drought and further promote high-elevation wildfires, releasing stores of carbon and further contributing to the buildup of greenhouse gases.

Forest response to increased atmospheric carbon dioxide could also contribute to more tree growth and thus more fuel for fires, but the effects of carbon dioxide on mature forests are still largely unknown. High carbon dioxide levels should enhance tree recovery after fire and young forest regrowth, as long as sufficient nutrients and soil moisture are available, although the latter is in question for many parts of the western United States because of climate change.

CHAPTER 8. AVALANCHE

8.1 GENERAL BACKGROUND

Avalanches can occur whenever a sufficient depth of snow is deposited on slopes steeper than about 20 degrees, with the most dangerous coming from slopes in the 35- to 40-degree range. Avalanche-prone areas can be identified with some accuracy, since they typically follow the same paths year after year, leaving scarring on the paths. However, unusual weather conditions can produce new paths or cause avalanches to extend beyond their normal paths.

Common factors contributing to the avalanche hazard are old snow depth, old snow surface, new snow depth, new snow type, snow density, snowfall intensity, precipitation intensity, settlement, wind direction and speed, temperature, and subsurface snow crystal structure.

In the spring, warming of the snowpack occurs from below (from the warmer ground) and above (from warm air, rain, etc.). Warming can be enhanced near rocks or trees that transfer heat to the snowpack. The effects of a snowpack becoming weak may be enhanced in steeper terrain where the snowpack is shallow, and over smooth rock faces that may focus meltwater and produce "glide cracks." Such slopes may fail during conditions that encourage melt.

Wind can affect the transfer of heat into the snowpack and associated melt rates of near-surface snow. During moderate to strong winds, the moistening near-surface air in contact with the snow is constantly mixed with drier air above through turbulence. As a result, the air is continually drying out, which enhances evaporation from the snow surface rather than melt. Heat loss from the snow necessary to drive the evaporation process cools off near-surface snow and results in substantially less melt than otherwise might occur, even if temperatures are well above freezing.

When the snow surface becomes uneven in spring, air flow favors evaporation at the peaks, while calmer air in the valleys favors condensation there. Once the snow surface is wet, its ability to reflect solar energy drops dramatically; this becomes a self-perpetuating process, so that the valleys deepen (favoring calmer air and more heat transfer), while more evaporation occurs near the peaks, increasing the differential between peaks and valleys. However, a warm wet storm can quickly flatten the peaks as their larger surface area exposed to warm air, rain or condensation hastens their melt over the sheltered valleys.

DEFINITIONS

Avalanche—Any mass of loosened snow or ice and/or earth that suddenly and rapidly breaks loose from a snowfield and slides down a mountain slope, often growing and accumulating additional material as it descends.

Slab avalanches—The most dangerous type of avalanche, occurring when a layer of coherent snow ruptures over a large area of a mountainside as a single mass. Like other avalanches, slab avalanches can be triggered by the wind, by vibration, or even by a loud noise, and will pull in surrounding rock, debris and even trees.

Climax avalanches—An avalanche involving multiple layers of snow.

Loose snow avalanches—An avalanche that occurs when loose, dry snow on a slope becomes unstable and slides. Loose snow avalanches start from a point and gather more snow as they descend, fanning out to fill the topography.

Powder snow avalanches—An avalanche that occurs when sliding snow has been pulverized into powder, either by rapid motion of low-density snow or by vigorous movement over rugged terrain.

Surface avalanches—An avalanche that occurs only in the uppermost snow layers.

Wet snow avalanche—An avalanche in wet snow, also referred to as a wet loose avalanche or a wet slab avalanche. Often the basal shear zone is a water-saturated layer that overlies an ice zone.

8.2 HAZARD PROFILE

8.2.1 Past Events

Avalanches in Washington have killed over 107 people since 1950, including 35 between 2003 and 2013 (CAIC, 2014). Records of large avalanches with loss of life or serious damage to property in or near the planning area include the following (Washington Emergency Management Division 2010, King County 2009 and Northwest Avalanche Center 2014):

- 1910 Stevens Pass—96 fatalities, 2 trains derailed
- 1971 Snoqualmie Pass—1 fatality
- 1996 Mount Index—3 fatalities
- 1996 – 1997 Snoqualmie Pass—hundreds of holiday travelers stranded
- 2001 Steven’s Pass—2 fatalities
- 2002 Snoqualmie Pass—I-90 road closures lasting several days
- 2003 Alpental—1 fatality
- 2003 Snoqualmie Pass—1 fatality
- 2005 Alpental—1 fatality
- 2007 Snoqualmie Pass—2 fatalities
- 2012 Tunnel Creek—3 fatalities
- 2013 Snoqualmie Pass—2 fatalities in one day from 2 separate events

Avalanches also regularly close small access roads at higher elevations.

8.2.2 Location

The Cascade Range in the eastern half of King County receives extensive precipitation due to its size and orientation to the flow of Pacific marine air. In the local maritime climate, it is common for air temperatures to rise above freezing and for precipitation to change from snow to rain during mid-winter storm cycles. Temperatures can change several degrees within minutes, causing abrupt changes in precipitation type. These conditions frequently cause the release of avalanches. Figure 8-1 shows avalanche hazard areas in Washington, including the easternmost portion of King County.

8.2.3 Frequency

At lower elevations of the Cascades, the avalanche season begins in November and continues until the last remnants of snow have melted in early summer. In the high alpine regions, the hazard continues year-round. Hundreds of thousands of avalanches are thought to occur each year in the Cascades.

8.2.4 Severity

Large external lateral loads can cause significant damage to structures and fatalities. Table 8-1 indicates the estimated potential damage for a given range of impact pressures.

There may be an impact on the planning area’s economy as a result of the avalanche hazard. The timber industry, power companies, recreational resorts, homeowners and recreational groups depend on relatively free access to wildland areas that may be restricted during periods of high avalanche threat.

AVALANCHE

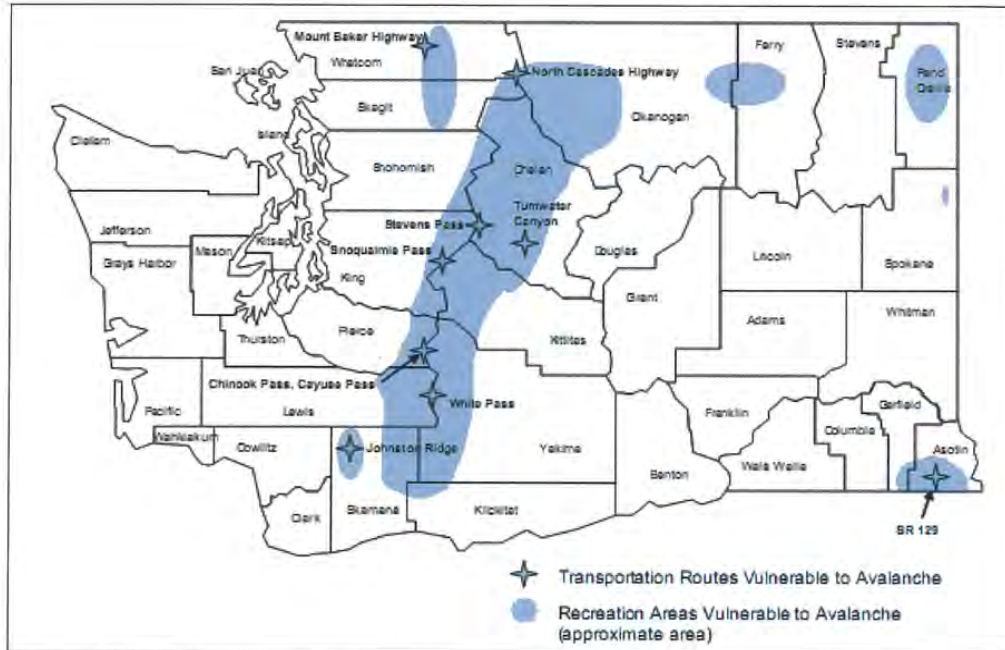


Figure 8-1. Areas Vulnerable to Avalanche

TABLE 8-1.
IMPACT PRESSURES RELATED TO DAMAGE

Impact Pressure (pounds per square foot)	Potential Damage
40-80	Break windows
60-100	Push in doors, damage walls, roofs
200	Severely damage wood frame structures
400-600	Destroy wood-frame structures, break trees
1,000-2,000	Destroy mature forests
>6,000	Move large boulders
Source: www.avalanche.org	

Avalanche control is important along Interstate 90 through Snoqualmie Pass. I-90 is a heavily traveled corridor that connects major Puget Sound communities to Eastern Washington through the Cascade Mountains. Snoqualmie Pass is the state's only Interstate highway link through the Cascades. It averages nearly 450 inches of snow each winter and has a daily traffic volume of 32,000 vehicles (including 8,000 trucks). Economists estimate that the closing of Snoqualmie Pass has an economic cost to the state of \$500,000 to \$750,000 per hour (Washington State Emergency Management Division, 2010).

The BNSF Railway follows essentially the same east-west route as SR-2. The potential for rail service interruption, or for damage to a train carrying hazardous cargo in populated or environmentally sensitive areas, is of concern.

The following weather and terrain factors affect avalanche severity and danger:

- Storms—A large percentage of all snow avalanches occur during and shortly after storms.
- Rate of snowfall—Snow falling at a rate of 1 inch or more per hour rapidly increases avalanche danger.
- Temperature—Storms starting with low temperatures and dry snow, followed by rising temperatures and wetter snow, are more likely to cause avalanches than storms that start warm and then cool with snowfall.
- Wet snow—Rainstorms or spring weather with warm, moist winds and cloudy nights can warm the snow cover, resulting in wet snow avalanches. Wet snow avalanches are more likely on sun-exposed terrain (south-facing slopes) and under exposed rocks or cliffs.
- Ground cover—Large rocks, trees and heavy shrubs help anchor snow.
- Slope profile—Dangerous slab avalanches are more likely to occur on convex slopes.
- Slope aspect—Leeward slopes are dangerous because windblown snow adds depth and creates dense slabs. South-facing slopes are more dangerous in the springtime.
- Slope steepness—Snow avalanches are most common on slopes of 30 to 45 degrees.

8.2.5 Warning Time

The Northwest Weather and Avalanche Center provides daily forecasts as well as information regarding significantly increased avalanche danger that may serve as advanced warning for individuals participating in activities where avalanches may occur. These warnings are generalized and simply alert exposed individuals to an increased risk of occurrence.

The time of an avalanche release depends on the condition of the snow pack; which can change rapidly during a day and particularly during rainfall. Research in the Cascade Mountains has shown that most natural avalanches occurred less than 1 hour after the onset of rain; in these cases the snow pack was initially weak (Washington Emergency Management Division, 1996). In cases where the snow pack was stronger, avalanche activity was delayed or did not occur. Nonetheless an avalanche can occur with little or no warning time, which makes them particularly deadly.

8.3 SECONDARY HAZARDS

Avalanches can cause blocked roads, which can isolate residents and businesses and delay commercial, public and private transportation. This could result in economic losses for businesses. Other potential problems resulting from avalanches are power and communication failures. Avalanches also can damage rivers or streams, potentially harming water quality, fisheries and spawning habitat.

8.4 EXPOSURE

There is minimal development in the high Cascade Range, which makes King County's exposure to an avalanche small. Most mountainous areas in the county are part of the Mount Baker-Snoqualmie National Forest and other protected forests. There is risk to the development and users that do exist. The only incorporated area near the avalanche hazard area is the Town of Skykomish; however impacts within the town limits are unlikely.

8.4.1 Population

There are no major populations exposed to avalanches in the county. Most of the avalanche hazard area is uninhabited or has minimal development. None of the ski resorts on King County's mountains are considered to be exposed to avalanches within their boundaries due to their ski slope maintenance protocols. Skiers who ski out of bounds in these areas are exposed to avalanches. People working in the mountains, such as miners and loggers, are exposed, as are recreational users, such as hikers and cross-country skiers. Travelers moving through avalanche-prone areas, especially Steven's Pass and Snoqualmie Pass, are also exposed.

8.4.2 Property

There is little property exposed to avalanches. Property and buildings exposed include National Forest huts and temporary structures belonging to mining and forestry operations.

8.4.3 Critical Facilities and Infrastructure

There are no critical facilities exposed to avalanches. There is a small amount of infrastructure that could be blocked by avalanches, including hiking trails, fire roads and logging roads. SR-2 above Index is exposed to avalanches, as are several stretches of Interstate 90. The BNSF Railway passes through the mountains and could be exposed.

8.4.4 Environment

Avalanches are a natural event, but they can negatively affect the environment. This includes trees located on steep slopes. A large avalanche can knock down many trees and kill the wildlife that lives in them. In spring, this loss of vegetation on the mountains may weaken the soil, causing landslides and mudflows.

8.5 VULNERABILITY

In general, everything that is exposed to an avalanche event is vulnerable. More and more people are working and building in or using the high mountain areas of the Cascades in potential avalanche areas. These individuals often have little experience with, caution regarding, or preparation for, avalanche conditions. The increasing development of recreational sites in the mountains brings added exposure to the people using these sites and the access routes to them. The risk to human life is especially great at times of the year when rapid warming follows heavy, wet snowfall.

Interstate 90 could be blocked by avalanches, but the Washington Department of Transportation conducts active winter avalanche control or mitigation on Interstate 90. This means avalanches are triggered intentionally on slopes above the roadways in a controlled environment to minimize traffic disruption and promote public safety. The Department of Transportation also conducts passive avalanche control by building elevated roadways so avalanches can pass under highways, snow sheds so that avalanching snow flows over highways, catchment basins to stop avalanche flow, and diversion dams and berms to keep snow off highways.

King County's transportation infrastructure is also vulnerable to avalanches. In most winters, snow slides can close any of the pass highways between western and eastern Washington. The avalanche threat was not a significant consideration in either the planning or construction of Washington's older mountain highways such as SR-2. Although costs associated with removing avalanches from SR-2 are borne by the state Department of Transportation, the County's road network and substantial commercial activity are also dependent upon the connectivity provided by this main highway.

8.6 FUTURE TRENDS IN DEVELOPMENT

Given the likely location and density of future development based on current land use regulations, there is a small amount of housing and employment capacity that has the potential to be developed in avalanche hazard areas. Most of the land area in the avalanche hazard zone is resource or protected land. As of 2005 there were approximately 5,700 existing housing units on resource lands in King County (King County, 2007). Not all of these housing units are located in the avalanche hazard area. It is estimated that about 4 percent of the county's growth will occur in rural and resource lands for the 2001-2022 planning period (King County, 2007). Based on the 2008 King County Annual Growth Report, only two new residential units were built in 2007 in possible avalanche hazard areas.

8.7 SCENARIO

In a worst-case scenario, an avalanche would occur in the Cascade Mountains after a series of storms. Storms starting with low temperatures and dry snow, followed by rising temperatures and wetter snow, are more likely to cause avalanches than storms that start warm and then cool with snowfall.

8.8 ISSUES

Avalanches pose a threat to recreational users and property and can disrupt the east-west transportation network. Specially trained Washington Department of Transportation avalanche-control teams use active and passive means to reduce the avalanche hazard near Snoqualmie and Stevens Pass each year. Their efforts limit the number and duration of highway closures. The state posts warning signs in key locations warning recreation users of avalanche dangers, although these signs are commonly ignored. There is no effective way to keep the public out of avalanche-prone recreational areas, even during times of highest risk. A coordinated effort is needed among state, county and local law enforcement, fire, emergency management and public works agencies and media to provide better avalanche risk information.

A national program to rate avalanche risk has been developed to standardize terminology and provide a common basis for recognizing and describing hazardous conditions. This United States Avalanche Danger Scale relates degree of avalanche danger (low, moderate, considerable, high, extreme) to descriptors of avalanche probability and triggering mechanism, degree and distribution of avalanche hazard, and recommended action in back country. Figure 8-2 shows key elements of the danger scale. This information, updated daily, is available during avalanche season from the joint NOAA/U.S. Forest Service Northwest Weather and Avalanche Center and can be obtained from Internet, NOAA weather wire, and Department of Transportation sources. Avalanche danger scale information should be explained to the public and made available through appropriate county and local agencies and the media.

The state's maintains over 50 years of detailed records to help technicians forecast how snow might behave; however, climate change will likely alter the frequency and magnitude of avalanche events in the planning area. Methods will need to be developed to integrate forward-looking standards and best practices for avalanche management techniques.

The Northwest Weather and Avalanche Center provides a source of information to recreational users regarding current conditions and danger levels as well as incident summaries by date and location and additional resources. Measures that have been used in other jurisdictions to reduce avalanche threat include monitoring timber harvest practices in slide-prone areas to ensure that snow cover is stabilized as well as possible, and encouraging reforestation in areas near highways, buildings, power lines and other improvements. The development of a standard avalanche report form, and the maintenance of a database of potential avalanche hazards likely to affect proposed developments in mountain wilderness areas, would be of significant value to permitting agencies.

AVALANCHE

Avalanche Safety Basics			
<u>Avalanches don't happen by accident</u> and most human involvement is a matter of <u>choice</u> not chance. Slab avalanches, which are triggered by the victim or a member of the victim's party, cause most avalanche accidents. However, any avalanche may cause injury or death and even small slides may be dangerous. Hence, always practice safe route finding skills, be aware of changing conditions, and carry avalanche rescue gear. Learn and apply avalanche terrain analysis and snow stability evaluation techniques to help minimize your risk. Remember that avalanche danger rating levels are only general guidelines. Distinctions between geographic areas, elevations, slope aspect and slope angle are approximate, and transition zones between dangers exist. No matter what the current avalanche danger is, there are avalanche-safe areas in the mountains.			
UNITED STATES AVALANCHE DANGER DESCRIPTORS			
Danger Level (Color)	Avalanche Probability and Avalanche Trigger	Degree and Distribution of Avalanche Danger	Recommended Action in the Back Country
Low (Green)	Natural Avalanches <u>very unlikely</u> . Human avalanches <u>unlikely</u> .	Generally stable snow. Isolated areas of instability.	Travel is generally safe. Normal caution advised.
Moderate (yellow)	Natural avalanches unlikely. Human triggered avalanches <u>possible</u> .	Unstable slabs <u>possible</u> on steep terrain.	Use caution on steeper terrain on certain aspects
Moderate to High (orange)	Natural avalanches <u>possible</u> . Human triggered avalanches <u>possible</u> .	Unstable slabs <u>possible</u> on steep terrain.	Be increasingly cautious in steep terrain.
High (red)	Natural and human triggered avalanches <u>likely</u> .	Unstable slabs <u>likely</u> on a variety of aspects and slope angles	Travel in avalanche terrain is not recommended. Safest travel on windward ridges of lower angle slopes without steeper terrain above.
Extreme (red with black border)	Widespread natural or human triggered avalanches are <u>certain</u>	Extremely unstable slabs are <u>certain</u> on most aspects and slope angles. Large destructive avalanches <u>possible</u> .	Travel in avalanche terrain should be avoided and travel confined to low angle terrain well away from avalanche path run-outs.

Figure 8-2. United States Avalanche Danger Scale

CHAPTER 9. DAM FAILURE

9.1 GENERAL BACKGROUND

9.1.1 Causes of Dam Failure

Dam failures in the United States typically occur in one of four ways:

- Overtopping of the primary dam structure, which accounts for 34 percent of all dam failures, can occur due to inadequate spillway design, settlement of the dam crest, blockage of spillways, and other factors.
- Foundation defects due to differential settlement, slides, slope instability, uplift pressures, and foundation seepage can also cause dam failure. These account for 30 percent of all dam failures.
- Failure due to piping and seepage accounts for 20 percent of all failures. These are caused by internal erosion due to piping and seepage, erosion along hydraulic structures such as spillways, erosion due to animal burrows, and cracks in the dam structure.
- Failure due to problems with conduits and valves, typically caused by the piping of embankment material into conduits through joints or cracks, constitutes 10 percent of all failures.

The remaining 6 percent of U.S. dam failures are due to miscellaneous causes. Many dam failures in the United States have been secondary results of other disasters. The prominent causes are earthquakes, landslides, extreme storms, massive snowmelt, equipment malfunction, structural damage, foundation failures, and sabotage.

Poor construction, lack of maintenance and repair, and deficient operational procedures are preventable or correctable by a program of regular inspections. Terrorism and vandalism are serious concerns that all operators of public facilities must plan for; these threats are under continuous review by public safety agencies.

DEFINITIONS

Dam—Any artificial barrier and/or any controlling works, together with appurtenant works, that can or does impound or divert water. (Washington Administrative Code, Title 173, Chapter 175.)

Dam Failure—An uncontrolled release of impounded water due to structural deficiencies in dam.

Emergency Action Plan—A document that identifies potential emergency conditions at a dam and specifies actions to be followed to minimize property damage and loss of life. The plan specifies actions the dam owner should take to alleviate problems at a dam. It contains procedures and information to assist the dam owner in issuing early warning and notification messages to responsible downstream emergency management authorities of the emergency situation. It also contains inundation maps to show emergency management authorities the critical areas for action in case of an emergency. (FEMA 64)

High Hazard Dam—Dams where failure or operational error will probably cause loss of human life. (FEMA 333)

Significant Hazard Dam—Dams where failure or operational error will result in no probable loss of human life but can cause economic loss, environmental damage or disruption of lifeline facilities, or can impact other concerns. Significant hazard dams are often located in rural or agricultural areas but could be located in areas with population and significant infrastructure. (FEMA 333)

9.1.2 Regulatory Oversight

National Dam Safety Act

The potential for catastrophic flooding due to dam failures led to passage of the National Dam Safety Act (Public Law 92-367). The National Dam Safety Program requires a periodic engineering analysis of every major dam in the country. The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect the lives and property of the public.

Washington Department of Ecology Dam Safety Program

The Dam Safety Office (DSO) of the Washington Department of Ecology regulates over 1,000 dams in the state that impound at least 10 acre-feet of water. The DSO has developed dam safety guidelines to provide dam owners, operators, and design engineers with information on activities, procedures, and requirements involved in the planning, design, construction, operation and maintenance of dams in Washington. The authority to regulate dams in Washington and to provide for public safety is contained in the following laws:

- State Water Code (1917)—RCW 90.03
- Flood Control Act (1935)—RCW 86.16
- Department of Ecology (1970)—RCW 43.21A.

Where water projects involve dams and reservoirs with a storage volume of 10 acre-feet or more, the laws provide for the Department of Ecology to conduct engineering review of the construction plans and specifications, to inspect the dams, and to require remedial action, as necessary, to ensure proper operation, maintenance, and safe performance. The DSO was established within Ecology's Water Resources Program to carry out these responsibilities.

The DSO's five-year periodic inspection program for dams with high and significant hazard classifications achieves the following purposes (Washington Department of Ecology, 2011):

- Assess the structural integrity and stability of project elements.
- Identify obvious defects, especially due to aging.
- Assess the stability of the structure under earthquake conditions.
- Determine the adequacy of the spillways to accommodate major floods.
- Evaluate project operation and maintenance.

The inspections, performed by professional engineers from the DSO, consist of the following elements (Washington Department of Ecology, 2011):

- Review and analysis of available data on the design, construction, operation and maintenance of the dam and its appurtenances
- Visual inspection of the dam and its appurtenances
- Evaluation of the safety of the dam and its appurtenances, which may include an assessment of the hydrological and hydraulic capabilities, structural stabilities, seismic stabilities, and any other condition that could constitute a hazard to the integrity of the structure
- Evaluation of the downstream hazard classification
- Evaluation of the operation, maintenance and inspection procedures employed by the owner and/or operator

- Review of the emergency action plan for the dam, including review or update of the dam breach inundation map.

The DSO provides reasonable assurance that impoundment facilities will not pose a threat to lives and property, but dam owners bear primary responsibility for the safety of their structures, through proper design, construction, operation, and maintenance. The DSO regulates dams with the sole purpose of reasonably securing public safety; environmental and natural resource issues are addressed by other state agencies. The DSO neither advocates nor opposes the construction and operation of dams.

U.S. Army Corps of Engineers Dam Safety Program

The U.S. Army Corps of Engineers is responsible for safety inspections of some federal and non-federal dams in the United States that meet the size and storage limitations specified in the National Dam Safety Act. The Corps has inventoried dams; surveyed each state and federal agency's capabilities, practices and regulations regarding design, construction, operation and maintenance of the dams; and developed guidelines for inspection and evaluation of dam safety (U.S. Army Corps of Engineers, 1997).

Federal Energy Regulatory Commission Dam Safety Program

The Federal Energy Regulatory Commission (FERC) cooperates with a large number of federal and state agencies to ensure and promote dam safety. More than 3,000 dams are part of regulated hydroelectric projects in the FERC program. Two-thirds of these are more than 50 years old. As dams age, concern about their safety and integrity grows, so oversight and regular inspection are important. FERC inspects hydroelectric projects on an unscheduled basis to investigate the following:

- Potential dam safety problems
- Complaints about constructing and operating a project
- Safety concerns related to natural disasters
- Issues concerning compliance with the terms and conditions of a license.

Every five years, an independent engineer approved by the FERC must inspect and evaluate projects with dams higher than 32.8 feet (10 meters), or with a total storage capacity of more than 2,000 acre-feet.

FERC monitors and evaluates seismic research and applies it in investigating and performing structural analyses of hydroelectric projects. FERC also evaluates the effects of potential and actual large floods on the safety of dams. During and following floods, FERC visits dams and licensed projects, determines the extent of damage, if any, and directs any necessary studies or remedial measures the licensee must undertake. The FERC publication *Engineering Guidelines for the Evaluation of Hydropower Projects* guides the FERC engineering staff and licensees in evaluating dam safety. The publication is frequently revised to reflect current information and methodologies.

FERC requires licensees to prepare emergency action plans and conducts training sessions on how to develop and test these plans. The plans outline an early warning system if there is an actual or potential sudden release of water from a dam due to failure. The plans include operational procedures that may be used, such as reducing reservoir levels and reducing downstream flows, as well as procedures for notifying affected residents and agencies responsible for emergency management. These plans are frequently updated and tested to ensure that everyone knows what to do in emergency situations.

9.2 HAZARD PROFILE

9.2.1 Past Events

Three dam failure incidents have occurred in King County; accounting for all lives lost due to dam failure in the state (Washington Emergency Management Division, 2013).

- December 1918—Masonry Dam near North Bend had excessive seepage, which caused a mudflow, destroyed a railroad line and damaged the village of Eastwick; no lives lost.
- February 1932—Eastwick railroad fill failed. A slide caused railroad fill to back up and fail, destroyed a railroad line and damaged the village of Eastwick; 7 lives were lost.
- July 1976—Increased discharge from Mud Mountain Dam caused a surge in flow killing two children playing in the White River near Auburn.

Another major incident involving dam safety in King County occurred in 2009, when seepage issues were discovered at Howard Hanson Dam after a January flood event. The dam is on the Green River, and dam failure would result in extreme flooding of downstream communities in the Green River valley. The Army Corps of Engineers began improvements to reduce risk at the facility immediately after the seepage was discovered. Most of the construction improvements were completed by 2011 and the dam is now operating at its design capability (U.S. Army Corps of Engineers, 2012).

9.2.2 Location

In King County there are 122 dams that impound 10 acre-feet of water or more. Table 9-1 lists the dams in King County that the Dam Safety Office rates as Hazard Class 1A, which is the highest-hazard classification for state regulated dams. Culmbach Dam, located in Snohomish County also has the potential to impact residents and property in King County.

9.2.3 Frequency

Dam failure events are infrequent and usually coincide with events that cause them, such as earthquakes, landslides and excessive rainfall and snowmelt. There is a “residual risk” associated with dams. Residual risk is the risk that remains after safeguards have been implemented. For dams, the residual risk is associated with events beyond those that the facility was designed to withstand. However, the probability of any type of dam failure is low in today’s regulatory and dam safety oversight environment.

9.2.4 Severity

The Dam Safety Office classifies regulated dams in Washington by hazard class, based on the at-risk population living in the area that could be inundated if the dam fails. The hazard class definitions and number of King County dams in each class are as follows:

- 7 Hazard Class 1A (a downstream at-risk population of more than 300)
- 8 Hazard Class 1B (a downstream at-risk population of 31 to 300)
- 31 Hazard Class 1C (a downstream at-risk population of 7 to 30)
- 26 Hazard Class 2 (a downstream at-risk population of 1 to 6)
- 50 Hazard Class 3 (no downstream at-risk population).

**TABLE 9-1.
HAZARD CLASS 1A DAMS WITH POTENTIAL TO AFFECT KING COUNTY**

	Howard A Hanson Dam	Masonry Dam	Tolt River Dam	Lake Youngs Outlet Dam	Green Lake Reservoir	Issaquah Highlands Detention Pond	Madsen Creek West Basin Dam	Culmbach Dam
National ID #	WA00298	WA00255	WA00177	WA00254	WA00212	WA00707	WA01862	WA00208
Water Course	Green River South	Cedar River	South Fork Tolt River	Little Soos Creek	Puget Sound Tributary, Off- stream	East Fork Issaquah Creek, Off-stream		Sultan River
Owner	U.S. Army Corps of Engineers	City of Seattle	Seattle Public Utilities	City of Seattle	Seattle Public Utilities	Port Blakely Communities	King County Natural Resources	Snohomish Co. Public Utility District
Year Built	1962	1914	1962	1921	1910	2008	2008	1965
Dam Type ^a	ER, RE	VA	RE	RE	RE	RE	RE	ER
Crest Length (feet)	500	980	980	1,450	1,920	380	775	900
Height (feet)	235	225	213	30	25	22	6.5	75
Storage Capacity (acre-feet)	136,700	175,000	67,200	18,908	181	53	28	16,200
Drainage area (sq. mi.)	221	81.4	18.8	3.94	0.02	0	0.11	2.6
a. RE = Earth fill; ER = Rock fill; VA = Concrete single arch								

The U.S. Army Corps of Engineers developed the classification system shown in Table 9-2 for the hazard potential of dam failures. The DSO and Corps of Engineers hazard rating systems are based only on the potential consequences of a dam failure; they do not take into account the probability of such failures.

According to the King County Office of Emergency Management, King County has four dams that would cause a countywide emergency if they should fail, located on the Tolt, Cedar, White, and Green Rivers. Areas of King County would also be adversely affected by failures of the White River Project in Pierce County or the Jackson Project in Snohomish County. Localized problems could occur if one of the minor dams in the county failed (King County Office of Emergency Management, 2013).

**TABLE 9-2.
CORPS OF ENGINEERS HAZARD POTENTIAL CLASSIFICATION**

Hazard Category ^a	Direct Loss of Life ^b	Lifeline Losses ^c	Property Losses ^d	Environmental Losses ^e
Low	None (rural location, no permanent structures for human habitation)	No disruption of services (cosmetic or rapidly repairable damage)	Private agricultural lands, equipment, and isolated buildings	Minimal incremental damage
Significant	Rural location, only transient or day-use facilities	Disruption of essential facilities and access	Major public and private facilities	Major mitigation required
High	Certain (one or more) extensive residential, commercial, or industrial development	Disruption of essential facilities and access	Extensive public and private facilities	Extensive mitigation cost or impossible to mitigate

a. Categories are assigned to overall projects, not individual structures at a project.
 b. Loss of life potential based on inundation mapping of area downstream of the project. Analyses of loss of life potential should take into account the population at risk, time of flood wave travel, and warning time.
 c. Indirect threats to life caused by the interruption of lifeline services due to project failure or operational disruption; for example, loss of critical medical facilities or access to them.
 d. Damage to project facilities and downstream property and indirect impact due to loss of project services, such as impact due to loss of a dam and navigation pool, or impact due to loss of water or power supply.
 e. Environmental impact downstream caused by the incremental flood wave produced by the project failure, beyond what would normally be expected for the magnitude flood event under which the failure occurs.

Source: U.S. Army Corps of Engineers, 1995

9.2.5 Warning Time

Warning time for dam failure varies depending on the cause of the failure. In events of extreme precipitation or massive snowmelt, evacuations can be planned with sufficient time. In the event of a structural failure due to earthquake, there may be no warning time. A dam's structural type also affects warning time. Earthen dams do not tend to fail completely or instantaneously. Once a breach is initiated, discharging water erodes the breach until either the reservoir water is depleted or the breach resists further erosion. Concrete gravity dams also tend to have a partial breach as one or more monolith sections are forced apart by escaping water. The time of breach formation ranges from a few minutes to a few hours (U.S. Army Corps of Engineers, 1997).

King County and its planning partners have established protocols for flood warning and response to imminent dam failure in the flood warning portion of its adopted emergency operations plan. These protocols are tied to the emergency action plans created by the dam owners.

9.3 SECONDARY HAZARDS

Dam failure can cause severe downstream flooding, depending on the magnitude of the failure. Other potential secondary hazards of dam failure are landslides around the reservoir perimeter, bank erosion on the rivers, and destruction of downstream habitat.

9.4 EXPOSURE

The flood module of Hazus-MH was used for a Level 2 assessment of dam failure. Hazus-MH uses census data at the block level and FEMA floodplain data, which has a level of accuracy acceptable for planning purposes. Where possible, the Hazus-MH data for this risk assessment was enhanced using GIS data from county, state and federal sources. The exposure and vulnerability analyses focused on three dams for which inundation information was available: the Culmbach Dam, the Tolt River Dam, and the Lake Youngs Dam. Inundation maps were prepared for this analysis, but will not be published in the publicly available version of this plan.

9.4.1 Population

All populations in a dam failure inundation zone would be exposed to the risk of a dam failure. The potential for loss of life is affected by the capacity and number of evacuation routes available to populations living in areas of potential inundation. The estimated population living in the mapped inundation areas within the planning area is 35,330 or 1.78 percent of the county's population. Table 9-3 summarizes the at-risk population in the planning area by city, where there is available inundation mapping.

TABLE 9-3. POPULATION WITHIN DAM FAILURE INUNDATION AREAS					
	Affected Population by Individual Dam			Total Affected Population	% of City Population
	Tolt	Culmbach	Lake Young's		
Auburn	0	0	9,058	9,058	14.08
Carnation	1,785	0	0	1,785	100
Covington	0	0	7,198	7,198	39.76
Duvall	235	159	0	394	5.53
Kent	0	0	2,121	2,121	1.76
Unincorporated	7,489	3,088	4,197	14,774	5.84
Total	9,509	3,247	22,574	35,330^a	1.78^b
a. Represents the total population in the combined inundation areas of all three evaluated dams.					
b. Represents the total affected population as a percent of total King County population.					

9.4.2 Property

The number and value of planning area buildings within the mapped inundation zones of the Tolt, Culmbach and Lake Youngs dams are summarized in Table 9-4 through Table 9-6. Each dam should be considered to be a stand-alone hazard, considering the low probability of multiple dam failures at the same time. For that reason, and because the inundation areas for the Tolt and Culmbach dams include some overlapping locations, it is not appropriate to add the totals for the three dams to generate a total planning area exposure estimate. The distribution of land uses in each dam's inundation area is in Table 9-7 summarizes

**TABLE 9-4.
EXPOSURE AND VALUE OF STRUCTURES IN TOLT RIVER DAM FAILURE INUNDATION
AREA**

	Buildings Exposed	Value Exposed			% of Total Assessed Value ^a
		Building	Contents	Total	
Carnation	822	\$187,128,000	\$138,939,000	\$326,067,000	99.2
Duvall	99	\$79,623,000	\$70,141,000	\$149,764,000	13.51
Unincorporated	3,160	\$899,550,000	\$554,805,000	\$1,454,355,000	3.25
Total	4,081	\$1,166,301,000	\$763,885,000	\$1,930,186,000	4.19

a. Percentages are based on the total assessed value for individual jurisdictions, not for the planning area as a whole. The “total” percentage shown is based on the sum of assessed values for jurisdictions in this table.

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

**TABLE 9-5.
EXPOSURE AND VALUE OF STRUCTURES IN CULMBACK DAM FAILURE INUNDATION
AREA**

	Buildings Exposed	Value Exposed			% of Total Assessed Value
		Building	Contents	Total	
Duvall	67	\$68,147,000	\$63,078,000	\$131,225,000	11.84
Unincorporated	1,303	\$423,784,000	\$267,227,000	\$691,011,000	1.55
Total	1,370	\$491,931,000	\$330,305,000	\$822,236,000	1.80

a. Percentages are based on the total assessed value for individual jurisdictions, not for the planning area as a whole. The “total” percentage shown is based on the sum of assessed values for jurisdictions in this table.

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

**TABLE 9-6.
EXPOSURE AND VALUE OF STRUCTURES IN LAKE YOUNGS DAM FAILURE INUNDATION
AREA**

	Buildings Exposed	Value Exposed			% of Total Assessed Value
		Building	Contents	Total	
Auburn	3,822	\$2,403,089,000	\$2,026,574,000	\$4,429,663,000	24.62
Covington	3,037	\$1,026,586,000	\$734,723,000	\$1,761,309,000	61.81
Kent	895	\$487,108,000	\$427,277,000	\$914,385,000	2.76
Unincorporated	1,771	\$446,138,000	\$253,335,000	\$699,473,000	1.57
Total	9,525	\$4,362,921,000	\$3,441,909,000	\$7,804,830,000	7.91

a. Percentages are based on the total assessed value for individual jurisdictions, not for the planning area as a whole. The “total” percentage shown is based on the sum of assessed values for jurisdictions in this table.

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

**TABLE 9-7.
PRESENT LAND USE IN DAM INUNDATION AREAS**

Present Use Classification	Culmback Inundation Area		Lake Youngs Inundation Area		Tolt Inundation Area	
	Area (acres)	% of total	Area (acres)	% of total	Area (acres)	% of total
Agriculture	179	2.0%	63	0.9%	196	0.6%
Church, Welfare or Religious Service	12	0.1%	18	0.3%	21	0.1%
Commercial	85	1.0%	699	10.2%	511	1.7%
Education	0	0.0%	33	0.5%	62	0.2%
Governmental Services	0	0.0%	8	0.1%	3	0.0%
Industrial/Manufacturing	21	0.2%	228	3.3%	62	0.2%
Medical/Dental Services	1	0.0%	19	0.3%	1	0.0%
Mixed Use Development (Residential & Commercial)	0	0.0%	0	0.0%	0	0.0%
Mortuary/Cemetery/Crematory	0	0.0%	0	0.0%	2	0.0%
Nursing Home/Retirement Facility	0	0.0%	8	0.1%	0	0.0%
Park/Open Space/Golf Course	74	0.8%	382	5.6%	846	2.7%
Residential	3,760	42.9%	2,073	30.4%	8,183	26.5%
Terminal or Marina	0	0.0%	102	1.5%	12	0.0%
Utility/Easement/Right of Way	3	0.0%	205	3.0%	459	1.5%
Water/Tideland/Wetland	13	0.2%	83	1.2%	13	0.0%
Uncategorized (includes vacant and resource lands)	4,609	52.6%	2,905	42.6%	20,465	66.4%
Total	8,757	100%	6,826	100%	30,836	100%

Source: Summarized from King, Pierce and Snohomish County parcel data. Acreage covers only mapped parcels and thus excludes many rights of way and major water features.

9.4.3 Critical Facilities

GIS analysis determined the following numbers of critical facilities and infrastructure in each mapped inundation area (see Table 9-8 through Table 9-10):

- Culmback Dam—17 facilities (fewer than 1 percent)
- Lake Youngs Dam—27 facilities (fewer than 1 percent)
- Tolt Dam—59 facilities (1 percent).

Additional critical facilities are likely in inundation areas where mapping was not available.

9.4.4 Environment

The environment would be exposed to a number of risks in the event of dam failure. The inundation could introduce many foreign elements into local waterways. This could result in destruction of downstream habitat and could have detrimental effects on many species of animals, especially endangered species such as salmon.

TABLE 9-8. CRITICAL FACILITIES AND INFRASTRUCTURE IN CULMBACK DAM INUNDATION AREA			
	Duvall	Unincorporated	Total
Medical and Health	0	0	0
Government Function	0	0	0
Protective Function	1	0	1
Schools	0	0	0
Hazmat	0	0	0
Other Critical Function	0	0	0
Bridges	1	14	15
Transportation	0	0	0
Water Supply	0	0	0
Wastewater	1	0	1
Power	0	0	0
Communications	0	0	0
Dams	0	0	0
Total	3	14	17

TABLE 9-9. CRITICAL FACILITIES AND INFRASTRUCTURE IN LAKE YOUNGS DAM INUNDATION AREA					
	Auburn	Covington	Kent	Unincorporated	Total
Medical and Health	0	3	0	0	3
Government Function	0	2	0	0	2
Protective Function	0	1	0	0	1
Schools	0	0	0	0	0
Hazmat	2	0	0	0	2
Other Critical Function	0	2	0	0	2
Bridges	0	6	2	1	9
Transportation	0	0	0	0	0
Water Supply	0	0	0	0	0
Wastewater	2	4	0	0	6
Power	0	1	0	0	1
Communications	1	0	0	0	1
Dams	0	0	0	0	0
Total	5	19	2	1	27

**TABLE 9-10.
CRITICAL FACILITIES AND INFRASTRUCTURE IN TOLT DAM INUNDATION AREA**

	Duvall	Carnation	Unincorporated	Total
Medical and Health	0	3	0	3
Government Function	0	0	0	0
Protective Function	1	2	0	3
Schools	0	4	0	4
Hazmat	0	0	0	0
Other Critical Function	0	0	0	0
Bridges	0	0	44	44
Transportation	0	0	0	0
Water Supply	0	0	0	0
Wastewater	1	0	0	1
Power	0	0	0	0
Communications	0	0	4	4
Dams	0	0	0	0
Total	2	9	48	59

9.5 VULNERABILITY

9.5.1 Population

Vulnerable populations are all populations downstream from dam failures that are incapable of escaping the area within the allowable time frame. This population includes the elderly and young who may be unable to get themselves out of the inundation area. The vulnerable population also includes those who would not have adequate warning from a television or radio emergency warning system. Impacts on persons and households in the planning area were estimated for dam failure events through the Level 2 Hazus-MH analysis. Table 9-11 summarizes the results.

**TABLE 9-11.
ESTIMATED DAM FAILURE IMPACT ON PERSONS AND HOUSEHOLDS**

	Number of Displaced Households	Persons Requiring Short-Term Shelter
Tolt Dam Failure	3,195	2,404
Culmbach Dam Failure	249	110
Lake Youngs Dam Failure	5,655	4,952

9.5.2 Property

Vulnerable properties are those closest to the dam inundation area. These properties would experience the largest, most destructive surge of water. Low-lying areas are also vulnerable since they are where the dam waters would collect. Transportation routes are vulnerable to dam inundation and have the potential to be

wiped out, creating isolation issues. This includes all roads, railroads and bridges in the path of the dam inundation. Those that are most vulnerable are those that are already in poor condition and would not be able to withstand a large water surge. Utilities such as overhead power lines, cable and phone lines could also be vulnerable. Loss of these utilities could create additional isolation issues for the inundation areas.

The estimated losses associated with planning area buildings within the mapped inundation zones of the Tolt, Culmbach and Lake Youngs dams are summarized in Table 9-12 through Table 9-14. Each dam should be considered to be a stand-alone hazard, considering the low probability of multiple dam failures at the same time. For that reason, and because the inundation areas for the Tolt and Culmbach dams include some overlapping locations, it is not appropriate to add the totals for the three dams to generate a total planning area loss estimate.

TABLE 9-12.
LOSS ESTIMATES FOR STRUCTURES IN TOLT RIVER DAM FAILURE INUNDATION AREA

	Estimated Loss Associated with Dam Failure			% of Total Assessed Value ^a
	Building	Contents	Total	
Carnation	\$122,464,000	\$111,251,000	\$233,715,000	71.17
Duvall	\$4,704,000	\$7,594,000	\$12,298,000	1.11
Unincorporated	\$94,792,000	\$82,819,000	\$177,611,000	0.40
Total	\$221,960,000	\$201,664,000	\$423,624,000	0.92

a. Percentages are based on the total assessed value for individual jurisdictions, not for the planning area as a whole. The “total” percentage shown is based on the sum of assessed values for jurisdictions in this table.

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

TABLE 9-13.
LOSS ESTIMATES FOR STRUCTURES IN CULMBACH DAM FAILURE INUNDATION AREA

	Estimated Loss Associated with Dam Failure			% of Total Assessed Value ^a
	Building	Contents	Total	
Duvall	\$2,200,000	\$3,772,000	\$5,972,000	0.54
Unincorporated	\$9,934,000	\$8,802,000	\$18,736,000	0.04
Total	\$12,134,000	\$12,574,000	\$24,708,000	0.05

a. Percentages are based on the total assessed value for individual jurisdictions, not for the planning area as a whole. The “total” percentage shown is based on the sum of assessed values for jurisdictions in this table.

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

**TABLE 9-14.
LOSS ESTIMATES FOR STRUCTURES IN LAKE YOUNGS DAM FAILURE INUNDATION AREA**

	Estimated Loss Associated with Dam Failure			% of Total Assessed Value ^a
	Building	Contents	Total	
Auburn	\$144,115,000	\$327,238,000	\$471,353,000	2.62
Covington	\$62,272,000	\$86,249,000	\$148,521,000	5.21
Kent	\$17,925,000	\$33,668,000	\$51,593,000	0.16
Unincorporated	\$17,714,000	\$16,043,000	\$33,757,000	0.08
Total	\$242,026,000	\$463,198,000	\$705,224,000	0.74

a. Percentages are based on the total assessed value for individual jurisdictions, not for the planning area as a whole. The "total" percentage shown is based on the sum of assessed values for jurisdictions in this table.

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

9.5.3 Critical Facilities

On average, critical facilities expected to sustain damage during a dam failure event would receive 23 percent damage to the structure and 75 percent damage to the contents during a dam failure event. The estimated time to restore these facilities to 100 percent of their functionality is 716 days.

9.5.4 Environment

The environment would be vulnerable to a number of risks in the event of dam failure. The inundation could introduce foreign elements into local waterways, resulting in destruction of downstream habitat and detrimental effects on many species of animals, especially endangered species such as coho salmon. The extent of the vulnerability of the environment is the same as the exposure of the environment.

As with any significant natural hazard event, large of amounts of debris generated from the damages buildings and infrastructure could have significant environmental impacts. These impacts were estimated for the dam failure events through the Level 2 Hazus-MH analysis. Table 9-15 summarizes the results.

**TABLE 9-15.
ESTIMATED DAM FAILURE-CAUSED DEBRIS**

	Debris to Be Removed (tons) ^a
Tolt Dam Failure Scenario	24.19 million
Culmback Dam Failure Scenario	2.77 million
Lake Young's Dam Failure Scenario	64.2 million

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

9.6 FUTURE TRENDS IN DEVELOPMENT

Land use in the planning area will be directed by local comprehensive plans, adopted under state law. The planning partners have established comprehensive policies regarding sound land use in identified flood hazard areas. While some of the areas vulnerable to the more severe impacts from dam failure intersect the mapped flood hazard areas, the inundation areas from a dam failure cover a much larger portion of the planning area. Flood-related policies in these comprehensive plans and in the local municipal code will help to reduce the risk associated with the dam failure hazard for development in the planning area, but will be unlikely to help reduce risk to all structures within the dam inundation area.

9.7 SCENARIO

An earthquake in the region could lead to liquefaction of soils around a dam. This could occur without warning during any time of the day. A human-caused incident such as a terrorist attack also could trigger a catastrophic failure of a dam that impacts the planning area. Failure of a high hazard dam in the county would likely result in the loss of life, roadways, structures and property and cause severe impacts on the local economy. While the possibility of failure is remote, results of such an event would be devastating.

While the probability of dam failure is very low, the probability of flooding associated with changes to dam operational parameters in response to climate change is higher. Dam designs and operations are developed based on hydrographs from historical records. If these hydrographs experience significant changes over time due to the impacts of climate change, the dam design and operations may no longer be valid for the changed condition. Specified release rates and impound thresholds may have to be changed. This would result in increased discharges downstream of these facilities, thus increasing the probability and severity of flooding.

9.8 ISSUES

In the late 1980s, the Department of Ecology DSO was reorganized to better use its resources to minimize public safety problems. The DSO has recognized the key role of other government agencies in carrying out its public safety charge. For example, the dam approval process now requires that dams located above populated areas develop emergency action plans in conjunction with local and county emergency management agencies.

The most significant issue associated with dam failure involves properties and populations in the inundation zones. Flooding as a result of a dam failure would significantly impact these areas. In certain scenarios there would be little or no warning time for dam failure. Dam failure events are frequently associated with other natural hazard events such as earthquakes, landslides or severe weather, which limits their predictability and compounds the hazard. Important issues associated with dam failure hazards include the following:

- It is unclear whether dam failure warning and notification strategies will be viable if dam failure occurs as a result of a significant earthquake that interrupts communication systems.
- Changes in hydrographs in the region as a result of climate change are likely to include more instances of winter flooding. This could alter dam operations and increase the potential for design failures.
- Downstream populations are often not aware that they are located in a dam failure inundation area and do not know the risks associated with probable dam failure.
- Balancing the need to address security concerns and the need to inform the public of the risk associated with dam failure is a challenge for public officials.

DAM FAILURE

- Dam failure inundation areas are often not considered special flood hazard areas under the National Flood Insurance Program, so flood insurance coverage in these areas is not common.
- Most dam failure mapping required at federal levels requires determination of the probable maximum flood. While the probable maximum flood represents a worst-case scenario, it is generally the event with the lowest probability of occurrence. For non-federal-regulated dams, mapping of dam failure scenarios that are less extreme than the probable maximum flood but have a higher probability of occurrence can be valuable to emergency managers and community officials downstream of these facilities. This type of mapping can show areas potentially impacted by more frequent events, to be used in support of emergency response and preparedness measures.

CHAPTER 10. EARTHQUAKE

10.1 GENERAL BACKGROUND

10.1.1 How Earthquakes Happen

An earthquake is the vibration of the earth's surface following a release of energy in the earth's crust. This energy can be generated by a sudden dislocation of the crust or by a volcanic eruption. Most destructive quakes are caused by dislocations of the crust. The crust may first bend and then, when the stress exceeds the strength of the rocks, break and snap to a new position. In the process of breaking, vibrations called "seismic waves" are generated. These waves travel outward from the source of the earthquake at varying speeds.

Earthquakes tend to reoccur along faults, which are zones of weakness in the crust. Even if a fault zone has recently experienced an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake could still occur.

10.1.2 Types of Earthquakes

The earth's crust is divided into eight major pieces (or plates) and many minor plates. In Western Washington, the primary plates of interest are the Juan De Fuca and North American plates. The Juan De Fuca plate moves northeastward with respect to the North America plate at a rate of about 3 to 4 centimeters per year. The boundary where these two plates converge, the Cascadia Subduction Zone, lies approximately 50 miles offshore and extends from the middle of Vancouver Island in British Columbia to northern California. As it collides with North America, the Juan De Fuca plate slides beneath the continent and sinks into the earth's mantle. More than 90 percent of Pacific Northwest earthquakes occur along the boundary between the Juan de Fuca plate and the North American plate. The collision of the Juan De Fuca and North America plates produces three types of earthquakes, as shown on Figure 10-1 and described below.

Subduction Zone Earthquakes

Subduction Zone earthquakes occur at the interface between tectonic plates. A subduction zone earthquake affecting King County would be centered in the Cascadia Subduction zone off the coast of Washington or Oregon. Such earthquakes typically have a minute or more of strong ground shaking, and are quickly followed by damaging tsunamis and numerous large aftershocks. The potential exists for large earthquakes along the Cascadia Subduction Zone, up to an earthquake measuring 9 or more on the Richter scale. This would cause coastal areas to drop up to 6 feet in minutes and would produce a tsunami all along the fault line from British Columbia to Mendocino, California. Such an earthquake would last several minutes and produce catastrophic damage.

DEFINITIONS

Earthquake—The shaking of the ground caused by an abrupt shift of rock along a fracture in the earth or a contact zone between tectonic plates.

Epicenter—The point on the earth's surface directly above the hypocenter of an earthquake. The location of an earthquake is commonly described by the geographic position of its epicenter and by its focal depth.

Fault—A fracture in the earth's crust along which two blocks of the crust have slipped with respect to each other.

Focal Depth—The depth from the earth's surface to the hypocenter.

Hypocenter—The region underground where an earthquake's energy originates

Liquefaction—Loosely packed, water-logged sediments losing their strength in response to strong shaking, causing major damage during earthquakes.

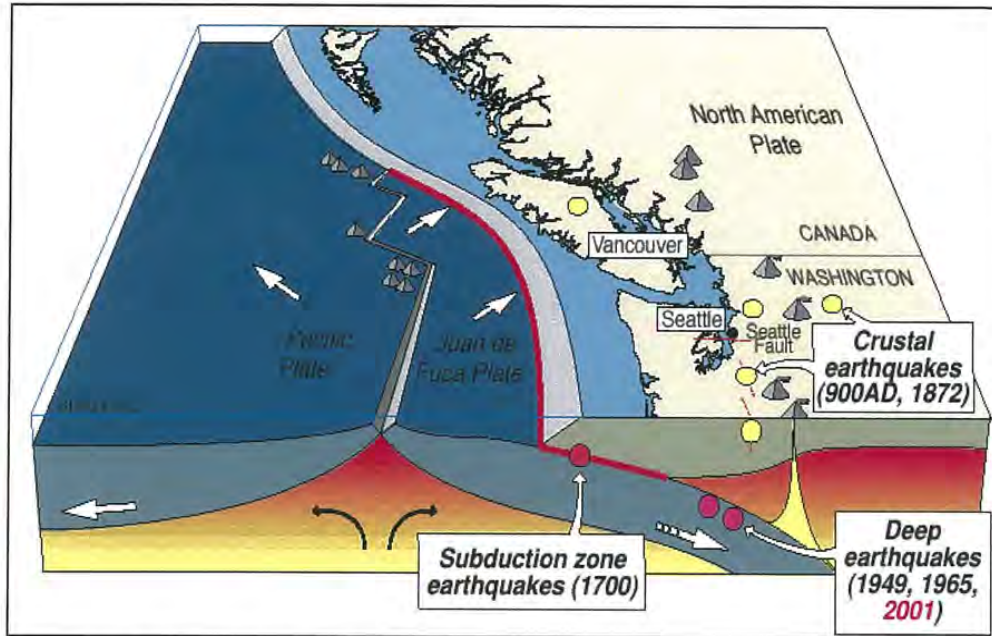


Figure 10-1. Earthquake Types in the Pacific Northwest

Benioff Zone (Deep) Earthquakes

Benioff Zone earthquakes occur within the Juan De Fuca plate as it sinks into the mantle. These are primarily deep earthquakes, 25 to 100 kilometers in depth. Due to their depth, aftershocks are typically not felt in association with these earthquakes. These earthquakes are caused by mineral changes as the plate moves deeper into the mantle. Minerals that make up the plates are altered to denser, more stable forms as temperature and pressure increase. This results in a decrease in the size of the plate, and stresses build up that pull the plate apart (Washington Department of Natural Resources, 2014). Deep earthquakes generally last 20 to 30 seconds and have the potential of reaching 7.5 on the Richter scale. The last major one in the Puget Sound region was the 6.8 magnitude Nisqually Earthquake on February 28, 2001.

Shallow Crustal Earthquakes

Shallow crustal earthquakes occur within the North America plate at depths of 30 kilometers or less. Shallow earthquakes within the North America plate account for most of the earthquakes in the Puget Sound region. Most are relatively small but the potential exists for major shallow earthquakes as well. Generally, these earthquakes are expected to have magnitudes less than 8 and last from 20 to 60 seconds.

Of the three types of earthquake, crustal events are the least understood. Ongoing research suggests that Magnitude 7 or greater events have occurred on at least eight faults in the Puget Sound basin. Large events on these faults have the potential to cause greater loss of life and property than any other disaster likely to affect the area. It is estimated that the St. Helens seismic zone could produce a Magnitude 6.2 to 6.8 earthquake. Evidence of a fault running east-west through south Seattle (the Seattle Fault) suggests that a major earthquake with a magnitude of 7 or greater affected the Seattle area about 1,100 years ago.

10.1.3 Faults

Earthquakes tend to reoccur along faults, which are zones of weakness in the crust. Even if a fault zone has recently experienced an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake could still occur.

Geologists classify faults by their relative hazards. Active faults, which represent the highest hazard, are those that have ruptured to the ground surface during the Holocene period (about the last 11,000 years). Potentially active faults are those that displaced layers of rock from the Quaternary period (the last 1,800,000 years). Determining if a fault is “active” or “potentially active” depends on geologic evidence, which may not be available for every fault. Although there are probably still some unrecognized active faults, nearly all the movement between the two plates, and therefore the majority of the seismic hazards, are on the well-known active faults.

Faults are more likely to have earthquakes on them if they have more rapid rates of movement, have had recent earthquakes along them, experience greater total displacements, and are aligned so that movement can relieve accumulating tectonic stresses. A direct relationship exists between a fault’s length and location and its ability to generate damaging ground motion at a given site. In some areas, smaller, local faults produce lower magnitude quakes, but ground shaking can be strong, and damage can be significant as a result of the fault’s proximity to the area. In contrast, large regional faults can generate great magnitudes but, because of their distance and depth, may result in only moderate shaking in the area.

10.1.4 Earthquake Classifications

Earthquakes are typically classified in one of two ways: By the amount of energy released, measured as **magnitude**; or by the impact on people and structures, measured as **intensity**.

Magnitude

Currently the most commonly used magnitude scale is the moment magnitude (M_w) scale, with the following classifications of magnitude:

- Great— $M_w \geq 8$
- Major— $M_w = 7.0 - 7.9$
- Strong— $M_w = 6.0 - 6.9$
- Moderate— $M_w = 5.0 - 5.9$
- Light— $M_w = 4.0 - 4.9$
- Minor— $M_w = 3.0 - 3.9$
- Micro— $M_w < 3$

Estimates of moment magnitude roughly match the local magnitude scale (ML) commonly called the Richter scale. One advantage of the moment magnitude scale is that, unlike other magnitude scales, it does not saturate at the upper end. That is, there is no value beyond which all large earthquakes have about the same magnitude. For this reason, moment magnitude is now the most often used estimate of large earthquake magnitudes.

Intensity

Currently the most commonly used intensity scale is the modified Mercalli intensity scale, with ratings defined as follows (USGS, 1989):

- I. Not felt except by a very few under especially favorable conditions
- II. Felt only by a few persons at rest, especially on upper floors of buildings.
- III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it is an earthquake. Standing cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
- IV. Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like a heavy truck striking building. Standing cars rocked noticeably.
- V. Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
- VI. Felt by all; many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
- VII. Damage negligible in buildings of good design and construction; slight in well-built ordinary structures; considerable in poorly built or badly designed structures. Some chimneys broken.
- VIII. Damage slight in specially designed structures; considerable damage in ordinary buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
- IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
- X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
- XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
- XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

10.1.5 Ground Motion

Earthquake hazard assessment is also based on expected ground motion. This involves determining the annual probability that certain ground motion accelerations will be exceeded, then summing the annual probabilities over the time period of interest. The most commonly mapped ground motion parameters are the horizontal and vertical peak ground accelerations (PGA) for a given soil or rock type. Instruments called accelerographs record levels of ground motion due to earthquakes at stations throughout a region. These readings are recorded by state and federal agencies that monitor and predict seismic activity.

Maps of PGA values form the basis of seismic zone maps that are included in building codes such as the International Building Code. Building codes that include seismic provisions specify the horizontal force due to lateral acceleration that a building should be able to withstand during an earthquake. PGA values are directly related to these lateral forces that could damage “short period structures” (e.g. single-family dwellings). Longer period response components determine the lateral forces that damage larger structures with longer natural periods (apartment buildings, factories, high-rises, bridges). Table 10-1 lists damage potential and perceived shaking by PGA factors, compared to the Mercalli scale.

EARTHQUAKE

TABLE 10-1.
MERCALLI SCALE AND PEAK GROUND ACCELERATION COMPARISON

Modified Mercalli Scale	Perceived Shaking	Potential Structure Damage		Estimated PGA ^a (%g)
		Resistant Buildings	Vulnerable Buildings	
I	Not Felt	None	None	<0.17%
II-III	Weak	None	None	0.17% - 1.4%
IV	Light	None	None	1.4% - 3.9%
V	Moderate	Very Light	Light	3.9% - 9.2%
VI	Strong	Light	Moderate	9.2% - 18%
VII	Very Strong	Moderate	Moderate/Heavy	18% - 34%
VIII	Severe	Moderate/Heavy	Heavy	34% - 65%
IX	Violent	Heavy	Very Heavy	65% - 124%
X - XII	Extreme	Very Heavy	Very Heavy	>124%

a. PGA measured in percent of g, where g is the acceleration of gravity
Sources: USGS, 2008; USGS, 2010

10.1.6 Effect of Soil Types

The impact of an earthquake on structures and infrastructure is largely a function of ground shaking, distance from the source of the quake, and liquefaction, a secondary effect of an earthquake in which soils lose their shear strength and flow or behave as liquid, thereby damaging structures that derive their support from the soil. Liquefaction generally occurs in soft sedimentary soils. A program called the National Earthquake Hazard Reduction Program (NEHRP) creates maps based on soil characteristics to help identify locations subject to liquefaction. Table 10-2 summarizes NEHRP soil classifications. NEHRP Soils B and C typically can sustain ground shaking without much effect, dependent on the earthquake magnitude. The areas that are commonly most affected by ground shaking have NEHRP Soils D, E and F. In general, these areas are also most susceptible to liquefaction.

TABLE 10-2.
NEHRP SOIL CLASSIFICATION SYSTEM

NEHRP Soil Type	Description	Mean Shear Velocity to 30 m (m/s)
A	Hard Rock	1,500
B	Firm to Hard Rock	760-1,500
C	Dense Soil/Soft Rock	360-760
D	Stiff Soil	180-360
E	Soft Clays	< 180
F	Special Study Soils (liquefiable soils, sensitive clays, organic soils, soft clays >36 m thick)	

10.2 HAZARD PROFILE

Earthquakes can last from a few seconds to over five minutes; they may also occur as a series of tremors over several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties generally result from falling objects and debris, because the shocks shake, damage or demolish buildings and other structures. Disruption of communications, electrical power supplies and gas, sewer and water lines should be expected. Earthquakes may trigger fires, dam failures, landslides or releases of hazardous material, compounding their disastrous effects. Small, local faults produce lower magnitude quakes, but ground shaking can be strong and damage can be significant in areas close to the fault. In contrast, large regional faults can generate earthquakes of great magnitudes but, because of their distance and depth, they may result in only moderate shaking in an area.

10.2.1 Past Events

There are about a dozen fault zones in the Puget Sound lowlands. Evidence exists that Magnitude 7 or greater earthquakes have occurred on at least eight of these—the Seattle Fault, the Tacoma Fault, the Darrington-Devils Mountain Fault, the Utsalady Point Fault, the Southern Whidbey Island Fault, the Frigid Creek Fault, the Canyon River Fault, and the Lake Creek Fault. Each year more than a thousand earthquakes are recorded in Washington. Fifteen to 20 of these are strong enough to be felt. Seismic events that have been felt in or have impacted King County since 1945 are listed in Table 10-3. Earthquakes that caused damage occurred in the county in 1909, 1939, 1946, 1949, 1965 and 2001.

TABLE 10-3. HISTORICAL EARTHQUAKES IMPACTING THE PLANNING AREA					
Year	Magnitude	Region Impacted	Year	Magnitude	Region Impacted
1945	5.7	SSE of North Bend	1997	3.1	Duvall
1949	7.1	ENE of Olympia	1998	2.9	Seattle
1965	6.5	N of Tacoma	1998	3.1	Pierce County
1995	5.0	NNE Tacoma	1998	2.9	Skykomish
1996	5.4	ENE of Duvall	1999	3.9	Tacoma
1996	2.9	Puget Sound	2001	7.2	Nisqually - Olympia
1997	3.0	SE of Seattle	2002	4.2	Friday Harbor, San Juan Islands
1997	4.9	Puget Sound off Vashon Island	2003	3.7	Bremerton, Kitsap County
1997	2.7	Puget Sound	2009	4.5	Bremerton

10.2.2 Location

Identifying the extent and location of an earthquake is not as simple as it is for other hazards such as flood, landslide or wild fire. The impact of an earthquake is largely a function of the following components:

- Ground shaking (ground motion accelerations)
- Liquefaction (soil instability)
- Distance from the source (both horizontally and vertically).

EARTHQUAKE

Mapping that shows the impacts of these components was used to assess the risk of earthquakes within the planning area. While the impacts from each of these components can build upon each other during an earthquake event, the mapping looks at each component individually. The mapping used in this assessment is described below.

In 1993, the U.S. Geological Survey began developing a database for Quaternary faults and folds for the United States. The database includes information on geographic, geologic, and seismic parameters for making assessments of seismic hazards. Figure 10-2 shows the identified faults within the planning area.

Shake Maps

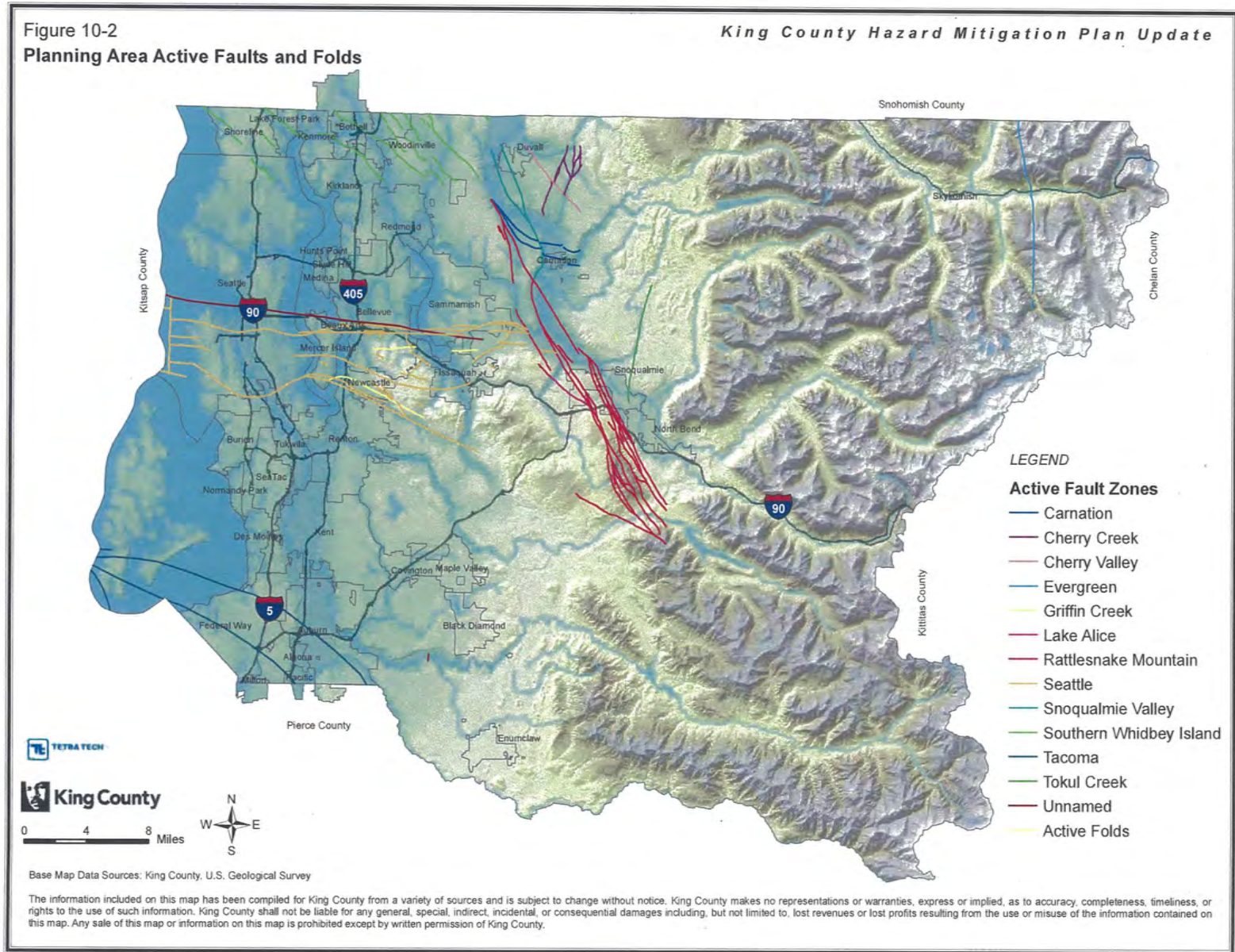
A shake map is a representation of ground shaking produced by an earthquake. The information it presents is different from the earthquake magnitude and epicenter that are released after an earthquake because shake maps focus on the ground shaking resulting from the earthquake, rather than the parameters describing the earthquake source. An earthquake has only one magnitude and one epicenter, but it produces a range of ground shaking at sites throughout the region, depending on the distance from the earthquake, the rock and soil conditions at sites, and variations in the propagation of seismic waves from the earthquake due to complexities in the structure of the earth's crust. A shake map shows the extent and variation of ground shaking in a region immediately following significant earthquakes.

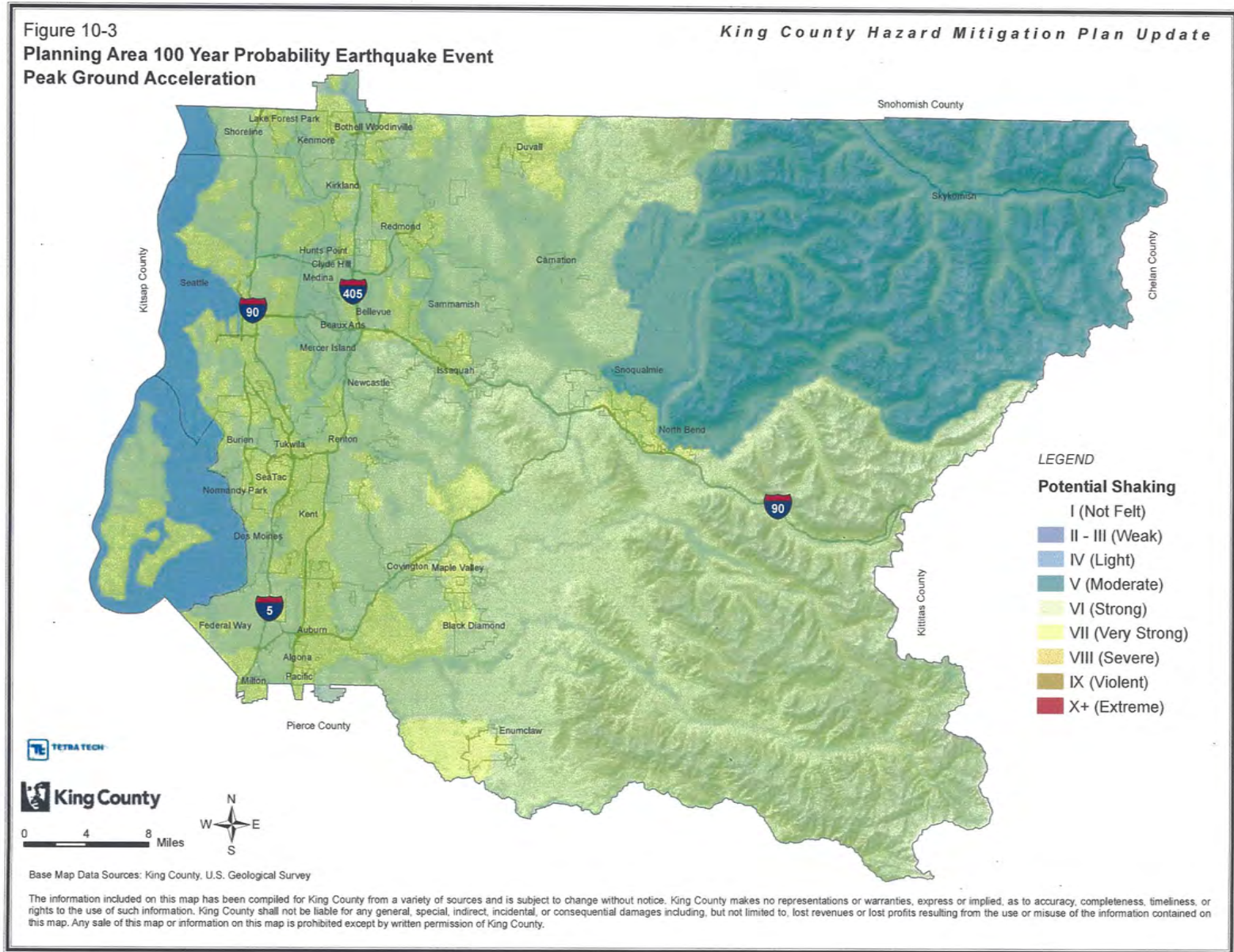
Ground motion and intensity maps are derived from peak ground motion amplitudes recorded on seismic sensors (accelerometers), with interpolation based on estimated amplitudes where data are lacking, and site amplification corrections. Color-coded instrumental intensity maps are derived from empirical relations between peak ground motions and Modified Mercalli intensity. Two types of shake map are typically generated from the data:

- A probabilistic seismic hazard map shows the hazard from earthquakes that geologists and seismologists agree could occur. The maps are expressed in terms of probability of exceeding a certain ground motion, such as the 10-percent probability of exceedance in 50 years. This level of ground shaking has been used for designing buildings in high seismic areas. Figure 10-3 and Figure 10-4 show the estimated ground motion for the 100-year and 500-year probabilistic earthquakes in the planning area.
- Earthquake scenario maps describe the expected ground motions and effects of hypothetical large earthquakes for a region. Maps of these scenarios can be used to support all phases of emergency management. Three scenarios were chosen for this plan:
 - Seattle Fault Scenario—A Magnitude 7.2 event with a shallow depth and epicenter approximately 6 miles south-southwest of downtown Seattle. See Figure 10-5
 - South Whidbey Island Fault Scenario—A Magnitude 7.4 event with a shallow depth and epicenter approximately 13.5 miles west-northwest of Everett. See Figure 10-6.
 - Tacoma Fault Scenario—A Magnitude 7.1 event with a shallow depth and epicenter approximately 16.5 miles northwest of Tacoma. See Figure 10-7.

NEHRP Soil Maps

NEHRP soil types define the locations that will be significantly impacted by an earthquake. NEHRP Soils B and C typically can sustain low-magnitude ground shaking without much effect. The areas that are most commonly affected by ground shaking have NEHRP Soils D, E and F. Figure 10-8 shows NEHRP soil classifications in King County.





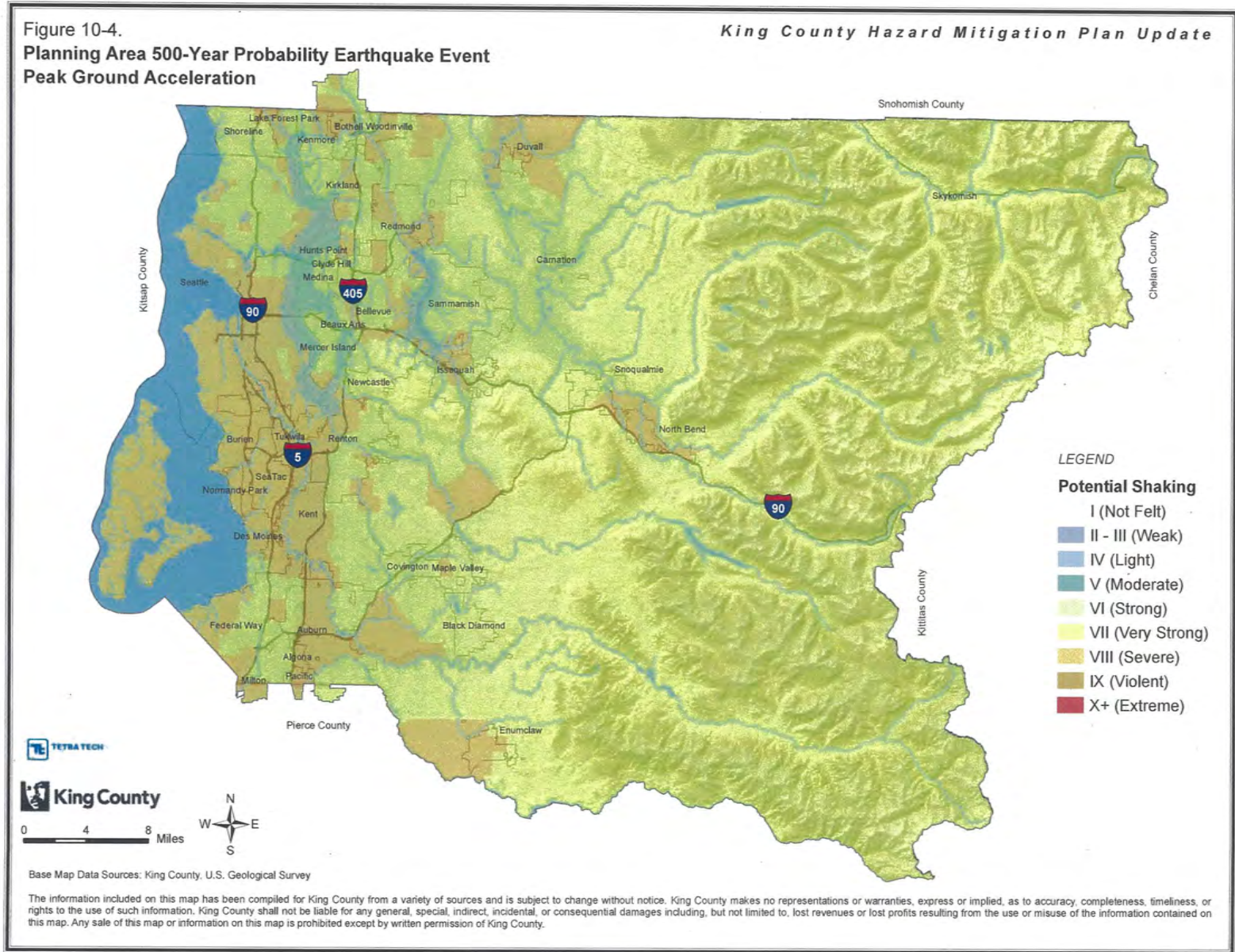
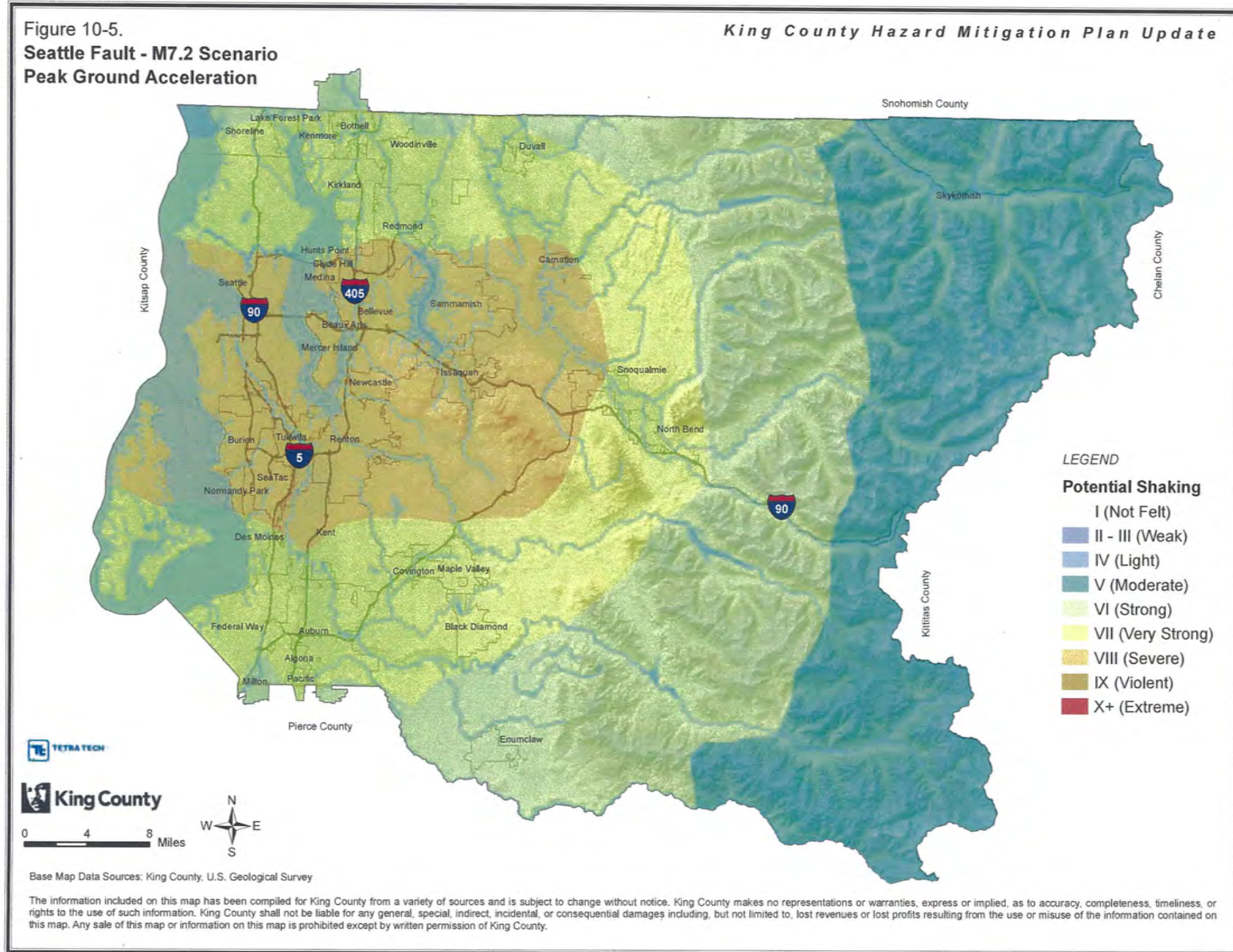


Figure 10-5.
Seattle Fault - M7.2 Scenario
Peak Ground Acceleration

King County Hazard Mitigation Plan Update



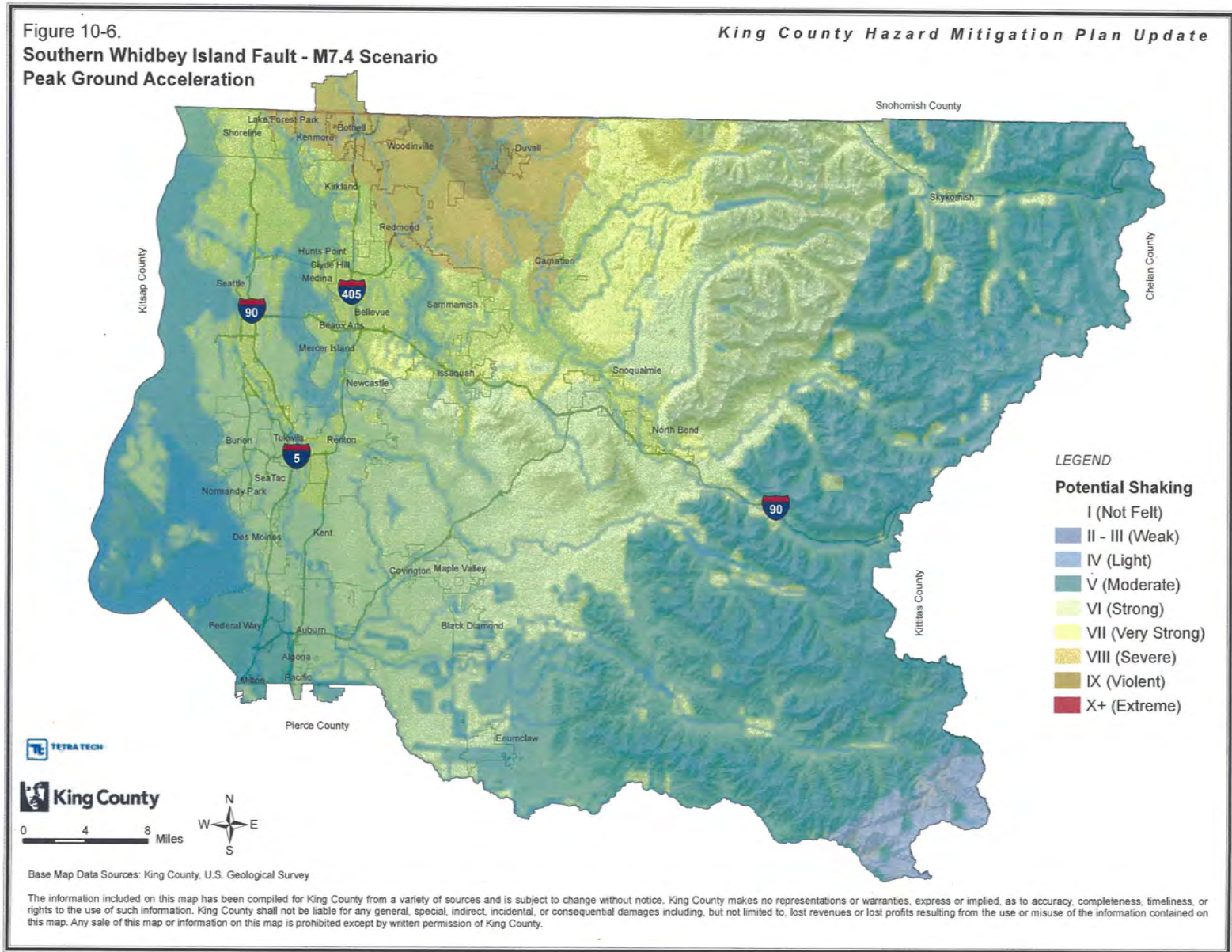


Figure 10-7.

**Tacoma Fault - M7.1 Scenario
Peak Ground Acceleration**

King County Hazard Mitigation Plan Update

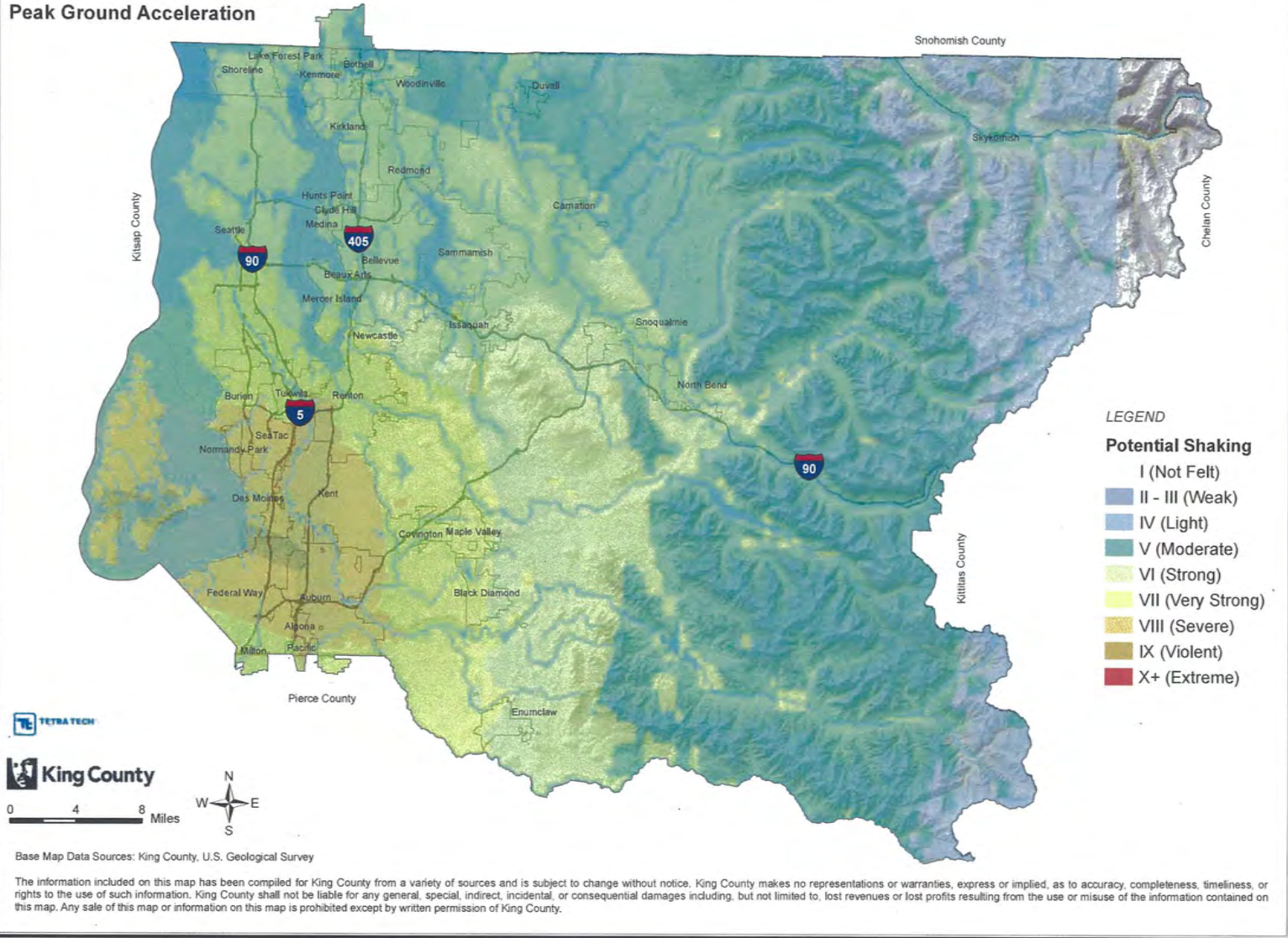
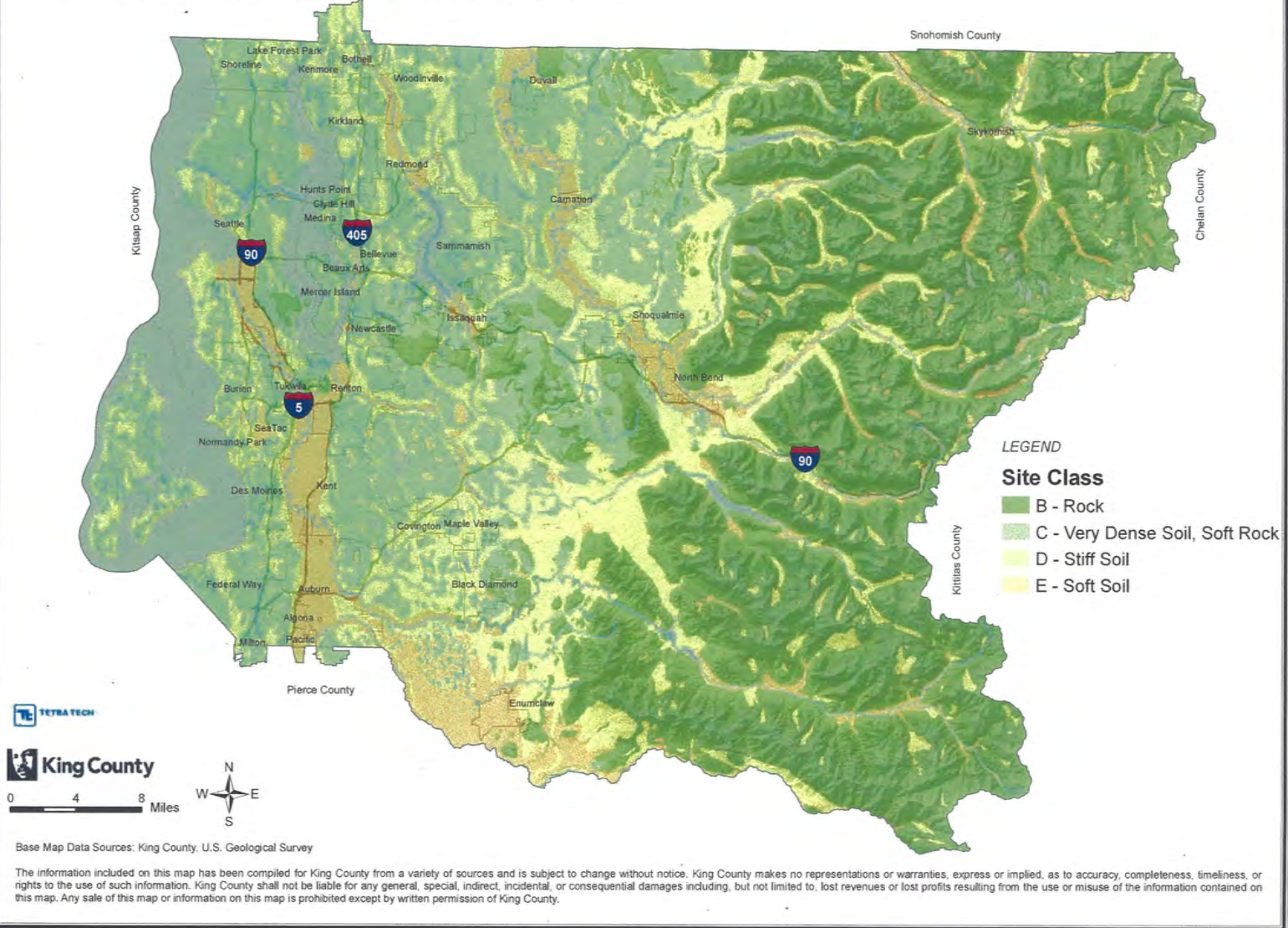


Figure 10-8.

National Earthquake Hazard Reduction Program Soil Classification

King County Hazard Mitigation Plan Update



Liquefaction Maps

Soil liquefaction maps are useful tools to assess potential damage from earthquakes. When the ground liquefies, sandy or silty materials saturated with water behave like a liquid, causing pipes to leak, roads and airport runways to buckle, and building foundations to be damaged. In general, areas with NEHRP Soils D, E and F are also susceptible to liquefaction. If there is a dry soil crust, excess water will sometimes come to the surface through cracks in the confining layer, bringing liquefied sand with it, creating sand boils. Figure 10-9 shows the liquefaction susceptibility in the planning area.

10.2.3 Frequency

The recurrence rate for a Magnitude 6.5 or greater earthquake is estimated to be about 350 years anywhere in the Puget Sound basin and 1,000 years on the Seattle Fault (Washington Emergency Management Division, 2014). In general, it is difficult to estimate the probability of occurrence of crustal earthquake events. Earthquakes on the South Whidbey Island and Seattle Faults have a 2 percent probability of occurrence in 50 years. The USGS estimated that a crustal zone earthquake has a recurrence interval of about 500 to 600 years.

Recurrence intervals for Benioff Zone earthquakes are estimated to be 30 to 40 years for Magnitude 6.5 and 50 to 100 years for Magnitude 7.0. A Benioff Zone earthquake has an 85 percent probability of occurrence in 50 years, making it the most likely of the three types.

Earthquake events occurring along the Cascadia Subduction Zone reoccur with far less frequency. Such events occur on average every 550 years, although the recurrence interval appears to be irregular. The intervals between earthquakes in this subduction zone have ranged from 100 years to more than 1,000 years. The USGS estimated that a Cascadia Subduction Zone earthquake has a 10 to 15 percent probability of occurrence in 50 years.

10.2.4 Severity

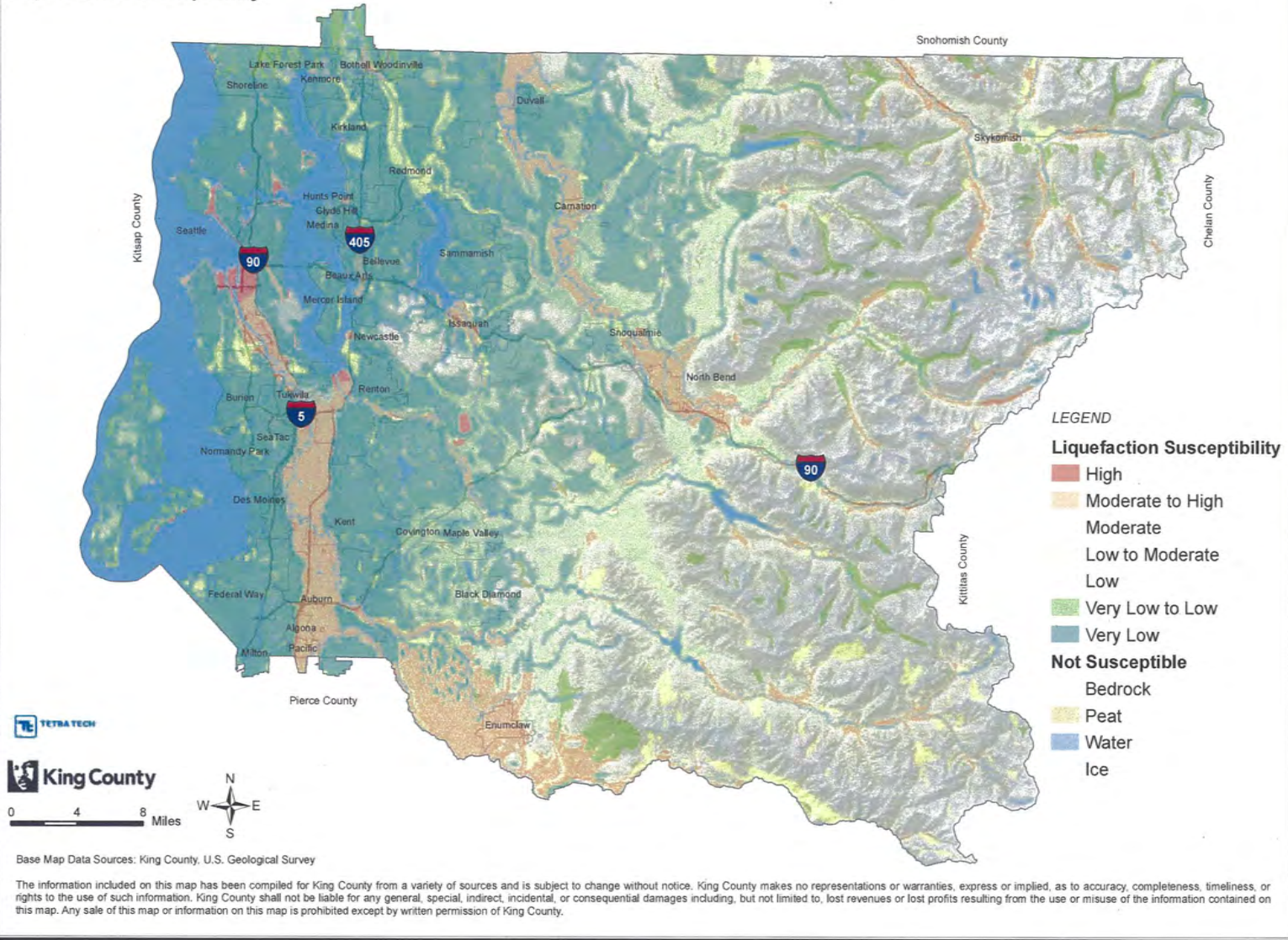
The severity of an earthquake can be expressed in terms of intensity or magnitude. Intensity represents the observed effects of ground shaking on people, buildings, and natural features. The USGS has created ground motion maps based on current information about several fault zones. These maps show the PGA that has a certain probability (2 percent or 10 percent) of being exceeded in a 50-year period. The PGA is measured in numbers of g's (the acceleration associated with gravity). Figure 10-10 shows the PGAs with a 2-percent exceedance chance in 50 years in Washington. King County is a medium- to high-risk area.

Magnitude is related to the amount of seismic energy released at the hypocenter of an earthquake. It is determined by the amplitude of the earthquake waves recorded on instruments. Whereas intensity varies depending on location with respect to the earthquake epicenter, magnitude is represented by a single, instrumentally determined value for each earthquake event. In simplistic terms, the severity of an earthquake event can be measured in the following terms:

- How hard did the ground shake?
- How did the ground move? (Horizontally or vertically)
- How stable was the soil?
- What is the fragility of the built environment in the area of impact?

Figure 10-9.
Liquefaction Susceptibility

King County Hazard Mitigation Plan Update



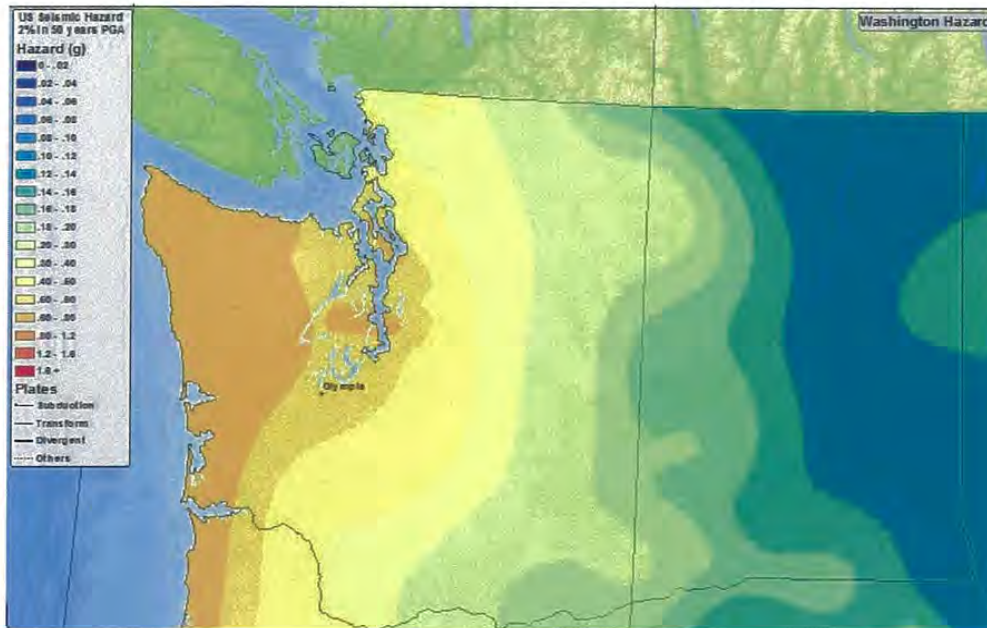


Figure 10-10. PGA with 2-Percent Probability of Exceedance in 50 Years, Northwest Region

10.2.5 Warning Time

There is currently no reliable way to predict the day or month that an earthquake will occur at any given location. Research is being done with warning systems that use the low energy waves that precede major earthquakes. These potential warning systems give approximately 40 seconds notice that a major earthquake is about to occur. The warning time is very short but it could allow for someone to get under a desk, step away from a hazardous material they are working with, or shut down a computer system.

10.3 SECONDARY HAZARDS

Earthquakes can cause large and sometimes disastrous landslides and mudslides. River valleys are vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. Soil liquefaction occurs when water-saturated sands, silts or gravelly soils are shaken so violently that the individual grains lose contact with one another and float freely in the water, turning the ground into a pudding-like liquid. Building and road foundations lose load-bearing strength and may sink into what was previously solid ground. Unless properly secured, hazardous materials can be released, causing significant damage to the environment and people. Earthen dams and levees are highly susceptible to seismic events and the impacts of their eventual failures can be considered secondary risks for earthquakes. Disruptions in utility services including power, communication, gas, wastewater and potable water may also occur.

10.4 EXPOSURE

10.4.1 Population

The entire population of King County is potentially exposed to direct and indirect impacts from earthquakes. The degree of exposure is dependent on many factors, including the age and construction

type of the structures people live in, the soil type their homes are constructed on, their proximity to fault location, etc. Whether directly impacted or indirectly impact, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of functions of utilities could impact populations that suffered no direct damage from an event itself.

10.4.2 Property

According to County Assessor records, there are 545,846 buildings in the planning area, with a total assessed value of \$556.7 billion. Since all structures in the planning area are susceptible to earthquake impacts to varying degrees, this total represents the countywide property exposure to seismic events. Most of the buildings (87.6 percent) are residential.

10.4.3 Critical Facilities and Infrastructure

All critical facilities in the planning area are exposed to the earthquake hazard. Table 6-3 and Table 6-4 list the number of each type of facility by jurisdiction. Hazardous materials releases can occur during an earthquake from fixed facilities or transportation-related incidents. Transportation corridors can be disrupted during an earthquake, leading to the release of materials to the surrounding environment. Facilities holding hazardous materials are of particular concern because of possible isolation of neighborhoods surrounding them. During an earthquake, structures storing these materials could rupture and leak into the surrounding area or an adjacent waterway, having a disastrous effect on the environment.

10.4.4 Environment

Secondary hazards associated with earthquakes will likely have some of the most damaging effects on the environment. Earthquake-induced landslides can significantly impact surrounding habitat. It is also possible for streams to be rerouted after an earthquake. This can change the water quality, possibly damaging habitat and feeding areas. There is a possibility of streams fed by groundwater drying up because of changes in underlying geology.

10.5 VULNERABILITY

Earthquake vulnerability data was generated using a Level 2 Hazus-MH analysis. Once the location and size of a hypothetical earthquake are identified, Hazus-MH estimates the intensity of the ground shaking, the number of buildings damaged, the number of casualties, the damage to transportation systems and utilities, the number of people displaced from their homes, and the estimated cost of repair and clean up.

10.5.1 Population

There are estimated to be 611,662 people in over 250,000 households living on NEHRP Class D or E soils within the planning area. This represents about 30 percent of the total population. Of this population, two groups are particularly vulnerable to earthquake hazards.

- **Population Below Poverty Level**—An estimated 37,857 households in the planning area census blocks on NEHRP D and E soils have household incomes less than \$20,000 per year. This is about 15 percent of all households located on Class D and E soils. These households may lack the financial resources to improve their homes to prevent or mitigate earthquake damage. Poorer residents are also less likely to have insurance to compensate for losses in earthquakes.

- **Population Over 65 Years Old**—An estimated 63,530 residents in the planning area census blocks on NEHRP D and E soils are over 65 years old. This is about 10 percent of all residents in these census blocks. This population group is vulnerable because they are more likely to need special medical attention, which may not be available due to isolation caused by earthquakes. Elderly residents also have more difficulty leaving their homes during earthquake events and could be stranded in dangerous situations.

Impacts on persons and households in the planning area were estimated for the 100-year and 500-year earthquakes and the three scenario events through the Level 2 Hazus-MH analysis. Table 10-4 summarizes the results.

TABLE 10-4. ESTIMATED EARTHQUAKE IMPACT ON PERSONS AND HOUSEHOLDS		
	Number of Displaced Households	Number of Persons Requiring Short-Term Shelter
100-Year Earthquake	6,016	3,192
500-Year Earthquake	29,204	15,613
Seattle Fault, M7.2 Scenario	27,205	14,657
South Whidbey Island Fault, M7.4 Scenario	3,579	1,855
Tacoma Fault, M 7.1 Scenario	8,737	5,551
Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.		

10.5.2 Property

Building Age

Table 10-5 identifies significant milestones in building and seismic code requirements that directly affect the structural integrity of development. Using these time periods, the planning team used King County Assessor's data to identify the number of structures in the planning area by date of construction.

The number of structures does not reflect the number of total housing units, as many multi-family units and attached housing units are reported as one structure. Approximately 21.7 percent of the planning area's structures were constructed after the Uniform Building Code was amended in 1994 to include seismic safety provisions. Approximately 11.9 percent were built before 1933 when there were no building permits, inspections, or seismic standards.

Loss Potential

Property losses were estimated through the Level 2 Hazus-MH analysis for the 100-year and 500-year earthquakes and the three scenario events. Table 10-6 through Table 10-8 show the results for two types of property loss (and the total of the two):

- Structural loss, representing damage to building structures
- Non-structural loss, representing the value of lost contents.

**TABLE 10-5.
AGE OF STRUCTURES IN PLANNING AREA**

Time Period	Number of Current Planning Area Structures Built in Period ^a	Significance of Time Frame
Pre-1933	65,301	Before 1933, there were no explicit earthquake requirements in building codes. State law did not require local governments to have building officials or issue building permits.
1933-1940	11,929	In 1940, the first strong motion recording was made.
1941-1960	106,435	In 1960, the Structural Engineers Association of California published guidelines on recommended earthquake provisions.
1961-1975	93,346	In 1975, significant improvements were made to lateral force requirements.
1976-1994	150,504	In 1994, the Uniform Building Code was amended to include provisions for seismic safety.
1994—2009	106,698	Seismic code is currently enforced.
2010—present	11,633	Revised calculations for shear loads and reinstated thresholds removed from the 2005 IBC.
Total	545,846	
a. Year built information was collected from King and Snohomish County tax assessor data. Information for Pierce County was collected from Hazus inventory data at the Census block level and was estimated based on the relative distribution of year built information in King County		

EARTHQUAKE

**TABLE 10-6.
LOSS ESTIMATES FOR PROBABILISTIC EARTHQUAKES**

Jurisdiction	Estimated Loss Associated with Earthquake					
	100- Year Earthquake			500- Year Earthquake		
	Structure	Contents	Total	Structure	Contents	Total
Algona	\$28,447,034	\$9,367,613	\$37,814,647	\$77,301,198	\$24,322,771	\$101,623,969
Auburn	\$462,154,483	\$160,282,043	\$622,436,526	\$1,415,743,454	\$464,744,577	\$1,880,488,032
Beaux Arts	\$168,562	\$45,743	\$214,304	\$1,044,067	\$303,208	\$1,347,275
Bellevue	\$640,848,452	\$201,922,013	\$842,770,465	\$2,566,496,520	\$758,116,466	\$3,324,612,986
Black Diamond	\$3,718,136	\$1,123,323	\$4,841,458	\$16,397,826	\$5,046,132	\$21,443,958
Bothell	\$47,686,655	\$16,009,519	\$63,696,174	\$262,737,548	\$84,295,405	\$347,032,954
Burien	\$66,229,851	\$21,414,579	\$87,644,430	\$364,002,299	\$114,120,614	\$478,122,913
Carnation	\$42,539	\$12,856	\$55,394	\$281,864	\$93,759	\$375,623
Clyde Hill	\$2,743,099	\$810,212	\$3,553,311	\$16,113,575	\$5,133,877	\$21,247,452
Covington	\$12,880,273	\$4,174,703	\$17,054,976	\$72,646,564	\$23,519,893	\$96,166,457
Des Moines	\$38,475,228	\$11,925,280	\$50,400,508	\$222,438,812	\$66,177,913	\$288,616,724
Duvall	\$1,630,530	\$504,177	\$2,134,707	\$5,971,102	\$1,811,135	\$7,782,237
Enumclaw	\$38,567,959	\$13,483,601	\$52,051,560	\$119,278,159	\$38,579,020	\$157,857,179
Federal Way	\$114,071,243	\$35,450,841	\$149,522,085	\$654,529,936	\$196,456,992	\$850,986,928
Hunts Point	\$1,085,822	\$319,057	\$1,404,879	\$6,541,221	\$2,091,174	\$8,632,395
Issaquah	\$102,581,533	\$33,161,003	\$135,742,536	\$369,935,555	\$110,492,179	\$480,427,734
Kenmore	\$45,239,642	\$13,006,393	\$58,246,035	\$156,005,873	\$44,162,406	\$200,168,279
Kent	\$802,731,743	\$289,992,114	\$1,092,723,857	\$2,396,185,649	\$804,078,666	\$3,200,264,315
Kirkland	\$142,578,938	\$46,237,343	\$188,816,280	\$730,179,385	\$226,714,883	\$956,894,268
Lake Forest Park	\$24,573,498	\$7,261,385	\$31,834,883	\$85,121,620	\$24,256,690	\$109,378,310
Maple Valley	\$31,523,875	\$8,765,966	\$40,289,841	\$99,588,196	\$27,261,781	\$126,849,977
Medina	\$1,354,018	\$403,645	\$1,757,663	\$8,039,972	\$2,589,848	\$10,629,820
Mercer Island	\$16,177,204	\$4,847,694	\$21,024,898	\$102,869,281	\$31,584,065	\$134,453,347
Milton	\$4,217,202	\$906,387	\$5,123,589	\$20,164,901	\$4,164,041	\$24,328,942
Newcastle	\$7,654,196	\$2,164,575	\$9,818,771	\$48,101,089	\$14,407,339	\$62,508,428
Normandy Park	\$7,577,980	\$2,240,173	\$9,818,153	\$46,424,547	\$14,321,858	\$60,746,405
North Bend	\$18,183,467	\$6,086,403	\$24,269,870	\$63,214,492	\$19,337,840	\$82,552,332
Pacific	\$30,296,181	\$8,713,663	\$39,009,844	\$80,128,485	\$21,851,511	\$101,979,996
Redmond	\$232,685,007	\$75,928,306	\$308,613,313	\$1,080,967,467	\$328,831,222	\$1,409,798,689
Renton	\$406,572,748	\$143,040,134	\$549,612,882	\$1,403,586,992	\$460,272,342	\$1,863,859,335
Sammamish	\$52,760,902	\$15,504,039	\$68,264,942	\$299,547,772	\$87,520,398	\$387,068,170
SeaTac	\$155,623,933	\$44,819,212	\$200,443,145	\$630,497,808	\$167,386,552	\$797,884,361
Seattle	\$2,802,657,956	\$961,072,154	\$3,763,730,110	\$11,215,069,752	\$3,547,034,568	\$14,762,104,319
Shoreline	\$59,560,229	\$18,830,291	\$78,390,520	\$357,176,854	\$110,576,261	\$467,753,115
Skykomish	\$597	\$185	\$782	\$4,095	\$1,460	\$5,554
Snoqualmie	\$10,675,550	\$3,604,971	\$14,280,521	\$47,677,353	\$15,278,946	\$62,956,299
Tukwila	\$310,376,519	\$119,723,909	\$430,100,428	\$1,046,914,316	\$373,510,850	\$1,420,425,165
Woodinville	\$39,567,847	\$13,634,733	\$53,202,580	\$215,153,720	\$69,553,103	\$284,706,823
Yarrow Point	\$1,212,508	\$357,543	\$1,570,051	\$7,124,863	\$2,271,934	\$9,396,797
Unincorporated	\$719,803,874	\$223,678,465	\$943,482,339	\$2,919,721,583	\$890,818,695	\$3,810,090,279
Total	\$7,484,937,013	\$2,520,826,246	\$10,005,763,257	\$29,230,925,765	\$9,183,092,374	\$38,413,568,141

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

**TABLE 10-7.
LOSS ESTIMATES FOR SEATTLE AND SOUTH WHIDBEY FAULT SCENARIO EARTHQUAKES**

Jurisdiction	Estimated Loss Associated with Earthquake					
	Seattle Fault, M 7.2			South Whidbey M7.4		
	Structure	Contents	Total	Structure	Contents	Total
Algona	\$9,312,999	\$3,468,595	\$12,781,594	\$2,256,845	\$1,072,789	\$3,329,634
Auburn	\$278,902,902	\$96,326,332	\$375,229,234	\$56,209,661	\$26,777,444	\$82,987,105
Beaux Arts	\$2,361,618	\$709,987	\$3,071,605	\$257,280	\$92,864	\$350,145
Bellevue	\$3,434,139,472	\$1,016,785,836	\$4,450,925,308	\$589,907,633	\$217,484,801	\$807,392,434
Black Diamond	\$5,923,269	\$2,327,217	\$8,250,486	\$767,579	\$368,249	\$1,135,828
Bothell	\$51,649,438	\$20,977,752	\$72,627,190	\$298,371,005	\$98,375,990	\$396,746,994
Burien	\$695,692,064	\$219,559,285	\$915,251,348	\$20,414,661	\$9,651,441	\$30,066,102
Carnation	\$118,081	\$49,977	\$168,059	\$192,109	\$73,170	\$265,278
Clyde Hill	\$14,948,435	\$5,328,871	\$20,277,306	\$5,352,228	\$2,206,565	\$7,558,793
Covington	\$43,932,177	\$16,833,097	\$60,765,274	\$3,467,376	\$1,768,741	\$5,236,118
Des Moines	\$171,506,484	\$54,888,620	\$226,395,104	\$8,952,242	\$4,369,474	\$13,321,716
Duvall	\$1,441,045	\$553,755	\$1,994,800	\$8,523,642	\$2,699,870	\$11,223,512
Enumclaw	\$7,227,401	\$3,348,255	\$10,575,656	\$2,605,245	\$1,424,519	\$4,029,764
Federal Way	\$195,621,507	\$73,320,392	\$268,941,899	\$18,826,043	\$9,806,837	\$28,632,880
Hunts Point	\$6,089,105	\$2,185,490	\$8,274,594	\$2,196,291	\$908,421	\$3,104,712
Issaquah	\$720,990,789	\$218,014,142	\$939,004,931	\$56,101,833	\$20,452,250	\$76,554,083
Kenmore	\$25,548,859	\$9,642,815	\$35,191,674	\$95,448,426	\$29,632,334	\$125,080,759
Kent	\$1,593,538,555	\$554,489,067	\$2,148,027,622	\$157,486,958	\$67,723,691	\$225,210,649
Kirkland	\$314,897,434	\$110,689,224	\$425,586,657	\$396,996,350	\$136,191,688	\$533,188,038
Lake Forest Park	\$14,091,542	\$5,417,427	\$19,508,969	\$42,430,262	\$14,180,063	\$56,610,324
Maple Valley	\$56,360,481	\$17,793,913	\$74,154,393	\$3,781,304	\$1,627,758	\$5,409,062
Medina	\$8,230,280	\$3,028,650	\$11,258,930	\$2,048,667	\$822,023	\$2,870,690
Mercer Island	\$252,055,774	\$77,686,233	\$329,742,007	\$19,666,773	\$7,870,084	\$27,536,858
Milton	\$3,213,992	\$926,353	\$4,140,345	\$630,147	\$194,175	\$824,322
Newcastle	\$142,040,003	\$42,469,585	\$184,509,589	\$8,009,079	\$3,333,689	\$11,342,768
Normandy Park	\$68,743,162	\$21,869,288	\$90,612,450	\$1,923,654	\$892,479	\$2,816,133
North Bend	\$14,482,858	\$5,008,343	\$19,491,201	\$4,724,690	\$1,880,176	\$6,604,866
Pacific	\$9,293,567	\$3,139,036	\$12,432,603	\$2,416,717	\$946,355	\$3,363,071
Redmond	\$622,049,570	\$197,255,876	\$819,305,445	\$580,144,955	\$185,646,136	\$765,791,091
Renton	\$2,022,643,852	\$652,940,003	\$2,675,583,855	\$117,991,166	\$49,442,315	\$167,433,481
Sammamish	\$561,031,386	\$171,233,052	\$732,264,439	\$138,125,055	\$48,175,995	\$186,301,050
SeaTac	\$706,090,996	\$188,194,129	\$894,285,125	\$34,980,585	\$13,309,802	\$48,290,387
Seattle	\$12,313,031,567	\$3,960,809,129	\$16,273,840,696	\$1,588,271,087	\$641,139,232	\$2,229,410,319
Shoreline	\$77,527,321	\$31,039,988	\$108,567,308	\$157,647,074	\$57,091,714	\$214,738,788
Skykomish	\$433	\$257	\$690	\$433	\$257	\$690
Snoqualmie	\$35,639,246	\$12,059,460	\$47,698,706	\$7,257,336	\$2,913,100	\$10,170,437
Tukwila	\$1,292,691,431	\$468,844,224	\$1,761,535,655	\$67,809,964	\$31,598,954	\$99,408,918
Woodinville	\$43,353,068	\$16,758,096	\$60,111,164	\$251,325,857	\$79,680,559	\$331,006,416
Yarrow Point	\$6,548,732	\$2,347,007	\$8,895,739	\$2,369,676	\$978,430	\$3,348,106
Unincorporated	\$3,232,912,649	\$1,031,014,151	\$4,263,926,800	\$1,049,421,802	\$355,234,888	\$1,404,656,690
Total	\$29,055,873,544	\$9,319,332,909	\$38,375,206,450	\$5,805,309,690	\$2,128,039,322	\$7,933,349,011

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

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TABLE 10-8.
LOSS ESTIMATES FOR TACOMA FAULT SCENARIO EARTHQUAKE

Jurisdiction	Estimated Loss Associated with Earthquake		
	Tacoma Fault, M 7.1		
	Structure	Contents	Total
Algona	\$40,512,324	\$12,995,487	\$53,507,811
Auburn	\$1,247,393,305	\$435,651,072	\$1,683,044,377
Beaux Arts	\$209,164	\$81,917	\$291,081
Bellevue	\$254,157,710	\$109,375,526	\$363,533,235
Black Diamond	\$4,807,101	\$2,002,608	\$6,809,709
Bothell	\$8,302,472	\$4,189,973	\$12,492,445
Burien	\$294,099,260	\$98,017,858	\$392,117,118
Carnation	\$8,100	\$3,875	\$11,975
Clyde Hill	\$1,809,649	\$808,320	\$2,617,969
Covington	\$44,578,433	\$16,781,240	\$61,359,672
Des Moines	\$513,424,310	\$155,360,307	\$668,784,618
Duvall	\$193,449	\$94,644	\$288,092
Enumclaw	\$12,174,444	\$5,266,960	\$17,441,404
Federal Way	\$916,550,997	\$267,213,881	\$1,183,764,878
Hunts Point	\$746,142	\$333,091	\$1,079,233
Issaquah	\$35,569,541	\$14,947,148	\$50,516,689
Kenmore	\$6,391,276	\$2,765,540	\$9,156,816
Kent	\$2,541,600,283	\$866,538,730	\$3,408,139,013
Kirkland	\$46,087,747	\$21,834,971	\$67,922,718
Lake Forest Park	\$3,481,676	\$1,515,039	\$4,996,715
Maple Valley	\$27,312,496	\$9,638,681	\$36,951,177
Medina	\$914,868	\$410,372	\$1,325,240
Mercer Island	\$23,621,689	\$9,565,851	\$33,187,540
Milton	\$3,805,993	\$1,155,397	\$4,961,391
Newcastle	\$12,769,901	\$4,973,465	\$17,743,366
Normandy Park	\$87,150,788	\$27,610,973	\$114,761,761
North Bend	\$3,496,593	\$1,602,392	\$5,098,985
Pacific	\$30,136,839	\$9,700,839	\$39,837,679
Redmond	\$77,985,476	\$38,214,491	\$116,199,967
Renton	\$623,151,688	\$209,993,765	\$833,145,453
Sammamish	\$30,146,607	\$12,136,180	\$42,282,787
SeaTac	\$567,020,003	\$155,817,792	\$722,837,795
Seattle	\$1,681,515,599	\$664,668,695	\$2,346,184,294
Shoreline	\$18,909,273	\$9,013,808	\$27,923,080
Skykomish	\$88	\$57	\$145
Snoqualmie	\$2,970,520	\$1,382,272	\$4,352,792
Tukwila	\$476,852,397	\$161,727,663	\$638,580,060
Woodinville	\$8,510,708	\$4,466,626	\$12,977,334
Yarrow Point	\$800,648	\$357,663	\$1,158,311
Unincorporated	\$1,094,557,431	\$373,765,410	\$1,468,322,841
Total	\$10,743,726,988	\$3,711,980,579	\$14,455,707,566

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

A summary of the property-related loss results is as follows:

- For a 100-year probabilistic earthquake, the estimated damage potential is \$10.0 billion, or 2.03 percent of the total assessed value for the planning area.
- For a 500-year probabilistic earthquake, the estimated damage potential is \$38.4 billion or 7.80 percent of the total assessed value for the planning area.
- For a 7.2-magnitude Seattle Fault event, the estimated damage potential is \$38.4 billion, or 7.80 percent of the total assessed value for the planning area.
- For a 7.4-magnitude South Whidbey Fault event, the estimated damage potential is \$7.9 billion, or 1.61 percent of the total assessed value for the planning area.
- For a 7.1-magnitude Tacoma Fault event, the estimated damage potential is \$14.5 billion, or 2.94 percent of the total assessed value for the planning area.

The Hazus-MH analysis also estimated the amount of earthquake-caused debris in the planning area for the 100-year and 500-year earthquakes and the three scenario events, as summarized in Table 10-9.

TABLE 10-9. ESTIMATED EARTHQUAKE-CAUSED DEBRIS	
	Debris to Be Removed (tons)
100-Year Earthquake	3,514,423
500-Year Earthquake	14,217,942
M 7.2, Seattle Fault Scenario	13,940,730
M 7.4 South Whidbey Island Fault Scenario	2,154,450
M 7.1 Tacoma Fault Scenario	5,137,030
Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.	

10.5.3 Critical Facilities and Infrastructure

Level of Damage

Hazus-MH classifies the vulnerability of critical facilities to earthquake damage in five categories: no damage, slight damage, moderate damage, extensive damage, or complete damage. The model was used to assign a vulnerability category to each critical facility in the planning area except hazmat facilities and “other infrastructure” facilities, for which there are no established damage functions. The analysis was performed for all scenario events. Results from the 100-year probability event, the 500-year probability event and the Seattle Fault scenario are summarized in Table 10-10 through Table 10-12.

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**TABLE 10-10.
ESTIMATED DAMAGE TO CRITICAL FACILITIES FROM 100-YEAR EARTHQUAKE**

Category ^a	Damage Extent				
	None	Slight	Moderate	Extensive	Complete
Medical and Health	28	425	0	0	35
Government Function	2	26	0	0	2
Protective Function	14	234	3	0	26
Schools	5	676	0	0	15
Other Critical Function	50	420	0	0	0
Bridges	1,061	0	0	0	0
Transportation	35	262	4	0	7
Water supply	263	87	3	0	1
Wastewater	216	49	0	0	1
Power	13	19	0	0	0
Communications	47	17	0	0	0
Total	1,734	2,215	10	0	87

a. Vulnerability not estimated for hazmat facilities or for "other infrastructure" facilities due to lack of established damage functions for these type facilities.

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

**TABLE 10-11.
ESTIMATED DAMAGE TO CRITICAL FACILITIES FROM 500-YEAR EARTHQUAKE**

Category ^a	Damage Extent				
	None	Slight	Moderate	Extensive	Complete
Medical and Health	13	9	232	90	144
Government Function	2	1	10	9	8
Protective Function	8	13	150	39	67
Schools	5	24	452	90	125
Other Critical Function	39	1	31	375	24
Bridges	905	0	0	127	29
Transportation	28	265	4	0	11
Water supply	56	20	268	4	6
Wastewater	97	67	100	0	2
Power	0	0	32	0	0
Communications	2	17	45	0	0
Total	1,155	417	1,324	734	416

a. Vulnerability not estimated for hazmat facilities or for "other infrastructure" facilities due to lack of established damage functions for these type facilities.

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

**TABLE 10-12.
ESTIMATED DAMAGE TO CRITICAL FACILITIES FROM SEATTLE FAULT SCENARIO**

Category ^a	Damage Extent				
	None	Slight	Moderate	Extensive	Complete
Medical and Health	8	200	47	20	213
Government Function	1	12	5	1	11
Protective Function	10	88	21	13	145
Schools	5	246	55	30	360
Other Critical Function	15	178	87	20	170
Bridges	977	0	0	17	67
Transportation	21	216	30	5	36
Water supply	22	100	178	49	5
Wastewater	92	72	96	5	1
Power	0	13	17	2	0
Communications	3	7	31	23	0
Total	1,154	1,132	567	185	1,008

a. Vulnerability not estimated for hazmat facilities or for “other infrastructure” facilities due to lack of established damage functions for these type facilities.
Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

Time to Return to Functionality

Hazus-MH estimates the time to restore critical facilities to fully functional use. Results are presented as probability of being functional at specified time increments: 1, 3, 7, 14, 30 and 90 days after the event. For example, Hazus-MH may estimate that a facility has 5 percent chance of being fully functional at Day 3, and a 95-percent chance of being fully functional at Day 90. The analysis of critical facilities in the planning area was performed for all scenario earthquake events. Results from the 100-year probability event, the 500-year probability event and the Seattle Fault scenario are summarized in Table 10-13 through Table 10-15.

10.5.4 Environment

The environment vulnerable to earthquake hazard is the same as the environment exposed to the hazard.

10.6 FUTURE TRENDS IN DEVELOPMENT

Land use in the planning area will be directed by comprehensive plans adopted under Washington’s Growth Management Act. The information in this plan provides the participating partners a tool to ensure that there is no increase in exposure in areas of high seismic risk. Development in the planning area will be regulated through building standards and performance measures so that the degree of risk will be reduced. The geologic hazard portions of the planning area are regulated under each jurisdiction’s critical areas ordinances. The International Building Code establishes provisions to address seismic risk.

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TABLE 10-13.
FUNCTIONALITY OF CRITICAL FACILITIES FOR 100-YEAR EARTHQUAKE

	# of Critical Facilities	Probability of Being Fully Functional (%) ^a					
		at Day 1	at Day 3	at Day 7	at Day 14	at Day 30	at Day 90
Medical and Health	488	9.5	10.7	60.2	61.5	82.7	87.5
Government Function	30	10	11.2	60.7	61.9	83.3	88.1
Protective Function	277	9.4	10.6	61.7	63	83.6	88.1
Schools	696	7.6	8.9	64.8	66.2	86.8	91
Other Critical Function	470	12.1	13.3	63.3	64.5	87.3	92.2
Bridges	1,061	96.6	97.8	98.4	98.5	98.6	99.2
Transportation	308	78	85.3	87.9	88.2	89.1	92.7
Water supply	354	74.9	94.2	97.5	98.0	98.5	99.5
Wastewater	266	67.6	87.8	95.1	95.9	96.6	98.3
Power	32	59.3	83.8	93.7	96.9	98.6	99.7
Communications	64	90.9	97.5	98.3	99	99.4	99.8
Total/Average	4,046	46.9	54.6	80.1	81.2	91.3	94.2

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

TABLE 10-14.
FUNCTIONALITY OF CRITICAL FACILITIES FOR 500-YEAR EARTHQUAKE

	# of Critical Facilities	Probability of Being Fully Functional (%) ^a					
		at Day 1	at Day 3	at Day 7	at Day 14	at Day 30	at Day 90
Medical and Health	488	2	2.4	20.7	21.2	46.8	59.4
Government Function	30	3	3.4	21.7	22.2	47.5	60
Protective Function	277	1.9	2.4	21.8	22.3	48.2	60.7
Schools	696	0.7	1.2	22	22.6	50	63
Other Critical Function	470	4.5	4.9	23.2	23.7	50.1	63.3
Bridges	1,061	79.4	84.2	86.7	87.2	87.8	92.1
Transportation	308	63.5	73.9	77.7	78.3	79.9	86.9
Water supply	354	43.3	74.0	84.0	86.5	90.0	96.4
Wastewater	266	38.8	68.4	84.5	86.8	90.0	96.5
Power	32	32.1	61	82.9	91.6	96	99.5
Communications	64	67.2	86.9	90.7	95.4	98	99.6
Total/Average	4,046	30.6	42.1	56.0	58.0	71.3	79.8

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

**TABLE 10-15.
FUNCTIONALITY OF CRITICAL FACILITIES FOR SEATTLE FAULT SCENARIO**

Planning Unit	# of Critical Facilities	Probability of Being Fully Functional (%) ^a					
		at Day 1	at Day 3	at Day 7	at Day 14	at Day 30	at Day 90
Medical and Health	488	2.4	2.9	24.4	24.9	45.2	54.2
Government Function	30	4.3	4.8	28.4	29	48.5	57.4
Protective Function	277	3.3	3.8	22	22.5	39.8	48.4
Schools	696	1.4	1.8	21	21.4	39.5	48.3
Other Critical Function	470	4.2	4.7	28.1	28.6	49.7	59
Bridges	1,061	80.6	84.5	86.7	87.2	87.7	91.7
Transportation	308	59.1	70	74	74.8	76.8	85.4
Water supply	354	38.7	64.6	74.6	78.1	83.6	93.5
Wastewater	266	41.3	68.9	83.0	85.3	89.3	96.6
Power	32	37.6	64.6	83.1	91.1	95.6	99.5
Communications	64	52.4	71.7	78.5	88.2	93.8	98.8
Total/Average	4,046	29.6	40.2	54.9	57.4	68.1	75.7

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

10.7 SCENARIO

Any seismic activity of 6.0 or greater on faults within the planning area's general region would have significant impacts throughout the planning area. Potential warning systems could give about 40 seconds' notice that a major earthquake is about to occur. This would not provide adequate time for preparation. Earthquakes of this magnitude or higher would lead to massive structural failure of property on NEHRP C, D, E, and F soils. Dams, levees and revetments built on these poor soils would likely fail, representing a loss of critical infrastructure. These events could cause secondary hazards, including landslides and mudslides that would further damage structures. River valley hydraulic-fill sediment areas are also vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. Soil liquefaction would occur in water-saturated sands, silts or gravelly soils.

10.8 ISSUES

Important issues associated with an earthquake include but are not limited to the following:

- Over 78 percent of the planning area's building stock was built prior to 1994, when seismic provisions became uniformly applied through building code applications.
- Critical facility owners should be encouraged to create or enhance continuity of operations plans using the information on risk and vulnerability contained in this plan.
- Geotechnical standards should be established that take into account the probable impacts from earthquakes in the design and construction of new or enhanced facilities.
- Earthquakes could trigger other natural hazard events such as dam failures and landslides, which could severely impact the planning area.
- There are likely additional faults in or around King County that have not yet been discovered.

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- After a major seismic event, King County is likely to experience disruptions in the flow of goods and services due to the destruction of major transportation infrastructure across the broader region.
- Citizens are expected to be self-sufficient up to three days following a major earthquake without government response agencies, utilities, private sector services and infrastructure components. Education programs are currently in place to facilitate the development of individual, family, neighborhood and business earthquake preparedness. Government alone can never make this region fully prepared. It takes individuals, families, and communities working in concert with one another to truly be prepared for disaster.
- Natural hazards have a devastating impact on businesses. Of all businesses that close following a disaster, more than 43 percent never reopen, and an additional 29 percent close for good within the next two years. The Institute of Business and Home Safety has developed "Open for Business," which is a disaster planning toolkit to help guide businesses in preparing for and dealing with the adverse effects of natural hazards. The kit integrates protection from natural disasters into companies' risk reduction measures to safeguard employees, customers, and the investment itself. The guide helps businesses secure human and physical resources during disasters, and helps to develop strategies to maintain business continuity before, during, and after a disaster occurs.
- King County has over 114 miles of earthen levees and revetments on soft, unstable soil. These soils are prone to liquefaction, which would severely undermine the integrity of these facilities.
- A worst-case scenario would be the occurrence of a large seismic event during a flood or high-water event. Levee failures would happen at multiple locations, increasing the impacts of the individual events.
- Earthquakes could trigger other natural hazard events such as dam failures, landslides or volcanic activity, which could severely impact district facilities.

CHAPTER 11. FLOOD

King County prepared a comprehensive flood hazard management plan in 2006 that is the principal policy document for the King County Flood Control District. The plan was updated in 2013 and is the basis for much of the information contained in this chapter (King County, 2013c). The comprehensive flood hazard management plan is hereby linked to this regional hazard mitigation plan by reference.

11.1 GENERAL BACKGROUND

A floodplain is the area adjacent to a river, creek or lake that becomes inundated during a flood. Floodplains may be broad, as when a river crosses an extensive flat landscape, or narrow, as when a river is confined in a canyon.

When floodwaters recede after a flood event, they leave behind layers of rock and mud. These gradually build up to create a new floor of the floodplain. Floodplains generally contain accumulations of sand, gravel, loam, silt, and/or clay, often extending below the bed of the stream. These sediments provide a natural filtering system, with water percolating back into the ground and replenishing groundwater. These are often important aquifers, the water drawn from them being filtered compared to the water in the stream. Fertile, flat reclaimed floodplain lands are commonly used for agriculture, commerce and residential development.

Connections between a river and its floodplain are most apparent during and after major flood events. These areas form a complex physical and biological system that not only supports a variety of natural resources but also provides natural flood and erosion control. When a river is separated from its floodplain with levees and other flood control facilities, natural, built-in benefits can be lost, altered, or significantly reduced.

11.1.1 Measuring Floods and Floodplains

The frequency and severity of flooding are measured using a discharge probability, which is the probability that a certain river discharge (flow) level will be equaled or exceeded in a given year. Flood studies use historical records to determine the probability of occurrence for the different discharge levels. The flood frequency equals 100 divided by the discharge probability. For example, the 100-year discharge has a 1-percent chance of being equaled or exceeded in any given year. The “annual flood” is the greatest flood event expected to occur in a typical year. These measurements reflect statistical averages only; it is possible for two or more floods with a 100-year or higher recurrence interval to occur in a short time period. The same flood can have different recurrence intervals at different points on a river. For example, the 1990 flood event was a 100-year flood on the Snoqualmie River at Snoqualmie but a 50-year flood on some tributaries.

DEFINITIONS

Flood—The inundation of normally dry land resulting from the rising and overflowing of a body of water.

Floodplain—The land area along the sides of a river that becomes inundated with water during a flood.

100-Year Floodplain—The area flooded by a flood that has a 1-percent chance of being equaled or exceeded each year. This is a statistical average only; a 100-year flood can occur more than once in a short period of time. The 1-percent annual chance flood is the standard used by most federal and state agencies.

Return Period—The average number of years between occurrences of a hazard (equal to the inverse of the annual likelihood of occurrence).

Riparian Zone—The area along the banks of a natural watercourse.

The extent of flooding associated with a 1-percent annual probability of occurrence (the base flood or 100-year flood) is used as the regulatory boundary by many agencies. Also referred to as the special flood hazard area (SFHA), this boundary is a convenient tool for assessing vulnerability and risk in flood-prone communities. Many communities have maps that show the extent and likely depth of flooding for the base flood. Corresponding water-surface elevations describe the elevation of water that will result from a given discharge level, which is one of the most important factors used in estimating flood damage.

11.1.2 Floodplain Ecosystems

Floodplains can support ecosystems that are rich in plant and animal species. A floodplain can contain 100 or even 1,000 times as many species as a river. Wetting of the floodplain soil releases an immediate surge of nutrients: those left over from the last flood, and those that result from the rapid decomposition of organic matter that has accumulated since then. Microscopic organisms thrive and larger species enter a rapid breeding cycle. Opportunistic feeders (particularly birds) move in to take advantage. The production of nutrients peaks and falls away quickly, but the surge of new growth endures for some time. This makes floodplains valuable for agriculture. Species growing in floodplains are markedly different from those that grow outside floodplains. For instance, riparian trees (trees that grow in floodplains) tend to be very tolerant of root disturbance and very quick-growing compared to non-riparian trees.

11.1.3 Effects of Human Activities

Because they border water bodies, floodplains have historically been popular sites to establish settlements. Human activities tend to concentrate in floodplains for a number of reasons: water is readily available; land is fertile and suitable for farming; transportation by water is easily accessible; and land is flatter and easier to develop. But human activity in floodplains frequently interferes with the natural function of floodplains. It can affect the distribution and timing of drainage, thereby increasing flood problems. Human development can create local flooding problems by altering or confining drainage channels. This increases flood potential in two ways: it reduces the stream's capacity to contain flows, and it increases flow rates or velocities downstream during flood events. Human activities can interface effectively with a floodplain as long as steps are taken to mitigate the activities' adverse impacts on floodplain functions.

11.1.4 Federal Flood Programs

National Flood Insurance Program

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. For most participating communities, FEMA has prepared a detailed Flood Insurance Study. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-year flood). Base flood elevations and the boundaries of the 100- and 500-year floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principle tool for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program.

Participants in the NFIP must, at a minimum, regulate development in floodplain areas in accordance with NFIP criteria. Before issuing a permit to build in a floodplain, participating jurisdictions must ensure that three criteria are met:

- New buildings and those undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 100-year flood.

- New floodplain development must not aggravate existing flood problems or increase damage to other properties.
- New floodplain development must exercise a reasonable and prudent effort to reduce its adverse impacts on threatened salmonid species.

In participating communities, structures permitted or built in the planning area before NFIP and related building code regulations went into effect are called “pre-FIRM” structures, and structures built afterwards are called “post-FIRM.” The insurance rate is different for the two types of structures. Communities participating in the NFIP may adopt regulations that are more stringent than those contained in 44 CFR 60.3, but not less stringent. The Washington State Building Code Act requires new construction to be elevated to 1 foot above the base flood elevation or to the design flood elevation, whichever is higher. Some communities in King County have adopted more stringent standards. For example, a 3-foot freeboard (height above the 100-year flood elevation) is standard for most structures in unincorporated King County.

The most recent preliminary FIRMs in the County are dated February 1, 2013. These maps include revisions that were made as part of the 2013 Flood Insurance Study for some parts of the County: the Sammamish River and tributaries (Bear Creek, Evans Creek, North Creek, Swamp Creek); coastal areas (Vashon Island and mainland); and the White River (from a quarter mile downstream of Highway 410 near Enumclaw to the Outlet Works at Mud Mountain Dam). These preliminary FIRMs encompass changes that were made to the November 6, 2010 Flood Insurance Study that covers all floodplains in King County (King County, 2013).

King County and 34 of the 39 incorporated areas in the County are participants in NFIP; all are currently in good standing with the provisions of the NFIP. The five jurisdictions that do not currently participate in NFIP are Beaux Arts Village, Hunts Point, Maple Valley, Newcastle and Yarrow Point. Except for Newcastle, these communities have no special flood hazard areas.

In Washington State, the Department of Ecology is the coordinating agency for floodplain management. Ecology works with FEMA and local governments by providing grants and technical assistance, evaluating community floodplain management programs, reviewing local floodplain ordinances, and participating in statewide flood hazard mitigation planning. Compliance is monitored by FEMA regional staff and by Ecology. Maintaining compliance under the NFIP is an important component of flood risk reduction. All planning partners that participate in the NFIP have identified initiatives to maintain their compliance and good standing. Planning partners who do not currently participate have identified initiatives to consider enrollment in the program.

The Community Rating System

The CRS is a voluntary program within the NFIP that encourages floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions meeting the following three goals of the CRS:

- Reduce flood losses.
- Facilitate accurate insurance rating.
- Promote awareness of flood insurance.

For participating communities, flood insurance premium rates are discounted in increments of 5 percent. For example, a Class 1 community receives a 45-percent premium discount, and a Class 9 community receives a 5-percent discount. (Class 10 communities are those that do not participate in the CRS; they receive no discount.) The CRS classes are based on 18 creditable activities in the following categories:

- Public information
- Mapping and regulations
- Flood damage reduction
- Flood preparedness.

Figure 11-1 shows the nationwide number of CRS communities by class as of March 2014, when there were 1,296 communities receiving flood insurance premium discounts under the CRS program. Although CRS communities represent only 5 percent of the over 22,000 communities participating in the NFIP, more than 67 percent of all flood insurance policies are written in CRS communities. CRS activities can help to save lives and reduce property damage.

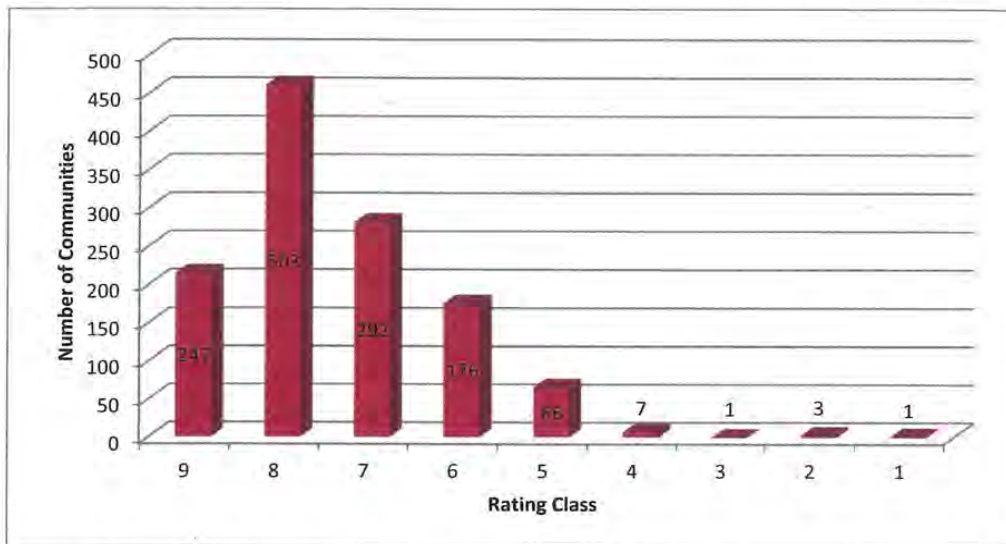


Figure 11-1. CRS Communities by Class Nationwide as of May 2014

King County and the cities of Auburn, Bellevue, Issaquah, Kent, North Bend, Renton and Snoqualmie currently participate in the CRS program. Their CRS status is summarized in Table 11-1. The total annual savings on flood insurance premiums within the planning area is \$1.33 million. Many of the mitigation actions identified in Volume 2 of this plan are creditable activities under the CRS program. Therefore successful implementation of this plan offers the potential for these communities to enhance their CRS classifications and for currently non-participating communities to join the program.

National Flood Insurance Program Biological Opinion

Background

On September 22, 2008, NOAA Fisheries issued a biological opinion that implementing the NFIP causes risk to several Endangered Species Act and Magnuson-Stevens Act listed Puget Sound salmonids and southern resident orca whales, as well as adverse modification of their habitat. NOAA Fisheries drafted the biological opinion following consultation with FEMA, in accordance with the judicial order for *National Wildlife Federation v. FEMA* (U.S. District Court for the Western District of Washington 2004).

**TABLE 11-1.
CRS COMMUNITY STATUS IN THE PLANNING AREA**

Community	NFIP Community #	CRS Entry Date	Current CRS Classification	% Premium Discount, SFHA/non-SFHA	Total Premium Savings
King County	530071	10/01/91	2	40/10	\$741,962
Auburn	530073	10/01/92	5	25/10	\$27,240
Bellevue	530074	10/01/92	5	25/10	\$36,778
Issaquah	530079	10/01/92	5	25/10	\$67,494
Kent	530080	05/01/2010	6	20/10	\$214,942
North Bend	530085	10/01/1995	6	20/10	\$60,690
Renton	530088	10/01/1994	6	20/10	\$31,436
Snoqualmie	530090	10/01/1992	5	25/10	\$149,367
Total					\$1,329,909

Reasonable and Prudent Alternative

Analysis focused on three elements of the NFIP—floodplain mapping, minimum floodplain management criteria, and the Community Rating System. The intent was to assess whether activities carried out under the NFIP lead to habitat changes that adversely affect listed species and their critical habitat. The biological opinion establishes seven elements of a Reasonable and Prudent Alternative to modify implementation of the NFIP in a manner that would reduce the risk to a level that may affect, but would not be likely to adversely affect, the listed species:

- **Reasonable and Prudent Alternative Element 1, Notification of Consultation Outcome**—FEMA is required to notify all communities that participate in the NFIP that development under the program could cause risk to several Endangered Species Act and Magnuson-Stevens Act listed Puget Sound salmonids and southern resident orca whales as well as adverse modification of their habitat.
- **Reasonable and Prudent Alternative Element 2, Mapping**—FEMA should only process Letters of Map Change addressing manmade alterations after determining that the alteration avoids habitat function changes or mitigates for those impacts. FEMA must also ensure that floodplain modeling incorporates on-the-ground data to increase the accuracy of maps depicting the floodplain and considers future conditions and cumulative effects from future land-use changes, including the risk of flooding behind 100-year levees.
- **Reasonable and Prudent Alternative Element 3, Floodplain Management Criteria**—This element describes land use and development criteria for development within mapped floodplains.
- **Reasonable and Prudent Alternative Element 4, Community Rating System**—FEMA will change the credit given under the CRS to incorporate habitat-based objectives. King County should benefit greatly under these changes because of the County's strong environmental protection policies, regulations, programs and projects.
- **Reasonable and Prudent Alternative Element 5, Addressing the Effects of Levee Vegetation Maintenance and Certain Types of Construction in the Floodplain**—FEMA shall not recognize levees that are certified by the U.S. Army Corps of Engineers using Public

Law 84-99 vegetation standards unless it is demonstrated that the standard will not adversely affect species or their habitat. King County and other jurisdictions in the Puget Sound region, as well as other communities on the west coast, are working with the U.S. Army Corps of Engineers to modify the Corps' levee vegetation standards for participation in the PL 84-99 program or to allow regional variances to those standards.

- **Reasonable and Prudent Alternative Element 6, Floodplain Mitigation Activities**—Any development in floodplains that degrades channel or floodplain habitat and occurs prior to full implementation of Elements 2, 3 and 5 must provide mitigation.
- **Reasonable and Prudent Alternative Element 7, Monitoring and Adaptive Management**—FEMA is required to report annually to NOAA Fisheries regarding progress on implementing the Reasonable and Prudent Alternative elements. NOAA Fisheries will determine, in coordination with FEMA, if some alternative actions or additional changes in the Reasonable and Prudent Alternative elements are needed to avoid risk and adverse modification of critical habitat.

Effect of Biological Opinion on NFIP Communities

The Reasonable and Prudent Alternative element that most significantly impacts local jurisdictions is Element 3: Floodplain Management Criteria. Under that element, FEMA must modify its floodplain management criteria as soon as possible to require NFIP communities to do the following:

- Carry out at least one of the following measures:
 - 1) Allow no development in the riparian buffer zone, identified as the greater of the channel migration zone plus a 50-foot buffer, the riparian buffer width specified by stream type, or the floodway.
OR
 - 2) Demonstrate to FEMA that proposed riparian buffer zone development does not adversely affect salmon habitat needs.
- In addition to either 1 or 2 above, carry out at least one of the following measures:
 - 1) Prohibit development in the 100-year flood floodplain.
OR
 - 2) Avoid, rectify or compensate for any loss of floodplain storage and fish habitat from development in the 100-year floodplain outside the riparian buffer zone. Any development allowed must use low impact development methods to minimize or avoid stormwater effects. Any indirect adverse effects must be mitigated.
OR
 - 3) Mitigate adverse effects on fish or their habitats from structural improvements or repairs resulting in greater than 10-percent increase in structure footprint.

Local Response to Biological Opinion

More than 120 communities in the Puget Sound region are affected by FEMA's response to the biological opinion. These communities have been divided into three tiers:

- Tier One communities, which include King County, must restore fish populations to a low extinction risk status because their contribution to the abundance, diversity, spatial structure and productivity of the evolutionary significant unit or distinct population segment is critical.

- Tier Two communities may have traits that are important to evolutionary significant unit or distinct population segment viability, but their contribution is less critical.
- All other Puget Sound NFIP communities are in Tier Three.

FEMA has identified three options for NFIP communities to document compliance with the biological opinion:

- Option 1—Adopt the model ordinance developed by FEMA.
- Option 2—Complete a FEMA-developed checklist to document that local regulations and best available science will reduce risk to a level that may affect, but is not likely to adversely affect the listed species.
- Option 3—Perform a case-by-case habitat assessment for development within the mapped 100-year floodplain.

King County selected Option 2 by preparing a programmatic habitat assessment to demonstrate its compliance with the Reasonable and Prudent Alternative elements. This document provides a broad description of salmonid habitat within main stem rivers, streams and lakes, along saltwater shorelines, and in the associated 100-year floodplains. The document identifies the Endangered Species Act- or Magnuson-Stevens Act-listed salmonid species that occupy these areas, and estimates the probable biological effects resulting from development after implementing all of King County's regulatory and non-regulatory programs that are aimed at protecting and restoring these habitats. The assessment was performed at the programmatic level following guidance from FEMA's Floodplain Habitat Assessment and Mitigation: Draft Regional Guidance (FEMA 2011).

Using NOAA Fisheries' matrix of pathways and indicators to summarize the environmental parameters affecting Endangered Species Act-listed salmonids, King County assessed current conditions of all the indicators as either "not properly functioning" or "at risk" given the legacy of past land uses. King County does not anticipate additional degradation of any of these pathways and indicators; instead, they are likely on an improving trajectory due to a combined effort of regulations and non-regulatory protection and restoration actions. However, it will likely take years or decades for conditions to change to the point of being considered "restored" under NOAA Fisheries criteria. As a result, King County conservatively anticipates that the conditions are expected to be maintained. Consequently, although the biological opinion establishes a take exemption of 44.16 acres per year for King County, the assessment is that take will not occur, although there may be some minor changes in land use based on development potential in the floodplain. Take, as defined by the Endangered Species Act, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

Development in unincorporated King County is subject to a range of recently updated shoreline, critical area, clearing and grading, and stormwater regulations, all of which were developed through substantial use of best available science as required under the Washington State Shorelines and Growth Management Acts. Furthermore, as noted in the biological opinion, the County's floodplain regulations exceed the minimum requirements of the NFIP. Taken together with non-floodplain regulations and a wide range of King County programmatic actions—such as the transfer of development rights program, open space acquisitions, ecological restoration projects, and low density zoning—the floodplain regulations "minimize the effects of floodplain development on fish habitat and habitat forming processes" (NOAA Fisheries, 2008). The programmatic habitat assessment and evaluation of potential future development impacts confirms NOAA Fisheries' conclusion and further demonstrates that future development impacts may affect but are not likely to adversely affect protected species in King County's watersheds.

11.1.5 Protection of the Floodplain Environment

Protection of biological resources within floodplains is important to King County. Through comprehensive planning, critical areas ordinances, open space planning, participation in regional planning initiatives such as the Puget Sound Partnership, proactive land use regulations, and property acquisitions that have identified critical habitat to be preserved, King County established a diverse inventory of preserve areas that maintain the natural and beneficial functions of the floodplain. These efforts have resulted in a floodplain that is predominantly free of high-density development. Key parks and preserve areas that promote the natural and beneficial functions of floodplains within the planning area are described in the following sections.

Green River Natural Resources Area

The 922-acre Green River Natural Area extends slightly north from the edge of the Enumclaw Plateau. It is about 7 miles east of Auburn along State Route 164 and roughly 6 miles northwest of Enumclaw. The natural area consists of the former Metzler, O'Grady and Green River Waterway Parks, all adjacent to the Green River. The King County Department of Natural Resources and Parks acquired the parcels between 1973 and 2003 with funds from a variety of sources.

Steep valley walls and a broad valley floor combine to create rich mosaics of plant communities that characterize the natural area. Mixed forest and deciduous upland forests cover much of the valley wall, with several forested and scrub-shrub wetlands nestled in the benches. Gallery cottonwood forests, deciduous forests, meadows (old pasture/agricultural fields), and forested, scrub-shrub, and emergent wetlands are common on the valley bottom. Native plant installation and invasive plant control enhancement efforts have occurred, along with streambed restoration projects focused on improving salmonid habitat. Several of these wetlands form the headwaters of short tributaries to the Green River. The lower reaches of the wall-based streams in this area are used for spawning by coho and chum and for rearing by chinook, coho, chum and winter steelhead. Cutthroat trout have also been reported.

Visitors to Green River Natural Area engage in activities such as walking, bicycling, nature observation and horseback riding, as well as fishing and river running activities such as rafting, tubing and kayaking. The O'Grady public access point is 500 feet north of the intersection of SE 373rd Street and 188th Avenue SE, Auburn, and the Metzler public access point is via a gravel road on the south side of SE Green Valley Road 2 miles west of its intersection with 218th Avenue. Other sections of the natural area have little use due to limited access. The site is managed for the protection of its ecological value. Public access that does not harm the ecological value of the site is accommodated.

Griffin Creek Natural Area

The Griffin Creek Natural Area covers about 46 acres of forestland on non-contiguous parcels between Carnation and Fall City. These sites are adjacent to the Carnation-Fall City Road (State Highway 203) and the Snoqualmie Valley Regional Trail. Griffin Creek, a King County Class I stream system, provides significant habitat for a number of salmonids including coho and steelhead, as well as some of the most concentrated coho spawning densities in the Snoqualmie River system. Griffin Creek Natural Area also provides low-impact passive recreation, interpretive and educational opportunities.

The northern parcel, over 27 acres of forest and former pasture lands, is bisected by the Snoqualmie Valley Regional Trail and is directly adjacent to the Archdiocese of Seattle's Camp Don Bosco. This parcel's proximity to the creek, forest lands, and regional trail will provide excellent opportunities for habitat protection as well as for continued low-impact passive recreation. The 19-acre southern group of small holdings is roughly three-quarters of a mile upstream, isolated and undeveloped.

Significant resources at Griffin Creek include:

- Griffin Creek, a King County Class I stream system, which provides significant habitat for a number of salmonids including coho and steelhead as well as some of the most concentrated coho spawning densities in the Snoqualmie River system.
- Habitat for terrestrial and aquatic wildlife, including native amphibians.
- Beaver ponds in the creek's main stem.
- Opportunities for the restoration of natural floodplain features as well as enhancement of in-stream and riparian habitats.
- Natural terraced topography that provides varied levels of public access and potential for restoration.
- Passive recreational, interpretive and educational opportunities adjacent to the Snoqualmie Valley Trail.

Mouth of Taylor Reach Natural Area

Mouth of Taylor Reach Natural Area consists of nearly 8 acres of open space at the mouth of Taylor Creek in unincorporated King County, approximately 5 miles southeast of Renton and 1.5 miles north of Maple Valley. The properties were acquired as part of the Cedar River Legacy program to protect and restore habitat. The primary restoration goal of the Mouth of Taylor Reach Natural Area is to establish a better connection between the channel and the floodplain. The Lower Cedar River Basin Plan, the Flood Hazard Reduction Plan, and the Water Resource Inventory Area 8 Draft Plan Framework and Preliminary Actions List contain a series of recommendations for levee setback and habitat restoration at or near the site. More in-depth analysis of historical river conditions, hydraulics and hydrology will be needed to determine the best approach for improving the channel-floodplain connection.

Although parking is constrained (there is no parking area, but parking may occur along the road shoulders), certain parts of the site are appropriate for low-impact passive recreation such as walking or nature observation. The primary area for use is the upland area off Maxwell Road SE. Wetlands and backwater areas that run north-south on the property limit access to the Getchman levee, which runs along the Cedar River on the southern parcels. Dense shrub vegetation may limit access on portions of the site, in particular to the northern parcels on Maxwell Road and on SE 197th Place, where there are no trails through the vegetation into the parcels.

Big Bend and Landsburg Reach Natural Areas

Big Bend and Landsburg Reach Natural Areas are both located in the Landsburg Reach of the Cedar River, from River Mile 19.6 to River Mile 21.2. Big Bend consists of three parcels (96 acres) and Landsburg Reach Natural Area consists of nine parcels (24 acres). The sites are about a mile east of Maple Valley, near the Cedar River Watershed's western boundary at Landsburg Road SE. Portions of the sites are adjacent to the King County Cedar River Regional Trail, as well as to City of Seattle's Cedar River Pipeline Road, which is also used as a trail.

The sites span both sides of the Cedar River. The Walsh Lake Diversion Ditch flows through Big Bend Natural Area, and other side channels and valley floor wetlands occur on the natural area. This reach of the Cedar River contains high-bank bluffs noted for their contribution of gravel to the river. The sites support mixed coniferous/deciduous second-growth forest relatively mature in age, along with stands predominated by coniferous, deciduous, or wetland vegetation. Invasive vegetation is present particularly along disturbed portions of the Cedar River channel.

Pedestrians, bicyclists, and equestrians traveling the Cedar River Trail pass through Big Bend Natural Area along the regional trail corridor, to or from the trailhead parking a mile east at Landsburg Road SE. There are no other parking areas for these natural areas. The natural area itself (outside the Cedar River Trail) is primarily used by pedestrians and equestrians, who follow the informal trails extending from the Cedar River Trail. The riverfront is also used seasonally by boaters and fishermen. Landsburg Reach Natural Area supports little public use except for trail connections between nearby Danville/Georgetown trails and the Cedar River Pipeline Road. The Backcountry Horsemen and the Friends of Rock Creek Valley are key community partners at these sites, contributing significant time and energy to observing site and trail conditions, picking up litter, and other activities related to trails at the site.

Carnation Marsh Natural Area

The Carnation Marsh Natural Area is a 67-acre portion of the 190-acre Carnation Marsh wetland system along the Snoqualmie River. In 1992, King County received funds from an Aquatic Lands Enhancement Account grant to purchase the natural area. Carnation Marsh is rated as a Class 1 wetland in the King County Wetland Inventory. The marsh has direct hydrologic connection to the Snoqualmie River and provides significant storage for floodwaters. It is characterized by an abundance of large woody debris; a high diversity of woody vegetation, including mature trees and snags; and a complex hydrology supplied by valley floor springs, tributaries and seeps draining the west valley wall. Carnation Marsh is environmentally significant for a multitude of plant and animal species that use it for all or part of their life cycles. Carnation Marsh is 30 miles east of Seattle near the town of Carnation. The public can access this natural area for passive recreation and educational use via Highway 203 at West Snoqualmie Valley Rd. NE and NE 8th Street.

Ricardi Reach, Cedar Grove, and Jones Reach Natural Areas

Ricardi Reach Natural Area, Cedar Grove Natural Area, and Jones Reach Natural Area contain adjacent properties along the Cedar River. These natural areas are along the Ricardi and Jones Reaches of the Lower Cedar River. The sites are about 1.5 miles east of Renton's urban growth boundary and are bounded by the Cedar River Trail and SR 169 to the south. These three natural areas contain nearly 1.25 miles of contiguous forested habitat along the Cedar River. The riparian forest and associated wetlands provide habitat for a variety of wildlife and bird species.

Ricardi Reach Natural Area is 7.45 acres and consists of three contiguous parcels on the left bank (facing downstream) of the Cedar River between RM 7.7 and RM 7.4. The site is bounded by the Cedar River Trail to the south and the Cedar River to the north. A mobile home park lies just west of the site. Ricardi Reach Natural Area contains a 6-acre forested wetland along the Cedar River, including a side channel off the main stem. The site is mostly forested, with a dense shrub understory. Vegetation and wetlands limit access points from the Cedar River Trail, though there may be small informal trails into the site. There is no parking at the site.

Cedar Grove Natural Area is a 73-acre parcel on the left bank of the river between RM 9.3 and RM 7.8, also bounded by the Cedar River Trail to the south and meander bends of the Cedar River to the north. This area contains a 30-acre forested/scrub-shrub wetland and multiple side channels that convey river flow during times of high water. It contains typical riparian red alder and black cottonwood forest, with a smaller proportion of coniferous trees and a dense shrub understory. There is no parking area (although drivers sometimes park on the highway shoulder at this site, Washington State Department of Transportation typically prohibits parking along state highway shoulders). There is one main access point on the west edge of Cedar Grove Natural Area, where a short informal trail extends from the Cedar River Trail to the water. This trail experiences regular use by pedestrians to view the river.

Jones Reach Natural Area contains just under 3 acres of land on the right bank at RM 8.9. Jones Reach Natural Area is bounded by Jones Road to the northeast and the Cedar River to the southwest. It is on the extremely steep north valley wall along the Cedar River (40-percent slopes in some places). The steep slopes and lack of parking on the road shoulder limit safe public access to this site.

Middle Fork of the Snoqualmie Natural Area

The Middle Fork Snoqualmie Natural Area consists of almost 150 acres of forested land on four parcels on the south side of the Middle Fork of the Snoqualmie River, about 9 miles east of North Bend. The natural area is served by only one road, the Lake Dorothy Road, which crosses the western edge of the area then crosses the river at a concrete bridge. The Middle Fork Snoqualmie is a King County Class I river and a shoreline of statewide significance because of its flow. Although anadromous fish do not spawn or rear above Snoqualmie Falls, the Middle Fork Snoqualmie River supports a valuable non-anadromous recreational fishery of cutthroat and rainbow trout, as well as whitefish. Although current use of the entire Middle Fork Snoqualmie Natural Area is minimal, passive recreational users and anglers access the river and small sandy beach via an old road just downstream of the concrete bridge. Significant resources and public access opportunities at the natural area include the following:

- The Middle Fork of the Snoqualmie River, a King County Class I stream and shoreline of statewide significance.
- Granite Creek, a King County Class II, non-anadromous salmonid-bearing stream.
- Numerous unnamed perennial creeks that drain to the river and beaver ponds in backwater areas.
- Deciduous forested wetlands within the floodplain.
- Habitat for terrestrial and aquatic wildlife including bear, elk, cougar, and amphibian species.
- High quality, diverse habitat for a variety of resident and migratory bird species.
- Good river viewing and relatively easy foot access to the river at a site adjacent to the Lake Dorothy Road bridge.

11.2 HAZARD PROFILE

King County's floodplains reflect a geologic past that includes large-scale tectonic and volcanic processes that occurred over tens of millions of years, a period of extensive glaciation that ended about 15,000 years ago (Booth et al. 2003), and at least one major mudflow, the Osceola Mudflow, which occurred roughly 5,700 years ago. The tectonic and volcanic processes created large-scale landforms, such as the Cascade and Olympic Mountain ranges, the Olympic Peninsula, and Puget Sound. The more recent glaciers and mudflows shaped many of the lowland surface features apparent today, including the topography and soils of King County's lowland river valleys. The Osceola Mudflow, which occurred when a flank of Mount Rainier collapsed, released sediment that filled the White River Basin to a depth of 75 feet and eventually settled in the lower Green River valley, converting it from an arm of Puget Sound to the fertile, low-gradient valley that it is today (Booth et al. 2003). These processes and events influenced the length, width, steepness, and sediment load and channel forms of King County's large rivers.

The headwaters and middle reaches of rivers in King County are typically steep and dominated by bedrock and boulders. In these areas, floodplains are often narrow or absent. When these rivers eventually reach the Puget Sound lowlands, they flatten out, deposit sediments, and form floodplains that are often broad, ecologically complex, and biologically productive.

In the relatively brief time since Euro-American settlement began in the Puget Sound basin, the region's floodplains have been altered extensively by development. Initially these changes were caused by land clearing and installation of drainage systems that supported land uses such as farming, mining, and railroad transportation. Despite the relatively small population of settlers in the region, major changes occurred at an accelerating pace, including conversion of forested and vegetated floodplains to farmland, removal of woody debris from stream and river channels, channelization and bank armoring, rerouting of major rivers, and the construction of dams for water supply, flood control, or hydropower.

These activities changed, often radically, the nature of King County rivers. The filling or disconnection of river side channels caused substantial losses of floodwater conveyance and habitat. Bank stabilization, typically using large, angular rock, reduced or eliminated natural riparian structures. Channel roughness was reduced and erosive water velocities increased. Large dams reduced peak flood flows and disrupted the natural flow of sediment and woody debris. Cumulatively, these actions changed many miles of rivers from hydraulically complex, multiple-thread or braided channels to higher-energy, flume-like, single-thread channels, sometimes in a matter of years. More recently, intensive residential, commercial and industrial land uses have come to occupy the downstream portions of King County's river valleys, exacerbating floodplain management conflicts and costs. It is in these flat, lowland floodplain areas that human development and flooding coincide, posing some of the greatest management challenges.

11.2.1 Types of Flood Related Hazards

Flooding in the planning area typically occurs after the Cascades experience large, wet and warm weather systems after winter snow pack has accumulated. Thus, most flooding in the planning area occurs during the winter months. During these flood events, river channels can be overwhelmed in hours, although water levels typically build over one to three days. Three types of flooding primarily affect King County: riverine, coastal and urban flooding.

Riverine Flooding

Riverine flooding is the overbank flooding of rivers and streams. The natural processes of riverine flooding add sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers. Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas that are inundated by the 100-year flood with flood depths of only 1 to 3 feet. These areas are generally flooded by low velocity sheet flows of water. Two types of flood hazards are generally associated with riverine flooding:

- **Inundation**—Inundation occurs when there is floodwater and debris flowing through an area that is not normally covered by water. Such events cause minor to severe damage, depending on the velocity and depth of flows, the duration of the flood event, the quantity of logs and other debris carried by the flows, and the amount and type of development and personal property along the floodwater's path.
- **Channel Migration**—Channel migration is erosion that results from the wearing away of banks and soils due to flowing water. This erosion, combined with sediment deposition, causes the migration or lateral movement of a river channel across a floodplain. A channel can also move by abrupt change in location, called avulsion, which can shift the channel location a large distance in as short a time as one flood event.

Urban Flooding

In urbanized areas of the County, localized or urban flooding not associated with stream overflow can occur where there are no drainage facilities to control flows or when runoff volumes exceed the design capacity of drainage facilities. As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization of a watershed changes the hydrologic systems of the basin. Heavy rainfall collects and flows faster on impervious concrete and asphalt surfaces. The water moves from the clouds to the ground and then into streams at a much faster rate in urban areas. Adding these elements to the hydrological systems can result in floodwaters that rise very rapidly and peak with violent force. During periods of urban flooding, streets can become swiftly moving rivers and basements can fill with water. Storm drains often back up with vegetative debris, causing additional, localized flooding. Urban flooding issues are generally addressed through stormwater management plans at the local level.

Coastal Flooding

Coastal flooding is the result of storm surges and tides. Maximum flood levels occur when high tides coincide with peak storm surges. The severity of coastal flooding varies with flood depths, wave effects and debris impacts. Wave pounding exerts substantial forces on structures. Frequent pounding by waves may destroy structures not designed to withstand wave forces. Wave action may also destroy structures by erosion that undermines foundations. Debris impacts can greatly increase damage as well (EMD, 2013).

11.2.2 Principal Flooding Sources

King County covers six drainage basins and coastal flood hazard areas, as described below.

South Fork Skykomish River Basin

The South Fork Skykomish River basin lies primarily in the northeast portion of King County and is a part of Water Resource Inventory Area 7. The King County portion of the South Fork Skykomish drains 234 square miles of mountainous terrain within the forest production zone and Alpine Lakes Wilderness Area. Major tributaries in King County include the Foss, Tye, Miller, and Beckler Rivers. There are no significant dams or reservoirs on the South Fork Skykomish or its tributaries. With its steep upper basin slopes in high elevation terrain forming the entire watershed, significant runoff can be delivered directly to the flood hazard management corridor along the South Fork Skykomish. Precipitation at these high elevations can generate flooding from rain-on-snow events.

Snoqualmie River Basin

The Snoqualmie River basin in northeast King County drains to the Snohomish River and ultimately to Puget Sound. It is a part of Water Resource Inventory Area 7. The watershed includes the Tolt River, the Raging River, Tokul Creek, Griffin Creek, Harris Creek, Patterson Creek and other tributaries. With the geologic segmentation of Snoqualmie Falls, the Snoqualmie River basin can be divided into two components: the Upper Snoqualmie and the Lower Snoqualmie.

Upper Snoqualmie River

There are no significant dams on the upper Snoqualmie River to regulate flood flows. All three forks of the Snoqualmie River are relatively steep and confined through most of their course upstream of the confluence area. The combination of no flood control impoundments and steep, confined upstream channels that open to lower-gradient floodplains creates widespread risk of inundation and channel migration during winter. Rain-on-snow events can have a significant effect in this unregulated system since the headwaters are in the high elevations of the Cascades.

Lower Snoqualmie River

With headwaters and much of the eastern basin in the Cascades and a drainage area of about 600 square miles at Carnation, the lower Snoqualmie River typically responds to winter rains with flood levels that rise and fall slowly and steadily. The low-gradient channel of the lower Snoqualmie meets the relatively steeper and faster-responding Skykomish River in Snohomish County, which can result in Skykomish River backwater influencing the lower Snoqualmie as far upstream as Duvall.

Sammamish River Basin

The Sammamish River originates at Lake Sammamish and drains a 240-square-mile watershed that includes 97 square miles of the Lake Sammamish basin, 50 square miles in the Bear Creek basin and 67 square miles of the combined Little Bear, North, and Swamp Creek basins. Water from the Lake Sammamish basin originally flowed into Lake Washington through the old Sammamish Slough, a widely meandering, low-gradient river bordered by extensive wetlands and floodplains. When Lake Washington was lowered by 9 feet after construction of the Lake Washington Ship Canal in 1912, property owners along the slough formed a drainage district to straighten and deepen the channel in order to reclaim the adjacent lands for agriculture. The U.S. Army Corps of Engineers completed river channelization in 1966 and constructed a low weir at the outlet of Lake Sammamish. The weir outlet slows release from Lake Sammamish during low-flow periods. During high flows, the weir is completely submerged by the river, acting as an uncontrolled spillway. The project was designed to pass approximately a 40-year springtime flood—equivalent to a 10-year winter storm—over the weir without the water surface elevation in Lake Sammamish exceeding 29.0 feet. The project has significantly reduced the frequency and severity of flooding risks around the lake and adjacent to the river.

Cedar River Basin

The Cedar River flows west and north from the Cascade Mountains into the south end of Lake Washington. The Cedar River is approximately 36 miles long from its mouth at Lake Washington in the City of Renton to Chester Morse Lake. The hydrology and hydraulics of the Cedar River basin have been substantially altered from natural conditions. The lowest mile of the river was rerouted by the U.S. Army Corps of Engineers in 1914 in order to provide additional water for operation of the locks between Lake Washington and Puget Sound. The mouth of the Cedar River, which previously drained to the Black River and subsequently the Green River and into Puget Sound, was diverted into Lake Washington through a straightened, dredged channel with rock-stabilized banks. In the upper Cedar River watershed, the City of Seattle operates three dams designed for municipal water supply and hydropower purposes:

- The rock-fill, timber-structured Crib Dam was constructed in 1903 and rebuilt as the Overflow Dike in 1987 at the outlet of what is now Chester Morse Lake.
- Masonry Dam controls storage capacity in Chester Morse Lake and the outflows used to produce hydroelectric power. The Masonry Dam was not designed or built to serve as a flood control dam, but in addition to its hydropower generation and water supply functions, it has the capacity to store up to 15,000 acre-feet of floodwater. However, flood-prone areas downstream remain vulnerable to severe flood risks.
- Eleven miles farther downstream is the Landsburg Diversion, constructed in 1899, which diverts municipal and industrial water supply for the City of Seattle.

Green River Basin

The Green/Duwamish River is a 93-mile long river system that originates in the Cascade Mountains at an approximate elevation of 4,500 feet and is entirely within King County. The headwaters are in the vicinity of Blowout Mountain and Snowshoe Butte, about 30 miles northeast of Mount Rainier. The river basin is

part of Water Resource Inventory Area 9. The river flows through several cities, including Auburn, Kent, Renton, Tukwila and Seattle. The basin is divided into four subbasins: the upper watershed above Howard Hanson Dam; the middle Green; the lower Green; and the Duwamish estuary. The middle Green River runs from the outlet of the Green River Gorge at about River Mile 45 near Flaming Geyser down to Auburn at about River Mile 31. The lower Green River runs from Auburn down to the Duwamish River at River Mile 11.

Major structural flood risk reduction features along the Green River include Howard Hanson Dam in the upper watershed and the levee system that lines the riverbanks along much of the lower Green River and portions of the middle Green River. Howard Hanson Dam and the levee system combine to reduce flooding in the lower river to a fraction of its historical magnitude. The dam is designed to store over 100,000 acre-feet, converting large storm flows to a flow at the Auburn flow gage equivalent to the 2-year pre-dam event—12,000 cubic feet per second (cfs). The capacity of the leveed portion of the river is approximately 12,800 cfs, with approximately 2 feet of freeboard in most locations.

Since 1962, dam operations, in combination with the levees, have contained most major river flood events from Auburn downstream to the mouth of the Duwamish River. Prior to construction of the dam, the river exceeded the target 12,000 cfs 15 times between 1932 and 1962. It is estimated that without the dam, the flows on the Green River would have exceeded this flood threshold 17 to 22 times since 1962.

White River Basin

The White River originates in the glaciers on the northeast face of Mount Rainier. The White River drains an area of about 490 square miles, approximately 30 percent of which lies within King County. The White River flows from its headwaters to the northwest, where it is joined by its major tributaries, the Greenwater River and Boise Creek. It then turns south to join with the Puyallup River in Pierce County, which flows to its outlet in Puget Sound at Commencement Bay.

Historically, the bulk of what is now the lower White River flowed northward to the join the Green River near Auburn. By the early 1900s, legal intervention resulted in an Inter-County agreement and permanent diversion of the White River to flow south to the Stuck River and the Puyallup.

Mud Mountain Dam is a flood control dam near River Mile 30 that has had a significant effect on flooding in the White River since its completion in 1948. Puget Sound Energy's diversion of flows since 1912 for hydropower generation through Lake Tapps near River Mile 24 lowers the overall White River flow regime, although the effect has been insignificant with regard to flood magnitudes.

Above the dam, the entire watershed is largely undeveloped, although it includes some scattered residential and commercial property around the community of Greenwater. The river then flows through the White River canyon, a deep and generally undeveloped valley on the county line, and portions of the Muckleshoot Indian Tribe Reservation. Development generally is concentrated in the downstream end of the basin, where both industrial and residential land uses are common.

With headwaters on Mount Rainier glaciers, the White River experiences flow increases from snowmelt in late summer, but not to a level of flood concern. The primary determinant for flooding in the White River is operation of Mud Mountain Dam. The river basin is part of Water Resource Inventory Area 10.

Coastal Flood Hazard Areas

Coastal areas are subject to a variety of natural processes that present significant hazards to public safety and property, including storm surge flooding, waves, erosion, rainfall and wind. Coastal flood hazards with potential to impact the sheltered waters of King County include coastal flooding and coastal erosion.

Changes in sea level and climate change further increase the potential impact of these hazards. Coastal flooding results from high water and wave action produced by storm systems. Storm surges, also referred to as storm tides, can affect a number of beachfront areas in King County. Generally, storm surges are caused by an increase in the usual tide level by a combination of low atmospheric pressure and onshore winds. During a storm surge, water levels and waves may run significantly higher than the predicted tide level, and these higher waters may result in flooding and erosion.

Areas of coastline subject to wave attack are referred to as coastal high hazard zones. Factors that affect wave run-up include length of water over which wind blows, sustained wind velocity, coastal water depth, land slope and other coastline features. Much of the coastline along Des Moines is protected by a breakwater that extends north and south along the coast to protect the Des Moines Marina. The area west of this breakwater and the unprotected area north and south of the breakwater have been designated as coastal high hazard zones by FEMA. The unprotected sections of the coastline are subject to waves generated by high winds from a southwest direction across Puget Sound.

11.2.3 Past Events

On average, major floods in King County occur every two to five years. In past floods, water depths above grade have exceeded 6 feet in some residential areas. To date, major river flooding in King County has infrequently contributed to injury or loss of life; more typically, it results in property damage. There has been one documented flood-related fatality since 2006. Major flood events in King County have resulted in significant property damage. Table 11-2 lists severe flood events in King County. The January 1990 event is considered to be the flood of record for most of the county except along the Lower Snoqualmie and Tolt Rivers.

11.2.4 Location

Approximately 7.5 percent of the County is located within mapped 100-year floodplains. Flooding in King County has been documented by gage records, high water marks, damage surveys and personal accounts. This documentation was the basis for the April 19, 2005, Flood Insurance Study that is incorporated in the currently effective FIRMs. The FIRMs are the most detailed and consistent data source available for determining flood extent. The 2005 Flood Insurance Study is the sole source of data used in this risk assessment to map the extent and location of the flood hazard, as shown in Figure 11-2.

11.2.5 Frequency

King County has experienced 27 flooding events since 1965 that have resulted in federal disaster declarations and, on average, one episode of minor river flooding each winter. Large, damaging floods typically occur every two to five years. Urban portions of the county annually experience nuisance flooding related to drainage issues.

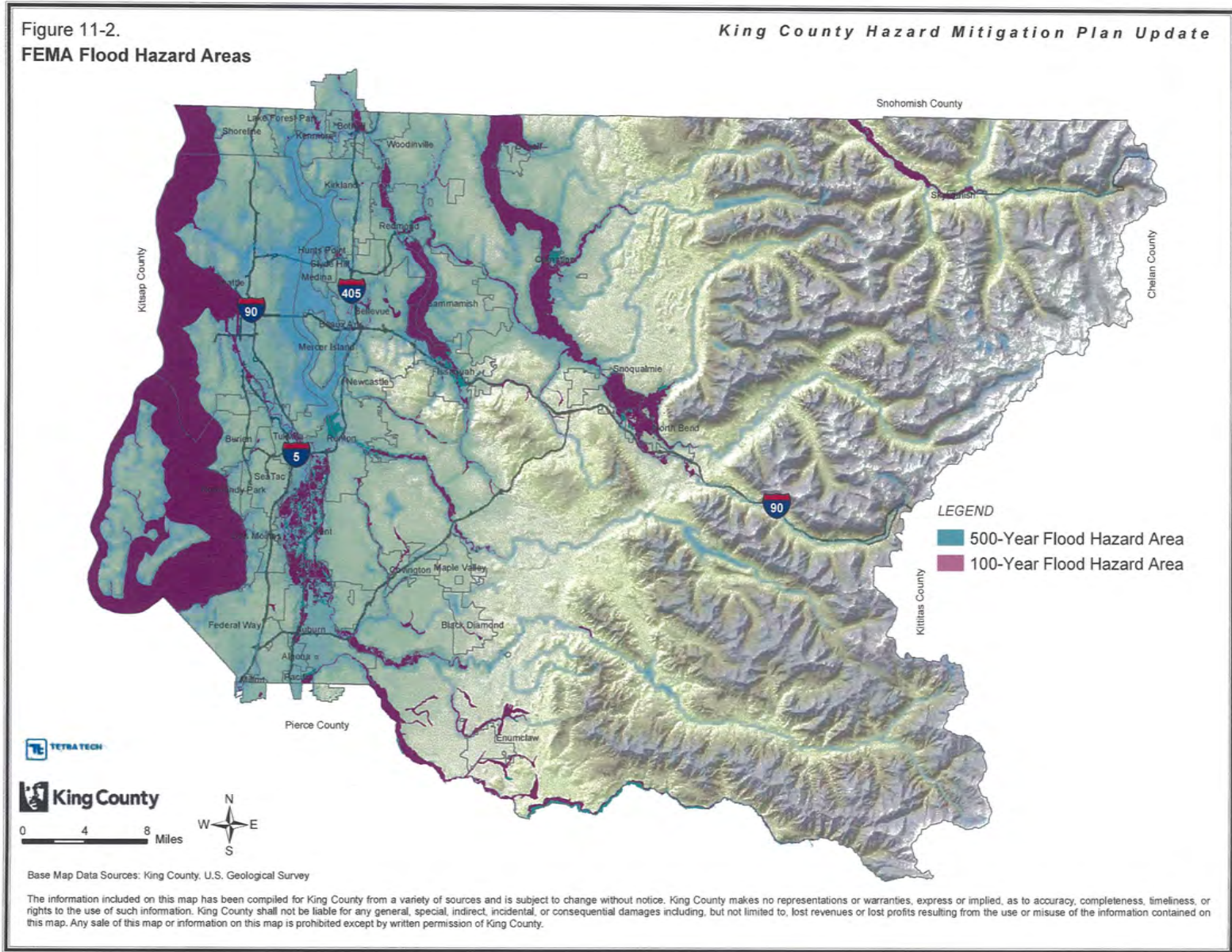
11.2.6 Severity

The principal factors affecting flood damage are flood depth and velocity. The deeper and faster flood flows become, the more damage they can cause. Shallow flooding with high velocities can cause as much damage as deep flooding with slow velocity. This is especially true when a channel migrates over a broad floodplain, redirecting high velocity flows and transporting debris and sediment. Flood severity is often evaluated by examining peak discharges; Table 11-3 lists peak flows used by FEMA to map the floodplains of King County.

FLOOD

**TABLE 11-2.
HISTORY OF FLOOD EVENTS**

Date	Declaration #	Type of event	Estimated Damage
12/29/64	DR 185	Heavy rains, flooding	N/A
03/24/72	DR 328	Heavy rains, flooding	N/A
12/13/75	DR 492	Severe storms, flooding	N/A
12/10/77	DR 545	Severe storms, mudslides, flooding	N/A
12/31/79	DR 612	Storms, high tides, mudslides, flooding	N/A
01/16/86	DR 757	Severe storms, flooding	\$294,117 (\$616,128)
11/22/86	DR 784	Severe storms, flooding	N/A
01/06/90	DR 852	Flooding, severe storm	\$5,246, 411 ^b
11/09/90	DR 883	Flooding, severe storm	\$3,694,824 ^b
12/20/90	DR 896	High tides, severe storm	\$477,737 ^b
11/07/95	DR 1079	Storms, high winds, floods	\$3,031,519 ^b
01/26/96	DR 1100	Severe storms, flooding	\$4,226,719 ^b
12/26/96	DR 1159	Severe storms, flooding, landslides and mudslides	\$3,576,309 ^b
03/18/97	DR 1172	Severe storms, flooding, landslides and mudslides	\$1,266,446 ^b
10/15/03	DR 1499	Severe storms, flooding	\$863,636 (\$1.0 million) ^a
11/02/06	DR 1671	Severe storms, flooding, landslides and mudslides	\$5,386,323 ^b
12/14/06	DR 1682	Severe Winter Storm, Landslides, and Mudslides	\$15,578,717 ^b
12/01/07	DR 1734	Severe storms, flooding, landslides and mudslides	\$5,123,841 ^b
12/12/08	DR 1825	Washington Severe Winter Storm and Record and Near Record Snow	\$7,606,550 ^b
02/27/09	DR 1817	Severe winter storm, flooding, landslides and mudslides	\$16,444,775
01/11/11	DR 1963	Severe winter storm, flooding, landslides and mudslides	N/A
01/14/12	DR 4056	Severe winter storm, flooding, landslides and mudslides	N/A
a. Data obtained from Spatial Hazard Events and Losses Database for the United States (SHELDUS)			
b. Information obtained from the 2013 King County Flood Hazard Management Plan-Update and Progress report			
N/A = Information is not available			



FLOOD

TABLE 11-3. KING COUNTY RIVER BASIN STREAM FLOW CHARACTERISTICS					
	USGS Station	River Mile	Drainage Area (square miles)	100-Year Flow (cfs)	Flood of Record Date; Peak Flow (cfs)
South Fork Skykomish River					
Gold Bar	12134500	43.0	535	119,300	11/6/2006; 129,000
Snoqualmie River Basin					
North Fork	12142000	9.2	64.0	18,000	1/7/09; 17,100 ^d
Middle Fork	12141300	55.6	154.0	37,100	11/6/2006; 31,700
South Fork	12143400	17.3	41.6	11,000	11/6/2006; 8,910
Snoqualmie @ Snoqualmie.	12144500	40.0	375	79,100	11/24/1990; 78,800
Snoqualmie @ Carnation	12149000	23	603.0	91,800	1/8/09; 83,400 ^c
Raging @ Fall City	12145500	2.75	30.6	6,970	11/24/1990; 6,220
North Fork Tolt	12147500	11.7	39.9	11,200	12/15/1959; 9,560
South Fork Tolt	12148000	6.8	19.7	8,720	12/15/1959; 6,500
Tolt @ Carnation	12148500	8.7	81.4	18,800	1/8/09; 17,900 ^c
Sammamish River Basin					
Sammamish River @ Mouth	12122000	5.6	99.6	4,300	1/1/1997; 2,870
Issaquah Creek @ Mouth	12121600	1.2	55.6	3,960	01/09/1990; 3,200
Cedar River basin					
Cedar Falls	12116500	33.2	84.2	8,030	11/24/1990; 12,300
Landsburg	12117500	23.4	121.0	10,300	11/18/1911; 14,200
Renton	12119000	1.6	184.0	12,000	11/24/1990; 10,600
Green River Basin					
Howard Hanson Dam	12105900	63.8	221.0	12,000 ^a	12/21/1960; 12,200 (pre-dam)
Auburn	12113000	32.0	399.0	12,000 ^a	11/23/1959; 28,100 (pre-dam)
Tukwila	12113350	NA	440.0	12,400	01/31/1965; 12,100
White River Basin					
Buckley	12098500	27.9	401.0	12,000 ^b	12/01/1933; 28,000 (pre-dam)
Auburn	12100496	6.30	464.0	15,500	02/10/1996; 15,000
Greenwater	12097500	1.10	73.5	6,7870	12/02/1977; 10,500
a. Flows regulated by Howard Hanson Dam b. Maximum release from Mud Mountain Dam c. Provisional USGS data					

11.2.7 Warning Time

Due to the sequential pattern of meteorological conditions needed to cause serious flooding, it is unusual for a flood to occur without warning. Warning times for floods can be between 24 and 48 hours. Flash flooding can be less predictable, but potential hazard areas can be warned in advanced of potential flash flooding danger.

Due to the extended precipitation needed to cause serious flooding, it is unusual for a flood to occur without warning. King County's flood-warning program warns of impending flooding on major rivers so residents and agencies can prepare before serious flooding occurs. In most locations, the warning system provides at least 2 hours of lead-time before floodwaters reach damaging levels. King County has an extensive flood warning capability that targets the six major river basins within the County, as described below.

The Flood Warning Center

The Flood Warning Center is the center of operations for the Flood Warning Program during flood events. The flood emergency director activates the Flood Warning Center whenever a river reaches Phase II of the four-phase flow-based flood warning alert system illustrated in Figure 11-3. At Phase III or greater, or at the flood emergency director's discretion, field inspection teams are sent out by the Flood Warning Center to monitor flood protection infrastructure and investigate potential flood risks.

Flood Alert System

Early flood warning notifications are critical in providing additional time for property owners, floodplain occupants and those responsible for their safety to respond to flood threats. The Flood Alert System was implemented to quickly and simultaneously send voice calls, text messages and emails to anyone who chooses to receive notifications. Subscribers can sign up for free flood alerts on a King County website or by phone. Messages are sent by King County staff using a software service when reliable river data is received that meets or exceeds Phase II, III and IV thresholds on individual rivers. Additionally, messages may be sent with flood-related emergency information.

The following is an example of a flood alert message:

“The Snoqualmie River has reached flood phase 2. Minor flooding is expected in low-lying areas. More information at www.kingcounty.gov/flood or 1-800-768-7932”

Subscribers have options to receive alerts regarding six different river systems using three separate phase thresholds on multiple phone, text and email contacts. Other agencies offer emergency notifications, including the U.S. Geological Survey. King County's flood alert website provides information on various notification systems to assist the public in selecting the services that are best suited to their needs. Multiple public outreach efforts are ongoing to encourage the public to sign-up for flood alerts. Currently the system has over 5,000 subscribers.

Coordination With Other Agencies

The Flood Warning Center works closely with The King County Office of Emergency Management, the Road Services Division, local jurisdictions and other agencies to obtain and share up-to-date information about major flood risks, road closures, evacuations and other emergency services. Coordination also occurs with the U.S. Army Corps of Engineers and Seattle Public Utilities regarding dam operations.

FLOOD

Phase	Tolt River (near Carnation)	Snoqualmie (Sum of forks)	Issaquah Creek (near Hobart)	Cedar River (Landsburg)	Green River (Auburn)	White River (near Buckley)
I	2,500 cfs	6,000 cfs	6.50 ft	1,800 cfs	5,000 cfs	5,000 cfs (Unless COE or NWS calls with specific info)
II	3,500 cfs	12,000 cfs	7.50 ft	2,800 cfs	7,000 cfs	8,000 cfs
III	5,000 cfs	20,000 cfs	8.50 ft	4,200 cfs	9,000 cfs	10,000 cfs
IV	8,500 cfs	38,000 cfs	9.00 ft	5,000 cfs	12,000 cfs	12,000 cfs

RECENT LARGE FLOOD PEAKS					
Tolt River (near Carnation)	Snoqualmie (Sum of forks)	Issaquah Creek (near Hobart)	Cedar River (Landsburg)	Green River (Auburn)	White River (near Buckley)
11,400 cfs 11/29/95	48,280 cfs 11/24/90	9.90 ft 11/24/90	10,800 cfs 11/24/90	11,500 cfs 11/24/90	14,100 cfs 1/9/90
11,800 cfs 12/15/99	53,500 cfs 11/6/06	9.73 ft 2/8/96	6,580 cfs 11/30/95	12,400 cfs 2/8/96	13,200 cfs 12/1/95
13,800 cfs 1/8/09	54,110 cfs 1/7/09	8.86 ft 1/8/09	7,870 cfs 1/8/09	12,200 cfs 11/7/06	11,700 cfs ¹ 11/9/06 and 1/9/09

¹ Based on Corps data on flow releases from Mud Mountain Dam.

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Figure 11-3. King County Flood Warning Phase Threshold and Flood Peak Summary

The King County Flood Warning Center has coordinated closely with the National Weather Service for many decades. The National Weather Service Seattle Forecast Office provides weather observations and forecasts for western Washington and issues warnings for many types of hazards, including floods, severe weather, windstorms, snowstorms and fire conditions. The National Weather Service issues a statement when heavy rain is expected to cause flooding or aggravate existing flood conditions. These statements are generally issued two to three days before the potential event. Flood watches for specific areas and rivers are issued one to two days before an event. Flood warnings are issued up to one day in advance when flooding is imminent. This applies to a specific river forecast point that is expected to exceed a flood stage based on predictive computer river modeling output, including dam operation information, and to other streams and urban areas. For large storms and major floods, the National Weather Service conducts direct Internet briefings and uses follow-up phone calls to King County. National Weather Service statements and information are communicated to other government agencies and the public via NOAA Weather Radio, radio and television, the Internet, telephone recordings and media outlets.

11.3 SECONDARY HAZARDS

The main secondary hazard for flooding is bank erosion, which in some cases can be more harmful than actual flooding. This is especially true in the upper courses of rivers with steep gradients, where floodwaters may pass quickly and without much damage, but scour the banks, edging properties closer to the floodplain or causing them to fall in. Flooding is also responsible for hazards such as landslides when high flows over-saturate soils on steep slopes, causing them to fail. Hazardous materials spills are also a secondary hazard of flooding if storage tanks rupture and spill into streams, rivers or storm sewers.

11.4 EXPOSURE

The Level 2 Hazus-MH protocol was used to assess the risk and vulnerability to flooding in the planning area. The model used census data at the block level and FEMA floodplain data, which has a level of accuracy acceptable for planning purposes. Where possible, the Hazus-MH default data was enhanced using local GIS data from county, state and federal sources.

11.4.1 Population

Population counts of those living in the floodplain in the planning area were generated by analyzing census blocks that intersect with the 100-year and 500-year floodplains identified on FIRMs. Census blocks do not follow the boundaries of the floodplain. Therefore, the methodology used to generate these estimates counted census block groups whose centers are in the floodplain or where the majority of the population most likely lives in or near the floodplain. Hazus-MH estimated the number of buildings within the floodplain in each block, and then estimated the total population by multiplying the number of residential structures by the average King County household size of 2.39 persons per household.

Using this approach, it was estimated that the exposed population for the entire county is 18,197 within the 100-year floodplain (0.90 percent of the total county population) and 22,857 within the 500-year floodplain (1.13 percent of the total). For unincorporated portions of the county, it is estimated that the exposed population is 1,946 within the 100-year floodplain (0.77 percent of the total unincorporated county population) and 2,140 within the 500-year floodplain (0.85 percent of the total).

11.4.2 Property

Structures in the Floodplain

Table 11-4 and Table 11-5 summarize the total area and number of structures in the floodplain by municipality. The Hazus-MH model determined that there are 6,469 structures within the 100-year floodplain and 10,235 structures within the 500-year floodplain. In the 100-year floodplain, about 32 percent of these structures are in unincorporated areas. Seventy-five percent are residential, and the balance are commercial, industrial or agricultural.

Exposed Value

Table 11-6 and Table 11-7 summarize the estimated value of exposed buildings in the planning area. This methodology estimated \$11.07 billion worth of building-and-contents exposed to the 100-year flood, representing 1.98 percent of the total assessed value of the planning area, and \$19.8 billion worth of building-and-contents exposed to the 500-year flood, representing 3.54 percent of the total.

FLOOD

TABLE 11-4. AREA AND STRUCTURES IN THE 100-YEAR FLOODPLAIN									
	Area in Floodplain (Acres)	Number of Structures in Floodplain							Total
		Residential	Commercial	Industrial	Agriculture	Religion	Government	Education	
Algona	0	0	0	0	0	0	0	0	0
Auburn	1,472	41	85	7	0	0	0	2	135
Beaux Arts Village	0	0	0	0	0	0	0	0	0
Bellevue	1,408	128	22	1	0	0	0	0	151
Black Diamond	80	0	0	0	0	0	0	0	0
Bothell	563	12	52	5	0	0	0	1	70
Burien	119	80	0	0	0	1	0	0	81
Carnation	236	64	3	1	0	0	0	1	69
Clyde Hill	0	0	0	0	0	0	0	0	0
Covington	213	22	4	0	0	0	0	0	26
Des Moines	239	36	2	0	0	0	0	2	40
Duvall	89	0	0	0	0	0	0	0	0
Enumclaw	147	0	0	0	0	0	0	0	0
Federal Way	136	24	0	0	0	0	0	0	24
Hunts Point	0	0	0	0	0	0	0	0	0
Issaquah	484	221	40	13	0	1	0	1	276
Kenmore	205	42	0	0	0	0	0	0	42
Kent	3,611	187	463	40	13	1	6	0	710
Kirkland	95	0	1	0	0	0	0	0	1
Lake Forest Park	14	29	1	0	0	0	0	0	30
Maple Valley	0	0	0	0	0	0	0	0	0
Medina	0	0	0	0	0	0	0	0	0
Mercer Island	0	0	0	0	0	0	0	0	0
Milton	79	26	3	1	0	0	0	0	30
Newcastle	11	0	0	0	0	0	0	0	0
Normandy Park	87	25	0	0	0	0	0	0	25
North Bend	1,194	588	127	15	0	4	9	12	755
Pacific	193	137	2	0	0	1	0	0	140
Redmond	1,361	11	62	3	0	0	0	0	76
Renton	1,074	55	75	5	0	0	1	0	136
Sammamish	2,208	134	0	0	0	0	0	0	134
SeaTac	75	2	2	0	0	0	0	0	4
Seattle	29,234	295	83	80	0	0	8	0	466
Shoreline	49	14	0	0	0	0	0	0	14
Skykomish	110	109	12	0	0	1	4	2	128
Snoqualmie	2,044	547	64	6	1	7	3	13	641
Tukwila	661	6	25	1	0	0	0	0	32
Woodinville	63	0	0	0	0	0	0	0	0
Yarrow Point	0	0	0	0	0	0	0	0	0
Unincorporated	83,137	2,024	36	7	2	0	3	0	2,072
Total	130,482	4,859	1,164	185	16	16	34	34	6,308

TABLE 11-5. AREA AND STRUCTURES IN THE 500-YEAR FLOODPLAIN									
	Area in Floodplain (Acres)	Number of Structures in Floodplain							Total
		Residential	Commercial	Industrial	Agriculture	Religion	Government	Education	
Algona	0	0	0	0	0	0	0	0	0
Auburn	1,959	125	146	23	0	0	0	2	296
Beaux Arts Village	0	0	0	0	0	0	0	0	0
Bellevue	1,445	127	22	1	0	0	0	0	150
Black Diamond	80	0	0	0	0	0	0	0	0
Bothell	582	14	52	5	0	0	0	1	72
Burien	159	227	0	0	0	1	0	0	228
Carnation	490	463	42	9	0	7	3	6	530
Clyde Hill	0	0	0	0	0	0	0	0	0
Covington	214	22	4	0	0	0	0	0	26
Des Moines	248	47	2	0	0	0	0	2	51
Duvall	98	0	0	1	0	0	0	0	1
Enumclaw	147	0	0	0	0	0	0	0	0
Federal Way	159	38	0	0	0	0	0	0	38
Hunts Point	0	0	0	0	0	0	0	0	0
Issaquah	862	609	190	19	1	4	5	8	836
Kenmore	229	47	0	0	0	0	0	0	47
Kent	5,065	331	793	79	15	2	8	4	1,232
Kirkland	95	0	1	0	0	0	0	0	1
Lake Forest Park	14	29	1	0	0	0	0	0	30
Maple Valley	0	0	0	0	0	0	0	0	0
Medina	0	0	0	0	0	0	0	0	0
Mercer Island	0	0	0	0	0	0	0	0	0
Milton	99	33	4	1	0	0	0	0	38
Newcastle	12	0	0	0	0	0	0	0	0
Normandy Park	90	28	0	0	0	0	0	0	28
North Bend	1,283	588	130	15	0	4	9	12	758
Pacific	281	317	4	0	0	1	0	0	322
Redmond	1,508	11	90	9	0	1	3	0	114
Renton	2,101	913	243	28	0	5	4	3	1,196
Sammamish	2,208	134	0	0	0	0	0	0	134
SeaTac	82	2	3	0	0	0	0	0	5
Seattle	29,440	589	106	80	0	0	10	0	785
Shoreline	53	16	0	0	0	0	0	0	16
Skykomish	111	110	12	0	0	1	4	2	129
Snoqualmie	2,079	548	64	6	1	7	3	13	642
Tukwila	686	6	30	1	0	0	0	0	37
Woodinville	79	1	3	0	0	0	0	0	4
Yarrow Point	0	0	0	0	0	0	0	0	0
Unincorporated	85,928	2,265	41	8	6	0	4	1	2,325
Total	137,887	7,640	1,983	285	23	33	53	54	10,071

**TABLE 11-6.
VALUE OF STRUCTURES IN 100-YEAR FLOODPLAIN**

	Value Exposed			% of Total Assessed Value
	Structure	Contents	Total	
Algona	\$0	\$0	\$0	0.00%
Auburn	\$411,707,349	\$406,167,669	\$817,875,017	4.55%
Beaux Arts	\$0	\$0	\$0	0.00%
Bellevue	\$177,903,677	\$138,806,964	\$316,710,641	0.64%
Black Diamond	\$0	\$0	\$0	0.00%
Bothell	\$362,519,629	\$375,933,302	\$738,452,931	14.52%
Burien	\$20,878,299	\$12,685,111	\$33,563,410	0.37%
Carnation	\$28,574,984	\$21,276,841	\$49,851,825	15.18%
Clyde Hill	\$0	\$0	\$0	0.00%
Covington	\$6,209,083	\$4,169,400	\$10,378,483	0.36%
Des Moines	\$42,115,261	\$22,133,285	\$64,248,546	1.12%
Duvall	\$0	\$0	\$0	0.00%
Enumclaw	\$0	\$0	\$0	0.00%
Federal Way	\$4,502,609	\$2,251,305	\$6,753,914	0.04%
Hunts Point	\$0	\$0	\$0	0.00%
Issaquah	\$162,812,100	\$131,248,996	\$294,061,096	3.07%
Kenmore	\$8,179,446	\$4,089,723	\$12,269,169	0.31%
Kent	\$2,458,097,904	\$2,397,209,118	\$4,855,307,022	14.63%
Kirkland	\$9,403,641	\$9,403,641	\$18,807,282	0.08%
Lake Forest Park	\$8,410,610	\$4,441,048	\$12,851,658	0.58%
Maple Valley	\$0	\$0	\$0	0.00%
Medina	\$0	\$0	\$0	0.00%
Mercer Island	\$0	\$0	\$0	0.00%
Milton	\$5,269,700	\$2,634,850	\$7,904,550	1.40%
Newcastle	\$0	\$0	\$0	0.00%
Normandy Park	\$5,951,156	\$2,975,578	\$8,926,734	0.68%
North Bend	\$266,769,190	\$209,843,232	\$476,612,422	32.79%
Pacific	\$26,210,249	\$13,379,670	\$39,589,919	4.78%
Redmond	\$257,373,349	\$251,016,037	\$508,389,386	2.19%
Renton	\$550,250,735	\$550,245,491	\$1,100,496,226	4.26%
Sammamish	\$44,235,226	\$22,117,613	\$66,352,839	0.71%
SeaTac	\$509,910	\$366,251	\$876,161	0.01%
Seattle	\$344,329,867	\$318,907,453	\$663,237,320	0.31%
Shoreline	\$2,902,641	\$1,451,320	\$4,353,961	0.04%
Skykomish	\$31,323,663	\$23,672,424	\$54,996,086	73.59%
Snoqualmie	\$224,779,632	\$189,496,963	\$414,276,595	18.03%
Tukwila	\$140,044,318	\$140,367,907	\$280,412,226	2.41%
Woodinville	\$0	\$0	\$0	0.00%
Yarrow Point	\$0	\$0	\$0	0.00%
Unincorporated	\$353,718,632	\$188,865,256	\$542,583,888	1.21%
Total	\$5,954,982,860	\$5,445,156,448	\$11,400,139,307	2.33%

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

**TABLE 11-7.
VALUE OF STRUCTURES IN 500-YEAR FLOODPLAIN**

	Value Exposed			% of Total Assessed Value
	Structure	Contents	Total	
Algona	\$0	\$0	\$0	0.00%
Auburn	\$631,703,751	\$620,251,194	\$1,251,954,945	10.14%
Beaux Arts	\$0	\$0	\$0	0.00%
Bellevue	\$178,329,780	\$139,020,015	\$317,349,796	0.65%
Black Diamond	\$0	\$0	\$0	0.00%
Bothell	\$362,519,629	\$375,933,302	\$738,425,931	14.53%
Burien	\$55,207,842	\$29,849,882	\$85,057,725	0.93%
Carnation	\$125,303,729	\$91,359,336	\$216,663,065	65.97%
Clyde Hill	\$0	\$0	\$0	0.00%
Covington	\$6,209,083	\$4,169,400	\$10,378,483	0.36%
Des Moines	\$44,226,001	\$23,188,655	\$67,414,656	1.17%
Duvall	\$446,448	\$669,672	\$1,116,120	0.10%
Enumclaw	\$0	\$0	\$0	0.00%
Federal Way	\$8,879,160	\$4,439,580	\$13,318,739	0.07%
Hunts Point	\$0	\$0	\$0	0.00%
Issaquah	\$573,904,868	\$470,754,810	\$1,044,659,678	10.90%
Kenmore	\$9,394,053	\$4,697,027	\$14,091,080	0.35%
Kent	\$3,849,872,069	\$3,782,107,671	\$7,631,979,740	23.00%
Kirkland	\$9,403,641	\$9,403,641	\$18,807,282	0.08%
Lake Forest Park	\$8,410,610	\$4,441,048	\$12,851,658	0.58%
Maple Valley	\$0	\$0	\$0	0.00%
Medina	\$0	\$0	\$0	0.00%
Mercer Island	\$0	\$0	\$0	0.00%
Milton	\$6,422,646	\$3,211,323	\$9,633,970	2.87%
Newcastle	\$0	\$0	\$0	0.00%
Normandy Park	\$6,498,278	\$3,249,139	\$9,747,417	0.75%
North Bend	\$302,642,728	\$245,716,770	\$548,359,498	37.72%
Pacific	\$57,953,167	\$29,676,711	\$87,629,878	10.56%
Redmond	\$419,783,605	\$413,056,189	\$832,839,794	3.58%
Renton	\$1,718,390,761	\$1,642,153,577	\$3,360,544,338	13.01%
Sammamish	\$44,235,226	\$22,117,613	\$66,352,839	0.71%
SeaTac	\$581,415	\$437,756	\$1,019,171	0.01%
Seattle	\$495,555,561	\$404,116,690	\$899,672,250	0.42%
Shoreline	\$3,412,544	\$1,706,272	\$5,118,816	0.05%
Skykomish	\$31,440,884	\$23,731,034	\$55,171,918	73.83%
Snoqualmie	\$225,647,285	\$189,930,789	\$415,578,074	18.09%
Tukwila	\$165,016,102	\$165,339,691	\$330,355,794	2.84%
Woodinville	\$3,313,452	\$3,170,899	\$6,484,352	0.14%
Yarrow Point	\$0	\$0	\$0	0.00%
Unincorporated	\$408,428,035	\$220,674,791	\$629,102,825	1.41%
Total	\$9,753,132,353	\$8,928,574,477	\$18,681,679,832	3.81

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

Land Use in the Floodplain

Some land uses, such as single-family homes, are more vulnerable to flooding than others, such as agricultural land or parks. Table 11-8 shows the existing land use of parcels in the 100-year and 500-year floodplain, including vacant parcels and those in public/open space uses, broken down for the planning area. About 48 percent of the parcels in the 100-year floodplain are uncategorized uses, which contains many vacant, unimproved parcels and resource lands. These are favorable, lower-risk uses for the floodplain. The precise amount of the floodplain that contains vacant, developable land is not known. This would be valuable information for gauging the future development potential of the floodplain.

**TABLE 11-8.
PRESENT LAND USE WITHIN THE FLOODPLAIN**

Land Use	100-Year Floodplain		500-Year Floodplain	
	Area (acres)	% of Total Area	Area (acres)	% of Total Area
Agriculture	677	0.6%	677	0.6%
Church, Welfare or Religious Service	254	0.2%	276	0.2%
Commercial	6,784	6.4%	7528	6.8%
Education	505	0.5%	589	0.5%
Governmental Services	1,074	1.0%	1155	1.0%
Industrial/Manufacturing	2,850	2.7%	3175	2.9%
Medical/Dental Services	66	0.1%	108	0.1%
Mixed Use Development (Residential & Commercial)	16	0.0%	23	0.0%
Mortuary/Cemetery/Crematory	7	0.0%	12	0.0%
Nursing Home/Retirement Facility	85	0.1%	104	0.1%
Park/Open Space/Golf Course	8,596	8.1%	8,968	8.1%
Residential	28,752	27.0%	29,945	27.1%
Terminal or Marina	3,129	2.9%	3,297	3.0%
Utility/Easement/Right of Way	2,212	2.1%	2,346	2.1%
Water/Tideland/Wetland	376	0.4%	384	0.3%
Uncategorized (includes vacant and resource lands)	50,943	47.9%	52,035	47.0%
Total	106,326	100%	110,622	100%

Source: Summarized from King, Pierce and Snohomish County parcel data. Acreage covers only mapped parcels and thus excludes many rights of way and major water features.

11.4.3 Critical Facilities and Infrastructure

Critical facilities are buildings and infrastructure that must remain operable during hazard events to maintain essential services. Critical facilities and infrastructure in the 100-year and 500-year floodplains of the planning area are summarized in Table 11-9 through Table 11-12. Details are provided in the following sections.

TABLE 11-9. CRITICAL FACILITIES IN THE 100-YEAR FLOODPLAIN							
	Medical & Health Services	Government Function	Protective Function	Schools	Hazardous Materials	Other Critical Function	Total
Algona	0	0	0	0	0	0	0
Auburn	0	0	0	0	1	1	2
Beaux Arts Village	0	0	0	0	0	0	0
Bellevue	0	0	0	0	0	0	0
Black Diamond	0	0	0	0	0	0	0
Bothell	4	0	0	1	0	1	6
Burien	0	0	0	0	0	0	0
Carnation	0	0	0	1	0	0	1
Clyde Hill	0	0	0	0	0	0	0
Covington	0	0	0	0	0	0	0
Des Moines	0	0	0	0	0	0	0
Duvall	0	0	0	0	0	0	0
Enumclaw	0	0	0	0	0	0	0
Federal Way	0	0	0	0	0	0	0
Hunts Point	0	0	0	0	0	0	0
Issaquah	1	0	0	0	0	1	2
Kenmore	0	0	0	0	0	0	0
Kent	8	0	3	0	7	2	20
Kirkland	0	0	0	0	0	0	0
Lake Forest Park	0	0	0	0	0	0	0
Maple Valley	0	0	0	0	0	0	0
Medina	0	0	0	0	0	0	0
Mercer Island	0	0	0	0	0	0	0
Milton	0	0	0	0	0	0	0
Newcastle	0	0	0	0	0	0	0
Normandy Park	0	0	0	0	0	0	0
North Bend	7	0	2	2	0	2	13
Pacific	0	0	0	0	0	0	0
Redmond	1	0	0	1	0	1	3
Renton	3	0	0	0	0	1	4
Sammamish	0	0	0	0	0	0	0
SeaTac	0	0	0	0	0	0	0
Seattle	0	0	1	0	4	0	5
Shoreline	0	0	0	0	0	0	0
Skykomish	0	1	2	1	0	1	5
Snoqualmie	1	0	0	8	0	1	10
Tukwila	0	0	0	0	0	0	0
Woodinville	0	0	0	0	0	0	0
Yarrow Point	0	0	0	0	0	0	0
Unincorporated	0	0	0	0	0	0	0
Total	25	1	8	14	12	11	71

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**TABLE 11-10.
CRITICAL FACILITIES IN THE 500-YEAR FLOODPLAIN**

	Medical & Health Services	Government Function	Protective Function	Schools	Hazardous Materials	Other Critical Function	Total
Algona	0	0	0	0	0	0	0
Auburn	0	0	0	0	3	1	4
Beaux Arts Village	0	0	0	0	0	0	0
Bellevue	0	0	0	0	0	0	0
Black Diamond	0	0	0	0	0	0	0
Bothell	4	0	0	1	0	1	6
Burien	0	0	0	0	0	0	0
Carnation	3	0	1	3	0	0	7
Clyde Hill	0	0	0	0	0	0	0
Covington	0	0	0	0	0	0	0
Des Moines	0	0	0	0	0	0	0
Duvall	0	0	0	0	0	0	0
Enumclaw	0	0	0	0	0	0	0
Federal Way	0	0	0	0	0	0	0
Hunts Point	0	0	0	0	0	0	0
Issaquah	4	0	2	2	1	3	12
Kenmore	0	0	0	0	0	0	0
Kent	13	0	3	2	13	2	33
Kirkland	0	0	0	0	0	0	0
Lake Forest Park	0	0	0	0	0	0	0
Maple Valley	0	0	0	0	0	0	0
Medina	0	0	0	0	0	0	0
Mercer Island	0	0	0	0	0	0	0
Milton	0	0	0	0	0	0	0
Newcastle	0	0	0	0	0	0	0
Normandy Park	0	0	0	0	0	0	0
North Bend	7	0	2	2	0	2	13
Pacific	0	0	0	0	0	0	0
Redmond	3	1	1	2	3	4	14
Renton	3	0	0	4	0	2	9
Sammamish	0	0	0	0	0	0	0
SeaTac	0	0	0	0	0	0	0
Seattle	0	0	1	0	4	0	5
Shoreline	0	0	0	0	0	0	0
Skykomish	0	1	2	1	0	1	5
Snoqualmie	1	0	0	8	0	1	10
Tukwila	0	0	0	0	0	0	0
Woodinville	0	0	0	0	0	0	0
Yarrow Point	0	0	0	0	0	0	0
Unincorporated	0	0	0	0	1	0	1
Total	38	2	12	25	25	17	119

TABLE 11-11. CRITICAL INFRASTRUCTURE IN 100-YEAR FLOODPLAIN								
	Bridges	Transportation	Water Supply	Wastewater	Power	Communications	Dams	Total
Algona	0	0	0	0	0	0	0	0
Auburn	5	0	0	1	0	0	0	6
Beaux Arts Village	0	0	0	0	0	0	0	0
Bellevue	2	0	0	0	0	0	0	2
Black Diamond	0	0	0	0	0	0	0	0
Bothell	5	0	0	0	0	0	0	5
Burien	0	0	0	0	0	0	0	0
Carnation	0	0	0	0	0	0	0	0
Clyde Hill	0	0	0	0	0	0	0	0
Covington	5	0	0	1	1	0	0	7
Des Moines	0	0	0	3	0	0	0	3
Duvall	0	0	0	1	0	0	0	1
Enumclaw	0	0	0	1	0	0	0	1
Federal Way	0	0	0	0	0	0	0	0
Hunts Point	0	0	0	0	0	0	0	0
Issaquah	2	0	0	0	0	0	0	2
Kenmore	2	0	0	0	0	0	0	2
Kent	10	2	0	0	1	0	0	13
Kirkland	1	0	0	0	0	0	0	1
Lake Forest Park	0	0	0	0	0	0	0	0
Maple Valley	0	0	0	0	0	0	0	0
Medina	0	0	0	0	0	0	0	0
Mercer Island	0	0	0	0	0	0	0	0
Milton	0	0	0	0	0	0	0	0
Newcastle	0	0	0	0	0	0	0	0
Normandy Park	0	0	0	0	0	0	0	0
North Bend	7	0	1	1	0	0	0	9
Pacific	0	0	0	0	0	0	0	0
Redmond	3	0	3	0	0	0	0	6
Renton	5	0	0	0	0	0	0	5
Sammamish	0	0	0	0	0	0	0	0
SeaTac	0	0	0	0	0	0	0	0
Seattle	11	54	0	1	0	0	0	66
Shoreline	1	0	0	0	0	0	0	1
Skykomish	2	1	1	0	0	0	0	4
Snoqualmie	5	0	1	5	2	0	1	14
Tukwila	2	1	0	0	0	0	0	3
Woodinville	0	0	0	0	0	0	0	0
Yarrow Point	0	0	0	0	0	0	0	0
Unincorporated	97	1	3	1	1	2	1	106
Total	165	59	9	15	5	2	2	257

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TABLE 11-12.
CRITICAL INFRASTRUCTURE IN 500-YEAR FLOODPLAIN

	Bridges	Transportation	Water Supply	Wastewater	Power	Communications	Dams	Total
Algona	0	0	0	0	0	0	0	0
Auburn	5	0	0	3	0	0	0	8
Beaux Arts Village	0	0	0	0	0	0	0	0
Bellevue	2	0	0	0	0	0	0	2
Black Diamond	0	0	0	0	0	0	0	0
Bothell	5	0	0	0	0	0	0	5
Burien	0	0	0	1	0	0	0	1
Carnation	0	0	0	0	0	0	0	0
Clyde Hill	0	0	0	0	0	0	0	0
Covington	5	0	0	1	1	0	0	7
Des Moines	3	0	0	3	0	0	0	6
Duvall	0	0	0	1	0	0	0	1
Enumclaw	0	0	0	1	0	0	0	1
Federal Way	0	0	0	0	0	0	0	0
Hunts Point	0	0	0	0	0	0	0	0
Issaquah	4	0	0	1	0	0	0	5
Kenmore	2	0	0	0	0	0	0	2
Kent	17	2	0	0	2	0	0	21
Kirkland	1	0	0	0	0	0	0	1
Lake Forest Park	0	0	0	0	0	0	0	0
Maple Valley	0	0	0	0	0	0	0	0
Medina	0	0	0	0	0	0	0	0
Mercer Island	0	0	0	0	0	0	0	0
Milton	0	0	0	0	0	0	0	0
Newcastle	0	0	0	0	0	0	0	0
Normandy Park	0	0	0	0	0	0	0	0
North Bend	7	0	1	1	2	0	0	11
Pacific	0	0		1	0	0	0	1
Redmond	3	0	3	0	0	0	0	6
Renton	7	2	0	0	0	0	0	9
Sammamish	0	0	0	0	0	0	0	0
SeaTac	0	0	0	0	0	0	0	0
Seattle	11	68	0	3	1	0	0	83
Shoreline	1	0	0	0	0	0	0	1
Skykomish	2	1	1	0	2	0	0	6
Snoqualmie	5	0	2	6	2	0	1	16
Tukwila	2	1	0	0	0	0	0	3
Woodinville	0	0	0	0	0	0	0	0
Yarrow Point	0	0	0	0	0	0	0	0
Unincorporated	97	1	3	1	1	2	1	106
Total	179	75	10	23	11	2	2	302

Tier II Facilities

Tier II facilities are those that use or store materials that can harm the environment if damaged by a flood. The planning area includes 12 businesses in the 100-year floodplain and 25 businesses in the 500-year floodplain that report having Tier II hazardous materials. During a flood event, containers holding these materials can rupture and leak into the surrounding area, having a disastrous effect on the environment as well as residents.

Utilities and Infrastructure

Flood damage to infrastructure presents numerous risks. Roads or railroads that are blocked or damaged can isolate residents and can prevent access throughout the county, including for emergency service providers needing to get to vulnerable populations or to make repairs. Bridges washed out or blocked by floods or debris also can cause isolation. Floodwaters can back up drainage systems, causing localized flooding. Culverts can be blocked by debris from flood events, also causing localized urban flooding. Floodwaters can get into drinking water supplies, causing contamination. Sewer systems can be backed up, causing waste to spill into homes, neighborhoods, rivers and streams. Underground utilities can also be damaged. Dikes can fail or be overtopped, inundating the land that they protect.

Roads and Bridges

The following major roads pass through the 100-year floodplain and thus are exposed to flooding:

- Interstate 405
- State Road 167
- State Road 518
- Interstate 5
- State Road 99
- State Road 520
- Interstate 90
- State Road 18
- State Road 522

Some of these roads are built above the flood level, and others function as levees to prevent flooding. Still, in severe flood events these roads can be blocked or damaged, preventing access to some areas.

Flooding can affect bridges, which provide the only ingress and egress to some neighborhoods. There are 165 bridges in or over the 100-year floodplain and 179 bridges in or over the 500-year floodplain.

Levees

King County's flood protection system includes more than 119 miles of levees that protect lives and more than \$7 billion in economic infrastructure in the county's 106,000 acres of floodplain. Most of these levees are operated and maintained by the King County Flood Control District. A detailed inventory of these facilities is provided in the 2013 King County Flood Hazard Management Plan Update. There are also levees on many smaller rivers, streams and creeks that protect small areas of land. Many of the levees are older and were built under earlier flood management goals. Many of these older levees are exposed to scouring and failure due to old age and construction methods. Existing levees in King County provide a highly variable level of service or level of protection. Flood flows contained by levees may have a recurrence interval ranging from 10 years to 100 years.

11.4.4 Environment

Flooding is a natural event, and floodplains provide many natural and beneficial functions. Nonetheless, with human development factored in, flooding can impact the environment in negative ways. Migrating fish can wash into roads or over dikes into flooded fields, with no possibility of escape. Pollution from roads, such as oil, and hazardous materials can wash into rivers and streams. During floods, these can settle onto normally dry soils, polluting them for agricultural uses. Human development such as bridge abutments and levees, and logjams from timber harvesting can increase stream bank erosion, causing rivers and streams to migrate into non-natural courses.

Many species of mammals, birds, reptiles, amphibians and fish live in King County in plant communities that are dependent upon streams, wetlands and floodplains. Changes in hydrologic conditions can result in a change in the plant community. Wildlife and fish are impacted when plant communities are eliminated or fundamentally altered to reduce habitat. Wildlife populations are limited by shelter, space, food and water. Since water supply is a major limiting factor for many animals, riparian communities are of special importance. Riparian areas are the zones along the edge of a river or stream that are influenced by or are an influence upon the water body. Human disturbance to riparian areas can limit wildlife's access to water, remove breeding or nesting sites, and eliminate suitable areas for rearing young. Wildlife rely on riparian areas and are associated with the flood hazard in the following ways:

- Mammals depend upon a supply of water for their existence. Riparian communities have a greater diversity and structure of vegetation than other upland areas. Beavers and muskrats are now recolonizing streams, wetlands and fallow farm fields, which are converted wetlands. As residences are built in rural areas, there is an increasing concern with beaver dams causing flooding of low-lying areas and abandoned farm ditches being filled in, which can lead to localized flooding.
- A great number of birds are associated with riparian areas. They swim, dive, feed along the shoreline, or snatch food from above. Puget Sound, rivers, lakes and wetlands are important feeding and resting areas for migratory and resident waterfowl. Other threatened or endangered species (such as the bald eagle or the peregrine falcon) eat prey from these riparian areas.
- Amphibians and reptiles are some of the least common forms of wildlife in riparian areas. However, some state threatened species, such as the western pond turtle and the spotted frog, are known to inhabit the waterways and wetlands.
- Fish habitat throughout the county varies widely based on natural conditions and human influence. Many ditches were dug throughout the county to make low, wet ground better for farming. As the water drained away and the wetlands were converted to farm fields, natural stream conditions were altered throughout the county. Agriculture along many rivers extends to the water's edge and smaller side channels have been tiled to drain better. Within developing areas, small streams were placed in pipes and wetland was filled in to support urban development. While salmonids prefer clear, free-flowing streams, other species like the Olympic mud-minnow inhabit the calm, backwater areas of sloughs and wetlands.

11.5 VULNERABILITY

11.5.1 Population

Vulnerable Populations

A geographic analysis of demographics using the Hazus-MH model identified populations vulnerable to the flood hazard as follows:

- **Economically Disadvantaged Populations**—An estimated 14 percent (1,805) of households within the 100-year floodplain are economically disadvantaged, defined as having household incomes of \$20,000 or less.
- **Population over 65 Years Old**—An estimated 11 percent (3,388) of the population in the census blocks that intersect the 100-year floodplain are over 65 years old.
- **Population under 16 Years Old**—An estimated 21 percent (6,529) of the population within census blocks located in or near the 100-year floodplain are under 16 years of age.

Impacts on Persons and Households

Table 11-13 summarizes estimated impacts on persons and households in the planning area for the 100-year and 500-year flood events.

TABLE 11-13. ESTIMATED FLOOD IMPACT ON PERSONS AND HOUSEHOLDS		
	Number of Displaced Households ^a	Number of Persons Requiring Short-Term Shelter
100-Year Flood	30789	24,382
500-Year Flood	43,251	35,926
a. Hazus-MH results in this table are not intended to be precise estimates of damage after a hazard event. They represent generalized estimates of damage that may occur as the result of the modeled scenario, based on the available data.		

Public Health and Safety

Floods and their aftermath present the following threats to public health and safety:

- **Unsafe food**—Floodwaters contain disease-causing bacteria, dirt, oil, human and animal waste, and farm and industrial chemicals. They carry away whatever lies on the ground and upstream. Their contact with food items, including food crops in agricultural lands, can make that food unsafe to eat and hazardous to human health. Power failures caused by floods damage stored food. Refrigerated and frozen foods are affected during the outage periods, and must be carefully monitored and examined prior to consumption. Foods kept inside cardboard, plastic bags, jars, bottles, and paper packaging are subject to disposal if contaminated by floodwaters. Even though the packages do not appear to be wet, they may be unhygienic with mold contamination and deteriorate rapidly.
- **Contaminated drinking and washing water and poor sanitation**—Flooding impairs clean water sources with pollutants. Contact with the contaminants—whether through direct food intake, vector insects such as flies, unclean hands, or dirty plates and utensils—can result in waterborne illnesses and life-threatening infectious disease. The pollutants also saturate into the groundwater or can infiltrate into sanitary sewer lines through the ground. Wastewater treatment plants, if flooded and caused to malfunction, can be overloaded with polluted runoff waters and sewage beyond their disposal capacity, resulting in backflows of raw sewage to homes and low-lying grounds. Private wells can be contaminated or damaged severely by floodwaters, while private sewage disposal systems can become a cause of infection if they are broken or overflow. Unclean drinking and washing water and sanitation, coupled with lack of adequate sewage treatment, can lead to disease outbreaks.
- **Mosquitoes and animals**—Prolonged rainfall and floods provide new breeding grounds for mosquitoes—wet areas and stagnant pools—and can lead to an increase in the number of mosquito-borne diseases such as malaria and dengue and West Nile fevers. Rats and other rodents and wild animals also can carry viruses and diseases. The public should avoid such animals and should dispose of dead animals in accordance with guidelines issued by local animal control authorities. Leptospirosis—a bacterial disease associated predominantly with rats—often accompanies floods in developing countries, although the risk is low in industrialized regions unless cuts or wounds have direct contact with disease-contaminated floodwaters or animals.

- **Mold and mildew**—Excessive exposure to mold and mildew can cause flood victims—especially those with allergies and asthma—to contract upper respiratory diseases, triggering cold-like symptoms. Molds grow in as short a period as 24 to 48 hours in wet and damp areas of buildings and homes that have not been cleaned after flooding, such as water-infiltrated walls, floors, carpets, toilets and bathrooms. Very small mold spores can be easily inhaled by human bodies and, in large enough quantities, cause allergic reactions, asthma episodes, and other respiratory problems. Infants, children, elderly people and pregnant women are considered most vulnerable to mold-induced health problems.
- **Carbon monoxide poisoning**—Carbon monoxide poisoning is as a potential hazard after major floods. In the event of power outages following floods, flood victims tend to use alternative sources of fuels for heating or cooking inside enclosed or partly enclosed houses, garages or buildings without an adequate level of air ventilation. Carbon monoxide can be found in combustion fumes such as those generated by small gasoline engines, stoves, generators, lanterns, gas ranges, or the burning of charcoal or wood. Built-up carbon monoxide from these sources can poison people and animals.
- **Hazards when reentering and cleaning flooded homes and buildings**—Flooded buildings can pose significant health hazards to people entering and cleaning damaged buildings or working to restore utility service after floodwaters recede. Electrical power systems, including fallen power lines, can become hazardous. Gas leaks from pipelines or propane tanks can trigger fire and explosion. Flood debris—such as broken bottles, wood, stones and walls—may cause wounds and injuries to those removing contaminated mud and cleaning damaged buildings. Containers of hazardous chemicals, including pesticides, insecticides, fertilizers, car batteries, propane tanks and other industrial chemicals, may be hidden or buried under flood debris. A health hazard can also occur when hazardous dust and mold in ducts, fans and ventilators of air-conditioning and heating equipment are circulated through a building and inhaled by those engaged in cleanup and restoration.
- **Mental stress and fatigue**—Having experienced a devastating flood and seen loved ones lost or injured and homes damaged or destroyed, flood victims can experience long-term psychological impact. The expense and effort required to repair flood-damaged homes places severe financial and psychological burdens on the people affected, in particular the unprepared and uninsured. Post-flood recovery—especially when it becomes prolonged—can cause mental disorders, anxiety, anger, depression, lethargy, hyperactivity, sleeplessness, and, in an extreme case, suicide. Behavior changes may also occur in children such as an increase in bed-wetting and aggression. There is also a long-term concern among the affected that their homes can be flooded again in the future.

Current loss estimation models such as Hazus are not equipped to measure public health impacts such as these. The best level of mitigation for these impacts is to be aware that they can occur, educate the public on prevention, and be prepared to deal with them in responding to flood events.

11.5.2 Property

Hazus-MH calculates flood losses to structures based on flooding depth and structure type. Using historical flood insurance claim data, Hazus-MH estimates the percentage of damage to structures and their contents by applying established damage functions to an inventory. For this analysis, local data on facilities was used instead of the default inventory data provided with Hazus-MH. The analysis is summarized in Table 11-14 and Table 11-15 for the 100-year and 500-year flood events, respectively.

TABLE 11-14.
LOSS ESTIMATES FOR 100-YEAR FLOOD EVENT

	Structures Impacted ^a	Estimated Loss Associated with Flood			% of Total Assessed Value
		Structure	Contents	Total	
Algona	0	\$0	\$0	\$0	0.00
Auburn	58	\$7,503,762	\$9,985,134	\$17,488,897	0.10
Beaux Arts	0	\$0	\$0	\$0	0.00
Bellevue	67	\$2,095,740	\$976,058	\$3,071,798	0.01
Black Diamond	0	\$0	\$0	\$0	0.00
Bothell	32	\$20,158,177	\$73,899,529	\$94,057,706	1.84
Burien	56	\$1,854,889	\$1,294,250	\$3,149,139	0.03
Carnation	24	\$621,401	\$386,436	\$1,007,837	0.31
Clyde Hill	0	\$0	\$0	\$0	0.00
Covington	12	\$195,286	\$123,303	\$318,589	0.01
Des Moines	26	\$6,689,850	\$4,029,779	\$10,719,629	0.19
Duvall	0	\$0	\$0	\$0	0.00
Enumclaw	0	\$0	\$0	\$0	0.00
Federal Way	22	\$750,623	\$417,817	\$1,168,439	0.01
Hunts Point	0	\$0	\$0	\$0	0.00
Issaquah	116	\$5,232,104	\$5,240,025	\$10,472,129	0.11
Kenmore	10	\$176,420	\$76,108	\$252,527	0.01
Kent	596	\$156,011,992	\$502,555,169	\$658,567,161	1.98
Kirkland	1	\$94,036	\$188,073	\$282,109	0.00
Lake Forest Park	30	\$1,577,002	\$1,072,523	\$2,649,525	0.12
Maple Valley	0	\$0	\$0	\$0	0.00
Medina	0	\$0	\$0	\$0	0.00
Mercer Island	0	\$0	\$0	\$0	0.00
Milton	17	\$199,565	\$82,654	\$282,218	0.07
Newcastle	0	\$0	\$0	\$0	0.00
Normandy Park	21	\$436,161	\$182,895	\$619,056	0.05
North Bend	404	\$16,164,488	\$24,689,852	\$40,854,339	2.81
Pacific	111	\$1,936,208	\$788,329	\$2,724,536	0.33
Redmond	28	\$951,468	\$2,950,857	\$3,902,324	0.02
Renton	78	\$29,802,495	\$95,059,777	\$124,862,272	0.48
Sammamish	47	\$1,088,099	\$463,054	\$1,551,153	0.02
SeaTac	2	\$6,735	\$7,043	\$13,778	0.00
Seattle	360	\$42,472,552	\$47,231,893	\$89,704,445	0.04
Shoreline	6	\$267,268	\$128,517	\$395,784	0.00
Skykomish	68	\$1,888,564	\$5,193,194	\$7,081,758	9.48
Snoqualmie	468	\$23,560,747	\$47,908,382	\$71,469,129	3.11
Tukwila	28	\$17,950,090	\$64,705,994	\$82,656,084	0.71
Woodinville	0	\$0	\$0	\$0	0.00
Yarrow Point	0	\$0	\$0	\$0	0.00
Unincorporated	1,206	\$31,459,320	\$19,211,450	\$50,670,771	0.11
Total	3,894	\$371,145,042	\$908,848,095	\$1,279,993,132	0.26

a. Impacted structures are those structures with finished floor elevations below the 100-year water surface elevation.

These structures are the most likely to receive significant damage in a 100-year flood event

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

FLOOD

TABLE 11-15.
LOSS ESTIMATES FOR 500-YEAR FLOOD EVENT

	Structures Impacted ^a	Estimated Loss Associated with Flood			% of Total Assessed Value
		Structure	Contents	Total	
Algona	0	\$0	\$0	\$0	0.00%
Auburn	135	\$10,190,074	\$30,467,915	\$40,657,989	0.22%
Beaux Arts	0	\$0	\$0	\$0	0.00%
Bellevue	135	\$45,274,716	\$54,053,230	\$99,327,946	0.20%
Black Diamond	0	\$0	\$0	\$0	0.00%
Bothell	52	\$25,504,524	\$78,148,137	\$103,652,661	2.02%
Burien	199	\$23,010,516	\$13,490,836	\$36,501,352	0.40%
Carnation	466	\$12,207,072	\$14,710,931	\$26,918,004	8.20%
Clyde Hill	0	\$0	\$0	\$0	0.00%
Covington	25	\$1,861,207	\$1,131,300	\$2,992,507	0.11%
Des Moines	31	\$15,844,654	\$10,821,901	\$26,666,555	0.46%
Duvall	0	\$0	\$0	\$0	0.00%
Enumclaw	0	\$0	\$0	\$0	0.00%
Federal Way	30	\$3,348,463	\$1,755,706	\$5,104,169	0.03%
Hunts Point	0	\$0	\$0	\$0	0.00%
Issaquah	155	\$19,652,486	\$31,685,737	\$51,338,223	0.54%
Kenmore	10	\$1,231,726	\$766,356	\$1,998,081	0.05%
Kent	596	\$156,011,992	\$502,555,169	\$658,567,161	1.98%
Kirkland	1	\$1,411,387	\$4,613,670	\$6,025,057	0.03%
Lake Forest Park	28	\$1,441,823	\$891,205	\$2,333,028	0.11%
Maple Valley	0	\$0	\$0	\$0	0.00%
Medina	0	\$0	\$0	\$0	0.00%
Mercer Island	0	\$0	\$0	\$0	0.00%
Milton	23	\$396,766	\$210,166	\$606,932	0.28%
Newcastle	0	\$0	\$0	\$0	0.00%
Normandy Park	21	\$1,772,968	\$1,052,160	\$2,825,127	0.22%
North Bend	596	\$20,205,860	\$26,587,391	\$46,793,250	3.22%
Pacific	258	\$2,129,830	\$906,578	\$3,036,408	0.37%
Redmond	117	\$25,200,967	\$80,007,513	\$105,208,480	0.45%
Renton	199	\$31,888,670	\$98,862,168	\$130,750,838	0.51%
Sammamish	119	\$12,254,163	\$7,645,982	\$19,900,145	0.21%
SeaTac	5	\$47,452	\$90,231	\$137,683	0.00%
Seattle	502	\$33,280,783	\$63,233,488	\$96,514,271	0.05%
Shoreline	8	\$1,275,211	\$581,675	\$1,856,886	0.02%
Skykomish	127	\$4,794,612	\$8,673,871	\$13,468,484	18.02%
Snoqualmie	371	\$51,362,428	\$159,055,828	\$210,418,256	9.16%
Tukwila	56	\$21,181,106	\$80,882,493	\$102,063,599	0.88%
Woodinville	2	\$505,498	\$1,510,471	\$2,015,969	0.04%
Yarrow Point	0	\$0	\$0	\$0	0.00%
Unincorporated	1,921	\$85,185,560	\$56,198,221	\$141,383,781	0.32%
Total	6,188	\$608,472,514	\$1,330,590,329	\$1,939,017,842	0.35%

a. Impacted structures are those structures with finished floor elevations below the 100-year water surface elevation.

These structures are the most likely to receive significant damage in a 100-year flood event

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

It is estimated that there would be up to \$1.28 billion of flood loss from a 100-year flood event in the planning area. This represents 11.57 percent of the total exposure to the 100-year flood and 0.25 percent of the total assessed value for the planning area. It is estimated that there would be \$1.16 billion of flood loss from a 500-year flood event, representing 5.87 percent of the total exposure to a 500-year flood event and 0.21 percent of the total assessed value.

National Flood Insurance Program

Table 11-16 lists flood insurance statistics for the jurisdictions in the planning area that participate in the NFIP. In these jurisdictions, 8,801 flood insurance policies provide \$2.5 billion in insurance coverage. According to FEMA, 2,823 flood insurance claims were paid between January 1, 1978 and December 31, 2010, for a total of \$49.5 million, an average of \$17,551 per claim.

Properties constructed after a FIRM has been adopted are eligible for reduced flood insurance rates. Such structures are less vulnerable to flooding since they were constructed after regulations and codes were adopted to decrease vulnerability. Properties built before a FIRM is adopted are more vulnerable to flooding because they do not meet code or are located in hazardous areas. The first FIRMs in King County were available in 1978.

Repetitive Loss

A repetitive loss property is defined by FEMA as an NFIP-insured property that has experienced any of the following since 1978, regardless of any changes in ownership:

- Four or more paid losses in excess of \$1,000
- Two paid losses in excess of \$1,000 within any rolling 10-year period
- Three or more paid losses that equal or exceed the current value of the insured property.

Repetitive loss properties make up only 1 to 2 percent of flood insurance policies in force nationally, yet they account for 40 percent of the nation's flood insurance claim payments. The government has instituted programs encouraging communities to identify and mitigate the causes of repetitive losses. A recent report on repetitive losses by the National Wildlife Federation found that 20 percent of these properties are outside any mapped 100-year floodplain. The key identifiers for repetitive loss properties are the existence of flood insurance policies and claims paid by the policies. With the potential for minor flood events every year and major events every two to five years, the County and its planning partners consider all of the mapped floodplain areas as susceptible to repetitive flooding.

A repetitive loss area is the portion of a floodplain holding structures that FEMA has identified as meeting the definition of repetitive loss. The CRS requires participating communities to identify repetitive loss areas. Identifying the broader area helps to identify structures that are at risk but are not on FEMA's list of repetitive loss structures because no flood insurance policy was in force at the time of loss. Figure 11-4 shows the repetitive loss areas in King County.

FEMA has identified 313 repetitive loss properties in the planning area as of January 31, 2014. The breakdown of the properties by jurisdiction is presented in Table 11-17. Of the identified properties, 306 were able to be geocoded for spatial analysis. A review of properties on this list indicated that 286 are located in the 100-year floodplain and three are outside the 100-year floodplain but within the 500-year floodplain. Of all listed properties, 95.5 percent are residential.

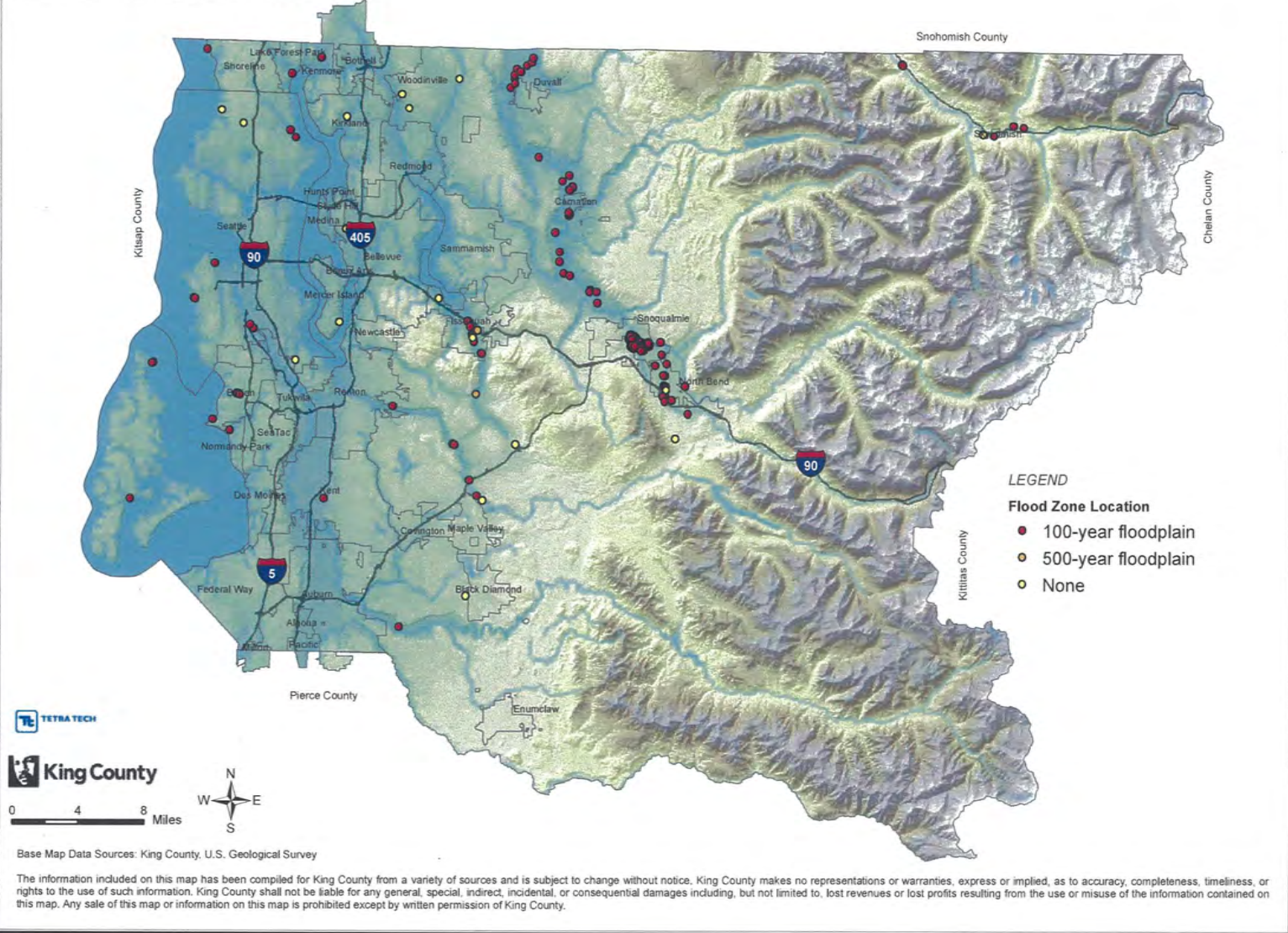
FLOOD

TABLE 11-16.
FLOOD INSURANCE STATISTICS

Jurisdiction	Date of Entry Initial FIRM Effective Date	# of Flood Insurance Policies as of 12/31/2013	Insurance In Force	Total Annual Premium	Claims, 11/1978 to 12/31/2013	Value of Claims paid, 11/1978 to 12/31/2013
Algona	05/16/95	53	14,812,000	21,769	0	0
Auburn	06/01/81	681	202,795,500	426,445	11	43,341.02
Bellevue	12/01/78	259	69,242,800	132,524	46	539,887.08
Black Diamond	10/30/79	1	350,000	460	0	0
Bothell	06/01/82	49	17,179,600	54,496	10	33,665.27
Burien	09/30/94	84	21,180,700	96,594	18	84,053.59
Carnation	03/04/80	108	30,572,100	72,767	26	786,646.68
Clyde Hill	05/16/95	8	2,800,000	3,488	0	0
Covington	04/19/01	6	1,772,200	7,013	0	0
Des Moines	05/15/80	20	5,156,000	21,114	4	211,934.98
Duvall	06/04/80	7	2,222,400	8,241	4	146,511.59
Enumclaw	09/29/89	10	2,860,000	8,283	3	69,500.65
Federal Way	05/16/95	48	14,451,000	29,717	3	18,172.55
Issaquah	05/01/80	230	58,770,700	217,807	148	3,974,505.06
Kenmore	11/13/98	4	1,051,300	5,345	1	14,697.30
Kent	04/01/81	1181	431,273,700	1,224,710	31	129,404.88
Kirkland	06/15/81	65	15,170,000	26,132	7	44,518.84
Lake Forest Park	02/15/80	9	2,675,000	7,261	4	1,886.44
Medina	05/16/95	8	2,800,000	3,440	0	0
Mercer Island	05/16/95	41	11,826,000	19,725	5	6,952.20
Milton	02/17/82	12	2,210,400	10,563	4	70,379.73
Normandy Park	11/02/77	23	6,282,000	22,951	7	13,978.43
North Bend	08/01/84	578	141,754,100	642,665	78	985,053.86
Pacific	12/02/80	162	49,796,700	78,229	26	437,038.95
Redmond	02/01/79	605	158,484,200	313,492	10	21,542.88
Renton	05/05/81	271	104,678,700	293,749	17	84,974.92
Sammamish	11/18/99	4	1,198,700	6,780	2	41,996.22
SeaTac	09/30/94	13	3,764,000	5,044	1	1,319.24
Seattle	07/19/77	840	225,234,200	481,145	201	2,020,690.16
Shoreline	03/04/97	1	350,000	414	1	4,021.74
Skykomish	07/02/81	39	8,009,700	50,616	18	304,215.24
Snoqualmie	07/05/84	509	120,403,000	635,009	952	17,994,157.86
Tukwila	08/03/81	256	119,042,900	404,672	3	1,309.89
Woodinville	05/16/95	34	11,386,900	48,067	0	0
Unincorporated	09/29/78	2582	668,274,400	1,981,647	1,182	21,459,886.16
Total		8,801	2,529,830,900	7,362,374	2,823	49,546,243.41

Figure 11-4
Planning Area Repetitive Loss Areas

King County Hazard Mitigation Plan Update



**TABLE 11-17.
REPETITIVE LOSS PROPERTIES**

	Current Repetitive Loss Structures							Properties Shown to Have Been Mitigated	Total
	Residential	Commercial	Industrial	Agriculture	Religion	Government	Education		
Bellevue	1	0	0	0	0	0	0	1	1
Burien	5	0	0	0	0	1	0	0	6
Issaquah	12	2	0	0	0	0	0	1	14
Kenmore	2	0	0	0	0	0	0	0	2
Kent	1	0	0	0	0	0	0	0	1
Kirkland	1	0	0	0	0	0	0	0	1
Lake Forest Park	1	0	0	0	0	0	0	0	1
Mercer Island	1	0	0	0	0	0	0	0	1
Normandy Park	1	0	0	0	0	0	0	0	1
North Bend	3	1	0	0	0	0	0	0	4
Seattle	11	1	1	0	0	0	0	0	13
Shoreline	1	0	0	0	0	0	0	1	1
Skykomish	1	0	0	0	0	0	0	0	1
Snoqualmie	151	4	0	0	1	0	0	43	156
Woodinville	2	0	0	0	0	0	0	0	2
Unincorporated	105	2	1	0	0	0	0	3	108
Total	299	10	2	0	1	1	0	49	313

Seventeen identified repetitive loss properties are outside the County's special flood hazard area. These appear to have minor flooding issues associated with localized stormwater flooding that does not cause repetitive flooding of any structures other than those listed on the repetitive loss list. The average claim paid for these properties was \$11,595, which is typical of shallow flood damage associated with stormwater issues.

11.5.3 Critical Facilities and Infrastructure

Hazus-MH was used to estimate potential flood damage to critical facilities exposed to the flood risk. Using depth/damage function curves to estimate the percent of damage to the building and contents of critical facilities, Hazus-MH correlates these estimates into an estimate of functional down-time (the estimated time it will take to restore a facility to 100 percent of its functionality). This helps to gauge how long the planning area could have limited usage of facilities deemed critical to flood response and recovery. The Hazus critical facility results are as follows:

- **100-year flood event**—On average, critical facilities would receive 5.12 percent damage to the structure and 8.28 percent damage to the contents during a 100-year flood event. The estimated time to restore these facilities to 100 percent of their functionality is 424 days.
- **500-year flood event**—A 500-year flood event would damage the structures an average of 5.63 percent and the contents an average 13.31 percent. The estimated time to restore these facilities to 100 percent of their functionality after a 500-year event is 438 days.

11.5.4 Environment

The environment vulnerable to flood hazard is the same as the environment exposed to the hazard. Loss estimation platforms such as Hazus-MH are not currently equipped to measure environmental impacts of flood hazards. The best gauge of vulnerability of the environment would be a review of damage from past flood events. Loss data that segregates damage to the environment was not available at the time of this plan. Capturing this data from future events could be beneficial in measuring the vulnerability of the environment for future updates.

11.6 FUTURE TRENDS

Several comprehensive plans guide development in the planning area. The County's Comprehensive Plan sets goals, objectives, policies and actions for frequently flooded areas. The County has developed several plans and initiatives to promote healthy watersheds and to manage stormwater runoff by directing future development away from flood risk areas. King County's critical areas regulations regulate how development and redevelopment can safely occur on lands that contain critical areas. Additionally, King County participates in the NFIP and has adopted flood damage prevention regulations in response to its requirements. King County and all planning partners that participate in the NFIP have committed to maintaining their good standing under the NFIP through initiatives identified in this plan.

King County's population increased an average of 1.07 percent per year between 2000 and 2010, a total of 10.05 percent. It is estimated that King County's population will increase by an additional 20 percent by 2040. County plans and regulations will reduce the impacts of this future growth on floodplains and critical areas and lessen the impacts of flooding on future development. State-mandated growth management, stormwater management and critical areas regulation has been effective in limiting an increase in flood risk throughout Washington. Development trends by basin are described below.

South Fork Skykomish River Basin

The South Fork Skykomish River basin has maintained a rural land use environment. Significant development has not and likely will not occur in this area because a large portion of it is protected wilderness area and forest production areas. Future land use is projected to be similar to current land use. Only a small increase in households is projected for the period through 2022 (King County 2004).

Snoqualmie River Basin

Much of the urbanization in the Snoqualmie River basin is in incorporated areas. While urban areas constitute only about 3 percent of the basin, they make up a significant portion of some subbasins, including the main stem Snoqualmie (15 percent), Patterson Creek (10 percent), and Cherry Creek (6 percent). The potential for high-density development is increased by the presence of vested lots and plats, particularly in the Patterson and Ames Creeks areas.

Sammamish River Basin

The Sammamish River basin has been urbanizing rapidly since the 1950s. Future development is expected to continue throughout the basin. Bellevue, Kirkland and Redmond have designated potential annexation areas, some of which are within the floodplain.

Cedar River Basin

The greater part of the Cedar River floodplain is in unincorporated King County, with a smaller portion in the City of Renton. There is commercial, industrial and residential development throughout the incorporated areas of the Cedar River floodplain. Residential development has also occurred in

unincorporated King County along the lower floodplain reaches, which is likely due to its proximity to Renton. Renton is expected to annex portions of the land along the Cedar River. There is expected to be a significant amount of growth in Renton by 2022 (King County 2005).

Green River Basin

The Green River basin has been urbanizing since the 1970s. In the 1990s, Black Diamond, Enumclaw and Covington experienced rapid growth. Land development estimates indicate that the largest areas of future development will be in the lower and middle Green River areas.

White River Basin

The majority of the White River basin is in unincorporated King County, with a smaller portion in the cities and the Muckleshoot Indian Tribe Reservation. There is commercial, industrial and residential development throughout the incorporated areas of the White River floodplain. The majority of development is along the White River in the Auburn and Pacific area. This area has significant potential for new residential, commercial and industrial development.

11.7 SCENARIO

Historically, floods have had significant impacts in King County. The County can expect significant flooding every two to five years. The duration and intensity of the storms that cause flooding may increase due to climate change. The floodplains mapped and identified by King County will continue to take the brunt of these floods. County residents prepare themselves for flooding by being informed and by pursuing mitigation. The impacts of flood events should decrease as the county, the Flood Control District and residents continue to promote and implement hazard mitigation and preparedness.

11.8 ISSUES

Important issues associated with flood hazards include but are not limited to the following:

- FEMA map updates have been on hold due to federal levee policy concerns. This delay perpetuates reliance on obsolete information for flood insurance purposes. It also creates confusion for the public regarding which maps should be used, as some local governments have completed new studies for regulatory purposes.
- The Revised King County Channel Migration Zone Public Rule became effective on March 31, 2014. The revised rule affects mapping efforts and does not alter land use regulations in these areas. The preparation of channel migration zone maps using updated mapping methods will proceed through 2014 and beyond.
- There are many Zone A areas in the County. These areas lack detailed hydraulic analyses, so base flood elevation and flood depth information is unavailable. Updates in these areas would provide more accurate information for hazard awareness and flood insurance rates.
- Although a significant number of flood studies have been completed, further effort is needed to continue to update the remaining major river reaches and larger tributary streams:
 - **Greenwater River**—This is a major tributary to the White River. Detailed flood mapping is only available from Pierce County’s Digital Flood Insurance Rate Map. But that study is based on regression equations that relate peak discharge-frequency data to drainage area and mean annual precipitation. An updated, detailed flood study is needed to reflect current conditions at a riverside residential community along the lowermost portion of the river.

- **White River Above Mud Mountain Dam**—This segment of the White River has only an approximate flood study, with no flood elevations and no delineated floodway. Significant flood inundation of State Route 410 has occurred, forcing closure of this state roadway. Fast erosive floodwaters have exposed riverside residents to life-threatening conditions and loss of homes. New flood hazard information could be used to educate area residents about potential risks and as a basis for planning effective flood risk reduction solutions.
 - **White River Muckleshoot Reach**—This segment of the White River has no flood hazard mapping. While much of the river is within Muckleshoot Indian Tribe jurisdiction, developable areas would benefit from accurate delineation of hazard areas to avoid future at-risk land uses.
- Although King County has completed numerous river flood studies, many studies are based on older data. King County should evaluate whether these studies adequately represent current flood hazards.
 - More information on flood risk is needed to support risk-based analysis of capital projects.
 - A sustained effort should be made to gather historical damage data, such as high water marks on structures and damages reports. The collection of this information will assist with determining the cost-effectiveness of future mitigation projects and will provide more information on the nature of the hazard.
 - Ongoing flood hazard mitigation will require funding from multiple sources to continue.
 - Flood hazards do not recognize jurisdictional boundaries, and actions in jurisdictions can impact upstream or downstream neighbors. Coordination is necessary to ensure that these connections are understood and hazards are effectively mitigated.
 - Floodplain residents need to continue to be educated about flood preparedness and the resources available during and after floods. Flood preparedness can help residents reduce risk to property and lives. Resources that are made available after flood events can help residents make informed decisions that may mitigate future risk to lives and property.
 - The risk associated with the flood hazard overlaps the risk associated with other hazards, such as earthquake and landslide. This provides an opportunity to seek mitigation alternatives that can reduce risk for multiple hazards.
 - The location of hazardous materials within the floodplain could result in secondary hazards during or after a flood event. Additional risk analysis should be performed on any such facilities within the County.
 - The accuracy of existing FEMA flood hazard mapping for the planning area in reflecting the true flood risk is questionable. FEMA maps do not recognize residual risk outside the mapped area. Where levees are accredited, there may be a misperception that there is no flood risk. Public outreach and awareness efforts should, therefore, emphasize the residual risk behind levees. Additionally, the risk to areas protected by levees not accredited by the FEMA mapping process may not be understood by residents. Furthermore, FEMA map data is often outdated and does not reflect updated flood studies.
 - The concept of residual risk should be considered in the design of future capital flood control projects and should be communicated with residents living in the floodplain.
 - There is no degree of consistency of land-use practices and regulatory floodplain management scope within the planning area. An external advisory review panel convened by King County to look at conditions along the Green River concluded: “Considering the

development that has occurred in the Lower Green River floodplain, it is evident to the review panel that this lack of regulatory consistency has resulted in a significant increase in risk exposure over time.” The panel identified actions that would strive to achieve regulatory consistency for the Green River that could be applied county-wide.

- The impacts of climate change on flood impacts in the planning area are uncertain.
- The promotion of flood insurance as a means of protecting private property owners from the economic impacts of frequent flood events should continue.
- Existing floodplain-compatible uses such as agricultural and open space need to be maintained. There is constant pressure to convert these existing uses to more intense uses within the planning area during times of moderate to high growth.
- Jurisdictions should be adequately resourced to maintain up-to-date hazard information and take appropriate mitigation actions to reduce risk in their community.

CHAPTER 12. LANDSLIDE

12.1 GENERAL BACKGROUND

A landslide is a mass of rock, earth or debris moving down a slope. Landslides may be minor or very large, and can move at slow to very high speeds. They can be initiated by storms, earthquakes, fires, volcanic eruptions or human modification of the land.

Mudslides (or mudflows or debris flows) are rivers of rock, earth, organic matter and other soil materials saturated with water. They develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil's reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud. A mudflow can move rapidly down slopes or through channels and can strike with little or no warning. The material can travel miles from its source, growing as it descends, picking up trees, boulders, cars and anything else in its path. Although these slides behave as fluids, they pack many times the hydraulic force of water due to the mass of material included in them.

DEFINITIONS

Landslide—The sliding movement of masses of loosened rock and soil down a hillside or slope. Such failures occur when the strength of the soils forming the slope is exceeded by the pressure, such as weight or saturation, acting upon them.

Mass Movement—A collective term for landslides, debris flows, falls and sinkholes.

Mudslide (or Mudflow or Debris Flow)—A river of rock, earth, organic matter and other materials saturated with water.

Landslides can be some of the most destructive events in nature, posing a serious hazard to properties on or below hillsides. When landslides occur—in response to such changes as increased water content, earthquake shaking, addition of load, or removal of downslope support—they deform and tilt the ground surface. The result can be destruction of foundations, offset of roads, breaking of underground pipes, or overriding of downslope property and structures.

12.1.1 Landslide Types and Run-Out

Two characteristics are essential to conducting an accurate risk assessment of the landslide hazard:

- The type of initial ground failure that occurs
- The post-failure movement of the loosened material (“run-out”), including travel distance and velocity.

Landslides are commonly categorized by the type of initial ground failure. Figure 12-1 through Figure 12-4 show common types of slides (Ecology, 2014). The most common is the shallow colluvial slide, occurring particularly in response to intense, short-duration storms. The largest and most destructive are deep-seated slides, although they are less common than other types.

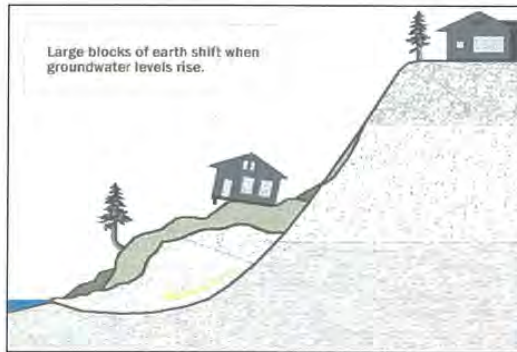


Figure 12-1. Deep Seated Slide

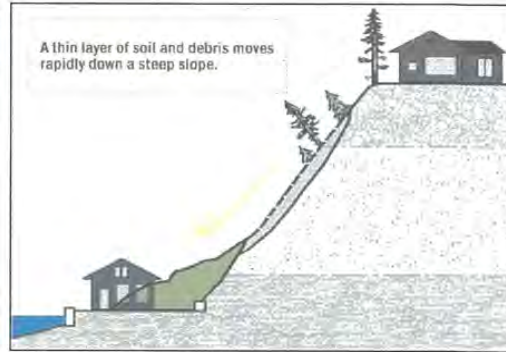


Figure 12-2. Shallow Colluvial Slide

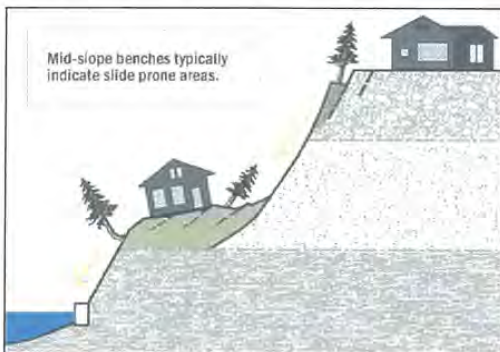


Figure 12-3. Bench Slide

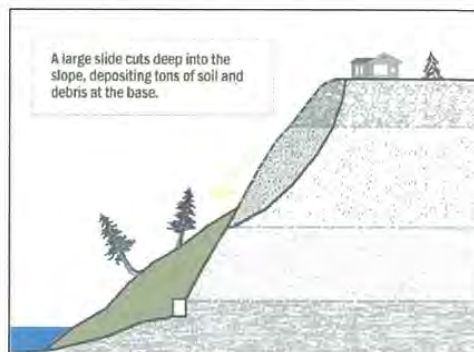


Figure 12-4. Large Slide

All current landslide models—those in practical applications and those more recently developed—use simplified hypothetical descriptions of mass movement to simulate the complex behavior of actual flow. The models attempt to reproduce the general features of the moving mass of material through measurable factors, such as base shear, that define a system and determine its behavior. Due to the lack of experimental data and the limited current knowledge about the behavior of the moving flows, landslide models use simplified parameters to account for complex aspects that may not be defined. These simplified parameters are not related to specific physical processes that can be directly measured, and there is a great deal of uncertainty in their definition. Some, but not all, models provide estimates of the level of uncertainty associated with the modeling approach.

Run-out modeling is complicated because the movement of materials may change over the course of a landslide event, depending on the initial composition, the extent of saturation by water, the ground shape of the path traveled and whether there is additional material incorporated during the event (Savage and Hutter 1991; Rickenmann 2000; Iverson et al. 2004).

12.1.2 Landslide Causes

Mass movements are caused by a combination of geological and climate conditions, as well as the encroaching influence of urbanization. Vulnerable natural conditions are affected by human residential, agricultural, commercial and industrial development and the infrastructure that supports it. The following

factors can contribute to landslide: change in slope of the terrain, increased load on the land, shocks and vibrations, change in water content, groundwater movement, frost action, weathering of rocks, and removing or changing the type of vegetation covering slopes.

Excavation and Grading

Slope excavation is common in the development of home sites or roads on sloping terrain. Grading can result in some slopes that are steeper than the pre-existing natural slopes. Since slope steepness is a major factor in landslides, these steeper slopes can be at an increased risk for landslides. The added weight of fill placed on slopes can also result in an increased landslide hazard. Small landslides can be fairly common along roads, in either the road cut or the road fill. Landslides occurring below new construction sites are indicators of the potential impacts stemming from excavation.

A study conducted by Burns and others at Portland State University found that changes to the slope through cutting or filling increased the risk of 76 percent of inventoried landslides in the Portland Metro region. The study documented 48 landslides that occurred in Oregon City in February 1996, and found that only about half the slides were considered natural.

Drainage and Groundwater Alterations

Water flowing through or above ground is often the trigger for landslides. Any activity that increases the amount of water flowing into landslide-prone slopes can increase landslide hazards. Broken or leaking water or sewer lines can be especially problematic, as can water retention facilities that direct water onto slopes. However, even lawn irrigation and minor alterations to small streams in landslide prone locations can result in damaging landslides. Ineffective stormwater management and excess runoff can also cause erosion and increase the risk of landslide hazards. Drainage can be affected naturally by the geology and topography of an area. Development that results in an increase in impervious surface impairs the ability of the land to absorb water and may redirect water to other areas. Channels, streams, flooding, and erosion on slopes all indicate potential slope problems.

Road and driveway drains, gutters, downspouts, and other constructed drainage facilities can concentrate and accelerate flow. Ground saturation and concentrated velocity flow are major causes of slope problems and may trigger landslides.

Changes in Vegetation

Removing vegetation from very steep slopes can increase landslide hazards. A study by the Oregon Department of Forestry found that landslide hazards in three out of four steeply sloped areas were highest for a period of roughly 10 years after timber harvesting (Oregon Department of Forestry, 1999). Areas that have experienced wildfire and land clearing for development may have long periods of increased landslide hazard. In addition, woody debris in stream channels (both natural and man-made from logging) may cause the impacts from debris flows to be more severe.

12.1.3 Landslide Management

Landslides are common features in river and stream valleys across King County. While small landslides are often a result of human activity, the largest landslides are often naturally occurring phenomena with little or no human contribution. The sites of large landslides are typically areas of previous landslide movement that are periodically reactivated by significant precipitation or seismic events. Such naturally occurring landslides can disrupt roadways and other infrastructure lifelines, destroy private property, and cause flooding, bank erosion and rapid channel migration.

Landslides can create immediate, critical threats to public safety. Engineering solutions to protect structures on or adjacent to large active landslides are often extremely or prohibitively expensive. In spite of their destructive potential, landslides are a part of the natural landscape of King County river valleys. They supply sediment and large wood to the channel network and can contribute to complexity and dynamic channel behavior critical for aquatic and riparian ecological diversity. Effective landslide management should include the following elements:

- Continuing investigation to identify natural landslides, understand their mechanics, assess their risk to public health and welfare, and understand their role in ecological systems
- Regulation of development in or near existing landslides or areas of natural instability through the King County Critical Areas Ordinance in King County Code Chapter 21A.24, the clearing and grading standards in King County Code Chapter 16.82, and the King County Surface Water Design Manual
- Preparation for emergency response to landslides to facilitate rapid, coordinated action among King County, local cities, and state and federal agencies, and to provide emergency assistance to affected or at-risk citizens
- Evaluation of options including landslide stabilization or structure relocation where landslides are identified that threaten critical public structures or infrastructure, such as the Auburn-Black Diamond Road project and the Sinnema Quaale Upper Project.

Because landslides regularly disrupt freight and commuter rail services that follow the Puget Sound shoreline, the Washington State Department of Transportation and BNSF Railway are involved in a federally funded project to increase the reliability of the rail corridor service between Vancouver, Washington and the Canadian border. Actions being taken to reduce impacts include geotechnical investigations, historical slide research, investigation of potential slide area investigations, construction of retaining walls, improvements to drainage systems, and implementation of erosion control strategies (Washington State Department of Transportation, 2014a). Washington State also has provided funding for preventive drainage maintenance and debris removal activities between Seattle and Shoreline (Washington State Department of Transportation, 2014b).

12.2 HAZARD PROFILE

12.2.1 Past Events

The majority of significant slide events in King County have occurred during or shortly after storm events. The following are significant slide events that have occurred in the county (King County, 2009; Washington Emergency Management Division, 2010; Seattle Office of Emergency Management, 2014):

- 900 AD—After a Seattle Fault event, landslides were triggered on Mercer Island and Lake Sammamish (Washington Emergency Management Division, 2010).
- 1949—Multiple landslides occurred in the Puget Sound region after a Magnitude-7.1 earthquake event. Urban slides occurred in areas of fill and areas made unstable by undercutting (Washington Emergency Management Division, 2010).
- 1965—At least 21 landslides were triggered from ground shaking within 60 miles of the epicenter of the Seattle-Tacoma earthquake event, including events in West and South Seattle, Auburn, near Maple Valley and at Mount Si near North Bend (Washington Emergency Management, 2010).
- 1972—King County experienced \$1.8 million in public damage as a result of slide events.
- 1983—A slide in the Queen Anne neighborhood of Seattle closed Aurora Avenue.

LANDSLIDE

- 1994—Five homes were destroyed in the Magnolia neighborhood of Seattle as the result of a slump.
- 1996—More than 40 slides were recorded in Seattle over the duration of the 1995/1996 winter, two-thirds of which were a result of a February storm. A slide also occurred east of Enumclaw, blocking State Route 410.
- 1996-1997—King County experienced \$9.0 million in combined public damage after hundreds of landslides were triggered, predominantly along the shorelines of Puget Sound, Lake Washington, Lake Union and Portage Bay, and in West Seattle, Magnolia Bluff and the I-5 corridor. There were more than 130 recorded slides on the shorelines between Seattle and Everett, including one that derailed five cars of a freight train.
- 2001—Slides on the Cedar River triggered by the Nisqually Earthquake caused \$1.71 million in public damage. Five homes in Burien were damaged. Damage was also reported at the King County International Airport/Boeing Field, Harbor Island, State Route 202 near Snoqualmie and Interstate 405 in Renton.
- 2004—Two slide events in January disrupted transportation routes: a North Seattle slide disrupted Sounder commuter train service; and a slide closed the I-90 on-ramp in Issaquah. In March, a landslide near Renton partially dammed the Cedar River.
- 2005—In May, 11 homes were isolated after a small slide on Mercer Island. In September, two lanes of I-90 west of Snoqualmie Pass were closed after a rockslide. In December, Juanita Drive in northeast Kirkland was closed after a slide.
- 2006—In January, landslides closed numerous lanes of Interstate 5. Four slides were triggered between Seattle and Everett. At least two slides occurred on Mercer Island and one occurred in Seattle's University District. A slide closed Issaquah Hobart Road near Tiger Mountain. A slide partially buried a house east of Renton. Three slides occurred near Maple Valley and the Cedar River. A slide closed Lake Dorothy Road in North Bend. Multiple slides closed commuter rail service, including one in Shoreline. In March, a slide isolated five homes on Mercer Island. Slides across King County in November included one that isolated 200 homes after access was blocked to Upper Preston Road. In mid-December, there were five landslides in Seattle and another slide that covered railroad tracks.
- 2007—Five slides were recorded in King County.
- 2008—In July, a slide occurred in Bellevue at a construction site for a subdivision after a thunderstorm. In November, State Road 410 was closed as the result of a debris flow east of Enumclaw. A landslide caused damage to the Green River Bridge on State Route 169 that resulted in the bridge being closed for repairs for eight months.
- 2009—There were 51 recorded slides. Numerous slides occurred in the Cascade foothills in January. This storm also created the potential for the reactivation of movement underneath Howard Hansen Dam.
- 2014—The multiple-fatality Oso landslide in Snohomish County occurred as this hazard mitigation plan was being prepared. The number of fatalities and damage costs had not been finalized by the time of this plan's completion.

Over the past decade, more than 200 landslides occurred along the Seattle to Everett coastline, and more than 800 trains have been canceled since 2009 as a result of landslide events (Washington State Department of Transportation, 2014). Between December 2012 and January 2013, coastline rail service disruption due to landslide events occurred at record levels.

12.2.2 Location

Slides occur in urban and rural areas throughout the County. The shorelines of Puget Sound are particularly vulnerable to slide events. In general, landslide hazard areas are where the land has characteristics that contribute to the risk of the downhill movement of material, such as the following:

- A slope greater than 33 percent
- A history of landslide activity or movement during the last 10,000 years
- Stream or wave activity, which has caused erosion, undercut a bank or cut into a bank to cause the surrounding land to be unstable
- The presence or potential for snow avalanches
- The presence of an alluvial fan, indicating vulnerability to the flow of debris or sediments
- The presence of impermeable soils, such as silt or clay, which are mixed with granular soils such as sand and gravel.

The best available predictor of where movement of slides and earth flows might occur is the location of past movements. Past landslides can be recognized by their distinctive topographic shapes, which can remain in place for thousands of years. Most landslides recognizable in this fashion range from a few acres to several square miles. Most show no evidence of recent movement and are not currently active. A small proportion of them may become active in any given year, with movements concentrated within all or part of the landslide masses or around their edges. Ancient dormant mass movement sites can be reactivated by earthquakes or by exceptionally wet weather. Also, because they consist of broken materials and frequently involve disruption of groundwater flow, these dormant sites are vulnerable to construction-triggered sliding. A landslide study for the City of Seattle analyzed more than 1,300 slides that had occurred in the City since 1890 and found that only 58 percent occurred in what were then known to be potential slide areas. Potential slide areas were remapped using the historical record of slide activity as the primary factor (Shannon & Wilson, 2000).

Landslides also occur in areas where no previous slides have been recorded. According to the Washington State Hazard Mitigation Plan, the geology of the Puget Sound lowlands predisposes much of the terrain to slide events, especially along steep coastal bluffs. The last continental glaciation deposited unconsolidated glacial till on top of impermeable bedrock. Channels eroded by glacial melt water and further eroded by precipitation and wave action have left over-steepened and unsupported slopes (Washington Emergency Management Division, 2010). Under the right conditions, these slopes are prone to landslides.

The Seattle landslide study found that human influence played some role in 84 percent of recorded slides. Critical area ordinances at the local level reduce the impacts of human alterations on critical areas, which include geologically hazardous areas such as areas prone to landslide, erosion, mass-wasting, debris flows and rock falls. The designation of critical areas, including geologically hazardous areas, is a requirement of the Washington State Growth Management Act (WAC 365-190-080(4)). The King County zoning code generally discourages development in landslide hazard areas, but it allows development in certain instances where avoidance is not desirable or practical. The King County Critical Areas Ordinance establishes differential regulations for landslide hazard areas on slopes greater than 40 percent (King County DPER, 2014). According to the King County Critical Areas Ordinance Manual, "In general, all alterations are allowed on landslide hazard areas provided that the landslide hazard itself is mitigated through proper engineering of the development so that the risk of property damage and injury is minimized or eliminated." Each incorporated area in the County has established its own rules and regulations pertaining to development in critical areas.

Landslide hazard areas and steep slopes within the planning area are shown on Figure 12-5. The map represents landslide location data from the Washington Department of Natural Resources, a landslide hazard data set from King County, and a data set created using surface geology and digital elevation model data provided by King County, as follows:

- Digital elevation model data defining slopes was taken from a LiDAR-derived bare-earth elevation raster collected in 2002.
- Surface geology data was taken from Pacific Northwest Center for Geologic Mapping Studies, 2006.
- Potential landslide hazard areas were defined as all areas with a slope greater than 40 percent (from the LiDAR data) and one of the following soil types (from the surface geology data):
 - Q_{ls} soils, indicating areas of discrete landslide
 - Q_{mw} soils, indicating areas of colluvium and the cumulative debris from small indistinct landslides that accumulate on and at the base of unstable slopes
 - Q_f soils, indicating alluvial fans, which are formed by the deposition of sediment from floods and debris flows at a point where a steep drainage course discharges onto an area of low gradient.

12.2.3 Frequency

Several landslides occur in King County every year. According to records from the Spatial Hazard Events and Losses Database for the United States (SHELDUS), the planning area has been impacted by severe storms at least once every other year since 1960. Until better countywide data is generated for the landslide hazard, this frequency is appropriate for ranking the risk associated with the landslide hazard. Landslides are often triggered by other natural hazards such as earthquakes, heavy rain, floods or wildfires, so landslide frequency is often related to the frequency of these other hazards.

Slides can occur at any time, although most occur during the rainy season. Most local landslides occur in January after the water table has risen during the wet months of November and December. In King County, landslides typically occur during and after major storms, so the potential for landslides largely coincides with the potential for sequential severe storms that saturate steep, vulnerable soils. Precipitation influences the timing of landslides on three scales: total annual rainfall, monthly rainfall, and single precipitation events. In general, landslides are most likely during periods of higher than average rainfall.

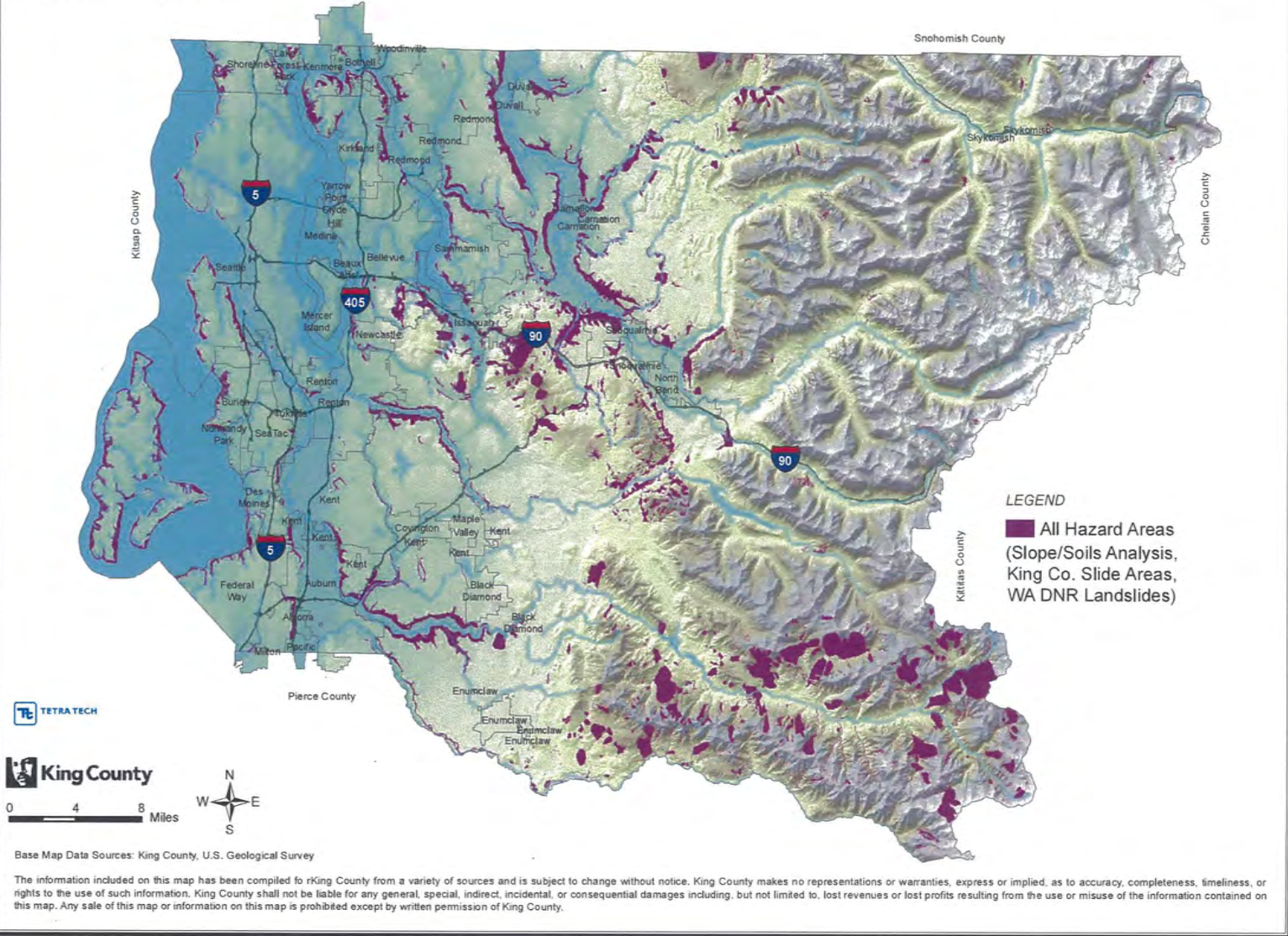
The ground must be saturated prior to the onset of a major storm for significant landsliding to occur. Studies conducted by the USGS have identified two precipitation thresholds to help identify when landslides are likely (USGS, 2007):

- Cumulative Precipitation Threshold (Figure 12-6)—A measure of precipitation over the last 18 days, indicating when the ground is wet enough to be susceptible to landslides. Rainfall of 3.5 to 5.3 inches is required to exceed this threshold, depending on how much rain falls in the last 3 days.
- Intensity Duration Threshold (Figure 12-7)—A measure of rainfall during a storm, indicating when it is raining hard enough to cause multiple landslides if the ground is already wet.

These thresholds are most likely to be crossed during the rainy season, so slide events in the planning area most commonly occur from January through March.

Figure 12-5
Landslide Hazard Areas

King County Hazard Mitigation Plan Update



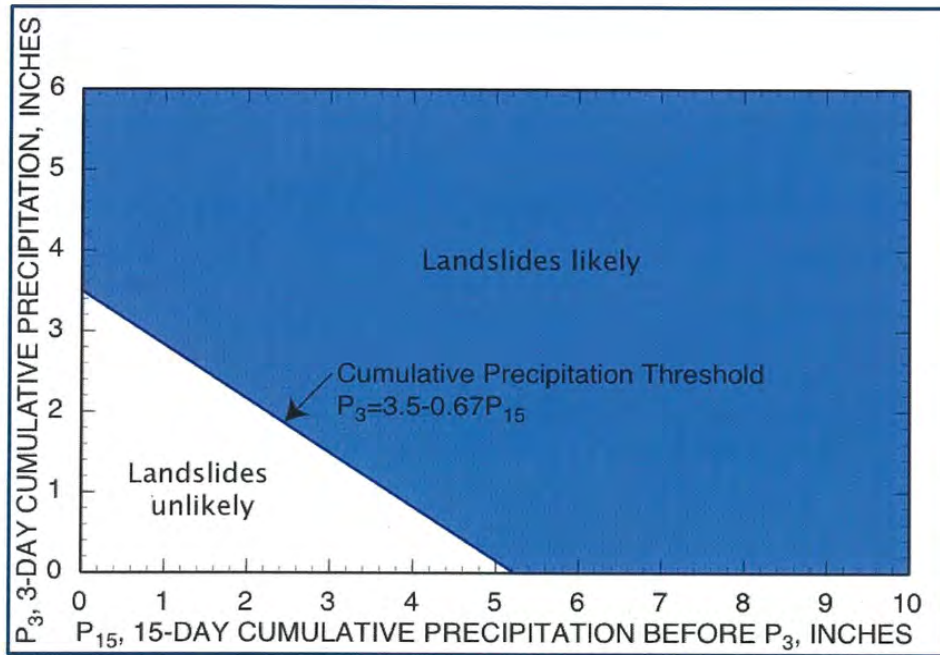


Figure 12-6. Cumulative Precipitation Threshold

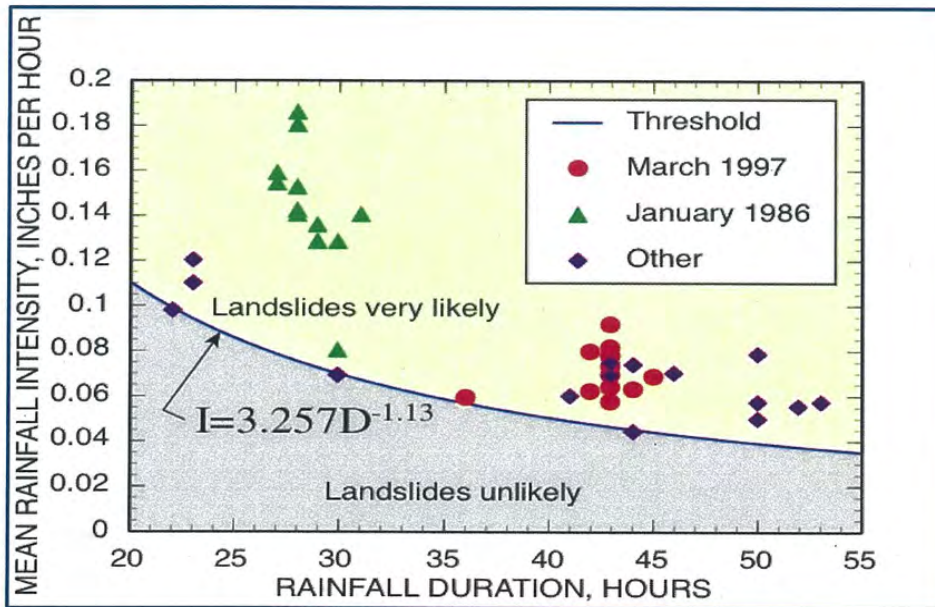


Figure 12-7. Intensity Duration Threshold

12.2.4 Severity

Landslides destroy property and infrastructure and can take the lives of people. Slope failures in the United States result in an average of 25 lives lost per year and an annual cost to society of about \$1.5 billion. The recent event in Oso, Washington showed the devastating potential that can be caused by landslides. The costs in lives and property damage have not been finalized as of the time that this hazard mitigation plan is being prepared, but this event may be the deadliest landslide event in Washington State history. Its proximity to King County has heightened the awareness of the severity of this hazard in the planning area.

Thousands of landslides have occurred within King County, but there is no consolidated database of them. Landslide events often occur concurrently with other hazard events, so damage estimates specifically related to landslide are difficult to obtain. SHELUDS lists 10 landslide events in the planning area since 1965. The combined estimated damage for these events exceeded \$3.3 million. There have been hundreds of slide events in the County over the last several decades, so it is likely that the true costs of landslide damage in the County has been far greater. There are no records of fatalities attributed to mass movement in the County. However, deaths have occurred in neighboring Washington counties and across the west coast as a result of slides and slope collapses.

12.2.5 Warning Time

Mass movements can occur suddenly or slowly. The velocity of movement may range from a slow creep of inches per year to many feet per second, depending on slope angle, material and water content. Generally accepted warning signs for landslide activity include the following:

- Springs, seeps, or saturated ground in areas that have not typically been wet before
- New cracks or unusual bulges in the ground, street pavements or sidewalks
- Soil moving away from foundations
- Ancillary structures such as decks and patios tilting and/or moving relative to the main house
- Tilting or cracking of concrete floors and foundations
- Broken water lines and other underground utilities
- Leaning telephone poles, trees, retaining walls or fences
- Offset fence lines
- Sunken or down-dropped road beds
- Rapid increase in creek water levels, possibly accompanied by increased turbidity (soil content)
- Sudden decrease in creek water levels though rain is still falling or just recently stopped
- Sticking doors and windows, and visible open spaces indicating frames out of plumb
- A faint rumbling sound that increases in volume as the landslide nears
- Unusual sounds, such as trees cracking or boulders knocking together.

Some methods used to monitor mass movements can provide an idea of the type of movement and the amount of time prior to failure. Assessing the geology, vegetation and amount of predicted precipitation for an area can help in predictions of what areas are at risk during general time periods. Currently, there is no practical warning system for individual landslides. The standard operating procedure is to monitor situations on a case-by-case basis and respond after an event has occurred.

The Washington Division of Geology and Earth Resources, in cooperation with NOAA, has developed a landslide warning system that is currently in beta testing. The forecasting model is based on storm and landslide data. It is unlikely that this model will be able to forecast individual landslide events before they occur, but it will be a useful system for alerting residents to be more vigilant about landslide risk.

12.3 SECONDARY HAZARDS

Landslides can cause several types of secondary effects, such as blocking access to roads, which can isolate residents and businesses and delay commercial, public and private transportation. This could result in economic losses for businesses. Other potential problems resulting from landslides are power and communication failures. Vegetation or poles on slopes can be knocked over, resulting in possible losses to power and communication lines. Landslides also have the potential of destabilizing the foundation of structures, which may result in monetary loss for residents. They also can damage rivers or streams, potentially harming water quality, fisheries and spawning habitat.

12.4 EXPOSURE

12.4.1 Population

Population could not be examined by landslide hazard area because census block group areas do not coincide with the hazard areas. A population estimate was made using the structure count of buildings within the landslide hazard areas and applying the census value of 2.39 persons per household for King County. Using this approach, the estimated population living in the landslide risk area is 35,000 or 2.8 percent of the total planning area population.

12.4.2 Property

Table 12-1 shows the number and assessed value of structures exposed to the landslide risk. There are approximately 24,000 structures on parcels in the landslide risk areas, with an estimated value of \$10.1 billion. This represents approximately 1.82 percent of the total assessed value for the planning area. Over 90 percent of the exposed structures are dwellings. Table 12-2 shows the general land use of parcels exposed to landslides in King County. The vast majority of the land area of parcels (86.5 percent) intersecting landslide hazard areas are uncategorized, which includes vacant and resource lands. Residential parcels make up 8.4 percent of the total acreage.

12.4.3 Critical Facilities and Infrastructure

Table 12-3 and Table 12-4 summarize the critical facilities exposed to the landslide hazard. No loss estimates were developed due to the lack of established damage functions for the landslide hazard. A significant amount of infrastructure can be exposed to mass movements:

- **Roads**—Access to major roads is crucial to life-safety after a disaster event and to response and recovery operations. Landslides can block egress and ingress on roads, causing isolation for neighborhoods, traffic problems and delays for public and private transportation. This can result in economic losses for businesses.
- **Bridges**—Landslides can block or damage road bridges. They can knock out bridge abutments or significantly weaken the soil supporting them, making them hazardous for use.
- **Power Lines**—Power lines are generally elevated above steep slopes, but the towers supporting them affected by landslides. A landslide can trigger failure of the soil underneath a tower, causing it to collapse and ripping down the lines. Power and communication failures due to landslides can create problems for vulnerable populations and businesses.

**TABLE 12-1.
EXPOSURE AND VALUE OF STRUCTURES IN LANDSLIDE RISK AREAS**

	Buildings Exposed	Value Exposed			% of Total Assessed Value
		Structure	Contents	Total	
Algona	14.0	\$7,522,861	\$6,957,820	\$14,480,680	1.60%
Auburn	132.0	\$115,123,083	\$61,450,630	\$176,573,713	0.98%
Beaux Arts Village	0.0	\$0	\$0	\$0	0.00%
Bellevue	1748.0	\$1,151,250,598	\$829,911,013	\$1,981,161,610	4.03%
Black Diamond	0.0	\$0	\$0	\$0	0.00%
Bothell	225.0	\$135,200,750	\$68,341,843	\$203,542,593	3.90%
Burien	735.0	\$206,988,490	\$104,654,051	\$311,642,541	3.40%
Carnation	0.0	\$0	\$0	\$0	0.00%
Clyde Hill	0.0	\$0	\$0	\$0	0.00%
Covington	0.0	\$0	\$0	\$0	0.00%
Des Moines	468.0	\$163,908,888	\$87,218,482	\$251,127,370	4.37%
Duvall	0.0	\$0	\$0	\$0	0.00%
Enumclaw	0.0	\$0	\$0	\$0	0.00%
Federal Way	478.0	\$152,956,101	\$76,736,012	\$229,692,113	1.20%
Hunts Point	0.0	\$0	\$0	\$0	0.00%
Issaquah	505.0	\$652,601,463	\$337,219,604	\$989,821,067	10.32%
Kenmore	473.0	\$122,363,761	\$65,289,738	\$187,653,499	4.69%
Kent	122.0	\$56,656,876	\$28,328,438	\$84,985,314	0.26%
Kirkland	899.0	\$312,493,103	\$159,494,731	\$471,987,834	2.13%
Lake Forest Park	756.0	\$211,960,182	\$108,041,231	\$320,001,413	14.45%
Maple Valley	0.0	\$0	\$0	\$0	0.00%
Medina	0.0	\$0	\$0	\$0	0.00%
Mercer Island	0.0	\$0	\$0	\$0	0.00%
Milton	6.0	\$978,634	\$489,317	\$1,467,951	1.04%
Newcastle	122.0	\$50,608,456	\$25,304,228	\$75,912,685	3.35%
Normandy Park	13.0	\$3,280,477	\$1,640,239	\$4,920,716	0.38%
North Bend	30.0	\$7,564,531	\$3,782,266	\$11,346,797	0.78%
Pacific	1.0	\$274,382	\$137,191	\$411,572	0.05%
Redmond	544.0	\$199,914,136	\$113,443,620	\$313,357,757	1.35%
Renton	193.0	\$190,774,870	\$110,754,702	\$301,529,572	1.17%
Sammamish	561.0	\$215,893,243	\$107,946,621	\$323,839,864	3.48%
SeaTac	21.0	\$3,829,801	\$1,914,900	\$5,744,701	0.08%
Seattle	2008.0	\$1,112,503,753	\$743,694,102	\$1,856,197,855	0.87%
Shoreline	548.0	\$191,365,011	\$96,360,779	\$287,725,789	2.58%
Skykomish	0.0	\$0	\$0	\$0	0.00%
Snoqualmie	54.0	\$20,169,969	\$11,020,692	\$31,190,661	1.36%
Tukwila	7.0	\$83,309,675	\$85,070,953	\$168,380,628	1.45%
Woodinville	130.0	\$101,006,592	\$73,710,254	\$174,716,846	3.86%
Yarrow Point	0.0	\$0	\$0	\$0	0.00%
Unincorporated	3,711	\$866,952,616	\$460,938,164	\$1,347,890,780	3.02
Total	14,504	\$6,337,452,302	\$3,769,851,621	\$10,127,303,921	1.82%

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

**TABLE 12-2.
PRESENT LAND USE IN LANDSLIDE RISK AREAS**

Present Use Category	Area in Landslide Risk Area (acres)	% of total
Agriculture	257	0.1%
Church, Welfare or Religious Service	293	0.1%
Commercial	2,310	0.5%
Education	546	0.1%
Governmental Services	1,355	0.3%
Industrial/Manufacturing	2,085	0.5%
Medical/Dental Services	5	0.0%
Mixed Use Development (Residential & Commercial)	4	0.0%
Mortuary/Cemetery/Crematory	149	0.0%
Nursing Home/Retirement Facility	90	0.0%
Park/Open Space/Golf Course	12,009	2.8%
Residential	36,382	8.4%
Terminal or Marina	178	0.0%
Water/Tideland/Wetland	6	0.0%
Uncategorized (includes vacant and resource lands)	375,153	86.5%
Utility/Easement/Right of Way	3,128	0.0%
Total	433,951	100%
Source: Summarized from King, Pierce and Snohomish County parcel data. Acreage covers only mapped parcel extents and thus excludes many rights of way and major water features. Acreage consists only of those areas intersecting mapped hazard layers.		

TABLE 12-3. CRITICAL FACILITIES IN LANDSLIDE RISK AREAS							
	Medical and Health	Government Functions	Protective Functions	Schools	Hazmat	Other Critical Functions	Total
Algona	0	0	0	0	0	1	1
Auburn	0	0	0	0	0	0	0
Beaux Arts Village	0	0	0	0	0	0	0
Bellevue	0	0	1	1	0	1	3
Black Diamond	0	0	0	0	0	0	0
Bothell	0	0	0	0	0	0	0
Burien	1	0	0	0	0	0	1
Carnation	0	0	0	0	0	0	0
Clyde Hill	0	0	0	0	0	0	0
Covington	0	0	0	0	0	0	0
Des Moines	0	0	0	0	0	0	0
Duvall	0	0	0	0	0	0	0
Enumclaw	0	0	0	0	0	0	0
Federal Way	0	0	0	0	0	0	0
Hunts Point	0	0	0	0	0	0	0
Issaquah	0	0	0	0	0	0	0
Kenmore	0	0	0	0	0	0	0
Kent	0	0	0	0	0	0	0
Kirkland	0	0	0	0	0	0	0
Lake Forest Park	0	0	0	0	0	0	0
Maple Valley	0	0	0	0	0	0	0
Medina	0	0	0	0	0	0	0
Mercer Island	0	0	0	0	0	0	0
Milton	0	0	0	0	0	0	0
Newcastle	0	0	0	0	0	0	0
Normandy Park	0	0	0	0	0	0	0
North Bend	0	0	0	0	0	0	0
Pacific	0	0	0	0	0	0	0
Redmond	0	0	0	0	0	3	3
Renton	0	0	0	1	0	0	1
Sammamish	0	0	0	1	0	0	1
SeaTac	0	0	0	0	0	0	0
Seattle	3	0	2	0	1	2	8
Shoreline	0	0	0	0	0	0	0
Skykomish	0	0	0	0	0	0	0
Snoqualmie	0	0	0	0	0	0	0
Tukwila	0	0	0	0	0	0	0
Woodinville	0	0	0	0	0	0	0
Yarrow Point	0	0	0	0	0	0	0
Unincorporated	1	0	1	1	0	0	3
Total	5	0	4	4	1	7	21

**TABLE 12-4.
CRITICAL INFRASTRUCTURE IN LANDSLIDE RISK AREAS**

	Bridges	Transportation	Water Supply	Wastewater	Power	Communications	Dams	Total
Algona	0	0	0	0	0	0	0	0
Auburn	1	0	2	0	0	0	0	3
Beaux Arts Village	0	0	0	0	0	0	0	0
Bellevue	0	0	0	0	0	0	0	0
Black Diamond	0	0	0	0	0	0	0	0
Bothell	0	0	3	0	0	0	0	3
Burien	0	0	2	2	0	0	0	4
Carnation	0	0	0	0	0	0	0	0
Clyde Hill	0	0	0	0	0	0	0	0
Covington	0	0	0	0	0	0	0	0
Des Moines	4	0	1	21	0	0	0	26
Duvall	0	0	0	0	0	0	0	0
Enumclaw	0	0	0	0	0	0	0	0
Federal Way	1	0	0	0	0	0	1	2
Hunts Point	0	0	0	0	0	0	0	0
Issaquah	3	0	9	1	0	0	0	13
Kenmore	5	0	0	0	0	0	0	5
Kent	0	0	0	0	0	0	1	1
Kirkland	0	0	0	0	0	0	0	0
Lake Forest Park	0	0	0	0	0	0	0	0
Maple Valley	0	0	0	0	0	0	0	0
Medina	0	0	0	0	0	0	0	0
Mercer Island	0	0	0	0	0	0	0	0
Milton	0	0	0	0	0	0	0	0
Newcastle	1	0	0	0	0	0	0	1
Normandy Park	0	0	0	0	0	0	0	0
North Bend	0	0	2	0	0	0	0	2
Pacific	0	0	0	0	0	0	0	0
Redmond	0	0	0	1	0	0	0	1
Renton	0	0	0	1	0	0	0	1
Sammamish	1	0	0	0	0	0	0	1
SeaTac	1	0	0	0	0	0	0	1
Seattle	1	1	0	2	0	0	0	4
Shoreline	1	0	0	5	0	0	1	7
Skykomish	0	0	0	0	0	0	0	0
Snoqualmie	0	0	0	3	0	0	1	4
Tukwila	3	0	0	0	0	0	0	3
Woodinville	0	0	1	0	0	0	0	1
Yarrow Point	0	0	0	0	0	0	0	0
Unincorporated	32	2	5	1	0	0	3	43
Total	54	3	25	37	0	0	7	126

12.4.4 Environment

Landslides that fall into streams may significantly impact fish and wildlife habitat, as well as affecting water quality. Hillsides that provide wildlife habitat can be lost for prolonged periods of time due to landslides. However, landslides also provide integral resources for many ecosystems. They contribute needed sediment and wood for building complex in-stream habitats, estuarine marshes, and beaches that are important for fisheries, wildlife and recreation (Washington Department of Community, Trade and Economic Development, 2007).

12.5 VULNERABILITY**12.5.1 Population**

Due to the nature of census block group data, it is difficult to estimate populations vulnerable to landslides. In general, all of the estimated 35,000 persons exposed to the landslide hazard are considered to be vulnerable. Increasing population, and the fact that many homes are built on view property atop or below bluffs and on steep slopes subject to mass movement, increases the number of lives endangered by this hazard.

12.5.2 Property

Although complete historical documentation of the landslide threat in the planning area is lacking, the landslides of 1997 and 2006 suggest a significant vulnerability to such hazards. The millions of dollars in damage countywide attributable to mass movement during those storms affected private property and public infrastructure and facilities.

Loss estimations for the landslide hazard are not based on modeling using damage functions, because no such damage functions have been generated. Instead, loss potential was developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to select a range of economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 12-5 shows the general building stock loss estimates in landslide risk areas.

12.5.3 Critical Facilities and Infrastructure

There are 147 critical facilities and infrastructure exposed to the landslide hazard to some degree. A more in-depth analysis of the mitigation measures taken by these facilities to prevent damage from mass movements should be done to determine if they could withstand impacts of a mass movement.

Infrastructure exposed to landslides includes transportation, water and sewer and power infrastructure. Highly susceptible areas of the county include mountain and coastal roads and transportation infrastructure. At this time all infrastructure and transportation corridors identified as exposed to the landslide hazard are considered vulnerable until more information becomes available.

12.5.4 Environment

The environment vulnerable to landslide hazard is the same as the environment exposed to the hazard.

LANDSLIDE

**TABLE 12-5.
LOSS POTENTIAL FOR LANDSLIDE**

	Exposed Value	Estimated Loss Potential from Landslide		
		10% Damage	30% Damage	50% Damage
Algona	\$14,480,680	\$1,448,068	\$4,344,204	\$7,240,340
Auburn	\$176,573,713	\$17,657,371	\$52,972,114	\$88,286,856
Beaux Arts Village	\$0	\$0	\$0	\$0
Bellevue	\$1,981,161,610	\$198,116,161	\$594,348,483	\$990,580,805
Black Diamond	\$0	\$0	\$0	\$0
Bothell	\$203,542,593	\$20,354,259	\$61,062,778	\$101,771,297
Burien	\$311,642,541	\$31,164,254	\$93,492,762	\$155,821,270
Carnation	\$0	\$0	\$0	\$0
Clyde Hill	\$0	\$0	\$0	\$0
Covington	\$0	\$0	\$0	\$0
Des Moines	\$251,127,370	\$25,112,737	\$75,338,211	\$125,563,685
Duvall	\$0	\$0	\$0	\$0
Enumclaw	\$0	\$0	\$0	\$0
Federal Way	\$229,692,113	\$22,969,211	\$68,907,634	\$114,846,057
Hunts Point	\$0	\$0	\$0	\$0
Issaquah	\$989,821,067	\$98,982,107	\$296,946,320	\$494,910,533
Kenmore	\$187,653,499	\$18,765,350	\$56,296,050	\$93,826,749
Kent	\$84,985,314	\$8,498,531	\$25,495,594	\$42,492,657
Kirkland	\$471,987,834	\$47,198,783	\$141,596,350	\$235,993,917
Lake Forest Park	\$320,001,413	\$32,000,141	\$96,000,424	\$160,000,707
Maple Valley	\$0	\$0	\$0	\$0
Medina	\$0	\$0	\$0	\$0
Mercer Island	\$0	\$0	\$0	\$0
Milton	\$1,467,951	\$146,795	\$440,385	\$733,975
Newcastle	\$75,912,685	\$7,591,268	\$22,773,805	\$37,956,342
Normandy Park	\$4,920,716	\$492,072	\$1,476,215	\$2,460,358
North Bend	\$11,346,797	\$1,134,680	\$3,404,039	\$5,673,398
Pacific	\$411,572	\$41,157	\$123,472	\$205,786
Redmond	\$313,357,757	\$31,335,776	\$94,007,327	\$156,678,878
Renton	\$301,529,572	\$30,152,957	\$90,458,872	\$150,764,786
Sammamish	\$323,839,864	\$32,383,986	\$97,151,959	\$161,919,932
SeaTac	\$5,744,701	\$574,470	\$1,723,410	\$2,872,351
Seattle	\$1,856,197,855	\$185,619,785	\$556,859,356	\$928,098,927
Shoreline	\$287,725,789	\$28,772,579	\$86,317,737	\$143,862,895
Skykomish	\$0	\$0	\$0	\$0
Snoqualmie	\$31,190,661	\$3,119,066	\$9,357,198	\$15,595,330
Tukwila	\$168,380,628	\$16,838,063	\$50,514,188	\$84,190,314
Woodinville	\$174,716,846	\$17,471,685	\$52,415,054	\$87,358,423
Yarrow Point	\$0	\$0	\$0	\$0
Unincorporated	1,347,890,780	\$134,789,078	\$404,367,204	\$673,945,390
Total	\$10,127,303,921	\$1,012,730,390	\$3,038,191,145	\$5,063,651,958

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

12.6 FUTURE TRENDS IN DEVELOPMENT

The County and its planning partners are equipped to handle future growth in landslide hazard areas. All municipal planning partners have comprehensive plans that define landslide hazard areas as critical areas. All partners have committed to linking their comprehensive plans to this hazard mitigation plan update. This will facilitate wise land use decisions as future growth impacts landslide hazard areas.

The State of Washington has adopted the International Building Code (IBC) by reference in its Washington Building Standards Code. The IBC includes provisions for geotechnical analyses in steep slope areas that have soil types considered susceptible to landslide hazards. These provisions ensure that new construction is built to standards that reduce vulnerability to the landslide risk.

12.7 SCENARIO

The worst-case scenario for landslide in the planning area would be a severe storm with heavy rain that pushes precipitation levels above the thresholds identified by USGS, followed by an earthquake. This scenario is most likely to occur during late winter when the water table is high. A recent study by Kate Allstadt and others and published online by the Bulletin of the Seismological Society of America assessed the effects of landslides on the City of Seattle following a Seattle Fault event. The analysis found that the southern portion of the city and its coastal bluffs would sustain the greatest impacts. Hundreds to thousands of buildings within the city could be impacted (University of Washington, 2013). The analysis also found that many landslides outside of mapped hazard areas may occur, impacting transportation routes. These slides could disrupt emergency response operations. Continued heavy rains and flooding would complicate the problem further.

12.8 ISSUES

Landslides are often a secondary hazard related to other natural disasters. Landslide-triggering rainstorms often produce damaging floods. Earthquakes often induce landslides that can cause additional damage. The identification of areas susceptible to landslides is necessary to support grading, building, foundation design, housing density, and other land development regulations in reducing the risk of property damage and personal injury. The most significant effect of landslides in King County is the disruption of transportation and the destruction of private and public property. Important issues associated with landslides in the planning area include the following:

- There are existing homes in landslide risk areas throughout the County. The degree of vulnerability of these structures depends on the codes and standards to which the structures were constructed.
- Although known landslide hazard areas and steep slopes are subject to regulation under critical area ordinances, continued development pressures could lead to more homes in landslide risk areas. Furthermore, landslides may occur that threaten people and property outside of these mapped areas.
- Mapping and assessment of landslide hazards are constantly evolving. As new data and science become available, assessments of landslide risk should be reevaluated.
- The impact of climate change on landslides is uncertain. Climate change impacts that alter vegetation patterns, increase the occurrence of wildfires or alter precipitation patterns may increase exposure to landslide risks.
- Landslides may cause negative environmental consequences, including water quality degradation.

- The risk associated with the landslide hazard overlaps the risk associated with other hazards such as earthquake, flood and wildfire. This provides an opportunity to seek mitigation alternatives that can reduce risk for multiple hazards.
- Facilities that contain hazardous materials located in landslide hazard areas may present additional risks for the planning area. Future analysis should assess the exposure and vulnerability of such facilities to landslide hazards.
- Mine hazard areas constitute additional geological hazards in the planning area. Future analyses should assess the exposure and vulnerability of the planning area to these sites. According to critical areas guidance, factors that should be considered in such an assessment include proximity to development, depth from ground surface to the mine working, and geological material (Washington State Department of Community, Trade and Economic Development, 2007).
- Additional studies should be performed that assess the risks from seismically induced landslides in the planning area.
- Numerous geological maps published since the 1990s cover portions of the planning area. This updated data may not be reflected in the risk analysis. The numerous landslide events in the planning area since 1990 are also unlikely to be included in the data set used for this analysis.
- LIDAR imagery allows for dramatically greater resolution in delineating landslide features and was not available in the 1990s. A simple, advisory analysis using data derived from LIDAR was performed for this plan, but a more sophisticated analysis should be performed.
- Currently available maps do not indicate run-out (where a landslide might go). Current maps show the area that might be unstable, but do not offer a complete picture of areas at risk.
- As of the completion of this planning effort, King County was convening a landslide task force to look at the landslide risk within King County more in depth. Products and recommendations from this task force should be considered in future updates to this plan.

CHAPTER 13. SEVERE WEATHER

13.1 GENERAL BACKGROUND

Severe weather refers to any dangerous meteorological phenomena with the potential to cause damage, serious social disruption, or loss of human life. It includes thunderstorms, hail storms, damaging winds, tornadoes and excessive heat.

Severe weather can be categorized into two groups: systems that form over wide geographic areas are classified as general severe weather; those with a more limited geographic area are classified as localized severe weather. Severe weather, technically, is not the same as extreme weather, which refers to unusual weather events at the extremes of the historical distribution for a given area.

The most common severe weather events that impact the planning area are thunderstorms, damaging winds and hail storms. These types of severe weather, as well as excessive heat events and tornadoes, are described in the following sections. Flooding issues associated with severe weather are discussed in Chapter 11.

13.1.1 Extreme Heat

Excessive heat events are defined by the U.S. EPA as “summertime weather that is substantially hotter and/or more humid than average for a location at that time of year” (U.S. EPA, 2006). Heat waves are excessive heat events that typically last two or more days (CDC, 2014b). Because extreme heat is relative to the usual weather in a region, criteria that define an extreme heat event may differ among jurisdictions and with the time of year. In general, extreme heat events can be characterized by temperatures greater than 90°F, warm stagnant air masses and consecutive nights with higher-than-usual minimum temperatures (CDC, 2009).

Heat Index

Extreme heat events are often a result of more than ambient air temperature. Heat index tables (see Figure 13-1) are commonly used to provide information about how hot it feels based on several meteorological conditions. Heat index values are for shady, light wind conditions; exposure to full sunshine can increase heat index values by up to 15°F. Strong winds with very hot, dry air also can be extremely hazardous (NWS, 2014b).

DEFINITIONS

Extreme Heat Event/Heat Wave—

Summertime weather that is substantially hotter and/or more humid than average for a location at that time of year. Typically a heat wave lasts two or more days.

Severe Local Storm—

Small-scale atmospheric systems, including tornadoes, thunderstorms, and windstorms. These storms may cause a great deal of destruction and even death, but their impact is generally confined to a small area. Typical impacts are on transportation infrastructure and utilities.

Thunderstorm—

A storm featuring heavy rains, strong winds, thunder and lightning, typically about 15 miles in diameter and lasting about 30 minutes. Hail and tornadoes are also dangers associated with thunderstorms. Lightning is a serious threat to human life. Heavy rains over a small area in a short time can lead to flash flooding.

Tornado—

Funnel clouds that generate winds up to 500 miles per hour. They can affect an area up to three-quarters of a mile wide, with a path of varying length. Tornadoes can come from lines of cumulonimbus clouds or from a single storm cloud. They are measured using the Fujita Scale, ranging from F0 to F5.

Windstorm—

A storm featuring violent winds. Southwesterly winds are associated with strong storms moving onto the coast from the Pacific Ocean. Southern winds parallel to the coastal mountains are the strongest and most destructive winds. Windstorms tend to damage ridgelines that face into the winds.

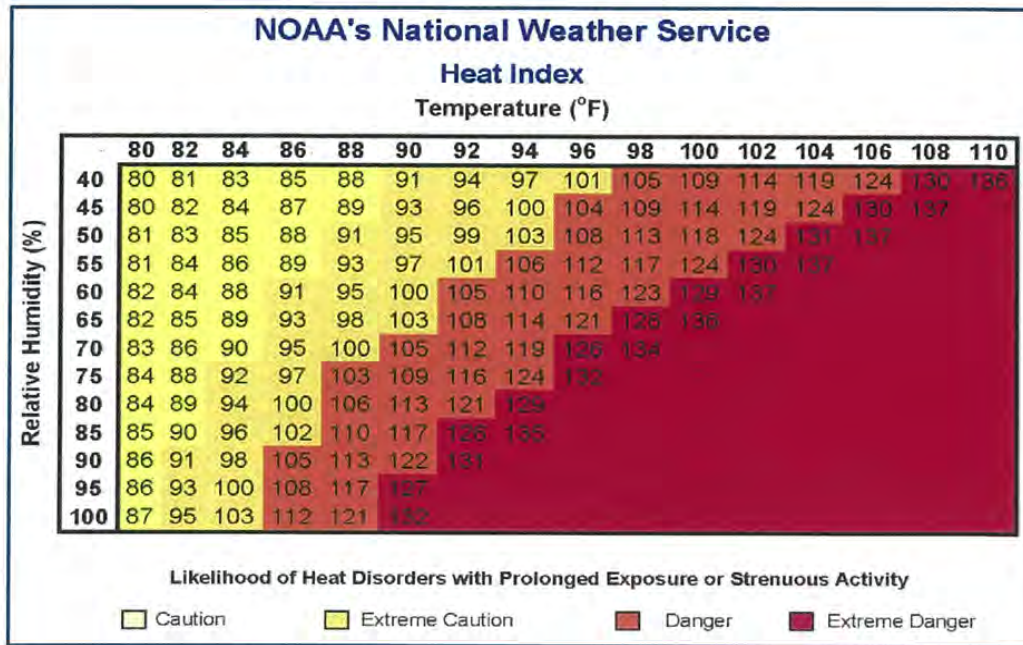


Figure 13-1. Heat Index Table

Heat Islands

Extreme heat events may be exacerbated in urban areas, where reduced air flow, reduced vegetation and increased generation of waste heat can contribute to temperatures that are several degrees higher than in surrounding rural or less urbanized areas. When urban buildings, roads and other infrastructure replace open land and vegetation, surfaces that were once permeable and moist become impermeable and dry. These changes cause urban areas to become warmer than the surrounding areas, serving as contiguous regions of higher temperatures. This phenomenon is known as urban heat island effect. Heat islands can affect communities by increasing peak summer energy demand, air pollution, greenhouse gas emissions, heat-related illness and death, and water quality degradation.

13.1.2 Thunderstorms

A thunderstorm is a rain event that includes thunder and lightning. A thunderstorm is classified as "severe" when it contains one or more of the following: hail with a diameter of three-quarter inch or greater, winds gusting in excess of 50 knots (57.5 mph), or tornado. Approximately 10 percent of the 100,000 thunderstorm that occur nationally every year are classified as severe (NOAA, 2014).

Three factors cause thunderstorms to form: moisture, rising unstable air (air that keeps rising when disturbed), and a lifting mechanism to provide the disturbance. The sun heats the surface of the earth, which warms the air above it. If this warm surface air is forced to rise (hills or mountains can cause rising motion, as can the interaction of warm air and cold air or wet air and dry air) it will continue to rise as long as it weighs less and stays warmer than the air around it. As the air rises, it transfers heat from the surface of the earth to the upper levels of the atmosphere (the process of convection). The water vapor it contains begins to cool and it condenses into a cloud. The cloud eventually grows upward into areas where the temperature is below freezing. Some of the water vapor turns to ice and some of it turns into

water droplets. Both have electrical charges. Ice particles usually have positive charges, and rain droplets usually have negative charges. When the charges build up enough, they are discharged in a bolt of lightning, which causes the sound waves we hear as thunder. Thunderstorms have three stages (see Figure 13-2):

- The *developing stage* of a thunderstorm is marked by a cumulus cloud that is being pushed upward by a rising column of air (updraft). The cumulus cloud soon looks like a tower (called towering cumulus) as the updraft continues to develop. There is little to no rain during this stage but occasional lightning. The developing stage lasts about 10 minutes.
- The thunderstorm enters the *mature stage* when the updraft continues to feed the storm, but precipitation begins to fall out of the storm, and a downdraft begins (a column of air pushing downward). When the downdraft and rain-cooled air spread out along the ground, they form a gust front, or a line of gusty winds. The mature stage is the most likely time for hail, heavy rain, frequent lightning, strong winds, and tornadoes. The storm occasionally has a black or dark green appearance.
- Eventually, a large amount of precipitation is produced and the updraft is overcome by the downdraft beginning the *dissipating stage*. At the ground, the gust front moves out a long distance from the storm and cuts off the warm moist air that was feeding the thunderstorm. Rainfall decreases in intensity, but lightning remains a danger.

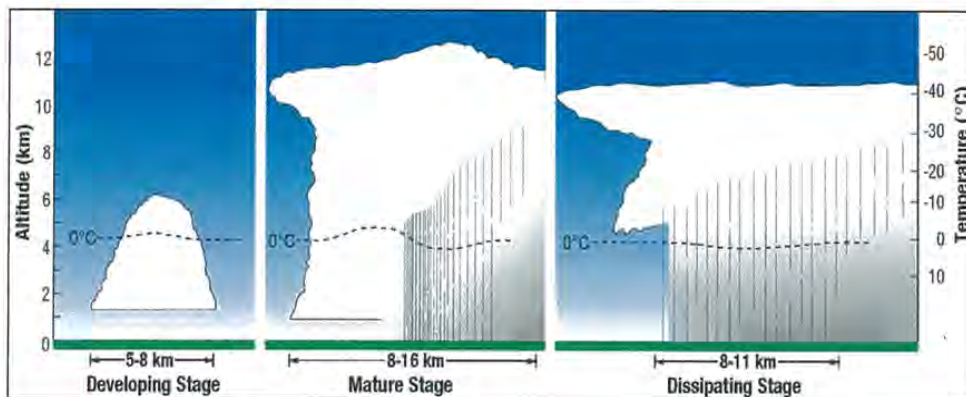


Figure 13-2. The Thunderstorm Life Cycle

There are four types of thunderstorms:

- **Single-Cell Thunderstorms**—Single-cell thunderstorms usually last 20 to 30 minutes. A true single-cell storm is rare, because the gust front of one cell often triggers the growth of another. Most single-cell storms are not usually severe, but a single-cell storm can produce a brief severe weather event. When this happens, it is called a pulse severe storm.
- **Multi-Cell Cluster Storm**—A multi-cell cluster is the most common type of thunderstorm. The multi-cell cluster consists of a group of cells, moving as one unit, with each cell in a different phase of the thunderstorm life cycle. Mature cells are usually found at the center of the cluster and dissipating cells at the downwind edge. Multi-cell cluster storms can produce moderate-size hail, flash floods and weak tornadoes. Each cell in a multi-cell cluster lasts

only about 20 minutes; the multi-cell cluster itself may persist for several hours. This type of storm is usually more intense than a single cell storm.

- **Multi-Cell Squall Line**—A multi-cell line storm, or squall line, consists of a long line of storms with a continuous well-developed gust front at the leading edge. The line of storms can be solid, or there can be gaps and breaks in the line. Squall lines can produce hail up to golf-ball size, heavy rainfall, and weak tornadoes, but they are best known as the producers of strong downdrafts. Occasionally, a strong downburst will accelerate a portion of the squall line ahead of the rest of the line. This produces what is called a bow echo. Bow echoes can develop with isolated cells as well as squall lines. Bow echoes are easily detected on radar but are difficult to observe visually.
- **Super-Cell Storm**—A super-cell is a highly organized thunderstorm that poses a high threat to life and property. It is similar to a single-cell storm in that it has one main updraft, but the updraft is extremely strong, reaching speeds of 150 to 175 miles per hour. Super-cells are rare. The main characteristic that sets them apart from other thunderstorms is the presence of rotation. The rotating updraft of a super-cell (called a mesocyclone when visible on radar) helps the super-cell to produce extreme weather events, such as giant hail (more than 2 inches in diameter), strong downbursts of 80 miles an hour or more, and strong to violent tornadoes.

Lightning occurs in all thunderstorms. There are two main types of lightning: intra-cloud lightning and cloud-to-ground lightning. Cloud-to-ground lightning consists of at least one leader and at least one return stroke. The leader initiates the first phase of the a lightning discharge, while a return stroke moves upward along a lightning channel from the ground to the cloud (National Weather Service, 2014).

13.1.3 Hail Storms

Hail occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. Recent studies suggest that super-cooled water may accumulate on frozen particles near the back-side of a storm as they are pushed forward across and above the updraft by the prevailing winds near the top of the storm. Eventually, the hailstones encounter downdraft air and fall to the ground.

Hailstones grow two ways: by wet growth or dry growth. In wet growth, a tiny piece of ice is in an area where the air temperature is below freezing, but not super cold. When the tiny piece of ice collides with a super-cooled drop, the water does not freeze on the ice immediately. Instead, liquid water spreads across tumbling hailstones and slowly freezes. Since the process is slow, air bubbles can escape, resulting in a layer of clear ice. Dry growth hailstones grow when the air temperature is well below freezing and the water droplet freezes immediately as it collides with the ice particle. The air bubbles are “frozen” in place, leaving cloudy ice.

Hailstones can have layers like an onion if they travel up and down in an updraft, or they can have few or no layers if they are “balanced” in an updraft. One can tell how many times a hailstone traveled to the top of the storm by counting its layers. Hailstones can begin to melt and then re-freeze together, forming large and very irregularly shaped hail.

13.1.4 Damaging Winds

Damaging winds are classified as those exceeding 60 mph. Damage from such winds accounts for half of all severe weather reports in the lower 48 states. Wind speeds can reach up to 100 mph and can produce a damage path extending for hundreds of miles. Isolated wind events in mountainous regions have more

localized effects. Windstorms in Washington typically occur from October through March (Washington Emergency Management, 2010). There are seven types of damaging winds:

- **Straight-line winds**—Any thunderstorm wind that is not associated with rotation; this term is used mainly to differentiate from tornado winds. Most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft.
- **Downdrafts**—A small-scale column of air that rapidly sinks toward the ground.
- **Downbursts**—A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst or damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.
- **Microbursts**—A small concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally less than 2.5 miles across and short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph. There are two kinds of microbursts: wet and dry. A wet microburst is accompanied by heavy precipitation at the surface. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.
- **Gust front**—A gust front is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop, and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.
- **Derecho**—A derecho is a widespread thunderstorm wind caused when new thunderstorms form along the leading edge of an outflow boundary (the boundary formed by horizontal spreading of thunderstorm-cooled air). The word “derecho” is of Spanish origin and means “straight ahead.” Thunderstorms feed on the boundary and continue to reproduce. Derechos typically occur in summer when complexes of thunderstorms form over plains, producing heavy rain and severe wind. The damaging winds can last a long time and cover a large area.
- **Bow Echo**—A bow echo is a linear wind front bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be 200 miles long, last for several hours, and produce extensive wind damage at the ground.

Windstorms can result in collapsed or damaged buildings, damaged or blocked roads and bridges, damaged traffic signals, streetlights and parks, and other damage. They can also cause direct losses to buildings, people, and vital equipment. There are direct consequences to the local economy resulting from windstorms related to both physical damage and interrupted services.

Wind pressure can create a direct and frontal assault on a structure, pushing walls, doors, and windows inward. Conversely, passing currents can create lift and suction forces that act to pull building components and surfaces outward. As positive and negative forces impact a building’s doors, windows and walls, the result can be roof or building component failures and considerable structural damage. The effects of winds are magnified in the upper levels of multi-story structures.

Debris carried along by extreme winds can contribute directly to loss of life and indirectly to the failure of protective building envelopes. Falling trees and branches can damage buildings, power lines, and other property and infrastructure. Tree limbs breaking in winds of only 45 mph can be thrown over 75 feet, so overhead power lines can be damaged even in relatively minor windstorm events. During wet winters, saturated soils cause trees to become less stable and more vulnerable to uprooting from high winds. Utility lines brought down by summer thunderstorms have also been known to cause fires, which start in

dry roadside vegetation. Electric power lines falling down to the pavement create the possibility of lethal electric shock.

Downed trees and power lines, and damaged property also can be major hindrances to emergency response and disaster recovery. Emergency response operations can be complicated when roads are blocked or when power supplies are interrupted. Industry and commerce can suffer losses from interruptions in electric service and from extended road closures.

13.1.5 Tornado

A tornado is a violently rotating column of air extending between, and in contact with, a cloud and the surface of the earth. As shown in Figure 13-3, Washington has a relatively low risk compared to states in the Midwestern and Southern U.S. Washington has experienced tornadoes on occasion. Some have produced significant damage, injury or death. Washington's tornadoes can be formed in association with large Pacific storms arriving from the west. Most of them, however, are caused by intense local thunderstorms. These storms also produce lightning, hail and heavy rain, and are more common during the warm season from April to October.

Tornadoes are often (but not always) visible as a funnel cloud. On a local-scale, tornadoes are the most intense of all atmospheric circulations and wind can reach destructive speeds of more than 300 mph. A tornado's vortex is typically a few hundred meters in diameter, and damage paths can be up to 1 mile wide and 50 miles long. Tornadoes can occur throughout the year at any time of day but are most frequent in the spring during the late afternoon. Figure 13-4 illustrates the potential impacts and damage from tornadoes of different magnitudes.

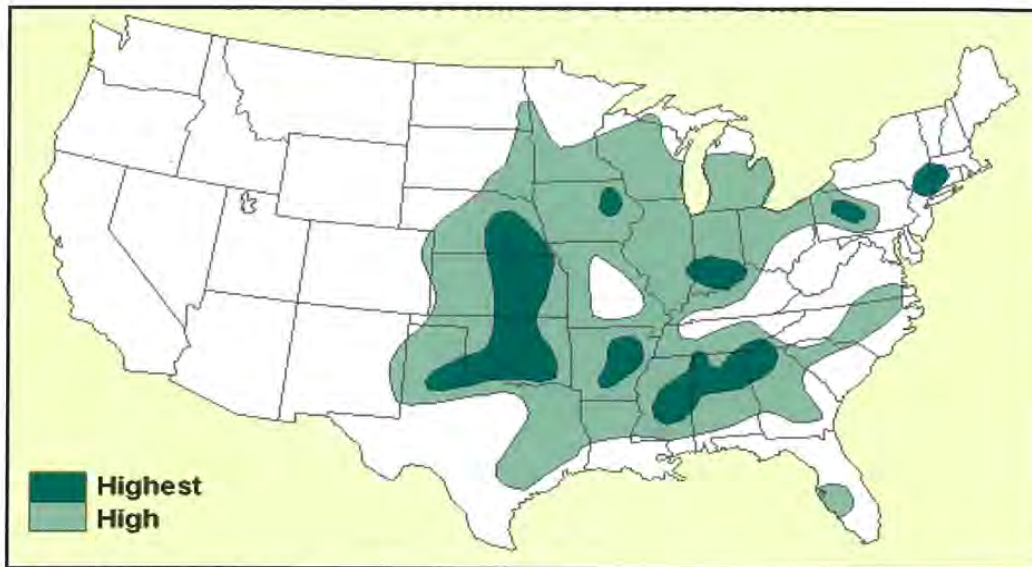


Figure 13-3. Tornado Risk Areas in the United States

SEVERE WEATHER

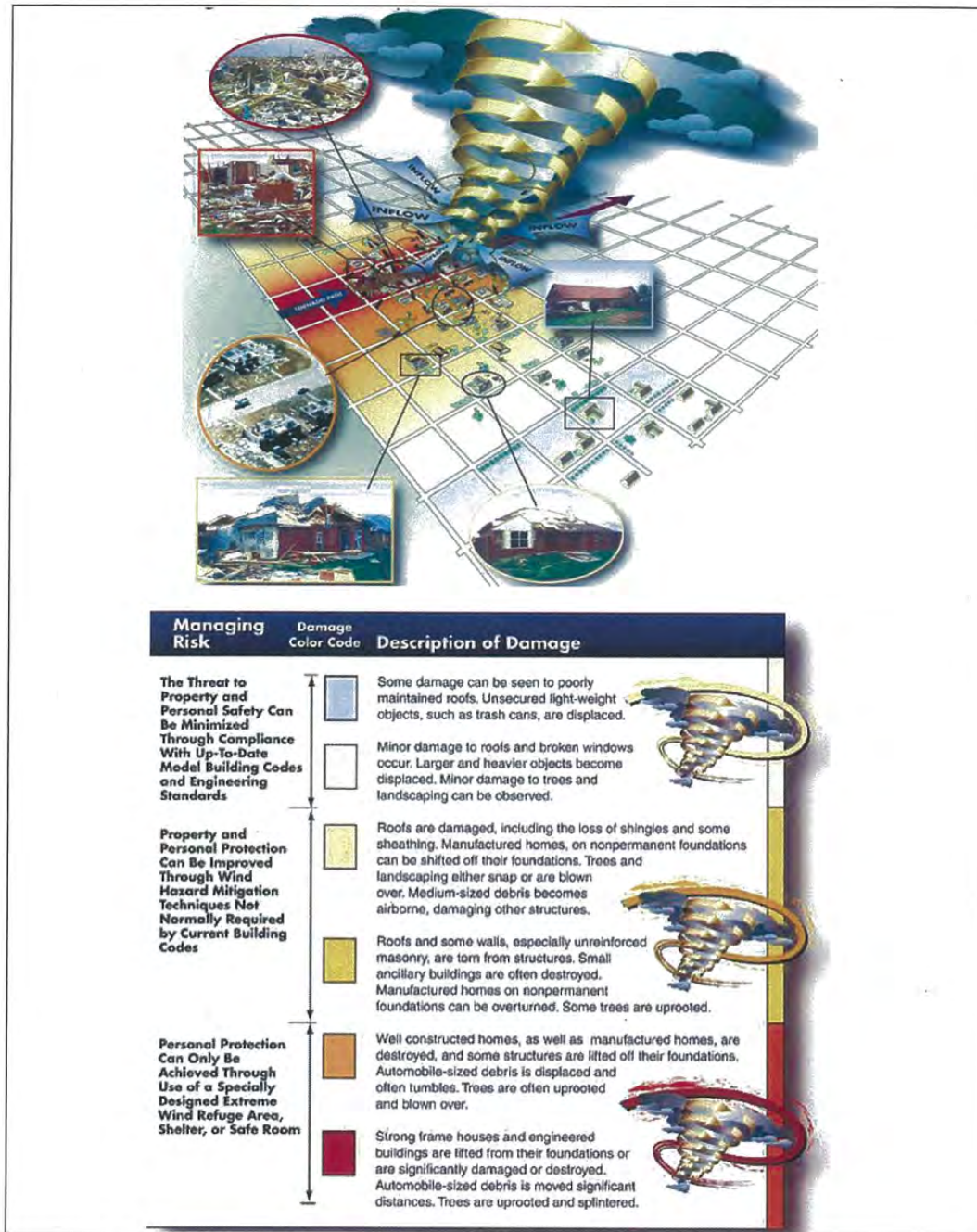


Figure 13-4. Potential Impact and Damage from a Tornado

13.2 HAZARD PROFILE

13.2.1 Past Events

Table 13-1 summarizes severe weather events in the planning area since 1996, as recorded by the National Oceanic and Atmospheric Administration (NOAA).

TABLE 13-1. PAST SEVERE WEATHER EVENTS IMPACTING PLANNING AREA			
Date	Type	Deaths or Injuries	Property Damage
09/03/1996	Flood	0	\$0
<i>Description: A couple of thunderstorms moved through Puget Sound, knocking out power, and forcing the closure of some roads due to flooding. There was also some marble sized hail. Most of the problems were due to urban flooding. Traffic was slowed to a crawl in most areas because of standing water and several apartments in Bellevue had flooded. Reports of a half an inch in 20 min and three quarters of an inch of rain in 30 min were common.</i>			
10/15/1996	Lightning	0	\$95,000
<i>Description: Lightning was the probable cause to a house fire that caused \$95,000 in damage.</i>			
11/30/1996	Lightning	1 injury	\$0
<i>Description: A woman suffered burns to her fingers when lightning struck a telephone line. Lightning also knocked out power in several areas of Bellevue when it struck transformers.</i>			
12/10/1996	Lightning	0	\$350,000
<i>Description: Lightning damaged a home, struck another mobile home and struck a tree near Lake Ballinger.</i>			
12/29/1996	Heavy Rain	0	\$31.5 million
<i>Description: Overall, the total damage from the storm that lasted from December 26 – 31, caused about \$315 million in both insured and uninsured damage (in all of WA). Although not all directly caused by the weather (some indirect) the storms claimed 16 lives and sparked a state of emergency in 30 counties. Seattle normally averages 1.44" of precipitation between Dec. 26 and Jan 2nd. This winter it received 8.35" during those eight days. The total number of customers without power at one time was nearly 300,000 and some people went a week without power. The damage affected people for weeks. In Seattle the Magnolia bridge had supports wiped out by mudslides and forced evacuations of 85 homes in the area due to mudslides and sinkholes..</i>			
01/02/1997	Lightning	0	\$0
<i>Description: Lightning struck a home knocking gutters off, blew the electric box out of the wall, left burn marks across the floor and melted a sewing machine. The lightning also affected two other homes, disabling a garage door and blacking out a computer.</i>			
04/03/1997	Lightning	1 injury	\$0
<i>Description: A woman holding an umbrella was struck by lightning.</i>			
06/03/1997	Funnel Cloud	0	\$0
<i>Description: A spotter observed a small funnel cloud.</i>			
07/05/1997	Lightning	2 injuries	\$0
<i>Description: Two people, a 30 year old woman and a 24 year old man, suffered minor injuries after being struck by lightning. Both were indirect hits, with one of the strikes travelling through a chain link fence before zapping the woman.</i>			
08/06/1997	Lightning	1 injury	\$0
<i>Description: Two people were struck by lightning. Only one was injured with burns on his leg. Lightning also damaged a church furnace and split trees. Power was knocked out to about 1000 customers.</i>			

SEVERE WEATHER

**TABLE 13-1.
PAST SEVERE WEATHER EVENTS IMPACTING PLANNING AREA**

Date	Type	Deaths or Injuries	Property Damage
10/04/1997	Lightning	0	\$5,000
<i>Description: A lightning bolt struck a home, blowing an 8 foot hole in the living-room wall. It also damaged a nearby tree.</i>			
04/08/1998	Lightning	0	0
<i>Description: Lightning struck a fir tree and a shed. It burned a hole through the roof of the shed and exploded two bags of lawn chemicals.</i>			
03/01/1999	Heavy Rain	0	\$5.5 million
<i>Description: The heavy rain, which in turn caused flooding and mudslides, over the winter season has caused 18.5 million damage to Washington State roads. The two hardest hit counties were Mason with 10.2 and King with 5.5 million in damage.</i>			
06/01/1999	Lightning	0	\$0
<i>Description: Lightning struck a tree and damaged about 50 windows in an apartment complex.</i>			
07/16/1999	Lightning	0	\$130,000
<i>Description: Lightning struck a house and knocked out power to about 8000 homes.</i>			
08/03/1999	Lightning	2 injuries	\$650,000
<i>Description: Over 1000 lightning strikes were recorded in a four hour period. One man was struck by lightning while standing under a tree, and another man while standing in water next to his boat. At its peak the storm knocked out power to about 20,000 customers.</i>			
08/30/1999	Hail	0	\$0
<i>Description: A thunderstorm left up to 2 inches of hail on the ground after it was over. There was also a funnel cloud spotted by a NWS employee.</i>			
11/17/1999	Heavy Rain	0	\$85,000
<i>Description: Heavy rains led to a road being washed out by Issaquah Creek.</i>			
01/14/2000	Heavy Rain	15 injuries	\$0
<i>Description: More than two dozen vehicles collided on Interstate 5 during a brief, but heavy, rain shower. Traffic was backed up for about 7 miles.</i>			
02/08/2000	Thunderstorm & Wind	0	\$25,000
<i>Description: A microburst with winds estimated at 50 mph hit West Seattle knocking down a few trees, damaging two homes and a car.</i>			
06/11/2001	Tornado	0	\$0
<i>Description: A very weak tornado tossed a teacher and a few children into the air. No one was injured.</i>			
08/21/2001	Heavy Rain	0	\$0
<i>Description: Record rainfall amounts were set in several locations throughout western Washington on the 22nd. Nearly a month's worth of rain (for Aug ~ 1 inch) fell over most of the area with 2 to 5 inches common along the coast and in the mountains. The greatest storm total was 6.38 inches at Finney Creek in the north Cascades. The heavy rains caused a few power outages and flooding of some roads including SR-16. A woman was swept to her death while trying to cross the Quinault River's east fork in Jefferson County.</i>			
11/13/2001	Heavy Rain	0	\$0
<i>Description: Heavy rain caused several mudslides which closed several roads across western Washington. In a 48 hour period 3-5 inches of rain fell in the interior with 4-8 inches along the coast. Several sites set records for rainfall on Wed Nov 14th - from midnight to midnight, Olympia received 3.64 inches while SeaTac got 2.61 inches. Several buildings were flooded and small mudslides flowed over a few homeowners property, but no significant damage was reported.</i>			

**TABLE 13-1.
PAST SEVERE WEATHER EVENTS IMPACTING PLANNING AREA**

Date	Type	Deaths or Injuries	Property Damage
09/08/2003	Heavy Rain	0	\$5,000
<i>Description: After about a month with little or no rainfall, a few heavy showers opened up over eastern King and Snohomish counties. Up to 1.5 inches fell in Kirkland, where a couple of homes and a church were flooded. In Duvall, 3500 customers lost power due to toppled trees.</i>			
10/20/2003	Heavy Rain	0	\$100,000
<i>Description: An all-time daily record rainfall total was set at SeaTac Airport with 5.02 inches. Almost all reporting stations had at least 2 inches of rain in the 24 hour period from midnight to midnight. In all, nearly 50 homes spread over several counties suffered damage from minor flooding especially in basements and garages. Traffic snarls were common as many roads throughout the region were temporarily closed. The national parks and forests suffered fairly extensive damage to several bridges and many trails or the roads that lead to the trails.</i>			
02/06/2004	Lightning	0	\$0
<i>Description: An airport ramp worker was dazed after lightning struck the plane he was attending at SeaTac Airport.</i>			
05/27/2004	Funnel Cloud	0	\$0
<i>Description: No description available.</i>			
08/22/2004	Heavy Rain	0	\$50,000
<i>Description: Heavy rain flooded a Qwest copper cable, which disrupted phone service to 1,500 customers. 26 homes in Seattle's Madison valley neighborhood suffered damage, when a storm water overflow tank backed up.</i>			
02/04/2005	Lightning	0	\$1,000
<i>Description: A lightning strike caused a small fire on the roof of a gas station.</i>			
03/16/2005	Funnel Cloud	0	\$0
<i>Description: No description available.</i>			
12/24/2005	Heavy Rain	0	\$10,000
<i>Description: Heavy rain caused a local creek to flood and damage 3 local businesses in north Seattle.</i>			
01/05/2006	Heavy Rain	0	\$800,000
<i>Description: The Governor declared a state of emergency after rain, at times heavy, over a period of about 10 days, caused over 7 million in damage, mainly to transportation infrastructure throughout western Washington. Mudslides closed parts of I-5 near the Pierce-Thurston county line, part of Highway 20 about a half mile east of Concrete, Highway 107 near Raymond, and Highway 166 near Port Orchard - where 3 cars crashed in the mud. In King County, there were 19 road closures from water over the roadway. Many homes had flooded basements or crawlspaces.</i>			
03/10/2006	Hail	0	\$0
<i>Description: A thunderstorm briefly dumped 1 inch hail in Redmond.</i>			
11/04/2006	Flood	0	\$11.1 million
<i>Description: A strong, warm and very wet Pacific weather system brought copious amounts of rainfall to Washington from November 2 through 7, with subsequent major flooding through November 11. This storm produced rain amounts of 10 to 38 inches in the Cascades and Olympics and 4 to 10 inches in western Washington lowlands. Floods occurred at 34 forecast points on 25 rivers. There were 22 locations with major flooding or greater. There were 20 record floods. Widespread and excessive urban and small stream flooding also occurred. 11 counties were declared disaster areas. A tally had 104 homes destroyed, 206 homes with major damage, and 572 received minor damage.</i>			

SEVERE WEATHER

**TABLE 13-1.
PAST SEVERE WEATHER EVENTS IMPACTING PLANNING AREA**

Date	Type	Deaths or Injuries	Property Damage
12/14/2006	Heavy Rain/Flash Flood	1 death	\$1.75 million
Description: A strong rain and wind storm on Dec 14 – 15 initially brought 1 to 2 inches of heavy rainfall to parts of western Washington, producing areas of urban and small stream flooding and overwhelming drainage systems. Widespread strong damaging winds followed. In western Washington, peak winds reached 80 to 90 mph along the coast and 60 to 75 mph elsewhere. A few locations had gusts as high 85 mph in the interior. Mountain areas recorded peak wind speeds in excess of 100 mph. The wind storm blew down thousands of trees and knocked power out to close to 1.5 million customers. There were four fatalities as a direct result of the storm and 11 indirect fatalities following the storm: Three people in western Washington were killed by fallen trees; one person drowned in Seattle when a basement filled with rain runoff; two people were electrocuted by downed power lines and one man died after his home burned apparently started by a candle used for light. 36 people were directly injured by the wind storm. Another 275 people in King county were treated for carbon monoxide poisoning.			
07/13/2007	Lightning	0	\$5,000
Description: Lightning struck a home in Kirkland causing minor damage.			
12/03/2007	Heavy Rain	0	\$12 million
Description: Flooding occurred on the Skykomish and Snoqualmie Rivers and Issaquah Creek. Significant urban and small stream flooding occurred in King County as 3 to 8 inches of rain fell over the area. A storm system initially generated lowland snow in western Washington and later created strong winds in the coastal region and avalanches in the Cascades. Four apartment buildings were evacuated in North Seattle, where some basement apartments had 3 feet of water in them. About 30 people were evacuated from apartments in Woodinville. Many roads were closed. About 20 roads were damaged. Nearly 5 inches of rain fell at SeaTac airport. Nathan Hale High School in north Seattle was closed for a week due to water damage from Thornton Creek. Homes and businesses had water damage.			
05/17/2008	Heat	2 indirect deaths, 14 indirect injuries	\$0
Description: Western Washington had its first hot spell of the year following below normal spring temperatures. The heat helped push mountain snow melt streams higher (below flood levels) with swift running and cold water temperatures. This combination led to people seeking relief from the heat by heading to these swift running streams. There were two indirect fatalities due to the heat. Both are missing and likely drowned. One kayaker spilled into the Green River and disappeared. One of four rafters who were thrown into the Green River when their raft flipped disappeared (King County).			
06/06/2008	Funnel Cloud	0	\$0
Description: A January type storm hit western Washington with strong winds and 2 funnel clouds. Winds gusting to 45 mph knocked out power to nearly 35,000 customers. One fallen tree struck three mobile homes in Purdy. South Kitsap high school students got the day off because of a power outage at the school. The final evening run of the Port Townsend - Keystone ferry was canceled. Funnel cloud reached about half way toward the ground.			
07/02/2008	Hail	0	\$0
Description: Lots of lightning and small hail was reported from the afternoon of the 2nd through the early morning hours of the 3 rd .			
08/25/2008	Funnel Cloud	0	\$0
Description: Two funnel clouds were spotted. One over Lake Washington, and another near Black Diamond.			
11/12/2008	Heavy Rain	0	\$100,000
Description: Heavy rain caused flooding on 15 western Washington rivers, with eight river forecast points reaching major flood stage. Major flooding on the Snoqualmie River.			

**TABLE 13-1.
PAST SEVERE WEATHER EVENTS IMPACTING PLANNING AREA**

Date	Type	Deaths or Injuries	Property Damage
01/07/2009	Heavy Rain	0	\$14 million
Description: Rainfall of 8-20 inches in the mountains and 1 to 9 inches in the lowlands occurred Jan 6 – 8. Record flooding occurred on the Snoqualmie, Tolt, and North Fork Stillaguamish Rivers. Major flooding occurred on 18 rivers and 21 forecast points. Surveys found an estimated 497 residences that were destroyed or suffered major damage, and another 2,340 residences that needed repairs. Over 44,000 people were evacuated. The cities of Snoqualmie, Carnation, Duvall and Fall City flooded. Issaquah Creek flooded some residences and businesses. It also eroded part of the riverbank, which caused a guest house to fall into the creek. About 40 King County roads were closed. In Pacific, about 1000 people evacuated due to flooding from releases from the Mud Mountain dam.			
04/28/2009	Funnel Cloud	0	\$0
Description: A funnel cloud was spotted near Maple Valley for a few minutes and photographed.			
07/27/2009	Excessive Heat	1 death	\$0
Description: Strong high pressure aloft led to a major heat event for Western Washington. The average temperature for July 2009 at Seattle-Tacoma airport was 69.5 degrees, the warmest July on record for the airport, and tying the record for the warmest July on record in Seattle. Many record high temperatures were broken, including 103°F at Seattle-Tacoma airport, 104°F at Olympia and 96°F at Bellingham. A heat related death occurred when a 66 year old male died in Seattle. The downtown Bremerton library closed for two days due to excessive heat. Some University of Washington libraries closed and several classes were held outside due to the lack of air conditioning in classrooms.			
09/06/2009	Lightning	0	\$20,000
Description: Lightning struck a tree next to a home, causing damage to the home's siding and electronics inside.			
05/08/2010	Funnel Cloud	0	\$0
Description: Some bicycles were tossed and a tent blew apart at Genesee Park in the Rainier Valley of Seattle.			
06/09/2010	Funnel Cloud	0	\$0
Description: A spotter saw a small funnel cloud east of Enumclaw. It was brief and spotter could not see if it touched the ground due to the trees.			
12/12/2010	Heavy Rain	0	\$3 million
Description: There was major flooding along the Snoqualmie River. Westside Hwy on Vashon island was closed due to a portion of the road sinking. Some basements flooded in Newcastle. Several roads around North Bend and Carnation were closed due to flooding.			
12/14/2010	Thunderstorm & Wind	0	\$25,000
Description: A squall line produced outflow winds with gusts between 45 and 70 mph. About 8600 Seattle City Light customers lost power. About 300 homes in the Sammamish area lost power. A Maple valley lumber storage building had its roof ripped off.			
01/16/2011	Heavy Rain	1	\$20,000
Description: A DOT worker was killed when a tree fell on Highway 203 south of Carnation. Several mudslides blocked roads. The Snoqualmie Falls golf course and parts of Highway 202 were flooded.			
07/13/2012	Lightning	1 injury	\$100,000
Description: A lightning strike cause minor damage to a home and minor injuries to the homeowner when he was blown across the room. After the lightning strike, a fire started, which caused nearly \$100,000 damage to the house.			
01/09/2013	Debris Flow	0	\$5,000
Description: Two mudslides between Jan 8th and 9th caused minor damage in King and Whatcom counties. A road was partially blocked and minivan damaged when a mudslide occurred just south of Alki Beach.			
05/13/2013	Thunderstorm, Wind	0	\$25,000
Description: A tree and power lines fell across cars in a parking lot at Green River Community College in Auburn. Classes were canceled for the rest of the day due to a power outage			

**TABLE 13-1.
PAST SEVERE WEATHER EVENTS IMPACTING PLANNING AREA**

Date	Type	Deaths or Injuries	Property Damage
07/17/2013	Lightning	0	\$5,000
<i>Description: One lightning strike damaged a transformer, which knocked out power to customers in Shoreline.</i>			
07/31/2013	Lightning	0	\$10,000
<i>Description: Thunderstorms damaged two homes and an underground pipeline near Sammamish.</i>			
09/05/2013	Heavy Rain	0	\$10,000
<i>Description: Heavy rain caused a sinkhole that damaged a road in Burien.</i>			
Source: http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=53%2CWASHINGTON			

13.2.2 Location

Severe weather events have the potential to happen anywhere in the planning area. Communities in low-lying areas next to streams or lakes are more susceptible to flooding. Wind events are most damaging to areas that are heavily wooded and areas with exposed property, major infrastructure, and above ground utility lines. The distribution of average weather conditions over the planning area is shown in Figure 6-2 through Figure 6-5.

13.2.3 Frequency

The severe weather events for King County shown in Table 13-1 are often related to high winds, heavy rain or lightning associated with storms. The planning area can expect to experience exposure to some type of severe weather event at least annually. In 18 years, the county has experienced 57 severe weather events with an average of 3 events per year.

According to the Washington State Hazard Mitigation Plan, King County is vulnerable to high winds. The County is likely to experience at least one high wind event per year. Washington averaged three tornadoes per year between 1991 and 2010, none with a rating of EF3 or greater. The state ranks low in the U.S. for average annual tornadoes per square mile—only Oregon, Nevada, Utah and Alaska have fewer yearly tornadoes per area than Washington's 0.4 per 10,000 square miles (NOAA, 2014b). Lightning strikes occur occasionally in the planning area, although much less frequently than in other parts of the country. Since 1996, NOAA reports 19 lightning strikes in King County, with 7 injuries, no deaths, and \$925,500 in damage. Flooding as a result of severe weather occurs annually within the planning area (see Chapter 11). Only two instances of extreme heat events are listed for the planning area between 1996 and 2013; however, this data likely underestimates the occurrence of such events in the planning area. Extreme heat events can occur several times per year, especially in the summer.

13.2.4 Severity

The most common problems associated with severe storms are immobility and loss of utilities. Fatalities are uncommon, but can occur. Roads may become impassable due to flooding, downed trees or a landslide. Power lines may be downed due to high winds, and services such as water or phone may not be able to operate without power. Lightning can cause severe damage and injury.

Windstorms can be a frequent problem in the planning area and have been known to cause damage to utilities. The predicted wind speed given in wind warnings issued by the National Weather Service is for a

one-minute average; gusts may be 25 to 30 percent higher. Lower wind speeds typical in the lower valleys are still high enough to knock down trees and power lines and cause other property damage. Mountainous sections of the County experience much higher winds under more varied conditions.

Tornadoes are potentially the most dangerous of local storms, but they are not common in the planning area. If a major tornado were to strike within the populated areas of the county, damage could be widespread. Businesses could be forced to close for an extended period or permanently, fatalities could be high, many people could be homeless for an extended period, and routine services such as telephone or power could be disrupted. Buildings may be damaged or destroyed.

The severity of an extreme heat event depends on how early the event occurs in the summer and the number of consecutive days it lasts (EPA, 2006). Urban heat island effect can exacerbate the severity of an extreme heat event.

13.2.5 Warning Time

Meteorologists can often predict the likelihood of a severe storm or other severe weather event. This can give several days of warning time. However, meteorologists cannot predict the exact time of onset or severity of the storm. Some storms may come on more quickly and have only a few hours of warning time. The Seattle Office of the National Weather Service monitors weather stations and issues watches and warnings when appropriate to alert government agencies and the public of possible or impending weather events. The watches and warnings are broadcast over NOAA weather radio and are forwarded to the local media for retransmission using the Emergency Alert System. NWS and NOAA also issue outlooks, watches, warnings and advisory information for extreme heat.

13.3 SECONDARY HAZARDS

The most significant secondary hazards associated with severe local storms are floods, falling and downed trees, landslides and downed power lines. Rapidly melting snow combined with heavy rain can overwhelm both natural and man-made drainage systems, causing overflow and property destruction. Landslides occur when the soil on slopes becomes oversaturated and fails. Excessive heat events can cause failure of motorized systems, such as ventilation systems used to control temperatures inside buildings, if these systems are operating above typical operating standards. Additionally, demand for cooling systems during these events can overload energy systems and result in controlled or unexpected power outages. Fires can occur as a result of lightning strikes.

13.4 EXPOSURE

13.4.1 Population

A lack of data separating severe weather damage from flooding and landslide damage prevented a detailed analysis for exposure and vulnerability. However, it can be assumed that the entire planning area is exposed to some extent to severe weather events. Certain areas are more exposed due to geographic location and local weather patterns. Populations living at higher elevations with large stands of trees or power lines may be more susceptible to wind damage and black out, while populations in low-lying areas are at risk for possible flooding. Populations living in densely populated urban areas are likely to be more exposed to extreme heat events.

13.4.2 Property

According to the King County Assessor, there are 545,846 structures within the census tracts that define the planning area. Most of these buildings are residential. It is estimated that 70 percent of the residential

structures were built without the influence of a structure building code with provisions for wind loads. All of these buildings are considered to be exposed to the severe weather hazard, but structures in poor condition or in particularly vulnerable locations (located on hilltops or exposed open areas) may risk the most damage. The frequency and degree of damage will depend on specific locations.

13.4.3 Critical Facilities and Infrastructure

All critical facilities exposed to flooding (Chapter 11) are also likely exposed to severe weather. Additional facilities on higher ground may also be exposed to wind damage or damage from falling trees. The most common problems associated with severe weather are loss of utilities. Downed power lines can cause blackouts, leaving large areas isolated. Phone, water and sewer systems may not function. Roads may become impassable due secondary hazards such as landslides.

13.4.4 Environment

The environment is highly exposed to severe weather events. Natural habitats such as streams and trees are exposed to the elements during a severe storm and risk major damage and destruction. Prolonged rains can saturate soils and lead to slope failure. Flooding events caused by severe weather can produce river channel migration or damage riparian habitat. Storm surges can erode beachfront bluffs and redistribute sediment loads.

13.5 VULNERABILITY

13.5.1 Population

Vulnerable populations are the elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Power outages can be life threatening to those dependent on electricity for life support. Isolation of these populations is a significant concern. These populations face isolation and exposure during severe weather events and could suffer more secondary effects of the hazard.

Nationally, lightning is one of the leading causes of weather-related fatalities (CDC, 2013). Lightning strikes are far more common in other areas of the country than they are in the Pacific Northwest. The majority of injuries and deaths associated with lightning strikes occur when people are out of doors; however, almost one-third of lightning related injuries occur indoors. Males are five times more likely than females to be struck by lightning and people between the ages of 15 and 34 account for 41 percent of all lightning strike victims (CDC, 2013).

According to the U.S. EPA, the individuals with one or more of the following characteristics are typically at greater risk to the adverse effects of excessive heat events: Individuals with physical or mobility constraints, cognitive impairments, economic constraints, and social isolation. The average summertime mortality for excessive heat events is dependent upon the methodology used to derive such estimates. Certain medical conditions, such as heat stroke, can be directly attributable to excessive heat, while others may be exasperated by excessive heat, resulting in medical emergencies. The U.S. EPA cites two studies that estimate excessive heat attributable deaths in select metropolitan regions in the U.S. based on 1990 population levels (EPA, 2006). Average estimated heat-attributed mortality in Seattle is between 5 (Kalkstein and Greene, 1997) and 96 (Davis et al., 2003).

13.5.2 Property

All property is vulnerable during severe weather events, but properties in poor condition or in particularly vulnerable locations may risk the most damage. Those in higher elevations and on ridges may be more

prone to wind damage. Those that are located under or near overhead lines or near large trees may be damaged in the event of a collapse.

Loss estimates for the severe weather hazard are not based on damage functions, because no such damage functions have been generated. Instead, estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to select a range of potential economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 13-2 lists the loss estimates.

13.5.3 Critical Facilities and Infrastructure

Incapacity and loss of roads are the primary transportation failures resulting from severe weather, mostly associated with secondary hazards. Landslides caused by heavy prolonged rains can block roads. High winds can cause significant damage to trees and power lines, blocking roads with debris, incapacitating transportation, isolating population, and disrupting ingress and egress. Of particular concern are roads providing access to isolated areas and to the elderly.

Prolonged obstruction of major routes due to landslides, debris or floodwaters can disrupt the shipment of goods and other commerce. Large, prolonged storms can have negative economic impacts for an entire region.

Severe windstorms and downed trees can create serious impacts on power and above-ground communication lines. Loss of electricity and phone connection would leave certain populations isolated because residents would be unable to call for assistance.

13.5.4 Environment

The vulnerability of the environment to severe weather is the same as the exposure.

13.6 FUTURE TRENDS IN DEVELOPMENT

All future development will be affected by severe storms. The ability to withstand impacts lies in sound land use practices and consistent enforcement of codes and regulations for new construction. The planning partners have adopted the International Building Code in response to Washington State mandates. This code is equipped to deal with the impacts of severe weather events. Land use policies identified in comprehensive plans within the planning area also address many of the secondary impacts (flood and landslide) of the severe weather hazard. To combat the effects of urban heat island effect, communities can implement design standards and urban planning principles that reduce the impacts of excessive heat events. With these tools, the planning partnership is well equipped to deal with future growth and the associated impacts of severe weather.

13.7 SCENARIO

Impacts of severe weather can be significant, particularly when secondary hazards of flood and landslide occur. A worst-case event would involve prolonged high winds accompanied by thunderstorms. Such an event would have both short-term and longer-term effects. Initially, schools and roads would be closed due to power outages caused by high winds and downed tree obstructions. In more rural areas, some subdivisions could experience limited ingress and egress. Prolonged rain could produce flooding, overtopped culverts with ponded water on roads, and landslides on steep slopes. Flooding and landslides could further obstruct roads and bridges, further isolating residents.

SEVERE WEATHER

**TABLE 13-2.
LOSS POTENTIAL FOR SEVERE WEATHER**

	Total Assessed Value	Estimated Loss Potential from Severe Weather		
		10% Damage	30% Damage	50% Damage
Algona	\$902,612,000	\$90,261,200	\$270,783,600	\$451,306,000
Auburn	\$17,992,313,000	\$1,799,231,300	\$5,397,693,900	\$8,996,156,500
Beaux Arts	\$60,778,000	\$6,077,800	\$18,233,400	\$30,389,000
Bellevue	\$49,163,714,000	\$4,916,371,400	\$14,749,114,200	\$24,581,857,000
Black Diamond	\$600,388,000	\$60,038,800	\$180,116,400	\$300,194,000
Bothell	\$5,215,897,000	\$521,589,700	\$1,564,769,100	\$2,607,948,500
Burien	\$9,165,566,000	\$916,556,600	\$2,749,669,800	\$4,582,783,000
Carnation	\$328,410,000	\$32,841,000	\$98,523,000	\$164,205,000
Clyde Hill	\$845,586,000	\$84,558,600	\$253,675,800	\$422,793,000
Covington	\$2,849,591,000	\$284,959,100	\$854,877,300	\$1,424,795,500
Des Moines	\$5,742,226,000	\$574,222,600	\$1,722,667,800	\$2,871,113,000
Duvall	\$1,108,322,000	\$110,832,200	\$332,496,600	\$554,161,000
Enumclaw	\$2,667,155,000	\$266,715,500	\$800,146,500	\$1,333,577,500
Federal Way	\$19,102,220,000	\$1,910,222,000	\$5,730,666,000	\$9,551,110,000
Hunts Point	\$160,100,000	\$16,010,000	\$48,030,000	\$80,050,000
Issaquah	\$9,587,897,000	\$958,789,700	\$2,876,369,100	\$4,793,948,500
Kenmore	\$4,000,207,000	\$400,020,700	\$1,200,062,100	\$2,000,103,500
Kent	\$33,182,020,000	\$3,318,202,000	\$9,954,606,000	\$16,591,010,000
Kirkland	\$22,202,262,000	\$2,220,226,200	\$6,660,678,600	\$11,101,131,000
Lake Forest Park	\$2,214,717,000	\$221,471,700	\$664,415,100	\$1,107,358,500
Maple Valley	\$3,129,530,000	\$312,953,000	\$938,859,000	\$1,564,765,000
Medina	\$947,196,000	\$94,719,600	\$284,158,800	\$473,598,000
Mercer Island	\$6,598,328,000	\$659,832,800	\$1,979,498,400	\$3,299,164,000
Milton	\$140,733,000	\$14,073,300	\$42,219,900	\$70,366,500
Newcastle	\$2,266,792,000	\$226,679,200	\$680,037,600	\$1,133,396,000
Normandy Park	\$1,306,626,000	\$130,662,600	\$391,987,800	\$653,313,000
North Bend	\$1,453,593,000	\$145,359,300	\$436,077,900	\$726,796,500
Pacific	\$830,743,000	\$83,074,300	\$249,222,900	\$415,371,500
Redmond	\$23,234,414,000	\$2,323,441,400	\$6,970,324,200	\$11,617,207,000
Renton	\$25,825,586,000	\$2,582,558,600	\$7,747,675,800	\$12,912,793,000
Sammamish	\$9,306,835,000	\$930,683,500	\$2,792,050,500	\$4,653,417,500
SeaTac	\$7,572,236,000	\$757,223,600	\$2,271,670,800	\$3,786,118,000
Seattle	\$212,337,688,000	\$21,233,768,800	\$63,701,306,400	\$106,168,844,000
Shoreline	\$11,169,471,000	\$1,116,947,100	\$3,350,841,300	\$5,584,735,500
Skykomish	\$74,730,000	\$7,473,000	\$22,419,000	\$37,365,000
Snoqualmie	\$2,297,236,000	\$229,723,600	\$689,170,800	\$1,148,618,000
Tukwila	\$11,628,108,000	\$1,162,810,800	\$3,488,432,400	\$5,814,054,000
Woodinville	\$4,522,687,000	\$452,268,700	\$1,356,806,100	\$2,261,343,500
Yarrow Point	\$300,638,000	\$30,063,800	\$90,191,400	\$150,319,000
Unincorporated	\$44,641,548,000	\$4,648,154,800	\$13,404,464,400	\$22,340,774,000
Total	\$556,676,699,000	\$55,851,669,900	\$167,015,009,700	\$278,358,349,500

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

13.8 ISSUES

Severe local storms are probably the most common widespread hazard. They affect large numbers of people in the planning area when they occur. Severe storms can quickly overwhelm city and county resources. Citizens should be prepared for these types of storms: family plans should be developed, disaster kits should be put in homes, workplaces, schools and cars, and every family member should be taught how to shut off household utilities. Initiating early dismissal from schools and business is an effective mitigation measure and should be encouraged.

Severe weather cannot be prevented, but measures can be taken to mitigate the effects. Critical infrastructure and utilities can be hardened to prevent damage during an event. The secondary effect of flooding can be addressed through decreasing runoff and water velocity. Important issues associated with severe weather in the King County planning area include the following:

- Redundancy of power supply throughout the planning area must be evaluated to better understand what areas may be vulnerable.
- The capacity for backup power generation is limited.
- The County has numerous isolated population centers.
- Public education on dealing with the impacts of severe weather needs to be provided so that citizens can be better informed and prepared for severe weather events.
- Debris management (downed trees, etc.) must be addressed, because debris can impact the severity of severe weather events, requires coordination efforts, and may require additional funding.
- The effects of climate change may result in an increase in frequency of extreme heat events.

CHAPTER 14. SEVERE WINTER WEATHER

14.1 GENERAL BACKGROUND

Severe winter weather is any dangerous cold-weather phenomena with the potential to cause damage, serious social disruption, or loss of human life. It includes snowstorms, ice storms, blizzards, and extreme cold. Typically, significant winter storms occur during the transition between cold and warm periods.

14.1.1 Blizzards and Snowstorms

The National Weather Service defines a winter storm as having significant snowfall, ice and/or freezing rain; the quantity of precipitation varies by elevation. Heavy snowfall is 4 inches or more in a 12-hour period, or 6 inches or more in a 24-hour period in non-mountainous areas; and 12 inches or more in a 12-hour period or 18 inches or more in a 24-hour period in mountainous areas. There are three key ingredients to a severe winter storm:

- **Cold Air**—Below-freezing temperatures in the clouds and near the ground are necessary to make snow and/or ice.
- **Moisture**—Moisture is required in order to form clouds and precipitation. Air blowing across a body of water, such as a large lake or the ocean, is an excellent source of moisture.
- **Lift**—Lift is required in order to raise the moist air to form the clouds and cause precipitation. An example of lift is warm air colliding with cold air and being forced to rise over the cold dome. The boundary between the warm and cold air masses is called a front. Another example of lift is air flowing up a mountain side.

Areas most vulnerable to winter storms are those affected by convergence of dry, cold air from the interior of the North American continent and warm, moist air off the Pacific Ocean. When strong storms crossing the Pacific arrive at the coast, if the air is cold enough, snow falls. As the moisture rises into the mountains, heavy snow closes the mountain passes and can cause avalanches. Cold air from the north has to filter through mountain canyons into the basins and valleys to the south. If the cold air is deep enough, it can spill over the mountain ridge. As the air funnels through canyons and over ridges, wind speeds can reach 100 mph. High winds with snow results in a blizzard.

Heavy snow can immobilize a region and paralyze a city, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse buildings and knock down trees and power lines. In rural areas, homes and farms may be isolated for days, and unprotected livestock may be lost. In the mountains, heavy snow can lead to avalanches. The cost of snow removal, repairing damages, and loss of business can have large economic impacts on cities and towns.

DEFINITIONS

Freezing Rain—The result of rain occurring when the temperature is below the freezing point. The rain freezes on impact, resulting in a layer of ice up to an inch thick. In severe events, an evergreen tree 60 feet high and 30 feet wide can be burdened with up to 6 tons of ice, creating a threat to utility lines and transportation routes.

Severe Local Storm—Small-scale atmospheric systems, including ice storms and snowstorms. These storms may cause a great deal of destruction, but their impact is generally confined to a small area. Typical impacts are on transportation infrastructure and utilities.

Winter Storm—A storm having significant snowfall, ice, and/or freezing rain; the quantity of precipitation varies by elevation.

14.1.2 Ice Storms

The National Weather Service defines an ice storm as a storm that results in the accumulation of at least 0.25 inches of ice on exposed surfaces. Ice storms occur when rain falls from a warm, moist, layer of atmosphere into a below freezing, drier layer near the ground. The rain freezes on contact with the cold ground and exposed surfaces, causing damage to trees, utility wires, and structures (see Figure 14-1).

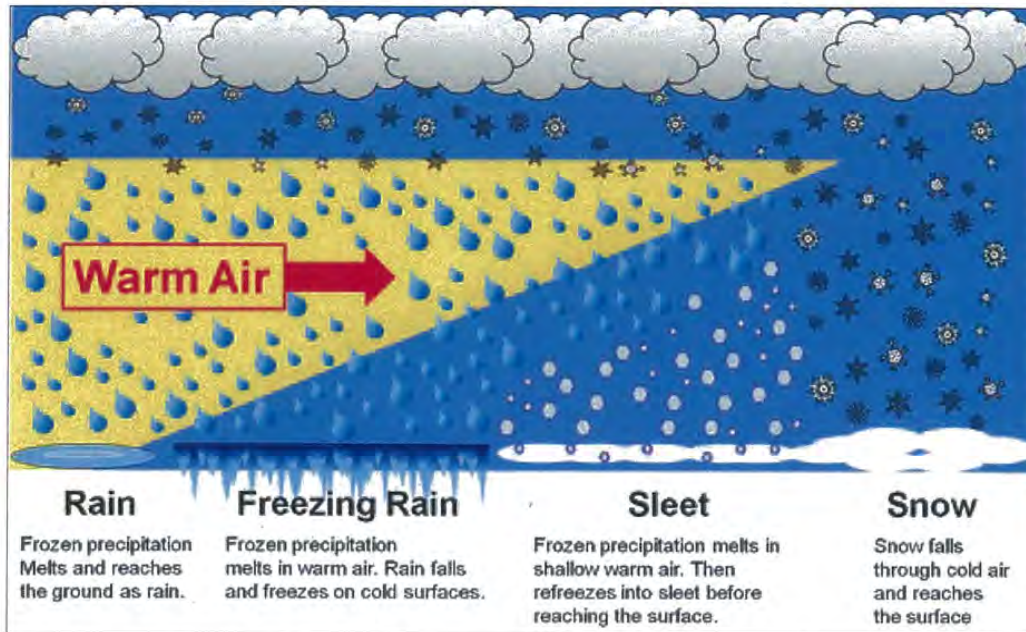


Figure 14-1. The Formation of Different Kinds of Precipitation

Ice accretion generally ranges from a trace to 1 inch. Accumulations between 1/4-inch and 1/2-inch can cause small branch and faulty limb breakage. Accumulations of 1/2-inch to 1 inch can cause significant breakage. Strong winds increase the potential for damage from ice accumulation.

14.1.3 Extreme Cold and Wind Chill

Weather that constitutes extreme cold varies across different parts of the U.S. In regions relatively unaccustomed to winter weather, near freezing temperatures are considered extreme cold (CDC, 2014a). Extreme cold can often accompany severe winter storms. Wind can exacerbate the effects of cold temperatures by carrying heat away from the body more quickly, thus making it feel colder than is indicated by the temperature. This phenomenon is known as wind chill. Wind chill is the temperature that your body feels when the air temperature is combined with wind speed (CDC, 2014a). Figure 14-2 shows the value of wind chill based on ambient temperature and wind speed.

SEVERE WINTER WEATHER

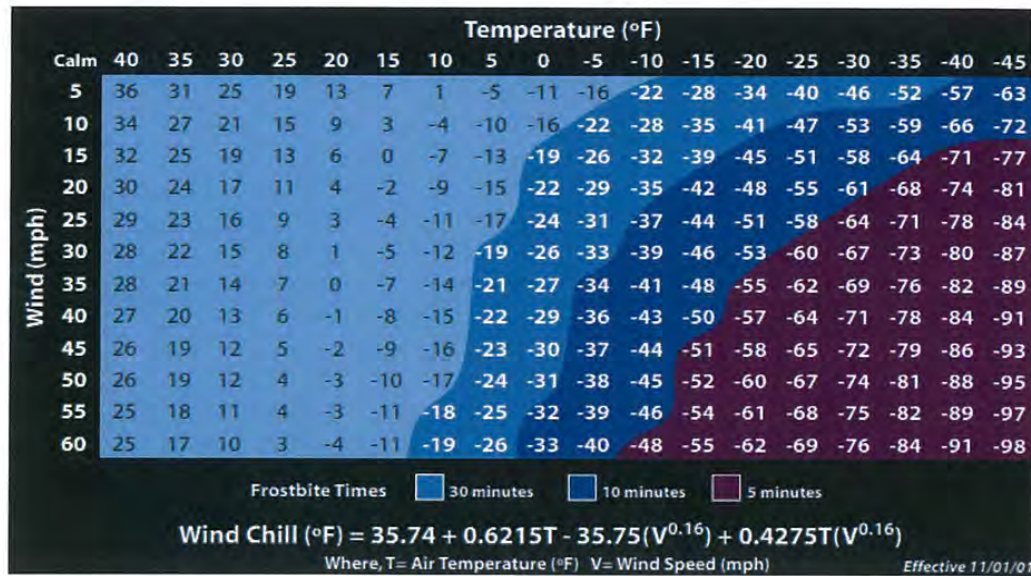


Figure 14-2. Wind Chill Chart

14.2 HAZARD PROFILE

14.2.1 Past Events

Table 14-1 lists King County winter weather events since 1960 recorded in the SHELDDUS database.

14.2.2 Location

Severe winter weather events have the potential to happen anywhere in the planning area. In general, snowfall increases at higher elevations and farther from Puget Sound. In most of the planning area, snow typically melts within a day or two and rarely exceeds 15 inches (Washington Regional Climate Center, 2014). Figure 6-3 shows the distribution of average minimum temperatures over the planning area.

14.2.3 Frequency

There is no record indicating the frequency of extreme cold events in King County; however, records from the Seattle-Tacoma International Airport indicate that on average there are 1.6 days per year when the maximum temperature is less than 32°F and 24.9 days per year when the minimum temperature is below 32°F (Washington Regional Climate Center, 2014). According to SHELDDUS, 44 winter weather events have affected the planning area since 1960. According to the Washington State Hazard Mitigation Plan, the recurrence interval for winter storms in King County is at least every other year (70 percent).

**TABLE 14-1.
PAST SEVERE WINTER WEATHER EVENTS IMPACTING PLANNING AREA**

Date	Hazard Type/Remarks	Injuries ^a	Fatalities ^a	Property & Crop Damage
11/20/1960	Winter Weather/Snow	0.06	0	\$2,941
12/16/1964	Severe Storm, Thunderstorm, Winter Weather/Cold wave, heavy snowfall, heavy rain	0	0.03	\$128,205
1/26/1965	Flooding, Landslide, Winter Weather/Flooding, mudslide, snow slide	0	0	\$12,821
10/1/1967	Severe Storm, Thunderstorm, Wind, Winter Weather/Wind, rain, snow	0	0	\$278
12/30/1968	Winter Weather/Snow	0	0	\$1,282
1/14/1971	Wind, Winter Weather/Wind and Snow	0	0.03	\$1,282
1/22/1971	Severe Storm, Thunderstorm, Wind, Winter Weather/Wind, Rain and Snow	0.33	4	\$2,778
1/24/1972	Winter Weather/Near Blizzard	0	0	\$14,103
1/24/1972	Winter Weather/Freeze	0	0	\$12,949
12/4/1972	Winter Weather/Cold, Freeze, Snow	0	0	\$12,821
12/26/1974	Wind, Winter Weather/Snow & Wind	0	0	\$16,683
1/7/1975	Wind, Winter Weather/Wind and Snow	0.05	0	\$1,282
11/30/1975	Avalanche, Winter Weather/Snowstorm, Avalanche	0	0	\$2,632
12/2/1985	Winter Weather/Ice Storm	0	1	\$128
2/1/1989	Winter Weather/Snowstorm/High Wind	0	4.03	\$128,205
12/18/1990	Wind, Winter Weather/Snowstorm, High Winds	0	0	\$416,667
12/19/1990	Winter Weather/Hard Freeze	0	0	\$1,282
12/29/1990	Winter Weather/Hard Freeze	0	0	\$1,282
12/8/1992	Winter Weather/Ice	0	4	\$714
12/10/1992	Winter Weather/Heavy Snow	0.17	0	\$4,167
1/19/1993	Winter Weather/Freezing Rain	0.63	0.67	\$12,500
12/24/1993	Winter Weather/Ice	1.7	0	\$5,000
2/23/1994	Winter Weather/Heavy Snow	0	0	\$417
1/18/1996	Winter Weather/Heavy Snow	2	0.5	\$0
11/19/1996	Winter Weather/Heavy Snow	22	0	\$0
12/28/1996	Winter Weather/Heavy Snow	0	1	\$10,416,667
2/15/2001	Winter Weather/	0	0	\$500
11/19/2003	Winter Weather/	0	0	\$75,000
1/6/2004	Winter Weather/	0	0	\$90,909
12/1/2005	Winter Weather/Heavy Snow	0	0	\$1,667
11/26/2006	Winter Weather/Heavy Snow	0	0	\$1,083,333
1/10/2007	Winter Weather/Heavy Snow	0	0	\$6,111
2/28/2007	Winter Weather/Winter Weather	0	0	\$25,000
2/28/2007	Winter Weather/Heavy Snow	0	0	\$1,333
6/10/2008	Winter Weather/Winter Weather	0.5	0.25	\$0
12/17/2008	Winter Weather/Heavy Snow	0	0	\$57,692
12/18/2008	Winter Weather/Heavy Snow	0	0	\$200,000
12/20/2008	Winter Weather/Heavy Snow	0	0	\$150,000

SEVERE WINTER WEATHER

**TABLE 14-1.
PAST SEVERE WINTER WEATHER EVENTS IMPACTING PLANNING AREA**

Date	Hazard Type/Remarks	Injuries ^a	Fatalities ^a	Property & Crop Damage
12/20/2008	Winter Weather/Heavy Snow	0	0	\$113,636
12/21/2008	Winter Weather/Heavy Snow	0.09	0	\$550,136
12/24/2008	Winter Weather/Heavy Snow	0	0	\$45,000
12/25/2008	Winter Weather/Winter Weather	0	0	\$87,500
1/19/2012	Winter Weather/Ice Storm	0	0	\$2,000,000
1/19/2012	Winter Weather/Ice Storm	0.33	0.33	\$266,667
12/15/2012	Winter Weather/Heavy Snow	0	0	\$0

a. Fractional values of injuries and fatalities indicate that data were available for a multi-county area; per-county counts were estimated by dividing the total by the number of counties in the defined area

Source: http://webra.cas.sc.edu/hvriapps/sheldus_web/sheldus_results.aspx

14.2.4 Severity

The most common problems associated with severe winter storms are immobility and loss of utilities. Fatalities are uncommon, but can occur. Roads may become impassable due to downed trees, ice or snow. Power lines may be downed due to ice accumulation, and services such as water or phone may not be able to operate without power. Physical damage to homes and facilities can be caused by wind or accumulation of snow or ice. Even a small accumulation of snow can cause havoc on transportation systems due to a lack of snow clearing equipment and experienced drivers and the hilly terrain.

Ice storms accompanied by high winds can have especially destructive impacts, especially on trees, power lines, and utility services. While sleet and hail can create hazards for motorists when it accumulates, freezing rain can cause the most dangerous conditions within a community. Ice buildup can bring down trees, communication towers and wires, creating hazards for property owners, motorists and pedestrians. Rain can fall on frozen streets, cars, and other sub-freezing surfaces, creating dangerous conditions.

Over the past 30 years western Washington has had an annual average of 11.4 inches of snowfall per year. Typically, the snow season is November through March. Snowfall records in the region are as follows:

- The one day record is 21 inches in January 1950
- The one month record is 57 inches during January 1950
- The winter long record is 67 inches during the winter of 1968—1969.

14.2.5 Warning Time

Meteorologists can often predict the likelihood of a severe winter storm. This can give several days of warning time. However, meteorologists cannot predict the exact time of onset or severity of the storm. Some storms may have only a few hours of warning time. The Seattle Office of the National Weather Service provides public warnings as appropriate to alert government agencies and the public of possible or impending storm, snow and ice events. The watches and warnings are broadcast over NOAA weather radio and are forwarded to the local media for retransmission using the Emergency Alert System.

14.3 SECONDARY HAZARDS

The most significant secondary hazards associated with severe local storms are floods, falling and downed trees, landslides and downed power lines. Rapidly melting snow combined with heavy rain can overwhelm natural and man-made drainage systems, causing overflow and property destruction. Landslides occur when the soil on slopes becomes oversaturated and fails. Pipes located in poorly insulated homes or in homes that have lost power may freeze or break. If a severe ice storm occurs within King County, prolonged power outages over widespread areas are possible.

14.4 EXPOSURE**14.4.1 Population**

A lack of data related to severe winter weather damage prevented a detailed analysis for exposure and vulnerability. However, it can be assumed that the entire planning area is exposed to some extent to severe winter weather events. Certain areas are more exposed due to geographic location and local weather patterns. Populations that do not have adequate shelter are more exposed to the impacts of severe winter weather.

14.4.2 Property

According to the King County Assessor, there are 545,846 buildings within the census tracts that define the planning area. Most of these buildings are residential. All of these buildings are considered to be exposed to the severe winter weather hazard, but structures in poor condition or in particularly vulnerable locations (located on hilltops or exposed open areas) may risk the most damage. The frequency and degree of damage will depend on specific locations.

14.4.3 Critical Facilities and Infrastructure

All critical facilities are likely exposed to severe winter weather. Facilities on higher ground may be exposed to damage from falling trees. The most common problems associated with severe winter weather are loss of utilities. Downed power lines can cause blackouts, leaving large areas isolated. Phone, water and sewer systems may not function. Roads may become impassable due to ice or snow.

14.4.4 Environment

The environment is highly exposed to severe winter weather events. Natural habitats such as streams and trees are exposed to the elements and risk damage from snow and ice. Flooding events caused by snowmelt can produce river channel migration or damage riparian habitat. Storm surges can erode beachfront bluffs and redistribute sediment loads.

14.5 VULNERABILITY**14.5.1 Population**

Many of the deaths that result from severe winter weather are indirectly related to the actual weather event, including deaths resulting from traffic accidents on icy roads and heart attacks while shoveling snow. Icy road conditions that lead to major traffic accidents can make it difficult for emergency personnel to travel. This may pose a secondary threat to life if police, fire, and medical personnel cannot respond to calls.

While all residents in the County are vulnerable to severe winter weather, elderly, low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that

SEVERE WINTER WEATHER

are isolated from major roads or without adequate shelter may be especially vulnerable. Power outages can be life threatening to those dependent on electricity for life support. Isolation of these populations is a significant concern. These populations face isolation and exposure during severe winter weather events and could suffer more secondary effects of the hazard. Power outages can also cause life-threatening situations if residents use alternative means to heat their homes without proper ventilation.

14.5.2 Property

All property is vulnerable during severe winter weather events, but properties in poor condition or in particularly vulnerable locations may risk the most damage. Those that are located under or near overhead lines or near large trees may be vulnerable to falling ice or may be damaged in the event of a collapse.

Loss estimations for the severe winter weather hazard are not based on damage functions, because no such damage functions have been generated. Instead, estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to select a range of potential economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 14-2 lists the estimates.

14.5.3 Critical Facilities and Infrastructure

Incapacity and loss of roads are the primary transportation failures resulting from severe winter weather, mostly associated with secondary hazards. Snowstorms in higher elevations can significantly impact the transportation system and the availability of public safety services. Of particular concern are roads providing access to isolated areas and to the elderly. Prolonged obstruction of major routes due to snow can disrupt the shipment of goods and other commerce. Large, prolonged winter storms can have negative economic impacts for the entire region. Economists estimate that the closing of Snoqualmie Pass has an economic cost to the state between \$500,000 and \$750,000 per hour (Washington State Emergency Management Division, 2010).

Downed trees and ice can create serious impacts on power and above-ground communication lines. Freezing of power and communication lines can cause them to break, disrupting electricity and communication. Loss of electricity and phone connection would leave certain populations isolated because residents would be unable to call for assistance. Water systems may also be impacted during severe winter weather events. The most frequent water system problem related to cold weather is a break in cast iron mainlines. Breaks frequently occur during severe freeze events, as well as during extreme cooling periods in October, November and December. Another common problem during severe freeze events is the failure of commercial and residential water lines. Inadequately insulated potable water and fire sprinkler pipes can rupture and cause extensive damage to property.

14.5.4 Environment

The vulnerability of the environment to severe winter weather is the same as the exposure.

14.6 FUTURE TRENDS IN DEVELOPMENT

All future development will be affected by severe winter weather. The ability to withstand impacts lies in sound land use practices and consistent enforcement of codes and regulations for new construction. The planning partners have adopted the International Building Code, which can deal with the impacts of severe winter weather. Land use policies identified in general plans for the planning area address many of the secondary impacts of the severe winter weather hazard. With these tools, the planning partnership is well equipped to deal with future growth and the associated impacts of severe winter weather.

TABLE 14-2.
LOSS POTENTIAL FOR SEVERE WINTER WEATHER

	Total Assessed Value	Estimated Loss Potential from Severe Winter Weather		
		10% Damage	30% Damage	50% Damage
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Bellevue	\$49,163,714,000	\$4,916,371,400	\$14,749,114,200	\$24,581,857,000
Black Diamond	\$600,388,000	\$60,038,800	\$180,116,400	\$300,194,000
Bothell	\$5,215,897,000	\$521,589,700	\$1,564,769,100	\$2,607,948,500
Burien	\$9,165,566,000	\$916,556,600	\$2,749,669,800	\$4,582,783,000
Carnation	\$328,410,000	\$32,841,000	\$98,523,000	\$164,205,000
Clyde Hill	\$845,586,000	\$84,558,600	\$253,675,800	\$422,793,000
Covington	\$2,849,591,000	\$284,959,100	\$854,877,300	\$1,424,795,500
Des Moines	\$5,742,226,000	\$574,222,600	\$1,722,667,800	\$2,871,113,000
Duvall	\$1,108,322,000	\$110,832,200	\$332,496,600	\$554,161,000
Enumclaw	\$2,667,155,000	\$266,715,500	\$800,146,500	\$1,333,577,500
Federal Way	\$19,102,220,000	\$1,910,222,000	\$5,730,666,000	\$9,551,110,000
Hunts Point	\$160,100,000	\$16,010,000	\$48,030,000	\$80,050,000
Issaquah	\$9,587,897,000	\$958,789,700	\$2,876,369,100	\$4,793,948,500
Kenmore	\$4,000,207,000	\$400,020,700	\$1,200,062,100	\$2,000,103,500
Kent	\$33,182,020,000	\$3,318,202,000	\$9,954,606,000	\$16,591,010,000
Kirkland	\$22,202,262,000	\$2,220,226,200	\$6,660,678,600	\$11,101,131,000
Lake Forest Park	\$2,214,717,000	\$221,471,700	\$664,415,100	\$1,107,358,500
Maple Valley	\$3,129,530,000	\$312,953,000	\$938,859,000	\$1,564,765,000
Medina	\$947,196,000	\$94,719,600	\$284,158,800	\$473,598,000
Mercer Island	\$6,598,328,000	\$659,832,800	\$1,979,498,400	\$3,299,164,000
Milton	\$140,733,000	\$14,073,300	\$42,219,900	\$70,366,500
Newcastle	\$2,266,792,000	\$226,679,200	\$680,037,600	\$1,133,396,000
Normandy Park	\$1,306,626,000	\$130,662,600	\$391,987,800	\$653,313,000
North Bend	\$1,453,593,000	\$145,359,300	\$436,077,900	\$726,796,500
Pacific	\$830,743,000	\$83,074,300	\$249,222,900	\$415,371,500
Redmond	\$23,234,414,000	\$2,323,441,400	\$6,970,324,200	\$11,617,207,000
Renton	\$25,825,586,000	\$2,582,558,600	\$7,747,675,800	\$12,912,793,000
Sammamish	\$9,306,835,000	\$930,683,500	\$2,792,050,500	\$4,653,417,500
SeaTac	\$7,572,236,000	\$757,223,600	\$2,271,670,800	\$3,786,118,000
Seattle	\$212,337,688,000	\$21,233,768,800	\$63,701,306,400	\$106,168,844,000
Shoreline	\$11,169,471,000	\$1,116,947,100	\$3,350,841,300	\$5,584,735,500
Skykomish	\$74,730,000	\$7,473,000	\$22,419,000	\$37,365,000
Snoqualmie	\$2,297,236,000	\$229,723,600	\$689,170,800	\$1,148,618,000
Tukwila	\$11,628,108,000	\$1,162,810,800	\$3,488,432,400	\$5,814,054,000
Woodinville	\$4,522,687,000	\$452,268,700	\$1,356,806,100	\$2,261,343,500
Yarrow Point	\$300,638,000	\$30,063,800	\$90,191,400	\$150,319,000
Unincorporated	\$44,641,548,000	\$4,648,154,800	\$13,404,464,400	\$22,340,774,000
Total	\$556,676,699,000	\$55,851,669,900	\$167,015,009,700	\$278,358,349,500

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

14.7 SCENARIO

Winter storms in the planning area are likely to occur between November and April. These storms would be caused by a sufficient amount of cold polar air flowing down from the north caused by a dip in the jet stream, combined with a significant source of moisture from the Pacific Ocean. Such events would have both short-term and long-term effects. Initially, schools and roads would be closed due to power outages caused by high winds and downed tree obstructions. In more rural areas, some subdivisions could experience limited ingress and egress. Economic losses as a result of closed businesses and disrupted transportation systems would be significant.

14.8 ISSUES

Important issues associated with a severe winter weather in the planning area include the following:

- Older building stock in the planning area is built to low code standards or none at all. These structures could be highly vulnerable to severe winter weather effects such as snow loads.
- Redundancy of power supply throughout the planning area must be evaluated to better understand what areas may be vulnerable.
- Urban forest management programs should be evaluated to help reduce impacts from forest-related damages.
- Climate change may increase the frequency and magnitude of winter flooding events, thus exacerbating severe winter weather events.

CHAPTER 15. TSUNAMI

15.1 GENERAL BACKGROUND

A tsunami consists of a series of high-energy waves that radiate outward like pond ripples from an area where a generating event occurs. The waves arrive at shorelines over an extended period.

Tsunamis are typically classified as local or distant. Locally generated tsunamis have minimal warning times, leaving few options except to run to high ground. They may be accompanied by damage resulting from the triggering earthquake due to ground shaking, surface faulting, liquefaction or landslides. Distant tsunamis may travel for hours before striking a coastline, giving a community a chance to implement evacuation plans.

In the open ocean, a tsunami may be only a few inches or feet high, but it can travel with speeds approaching 600 miles per hour. As a tsunami enters the shoaling waters near a coastline, its speed diminishes, its wavelength decreases, and its height increases greatly. The first wave usually is not the largest. Several larger and more destructive waves often follow the first one. As tsunamis reach the shoreline, they may take the form of a fast-rising tide, a cresting wave, or a bore (a large, turbulent wall-like wave). The bore phenomenon resembles a step-like change in the water level that advances rapidly (from 10 to 60 miles per hour).

The configuration of the coastline, the shape of the ocean floor, and the characteristics of advancing waves play important roles in the destructiveness of the waves. Offshore canyons can focus tsunami wave energy and islands can filter the energy. The orientation of the coastline determines whether the waves strike head-on or are refracted from other parts of the coastline. A wave may be small at one point on a coast and much larger at other points. Bays, sounds, inlets, rivers, streams, offshore canyons, islands, and flood control channels may cause various effects that alter the level of damage. It has been estimated, for example, that a tsunami wave entering a flood control channel could reach a mile or more inland, especially if it enters at high tide.

The first visible indication of an approaching tsunami may be recession of water (draw down) caused by the trough preceding the advancing, large inbound wave crest. Rapid draw down can create strong currents in harbor inlets and channels that can severely damage coastal structures due to erosive scour around piers and pilings. As the water's surface drops, piers can be damaged by boats or ships straining at or breaking their mooring lines. The vessels can overturn or sink due to strong currents, collisions with other objects, or impact with the harbor bottom.

Conversely, the first indication of a tsunami may be a rise in water level. The advancing tsunami may initially resemble a strong surge increasing the sea level like the rising tide, but the tsunami surge rises faster and does not stop at the shoreline. Even if the wave height appears to be small, 3 to 6 feet for example, the strength of the accompanying surge can be deadly. Waist-high surges can cause strong

DEFINITIONS

Seiche—A standing wave in an enclosed or partly enclosed body of water, normally caused by earthquake activity; can affect harbors, bays, lakes, rivers and canals.

Tsunami—A series of traveling ocean waves of extremely long wavelength usually caused by displacement of the ocean floor and typically generated by seismic or volcanic activity or by underwater landslides.

currents that float cars, small structures, and other debris. Boats and debris are often carried inland by the surge and left stranded when the water recedes.

At some locations, the advancing turbulent wave front will be the most destructive part of the wave. In other situations, the greatest damage will be caused by the outflow of water back to the sea between crests, sweeping all before it and undermining roads, buildings, bulkheads, and other structures. This outflow action can carry enormous amounts of highly damaging debris with it, resulting in further destruction. Ships and boats, unless moved away from shore, may be dashed against breakwaters, wharves, and other craft, or be washed ashore and left grounded after the withdrawal of the seawater.

15.2 HAZARD PROFILE

15.2.1 Past Events

Geological evidence of tsunamis in the Puget Sound has been found at Cultus Bay on Whidbey Island and at West Point in Seattle. Researchers believe these tsunami deposits are evidence of earthquake activity along the Seattle Fault or other shallow crustal Puget Sound faults. There is evidence that an earthquake around 900 A.D. on the Seattle Fault caused an uplift of up to 20 feet in some areas, triggering a tsunami in central Puget Sound (EMD, 2012). The tsunami deposited a sheet of sand across West Point in Seattle. Computer simulations suggest that wave height may have reached 20 feet at the Seattle waterfront. Sand sheets were also deposited as a result of this event on the southern portion of Whidbey Island and along some tributaries of the Snohomish River. There is also evidence of a past event on Possession Beach on Whidbey Island that caused sloughing and a tsunami.

Verbal accounts among the Snohomish Tribe reported by Colin Tweddell in 1953 describe a great landslide-induced wave caused by the collapse of Camano Head at the south end of Camano Island around the 1820s and 1830s. The slide itself is said to have buried a small village, and the resulting tsunami drowned people who were clamming on Hat (Gedney) Island, 2 miles to the south. Bathymetry between Camano Head and Hat Island could have contributed to the size and destructive power of the wave (Koshimura et al., 2001).

Area lakes have experienced seiches in historical times. In 1891, an earthquake near Port Angeles caused an 8-foot seiche in Lake Washington. Additionally, seiches were generated in area lakes after the 1949 Magnitude-7.1 Olympia earthquake and the 1965 Magnitude-6.5 earthquake. The 1964 Magnitude-9.2 Alaska earthquake created seiches on 14 inland bodies of water in Washington, including Lake Union where several pleasure craft, houseboats and floats sustained minor damage. The Magnitude-7.9 Denali earthquake in Alaska in 2002 resulted in water waves that, again, damaged 20 houseboats and water and sewer lines in Seattle's Lake Union. Sloshing action was reported in other lakes and swimming pools around the area.

15.2.2 Location

Most tsunamis originate in the Pacific Ocean, where tsunami waves triggered by seismic activity can travel at up to 500 miles per hour, striking distant coastal areas in a matter of hours (see Figure 15-1). Most recorded tsunamis affecting the Pacific Northwest originated in the Gulf of Alaska. There is also geological evidence of significant impacts from tsunamis originating along the Cascadia subduction zone, which extends from Cape Mendocino, California to the Queen Charlotte Islands in British Columbia. Tsunamis affecting Washington may be induced by geologic events of local origin, or earthquakes at a considerable distance, such as in Alaska or South America.

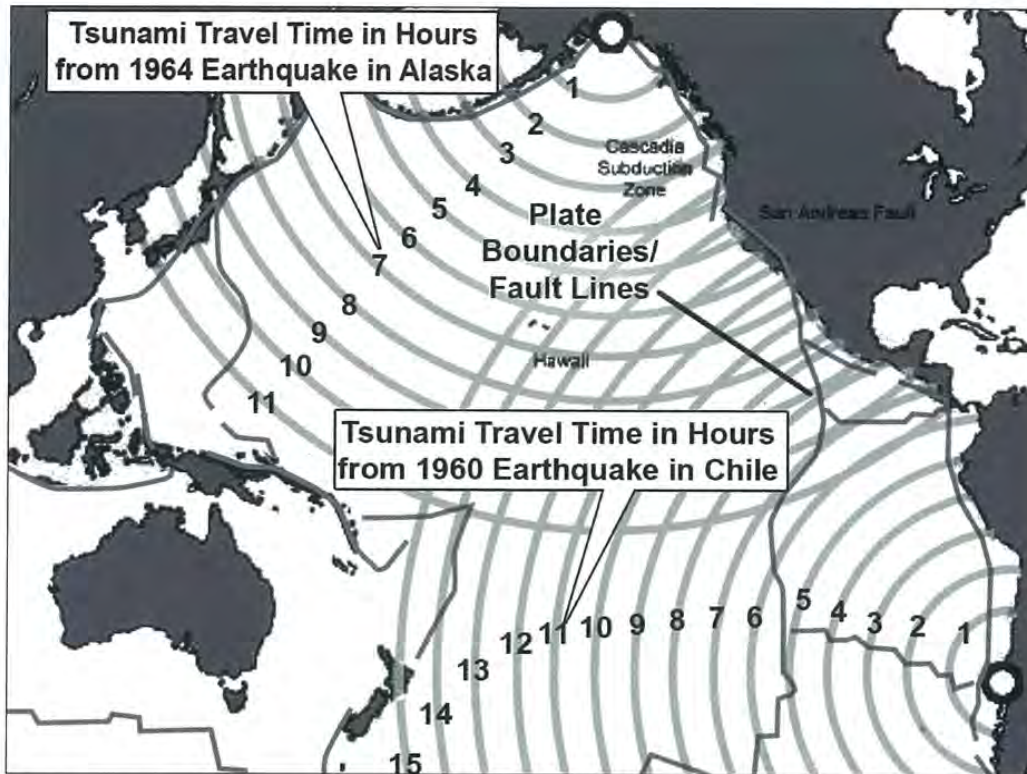


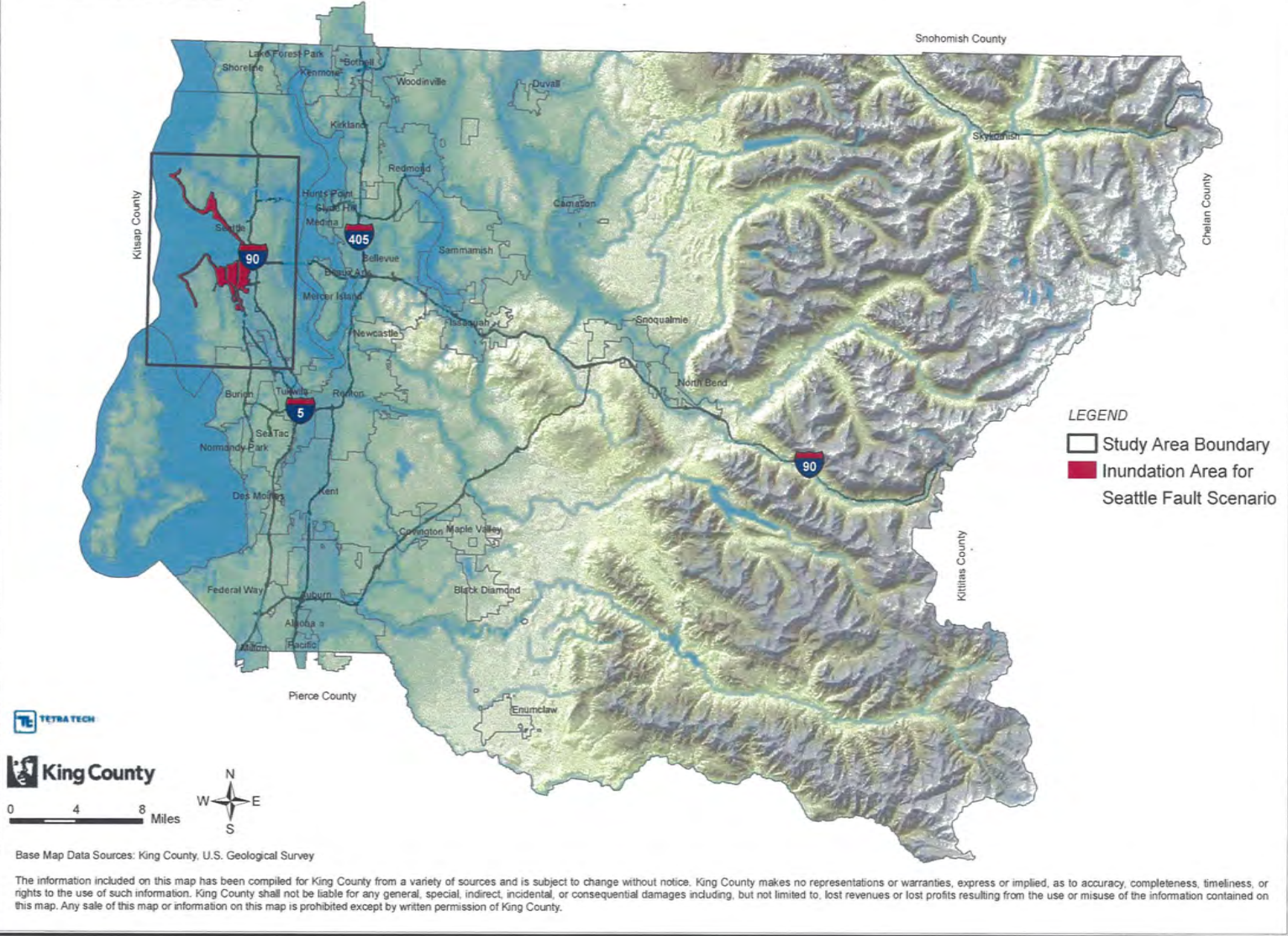
Figure 15-1. Potential Tsunami Travel Times in the Pacific Ocean

Tsunamis generated in the Pacific, including from a Cascadia subduction zone event, would have a difficult time reaching the shores of Puget Sound in King County. The wave would need to pass through the Strait of Juan de Fuca and south into the sound. The complex coastline of Puget Sound would act as a giant baffle and dissipate the wave (Seattle Office of Emergency Management, 2010). For example, The tsunami generated by the Magnitude-9.0 earthquake in Japan in March 2011 did reach Puget Sound, but the maximum wave height recorded was only 0.4 meters. Of greater concern are local tsunamis that may be generated as a result of events in the Puget Sound lowlands. The Washington Department of Natural Resources, working with the National Oceanic and Atmospheric Administration (NOAA) and the National Tsunami Hazard Mitigation Program, is in the process of modeling tsunami impacts in Puget Sound using computer models of earthquake-generated tsunamis from nearby seismic sources.

At the time of the writing of this plan, the only model that has been completed shows the likely tsunami inundation in the Elliott Bay area in Seattle after a Magnitude-7.3 Seattle Fault event (see Figure 15-2). This event is considered to be the most dangerous event for King County, based on geological evidence of the tsunami in 900 A.D. This is the only known event resulting from a Seattle Fault earthquake, so the probability of future events is difficult to predict. The Seattle Fault is not the only crustal fault in the area that is thought to be capable of producing tsunamis. Other such faults are present in South Whidbey Island/Mukilteo, Kingston-Edmonds and Tacoma. Future projects of the National Tsunami Hazard Mitigation Program may include mapping additional King County communities that may be at risk from tsunamis, including Burien, Des Moines, Federal Way, Normandy Park and Vashon Island.

Figure 15-2.
Tsunami Inundation Area

King County Hazard Mitigation Plan Update



15.2.3 Frequency

The frequency of tsunamis is related to the frequency of the events that cause them, so it is similar to the frequency of seismic or volcanic activities or landslides. Generally four or five tsunamis occur every year in the Pacific Basin, and those that are most damaging are generated in the Pacific waters off South America rather than in the northern Pacific.

There is only one known occurrence of a tsunami occurring as a result of a Seattle Fault event, although geological evidence suggests that more than one earthquake that could have generated a tsunami has occurred on the fault. Because of this, it is difficult to predict the relative frequency by which such events may occur. Estimates suggest, however, that an event large enough to generate a tsunami may occur once every 1,100 years (King County, 2009). Researchers involved in the Seattle tsunami mapping project believe that a tsunami will accompany a large rupture on the Seattle Fault (Titov et al., 2003).

15.2.4 Severity

Tsunamis are a threat to life and property to anyone living near the ocean. From 1950 to 2007, 478 tsunamis were recorded globally. Fifty-one of these events caused fatalities, to a total of over 308,000 coastal residents. The overwhelming majority of these events occurred in the Pacific basin. Recent tsunamis have struck Nicaragua, Indonesia, and Japan, killing several thousand people. Property damage due to these waves was nearly \$1 billion. The March 2011 Japan earthquake and tsunami claimed thousands of lives and caused over \$200 billion in damage. Historically, tsunamis originating in the northern Pacific and along the west coast of South America have caused more damage on the west coast of the United States than tsunamis originating in Japan and the Southwest Pacific.

The Cascadia subduction zone will produce the state's largest tsunami, although it is not likely to significantly impact King County. The Cascadia subduction zone is similar to the Alaska-Aleutian trench that generated the Magnitude-9.2 1964 Alaska earthquake and the Sunda trench in Indonesia that produced the Magnitude-9.3 December 2004 Sumatra earthquake. Native American accounts of past Cascadia earthquakes suggest tsunami wave heights on the order of 60 feet, comparable to water levels in Aceh Province Indonesia during the December 2004 tsunami there. Water heights in Japan produced by the 1700 Cascadia earthquake were over 15 feet, comparable to tsunami heights observed on the African coast after the Sumatra earthquake. The Cascadia subduction zone last ruptured on January 26, 1700, creating a tsunami that left markers in the geologic record from Humboldt County, California, to Vancouver Island in Canada and is noted in written records in Japan. At least seven ruptures of the Cascadia subduction zone have been observed in the geologic record.

15.2.5 Warning Time

Typical signs of a tsunami hazard are earthquakes and/or sudden and unexpected rise or fall in coastal water. The large waves are often preceded by coastal flooding and followed by a quick recession of the water. Tsunamis are difficult to detect in the open ocean; with waves less than 3 feet high. In general, scientists believe it requires an earthquake of at least a magnitude 7 to produce a tsunami.

The Pacific tsunami warning system evolved from a program initiated in 1946. It is a cooperative effort involving 26 countries along with numerous seismic stations, water level stations and information distribution centers. The National Weather Service operates two regional information distribution centers. One is located in Ewa Beach, Hawaii, and the other is in Palmer, Alaska. The Ewa Beach center also serves as an administrative hub for the Pacific warning system.

The warning system only begins to function when a Pacific basin earthquake of magnitude 6.5 or greater triggers an earthquake alarm. When this occurs, the following sequence of actions occurs:

- Data is interpolated to determine epicenter and magnitude of the event.
- If the event is magnitude 7.5 or greater and located at sea, a TSUNAMI WATCH is issued.
- Participating tide stations in the earthquake area are requested to monitor their gages. If unusual tide levels are noted, the tsunami watch is upgraded to a TSUNAMI WARNING.
- Tsunami travel times are calculated, and the warning is transmitted to the disseminating agencies and thus relayed to the public.
- The Ewa Beach center will cancel the watch or warning if reports from the stations indicate that no tsunami was generated or that the tsunami was inconsequential.

This system is not considered to be effective for communities located close to the tsunami because the first wave would arrive before the data were processed and analyzed. In this case, strong ground shaking would provide the first warning of a potential tsunami. Ground shaking is likely to be the only warning available to residents in the planning area.

Seiches are usually earthquake-induced but typically do not occur close to the epicenter of an earthquake, but hundreds of miles away. This is due to the fact that earthquake shock waves close to the epicenter consist of high-frequency vibrations, while those at much greater distances are of lower frequency, which can enhance the rhythmic movement in a body of water. The biggest seiches develop when the period of the ground shaking matches the frequency of oscillation of the water body.

15.3 SECONDARY HAZARDS

Aside from the tremendous hydraulic force of the tsunami waves themselves, floating debris carried by a tsunami can endanger human lives and batter inland structures. Ships moored at piers and in harbors often are swamped and sunk or are left battered and stranded high on the shore. Breakwaters and piers collapse, sometimes because of scouring actions that sweep away their foundation material and sometimes because of the sheer impact of the waves. Railroad yards and oil tanks situated near the waterfront are particularly vulnerable. Oil fires frequently result and are spread by the waves.

Port facilities, naval facilities, fishing fleets and public utilities are often the backbone of the economy of the affected areas, and these are the resources that generally receive the most severe damage. Until debris can be cleared, wharves and piers rebuilt, utilities restored, and fishing fleets reconstituted, communities may find themselves without fuel, food and employment. Wherever water transport is a vital means of supply, disruption of coastal systems caused by tsunamis can have far-reaching economic effects.

15.4 EXPOSURE

The exposure and vulnerability assessments presented in this plan are limited by the available models of tsunami inundation for King County; therefore these assessments are focused solely on the shores of Elliott Bay in Seattle.

15.4.1 Population

The population living in tsunami hazard zones was estimated based on the census blocks that intersect with the estimated tsunami hazard zones. The populations that would be most exposed to this type of hazard are those along beaches, low-lying coastal areas, tidal flats and river deltas that empty into ocean-going waters. Hazus-MH estimated the number of buildings in each block that are in the tsunami hazard zone, and then estimated the total population by multiplying the average King County household size of 2.39 persons per household by the number of structures. Using this approach, it is estimated that exposed population is 4,015 people (less than 1 percent of the county total).

15.4.2 Property

The value of buildings in the tsunami hazard zone within the planning area was generated using Hazus-MH census block information and is summarized in Table 15-1. The number of buildings in each census block was multiplied by the percentage of that block that lies within the tsunami hazard zone. This methodology estimates that there are 1,964 structures exposed to the tsunami hazard within the planning area, with an assessed structure and content value of \$9,704,665,516. Table 15-2 shows the general land use of parcels exposed to Tsunami in King County.

**TABLE 15-1.
EXPOSURE AND VALUE OF STRUCTURES IN TSUNAMI INUNDATION ZONE (SEATTLE ONLY)**

Buildings Exposed.....	1,964
Value Exposed	
Structure.....	\$4,916,842,434
Contents.....	\$4,787,823,082
Total.....	\$9,704,665,516
% of Total Assessed Value (Seattle).....	4.57%

**TABLE 15-2.
PRESENT LAND USE IN TSUNAMI INUNDATIONS AREA**

Present Use Classification	Area (acres)	% of total (Seattle only)
Agriculture	0	0.0%
Church, Welfare or Religious Service	0	0.0%
Commercial	447	12.5%
Education	0	0.0%
Governmental Services	59	1.7%
Industrial/Manufacturing	404	11.3%
Medical/Dental Services	32	0.9%
Mixed Use Development (Residential & Commercial)	4	0.1%
Mortuary/Cemetery/Crematory	0	0.0%
Nursing Home/Retirement Facility	0	0.0%
Park/Open Space/Golf Course	339	9.5%
Residential	199	5.6%
Terminal or Marina	1,148	32.1%
Utility/Easement/Right of Way	152	4.2%
Water/Tideland/Wetland	39	1.1%
Uncategorized (includes vacant and resource lands)	750	21.0%
Total	3,573	100%

Source: Summarized from King County parcel data. Acreage covers only mapped parcel extents and thus excludes many rights of way and major water features.

15.4.3 Critical Facilities and Infrastructure

Roads or railroads that are blocked or damaged can prevent access throughout the county and can isolate residents and emergency service providers needing to get to vulnerable populations or to make repairs. Bridges washed out or blocked by tsunami inundation or debris from flood flows also can cause isolation. Water and sewer systems can be flooded or backed up, causing further health problems. Underground utilities can also be damaged during flood events. Table 15-3 provides an estimate of the number and types of critical facilities exposed to the tsunami hazard.

TABLE 15-3. CRITICAL FACILITIES AND INFRASTRUCTURE IN TSUNAMI INUNDATION ZONE (SEATTLE)	
Number of Critical Facilities in Inundation Zone	
Medical and Health Services	0
Government Function	0
Protective Function	2
Schools	1
Hazmat	26
Other Critical Function	2
Bridges	9
Transportation	51
Water Supply	0
Wastewater	7
Power	1
Communications	2
Total	101

Roads

Roads are an important component in the management of tsunami-related emergencies in that they act as the primary resource for evacuation to higher ground before and during the course of a tsunami event. Roads often act as flood control facilities in low depth, low velocity flood events by acting as levees or berms and diverting or containing flood flows. A GIS analysis indicated that State Route 99 and the West Seattle bridge, as well as numerous arterial roads and streets, may be impacted by tsunami events. This list of roads should not be misinterpreted as possible evacuation routes for tsunami events. Evacuation routes are identified in emergency response plans.

Bridges

Bridges exposed to tsunami events can be extremely vulnerable due to forces transmitted by the wave and by the impact of debris carried by the wave action. A GIS analysis identified nine bridges that would be exposed to the tsunami scenario event.

Water/Sewer/Utilities

Water and sewer systems can be affected by the flooding associated with tsunami events. Floodwaters can back up drainage systems, causing localized flooding. Culverts can be blocked by debris from flood events, also causing localized urban flooding. Floodwaters can get into drinking water supplies, causing

contamination. Sewer systems can be backed up. The force of tsunami waves can knock down power lines and radio/cellular communication towers. Power generation facilities can be severely impacted by both the impact of the wave action and the inundation of floodwaters.

15.4.4 Environment

All waterways would be exposed to the effects of a tsunami; inundation of water and introduction of foreign debris could be hazardous to the environment. All wildlife inhabiting the area also is exposed.

15.5 VULNERABILITY

15.5.1 Population

The populations most vulnerable to the tsunami hazard are the elderly, disabled and very young who reside near beaches, low-lying coastal areas, tidal flats and river deltas that empty into ocean-going waters. In the event of a local tsunami generated in or near the planning area, there would be little warning time, so more of the population would be vulnerable. The degree of vulnerability of the population exposed to the tsunami hazard event is affected by the presence and effectiveness of warning systems and whether the public is informed about the system and will evacuate in a timely manner.

For this assessment, the population vulnerable to possible tsunami inundation is considered to be the same as the exposed population.

15.5.2 Property

All structures along beaches, low-lying coastal areas, tidal flats and river deltas would be vulnerable to a tsunami, especially in an event with little or no warning time. The impact of the waves and the scouring associated with debris that may be carried in the water could be damaging to structures in the tsunami's path. Those that would be most vulnerable are those located in the front line of tsunami impact and those that are structurally unsound. Hazus-MH generated loss estimates for the estimated tsunami hazard areas, as reflected in Table 15-4. It is estimated that there would be up to \$2.081 billion of loss from a scenario tsunami hazard event.

TABLE 15-4.
LOSS ESTIMATES TSUNAMI INUNDATION ZONE (SEATTLE ONLY)

Structures Impacted ^a	905
Estimated Loss from Tsunami	
Structure	\$885,031,638
Contents.....	\$1,196,955,771
Total	\$2,081,987,409
% of Total Assessed Value (Seattle).....	0.98%

a. Impacted structures are those structures expected to receive measurable damage from the scenario tsunami event because they have lowest floor elevations below the projected tsunami inundation height.

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

15.5.3 Critical Facilities and Infrastructure

Using damage function curves to estimate the percent of damage to critical buildings and their contents, Hazus-MH correlates these estimates to estimated functional down-time. Functional down-time is the time it will take to restore a facility to 100 percent of its functionality. Hazus estimated that on the average, critical facilities would receive 16.7 percent damage to structures and 68 percent damage to contents during the scenario tsunami event. The functional down-time to restore these facilities to 100 percent of their functionality would be approximately 647 days.

15.5.4 Environment

The vulnerability of aquatic habit and associated ecosystems would be highest in low-lying areas close to the coastline. Areas near gas stations, industrial areas and Tier II facilities would be vulnerable due to potential contamination from hazardous materials.

Tsunami waves can carry destructive debris and pollutants that can have devastating impacts on all facets of the environment. Millions of dollars spent on habitat restoration and conservation in the planning area could be wiped out by one significant tsunami. There are currently no tools available to measure these impacts. However, it is conceivable that the potential financial impact of a tsunami event on the environment could equal or exceed the impact on property. Community planners and emergency managers should take this into account when preparing for the tsunami hazard.

15.6 FUTURE TRENDS IN DEVELOPMENT

The Washington State Growth Management Act states that “seismic hazard areas must include areas subject to severe risk of damage as a result of earthquake induced ground shaking, slope failure, settlement or subsidence, soil liquefaction, surface faulting, or tsunamis (WAC 365-190-120).” This interpretation of the Growth Management Act and its effects on future development trends in King County is yet to be determined. The City of Seattle did not designate such areas as geologically hazardous until 2007 after the City’s Environmentally Critical Areas ordinance, which did not designate tsunami inundation zones among other geological hazards as critical areas, was appealed to the Central Puget Sound Growth Management Hearing Board (Central Puget Sound Growth Management Board, 2006). Because all of King County falls within the Board’s jurisdiction, the decision is binding on the entire County. The amended ordinance uses the best available science to acknowledge the suspected risk of tsunami inundation along the marine shoreline and the unknown risk of tsunami inundation along the shores of Lake Washington. Additionally, Lake Union, Lake Washington and Elliot Bay are classified as having known risk of seiche events.

15.7 SCENARIO

The worst-case scenario for the planning area is a local tsunami event triggered by a seismic event within Puget Sound (a Seattle Fault or South Whidbey Island Fault scenario). A seiche would be most likely from a local earthquake in the Puget Sound area. This would probably be very damaging, giving little or no warning time. This could result in great loss of life and property and cause severe environmental impacts.

15.8 ISSUES

The planning team has identified the following issues related to the tsunami hazard for the planning area:

- **Hazard Identification:** To truly measure and evaluate the probable impacts of tsunamis on planning, new hazard mapping based on probabilistic scenarios likely to occur for King County needs to be created. The science and technology in this field are emerging. For

tsunami hazard mitigation programs to be effective, probabilistic tsunami mapping will need to be a key component.

- Present building codes and guidelines do not adequately address the impacts of tsunamis on structures, and current tsunami hazard mapping is not appropriate for code enforcement.
- As tsunami warning technologies evolve, the tsunami warning capability within the planning area will need to be enhanced to provide the highest degree of warning to planning partners with tsunami risk exposure.
- With the possibility of climate change, the issue of sea level rise may become an important consideration as probable tsunami inundation areas are identified through future studies.
- Special attention will need to be focused on the vulnerable communities in the tsunami zone and on hazard mitigation through public education and outreach.

CHAPTER 16. VOLCANO

16.1 GENERAL BACKGROUND

A volcano is a vent in the earth's crust through which magma, rock fragments, gases, and ash are ejected from the earth's interior. Over time, accumulation of these erupted products on the earth's surface creates a volcanic mountain. There are a wide variety of hazards related to volcanoes and volcanic eruptions. The hazards are distinguished by the different ways in which volcanic materials and other debris flow from the volcano. Molten rock that erupts from the volcano (lava) forms a hill or mountain around the vent. The lava may flow out as a viscous liquid, or it may explode from the vent as solid or liquid particles.

Washington has five major volcanoes in the Cascade Range—Mount Baker, Glacier Peak, Mount Rainier, Mount St. Helens and Mount Adams. Mount Hood, located in northern Oregon, can also affect the state.

Volcanoes can lie dormant for centuries between eruptions, and the risk they pose is not always apparent. When Cascade volcanoes erupt, high-speed avalanches of hot ash and rock called pyroclastic flows, lava flows, and landslides can devastate areas 10 or more miles away, while huge mudflows of volcanic ash and debris called lahars can inundate valleys more than 50 miles downstream. Falling ash from explosive eruptions, called tephra, can disrupt human activities hundreds of miles downwind, and drifting clouds of fine ash can cause severe damage to the engines of jet aircraft hundreds or thousands of miles away.

DEFINITIONS

Lahar—A rapidly flowing mixture of water and rock debris that originates from a volcano. While lahars are most commonly associated with eruptions, heavy rains, and debris accumulation, earthquakes may also trigger them.

Lava Flow—The least hazardous threat posed by volcanoes. Cascades volcanoes are normally associated with slow moving andesite or dacite lava.

Stratovolcano—Typically steep-sided, symmetrical cones of large dimension built of alternating layers of lava flows, volcanic ash, cinders, blocks, and bombs, rising as much as 8,000 feet above their bases. The volcanoes in the Cascade Range are all stratovolcanoes.

Tephra—Ash and fragmented rock material ejected by a volcanic explosion

Volcano—A vent in the planetary crust from which magma (molten or hot rock) and gas from the earth's core erupts.

16.1.1 Types of Eruptions

The following types of eruptions occur at volcanoes around the world:

- Hawaiian eruptions, the least violent type of eruption, are characterized by extensive fluid lava flows from central vents or fissures, occasionally accompanied by lava fountains.
- Strombolian eruptions are characterized by moderately fluid lava flows, usually accompanied by a violent lava fountain that produces an abundance of volcanic bombs and cinders.
- Vulcanian eruptions are characterized by viscous magmas that form short, thick flows around vents; very viscous or solid fragments of lava are violently ejected from these vents.
- Pelean eruptions are similar to Vulcanian eruptions but have even more viscous lava; domes form over the vents, and ash flows commonly accompany the dome formations.

- Plinian eruptions, such as that of Mt. St. Helens in 1980, are the most violent eruptions. They include the violent ejection of large volumes of volcanic ash, followed by collapse of the central part of the volcano.

A volcano may exhibit different styles of eruption at different times, and eruptions may change from one type to another as they progress.

16.1.2 Hazards Associated with the Eruption of Volcano

Tephra or Ash Fall

Tephra is fragmented rock material ejected by a volcanic explosion. It normally accompanies the eruptions of volcanoes in the Cascades. These volcanoes tend to erupt lavas so thick and charged with gases that they explode into ash rather than flow.

A 1-inch deep layer of ash weighs an average of 10 pounds per square foot, causing danger of structural collapse. Ash is harsh, acidic, gritty, and smelly. Ash may also carry a high static charge for up to two days after being ejected from a volcano. Although the gases are usually too diluted to constitute danger to a person in normal health, the combination of acidic gas and ash may cause lung problems. Extremely heavy ash can clog breathing passages and cause death. When an ash cloud combines with rain, sulfur dioxide in the cloud combines with water to form diluted sulfuric acid that may cause minor, but painful burns to the skin, eyes, nose, and throat. Hydrochloric acid rains have also been reported. Acid rains may affect water supplies, strip and burn foliage, strip paint, corrode machinery, and dissolve fabric.

Heavy tephra blots out light. Sudden heavy demand for electric light and air conditioning may cause a drain on power supplies, leading to a partial or full power failure. Ash clogs machinery of all kinds and poses a serious threat to aviation because particles can damage aircraft systems and jet engines. It drifts into roadways, railways, and runways where it is slippery and dangerous. Its weight may cause structural collapse. Because winds and air currents easily carry it, it remains a hazard to machinery and transportation (particularly aviation) for months after the eruption.

Lava Flows

Lava flows are coherent masses of hot, partially molten rock that flow downslope; generally following valleys. Lava flows from Cascade volcanoes tend to be short and slow-moving. They may extrude from the main volcanic cone or from nearby cinder cones formed at or near the base of the mountain. The heat of the lava burns vegetation, potentially causing forest or grass fires. Flows may bury roads or other escape routes. Lava flows that move over snow and ice can produce debris flows. Because lava flows are slow moving and take predictable paths, they generally pose little threat to human life, however, they will destroy structures and property in their paths. Additionally, their secondary effects, such as debris flows and wildfires, can threaten life and property.

Volcanic Earthquakes

Volcanic earthquakes, often centered within or beneath a volcano, are usually one of three kinds: pre-eruption earthquakes caused by explosions of steam or underground magma movements, eruption earthquakes caused by explosions and collapse of walls inside the volcano, and post-eruption earthquakes caused by the retreat of magma and interior structural collapse. Although volcanic earthquakes are strong near the volcano, they are generally confined there. There are some exceptions, as with the St. Helens Fault Zone, where a tectonic fault is closely associated with the volcano. Tremors may cause large rock falls, snow avalanches, landslides, and building collapse. Since all Northwest volcanoes are in a regular seismic zone, tremors are monitored by the USGS and the University of Washington Seismology Lab.

Pyroclastic Flows and Surges

Pyroclastic flows and surges can occur during explosive eruptions. Pyroclastic flows are avalanches of hot ash, rock fragments and gas that move at high speeds down the sides of a volcano during explosive eruptions or when the edge of a thick, viscous, lava flow or dome breaks apart or collapses. Such flows can be as hot as 800°C and are capable of burning and destroying everything in their paths. Pyroclastic surges are more energetic and thus less restricted by topography; they can move over ridge tops. Pyroclastic flows and surges are extremely dangerous. Injury or death can result from a number of factors, including burial, impact, burning and asphyxiation. Although pyroclastic flows move down valleys like lava and debris flows, the immediate hazards associated with them are very different. People can usually outrun the advancing front of a lava flow or climb quickly up the valley sides to a height above a debris flow. The high mobility of pyroclastic flows and surges threaten anyone nearby; even ridge tops and valley slopes may be unsafe.

Lateral Blast

Lateral blasts are explosive events in which energy is directed horizontally instead of vertically from a volcano. They are gas-charged, hot mixtures of rock, gas and ash that are expelled at speeds up to 650 mph. Lateral blasts vary in size, but large ones are fairly rare, with only a few historical examples worldwide. The most recent was the 1980 eruption of Mt. St. Helens when almost everything within the blast zone perished.

16.1.3 Hazards That Can Occur With or Without an Eruption

In addition to the hazards associated with volcanic eruptions (defined as magmatic activity), volcanoes can produce non-magmatic hazards. The USGS differentiates between these two types of volcanic activity because the movement of magma can usually be detected through volcano monitoring, so there is generally some warning prior to a magmatic event. There is generally no movement of magma for non-magmatic events, such as the generation of debris flows, so these events may not be detected before they happen.

Lahar

Lahars are mixtures of water, rock, sand, and mud that rush down valleys leading away from a volcano. They can be hot or cold and form when loose masses of unconsolidated material are saturated, become unstable, and move downslope. The source of water varies but includes rainfall, melting snow or ice, and glacial outburst floods. This danger continues for months, even years following an eruption.

Lahars can travel over 50 miles downstream, commonly reaching speeds between 20 and 40 miles per hour. Sometimes they contain so much rock debris (60 to 90 percent by weight) that they look like fast-moving rivers of wet concrete. Close to the volcano they have the strength to rip huge boulders, trees, and houses from the ground and carry them down-valley. Further downstream they simply entomb everything in mud. The highest speed measured on the slopes of Mt. St. Helens during the 1980 eruption was 88 mph; the lowest, in the lower valleys, was about 2.5 mph. Historically, lahars have been one of the most deadly volcanic hazards.

Volcanic Landslides and Debris Avalanches

Volcanic landslides and debris avalanches of glacial ice or rock debris may be set in motion by explosions, earthquakes, or heat-induced melting of ice and snow. They can occur with or without an accompanying magmatic event. Landslides are defined as the downward and outward movement of slope forming materials, natural rock, snow, glacial ice, soils or any combination of these materials. Debris avalanches are a type of landslide that move at high speeds. Many debris avalanches will, if they contain

sufficient water and fine sediment, transform downstream into debris flows. Therefore the down-valley hazards associated with debris avalanches are the same as those associated with debris flows; the main hazard to life and property being burial and impact.

Explosion of Steam and Other Gases

Explosion of steam and other gases may occur any time hot material comes into contact with water, glacial ice or snow. No eruptive activity is necessary for this to occur. These explosions often contain or are accompanied by one or more of the following: pulverized lava and rock particles in suspension, fragments of older rocks from pea-sized pebbles to hundred-ton boulders, newly erupted hot lava blocks, and a shock wave that may be minimal or may extend for several miles.

Toxic Gases

Pockets or clouds of toxic gases may develop on or near both active and inactive volcanoes. Their chemical poisons can cause internal and external burns, or asphyxiation through oxygen starvation. Carbon dioxide, which causes asphyxiation, is heavier than air and therefore collects in low-lying areas. It is difficult to detect because it is both odorless and colorless. These gases, mixed with ash, make up the eruptive cloud of a volcano.

16.2 HAZARD PROFILE

16.2.1 Past Events

Volcanic eruptions may only occur every few generations. Table 16-1 and Figure 16-1 summarize past eruptions in the Cascades and in the Puget Sound region. The last major volcanic eruption in the Northwest was the explosion of Mount St. Helens on May 18, 1980. The eruption reduced the elevation of the mountain from 9,677 feet to 8,364 feet, buried the North Fork of the Toutle River under 23 square miles of volcanic material, and caused 57 human fatalities. Due to its distance, the lava and lahar flow from this eruption did not affect the King County area. The county was exposed to minor tephra fall, which was more of a curiosity than a hazard. Schools and businesses were closed for day or so, but no major disruptions or harm was done.

**TABLE 16-1.
PAST ERUPTIONS OF WASHINGTON VOLCANOES**

Volcano	Number of Eruptions	Type of Eruptions
Mount Adams	3 in the last 10,000 years, most recent between 1,000 and 2,000 years ago	Andesite lava
Mount Baker	5 eruptions in past 10,000 years; mudflows have been more common (8 in same time period)	Pyroclastic flows, mudflows, ash fall in 1843.
Glacier Peak	8 eruptions in last 13,000 years	Pyroclastic flows and lahars
Mount Rainier	14 eruptions in last 9,000 years; also 4 large mudflows	Pyroclastic flows and lahars
Mount St. Helens	19 eruptions in last 13,000 years	Pyroclastic flows, mudflows, lava, and ash fall

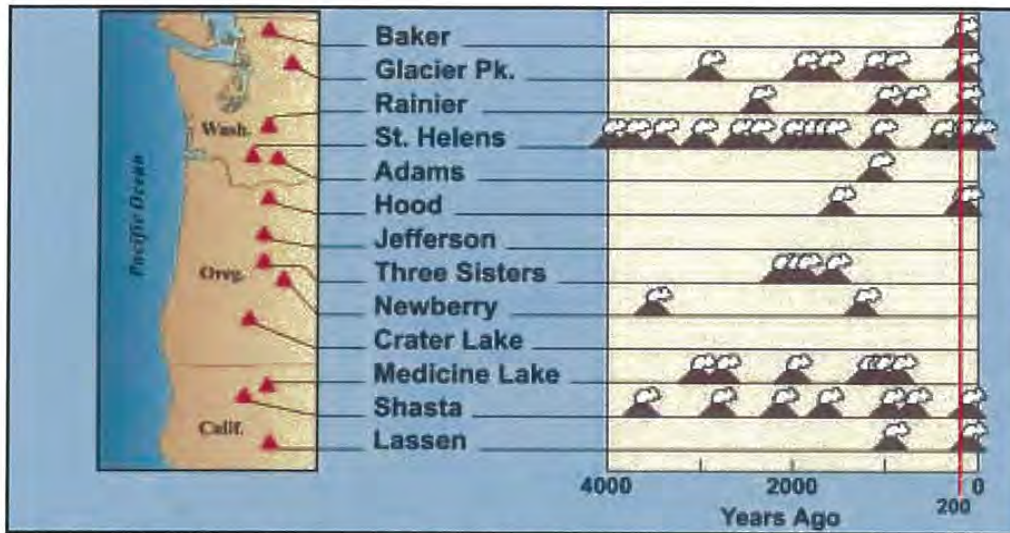


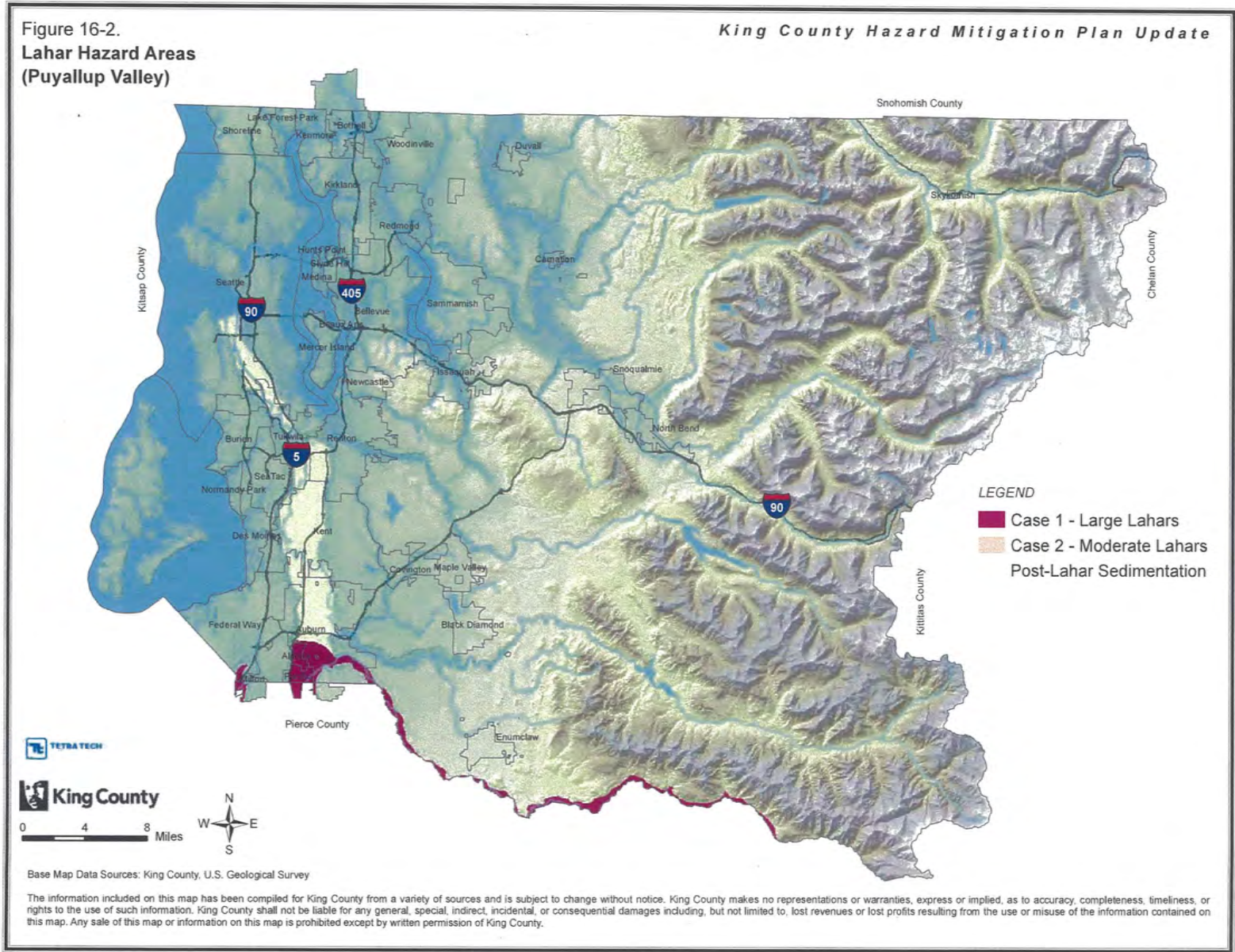
Figure 16-1. Cascade Range Eruptions in the Past 4,000 Years

16.2.2 Location

The Cascade Range extends more than 1,000 miles from southern British Columbia into northern California and includes 13 potentially active volcanic peaks in the U.S. Figure 16-1 shows the location of the Cascade Mountains in Washington State. The closest volcanoes to King County are Mt. Rainier and Glacier Peak. Other nearby volcanoes include Mt. St. Helens and Mt. Baker. The most hazardous volcanoes are those directly to the west and southwest (along the direction of prevailing winds).

Lahar zones on Mt. Rainier impacting the southern portion of King County have been mapped by USGS. Three lahar scenarios have been mapped, as shown on Figure 16-2:

- **Case 1, Large Lahars (Recurrence intervals 500 – 1,000 years)**—Areas that could be affected by cohesive lahars that originate as enormous avalanches on weak, chemically altered rock from the volcano. Case 1 lahars can occur with or without eruptive activity. The time interval between such events on Mt. Rainier is about 500 to 1,000 years.
- **Case 2, Moderate Lahars (recurrence intervals 100 – 500 years)**—Areas that could be affected by relatively large, non-cohesive lahars, which are commonly caused by the melting of snow and glacier ice by hot rock fragments during an eruption. They can also have a non-eruptive origin. The time interval between such lahars on Mt. Rainier is near the lower end of the 100- to 500-year range.
- **Post-Lahar Sedimentation**—Areas subject to post-lahar erosion and sedimentation and the ongoing potential for flooding.



16.2.3 Frequency

The Cascades have experienced an average of one or two eruptions per century during the last 4,000 years. Mount St. Helens is the most active volcano in the Cascades, with four major explosive eruptions in the last 515 years. Still, the probability of an eruption in any given year is extremely low. There is a 1 in 500 probability that portions of two counties in the state will receive 4 inches or more of volcanic ash from any Cascades volcano in any given year, and a 1 in 1,000 probability that parts or all of three or more counties will receive that quantity of ash. There is a 1 in 100 annual probability that small lahars or debris flows will impact river valleys below Mount Baker and Mount Rainier, and less than a 1 in 1,000 annual probability that the largest destructive lahars would flow down Glacier Peak, Mount Adams, Mount Baker or Mount Rainier. Figure 16-3 shows the annual probability of a tephra accumulation of 4 inches. The probability for King County is 0.02 percent or less in any given year.

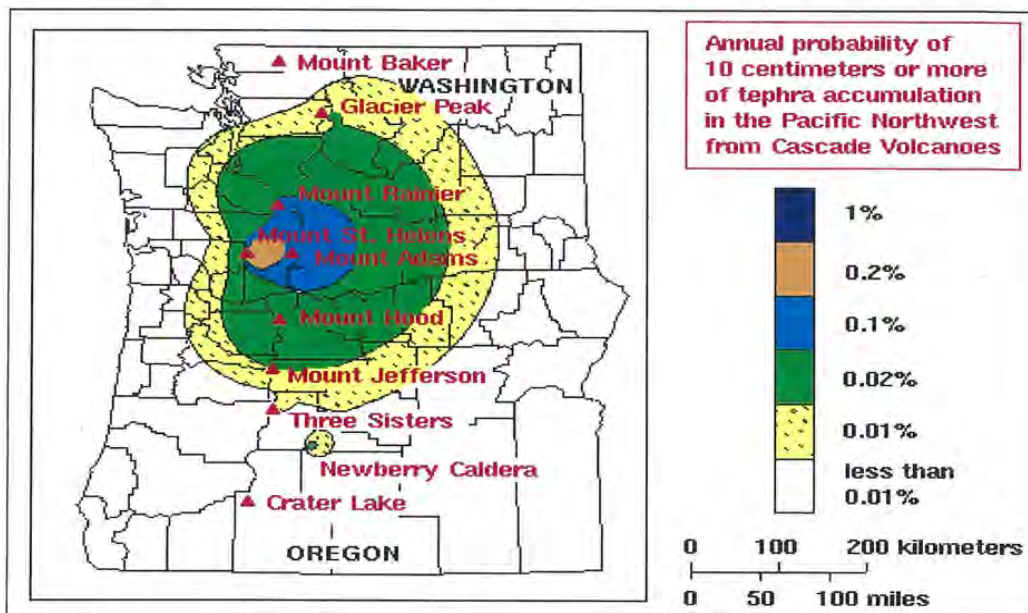


Figure 16-3. Annual Probability of Tephra Fall in the Northwest

16.2.4 Severity

Lahar

The major hazard to human life from debris flows is from burial or impact by boulders and other debris. People and animals also can be severely burned by debris flows carrying hot debris. Buildings and other property in the path of a debris flow can be buried, smashed, or carried away. Because of their relatively high density and viscosity, debris flows can move and even carry away vehicles and other objects as large as bridges and locomotives. Lahars can also erode the sides of river channels, causing bank failures. Buildings, roads, water pipes, or bridge abutments built along those banks may then be incorporated into the debris flow. A large-volume lahar may overtop or destroy a dam. The mudflows that accompanied the Mt. St. Helens eruptions damaged or destroyed more than 200 buildings, ruined 44 bridges, buried

17 miles of railway and more than 125 miles of roadway, badly damaged three logging camps, disabled several community water supply and sewage disposal systems and partly filled channels and reservoirs.

Because debris flows are confined to areas downslope and down-valley from their points of origin, people can avoid them by seeking high ground. People seeking to escape flows should climb valley sides rather than try to outrun debris flows in valley bottoms. Debris-flow hazard decreases gradually down-valley from volcanoes but more abruptly with increasing altitude above valley floors. During eruptive activity or precursors to eruptions, local government officials evacuate areas likely to be affected.

Tephra or Ash Fall

A 1-inch deep layer of ash weighs an average of 10 pounds per square foot, causing danger of structural collapse. Ash is harsh, acidic and gritty, and it has a sulfuric odor. Ash may also carry a high static charge for up to two days after being ejected from a volcano. As ash combines with rain, sulfur dioxide in the ash combines with water to form diluted sulfuric acid that may cause minor, but painful burns to the skin, eyes, nose, and throat.

16.2.5 Warning Time

Monitoring Volcanic Activity at Mount Rainier and Mount St. Helens

The USGS and the Pacific Northwest Seismograph Network at the University of Washington conduct seismic monitoring of all Cascade volcanoes in Washington and Oregon. The USGS began a collaboration with scientists from the Geophysics Program at the University of Washington to monitor seismic activity at both Mount St. Helens and Mount Rainier after the May 1980 eruption at Mount St. Helens. When unusual activity is observed, scientists immediately notify government officials and the public. The U.S. Forest Service serves as the primary dissemination agency for emergency information. As the activity changes, USGS scientists provide updated advisories and meet with local, state and federal officials to discuss the hazards and appropriate levels of emergency response. Experience since 1980 at Mount St. Helens and elsewhere indicates that monitoring is sufficient for scientists to detect the ascent of fresh magma that must take place before another large eruption. This information will enhance warnings and facilitate updated assessments of the hazard.

In addition, the USGS and the National Weather Service monitor lahar and flood hazards at Mount St. Helens. The latter agency has responsibility for providing warnings of floods, including lahars. These monitoring activities not only help nearby communities, but also can provide significant benefit throughout the Pacific Northwest, including King County.

Volcanic Event Notification

An emergency coordination center was established at the U.S. Forest Service office in Vancouver, Washington after the 1980 eruption of Mount St. Helens. A communications network and telephone call-down procedure were developed to facilitate rapid dissemination of information about the activity of the volcano. Information was also disseminated through public meetings, press conferences, and briefings with governmental agencies and private businesses. Emergency coordination and communication is necessary to reduce risk from potential volcanic eruptions in the Cascade region.

Warning Systems

Eruption

The best warning of a volcanic eruption is one that specifies when and where an eruption is likely and what type and size eruption should be expected. Such accurate predictions are sometimes possible but still

rare in volcanology. The most accurate warnings are those in which scientists indicate an eruption is probably only hours to days away based on significant changes in a volcano's earthquake activity, ground deformation, and gas emissions. Experience from around the world has shown that most eruptions are preceded by such changes over a period of days to weeks.

A volcano may begin to show signs of activity several months to a few years before an eruption. However, a warning that specifies months or years in advance when it might erupt are extremely rare. The USGS Cascade Volcano Observatory uses a series of alert levels that correspond generally to increasing levels of volcanic activity. As a volcano becomes increasingly active or as incoming data suggest that a given level of activity is likely to lead to a significant eruption, the Cascade Volcano Observatory declares a correspondingly higher alert level. This alert level ranking offers a framework that the public and civil authorities can use to gauge and coordinate a response to a developing volcano emergency.

Lahar

The USGS, Pierce County Department of Emergency Management and the Washington State Emergency Management Division have established a lahar warning system for the western flank of Mt. Rainier because of the high risk posed to communities below the volcano. Arrays of monitors record ground vibrations of a lahar, computerized evaluation of the data assesses the presence of a flowing lahar. When a lahar is detected, the system issues an automatic alert to emergency-management agencies. Emergency managers can then begin response measures. City, county, and state agencies design and maintain their own notification procedures, evacuation routes, and public-education programs (Driedger and Scott, 2008). This warning systems reduces but does not eliminate risk to people in lahar inundation areas. Individuals in the inundation area need to take immediate action to evacuate in the event of a large lahar event. The USGS estimates that a Case 1 lahar would reach Auburn within 96 minutes after a warning alarm was activated (EMD, 2012).

16.3 SECONDARY HAZARDS

Secondary hazards associated with volcanic eruptions are mud flows and landslides as well as traffic disruptions. The mudflow and landslide hazards are not as typical for most parts of the county, although communities in the south end of the county are located in historical lahar inundation areas. Traffic disruption caused by accumulation of ash fall could affect the entire planning area. It should also be noted that past volcanic activity in the Cascade ranges has been preceded by an earthquake.

16.4 EXPOSURE

All of the King County planning area would be exposed to tephra from volcanic eruptions in the Cascade Range to some degree. The location of the event as well as the prevailing wind direction would influence the extent of this impact. Only the southern portion of the county along the White River is considered to be exposed to lahar flows from Mt. Rainier.

16.4.1 Population

The entire population of King County is exposed to the effects of a tephra fall. Population centers in the lahar path along the White River could become isolated after a volcanic eruption, although there would likely be adequate warning time for evacuation. Population could not be examined by lahar zone because census block groups do not coincide with the lahar risk areas. However, population was estimated using the structure count of buildings within the lahar zones and applying the census value for King County of 2.39 persons per household. Using this approach, it is estimated that the exposed population is 17,920 in the Case 1 lahar zone, 3,527 in the Case 2 lahar zone, and 49,486 in the post-lahar sedimentation zone. Cumulatively, this represents about 3.52 percent of the total population for the planning area.

16.4.2 Property

Lahar

All of the lahar exposure is in the southern portion of the planning area along the White River. All property in the lahar inundation areas would be exposed to lahar flows. The number and value of planning area structures in the three lahar zones are summarized in Table 16-2 through Table 16-4. The breakdown of the present land use in the three lahar zones is shown in Table 16-5 and Table 16-6.

Tephra

All property in the planning area would be exposed to tephra accumulation in the event of a volcanic eruption.

TABLE 16-2.
EXPOSURE AND VALUE OF STRUCTURES IN CASE 1 LAHAR INUNDATION ZONE

Jurisdiction	Buildings Exposed	Value Exposed			% of Total Assessed Value
		Structure	Contents	Total	
Algona	1,116	\$474,135,845	\$408,162,897	\$882,298,743	97.75
Auburn	3,708	\$1,936,256,506	\$1,696,974,752	\$3,633,231,258	19.66
Federal Way	74	\$14,231,981	\$10,029,017	\$24,260,998	0.13
Milton	256	\$36,487,773	\$18,229,710	\$54,717,483	9.72
Pacific	2,073	\$540,777,225	\$324,967,156	\$865,744,381	95.54
Unincorporated	271	\$55,528,363	\$40,760,327	\$96,288,690	0.22
Total	7,498	\$3,057,417,693	\$2,499,123,859	\$5,556,541,553	0.99

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

TABLE 16-3.
EXPOSURE AND VALUE OF STRUCTURES IN CASE 2 LAHAR INUNDATION ZONE

Jurisdiction	Buildings Exposed	Value Exposed			% of Total Assessed Value
		Structure	Contents	Total	
Algona	261	\$38,851,867	\$23,146,394	\$61,998,261	6.87
Pacific	1,127	\$287,102,157	\$181,253,917	\$468,356,074	51.68
Unincorporated	8	\$1,884,205	\$1,462,398	\$3,346,603	0.01
Total	1,396	\$327,838,229	\$205,862,709	\$533,700,938	0.10

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

**TABLE 16-4.
EXPOSURE AND VALUE OF STRUCTURES IN POST-LAHAR SEDIMENTATION ZONE**

Jurisdiction	Buildings Exposed	Value Exposed			% of Total Assessed Value
		Structure	Contents	Total	
Algona	1	\$8,895	\$4,448	\$13,343	0.00
Auburn	8,283	\$4,898,419,869	\$4,244,306,287	\$9,142,726,156	50.81
Kent	6,466	\$9,394,517,677	\$8,687,789,310	\$18,082,306,986	54.49
Renton	681	\$2,382,266,163	\$2,577,625,412	\$4,959,891,575	19.21%
Seattle	3,421	\$3,618,450,762	\$3,974,253,224	\$7,592,703,987	3.58%
Tukwila	1,467	\$3,035,596,239	\$3,197,653,732	\$6,233,249,971	53.61%
Unincorporated	387	\$170,905,971	\$161,657,007	\$332,362,978	0.74
Total	20,706	\$23,500,165,576	\$22,843,289,420	\$46,343,254,996	0.97

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

**TABLE 16-5.
PRESENT LAND USE IN CASE 1 LAHAR INUNDATION AREA**

Present Use Classification	Case 1 Lahar		Case 2 Lahar	
	Area (acres)	% of total	Area (acres)	% of total
Agriculture	3	0.1%	68	0.4%
Church, Welfare or Religious Service	2	0.1%	125	0.8%
Commercial	251	7.5%	1,105	6.7%
Education	9	0.3%	105	0.6%
Governmental Services	3	0.1%	16	0.1%
Industrial/Manufacturing	79	2.4%	437	2.7%
Medical/Dental Services	3	0.1%	3	0.0%
Mixed Use Development (Residential & Commercial)	1	0.0%	1	0.0%
Mortuary/Cemetery/Crematory	0	0.0%	74	0.4%
Nursing Home/Retirement Facility	1	0.0%	5	0.0%
Park/Open Space/Golf Course	274	8.2%	629	3.8%
Residential	412	12.4%	2,850	17.4%
Terminal or Marina	0	0.0%	70	0.4%
Utility/Easement/Right of Way	38	1.2%	178	1.1%
Water/Tideland/Wetland	0	0.0%	7	0.0%
Uncategorized (includes vacant and resource lands)	2,250	67.7%	10,742	65.5%
Total	3,324	100%	16,411	100%

Source: Summarized from King, Pierce and Snohomish County parcel data. Acreage covers only mapped parcel extents and thus excludes many rights of way and major water features.

**TABLE 16-6.
PRESENT LAND USE IN POST LAHAR SEDIMENTATION AREAS**

Present Use Classification	Area (acres)	% of total
Agriculture	109	0.5%
Church, Welfare or Religious Service	48	0.2%
Commercial	6,813	30.6%
Education	126	0.6%
Governmental Services	131	0.6%
Industrial/Manufacturing	2,026	9.1%
Medical/Dental Services	43	0.2%
Mixed Use Development (Residential & Commercial)	11	0.0%
Mortuary/Cemetery/Crematory	47	0.2%
Nursing Home/Retirement Facility	21	0.1%
Park/Open Space/Golf Course	913	4.1%
Residential	3,422	15.4%
Terminal or Marina	1,733	7.8%
Utility/Easement/Right of Way	1,194	5.4%
Water/Tideland/Wetland	98	0.4%
Uncategorized (includes vacant and resource lands)	5,503	24.7%
Total	22,238	100%

Source: Summarized from King, Pierce and Snohomish County parcel data. Acreage covers only mapped parcel extents and thus excludes many rights of way and major water features.

16.4.3 Critical Facilities and Infrastructure

Lahar

All critical facilities along the White River are exposed to the lahar hazard. The exposed critical facilities and infrastructure in the three lahar zones within the planning area are summarized in Table 16-7 through Table 16-12.

Tephra

All transportation routes are exposed to tephra accumulation, which could create hazardous driving conditions on roads and highways and hinder evacuations and response.

16.4.4 Environment

The environment is highly exposed to the effects of a volcanic eruption. Even if ash fall from a volcanic eruption were to fall elsewhere, it could still be spread throughout the county by surrounding rivers and streams. A volcanic blast would expose the local environment to effects such as lower air quality and other elements that could harm local vegetation and water quality.

**TABLE 16-7.
CRITICAL FACILITIES IN THE CASE 1 LAHAR INUNDATION ZONE**

	Medical & Health Services	Government Function	Protective Function	Schools	Hazardous Materials	Other Critical Function	Total
Algona	0	0	1	1	0	0	2
Auburn	0	0	1	7	10	2	20
Milton	0	0	1	0	0	0	1
Pacific	0	0	2	1	0	0	3
Unincorporated	0	0	0	0	0	0	0
Total	0	0	5	9	10	2	26

**TABLE 16-8.
CRITICAL FACILITIES IN THE CASE 2 LAHAR INUNDATION ZONE**

	Medical & Health Services	Government Function	Protective Function	Schools	Hazardous Materials	Other Critical Function	Total
Algona	0	0	0	0	0	0	0
Auburn	0	0	0	0	0	0	0
Milton	0	0	0	0	0	0	0
Pacific	0	0	0	1	0	0	1
Unincorporated	0	0	0	0	0	0	0
Total	0	0	0	1	0	0	1

**TABLE 16-9.
CRITICAL FACILITIES IN THE POST LAHAR SEDIMENTATION ZONE**

	Medical & Health Services	Government Function	Protective Function	Schools	Hazardous Materials	Other Critical Function	Total
Auburn	10	1	3	12	3	20	49
Kent	23	0	7	4	20	7	61
Renton	5	0	1	1	7	5	19
Seattle	4	0	5	0	40	1	50
Tukwila	5	0	4	0	7	4	20
Unincorporated	0	0	0	0	0	1	1
Total	47	1	20	17	77	38	200

TABLE 16-10.
CRITICAL INFRASTRUCTURE IN THE CASE 1 LAHAR INUNDATION ZONE

	Bridges	Transportation	Water Supply	Wastewater	Power	Communications	Dams	Total
Algona	1	0		0	1	0	1	3
Auburn	1	0	0	4	0	0	2	7
Milton	3	0	0	0	0	0	0	3
Pacific	4	0	0	1	0	0	0	5
Unincorporated	2	0	0	0	0	0	0	2
Total	11	0	0	5	1	0	3	20

TABLE 16-11.
CRITICAL INFRASTRUCTURE IN THE CASE 2 LAHAR INUNDATION ZONE

	Bridges	Transportation	Water Supply	Wastewater	Power	Communications	Dams	Total
Algona	0	0	0	0	0	0	0	0
Auburn	0	0	0	0	0	0	0	0
Milton	3	0	0	0	0	0	0	3
Pacific	2	0	0	0	0	0	0	2
Unincorporated	0	0	0	0	0	0	0	0
Total	5	0	0	0	0	0	0	5

TABLE 16-12.
CRITICAL INFRASTRUCTURE IN THE POST LAHAR SEDIMENTATION ZONE

	Bridges	Transportation	Water Supply	Wastewater	Power	Communications	Dams	Total
Auburn	17	3	1	16	0	1	0	38
Kent	27	5	0	0	2	0	0	34
Renton	14	0	0	1	0	0	0	15
Seattle	10	74	0	3	1	2	0	90
Tukwila	12	3	1	8	0	1	0	25
Unincorporated	4	1	0	1	0	0	0	6
Total	84	86	2	29	3	4	0	208

Lahars racing down river valleys and spreading across floodplains tens of miles downstream from a volcano often cause serious economic and environmental damage. A lahar's turbulent flow front and the boulders and logs carried by the lahar can easily crush, abrade, or shear off at ground level just about anything in the path of the lahar. Even if not crushed or carried away by the force of a lahar, buildings and valuable land may become partially or completely buried by one or more cement-like layers of rock debris. By destroying bridges and key roads, lahars can trap people in areas vulnerable to other hazardous volcanic activity, especially if the lahars leave deposits that are too deep, too soft, or too hot to cross. Lahars can destroy by direct impact, lead to increased deposition of sediment, block tributary streams and bury valleys and communities with debris.

16.5 VULNERABILITY

16.5.1 Population

Lahar

Since there is generally adequate warning time before a volcanic event, the population vulnerable to the lahar hazard consists of those who choose not to evacuate or are unable to evacuate. The latter includes the elderly and the very young.

Tephra

The entire population of the planning area is vulnerable to the damaging effects of volcanic ash fall in the event of a volcanic eruption. The elderly, very young and those who experience ear, nose and throat problems are especially vulnerable to the tephra hazard.

16.5.2 Property

Lahar

There are currently no generally accepted damage functions for volcanic hazards in risk assessment platforms such as Hazus-MH. Therefore the planning team was not able to generate damage estimates for this hazard. All properties listed in Table 16-2 through Table 16-4 are vulnerable to the lahar hazard in the planning area. These lahar inundation areas are the outflow areas of past volcanic eruptions and are potential outflow areas for future volcanic eruptions. The most vulnerable structures would be those that are located closest to the lahar outflow areas, and those that are not structurally sound.

Tephra

All of the property exposed to nature in the planning area is exposed to the effects of a tephra fall. Among these properties, the most vulnerable structures are those that are not as structurally sound and may collapse under the excessive weight of tephra and possible rainfall. Vulnerable property includes equipment and machinery left out in the open, such as combines, whose parts can become clogged by the fine dust. Infrastructure, such as drainage systems, is potentially vulnerable to the effects of a tephra fall, since the fine ash can clog pipes and culverts. This may be more of a problem if an eruption occurs during winter or early spring when precipitation is highest and floods are most likely.

To estimate the loss potential for this hazard, a qualitative approach was used, based on recommendations from FEMA guidelines on state and local mitigation planning. Loss estimation tools such as Hazus-MH currently do not have the ability to analyze impacts from volcano hazards. For this study, it was decided to use 0.1 percent as the loss ratio for the volcano hazard. Assessed valuations for the entire planning area were the basis for these estimations. The results are summarized in Table 16-13.

TABLE 16-13.
LOSS ESTIMATES FOR TEPHRA

Jurisdiction	Exposed Value	Estimated Loss Potential @ 0.1% Damage
Algona	\$902,612,000	\$902,612
Auburn	\$17,992,313,000	\$17,992,313
Beaux Arts	\$60,778,000	\$60,778
Bellevue	\$49,163,714,000	\$49,163,714
Black Diamond	\$600,388,000	\$600,388
Bothell	\$5,215,897,000	\$5,215,897
Burien	\$9,165,566,000	\$9,165,566
Carnation	\$328,410,000	\$328,410
Clyde Hill	\$845,586,000	\$845,586
Covington	\$2,849,591,000	\$2,849,591
Des Moines	\$5,742,226,000	\$5,742,226
Duvall	\$1,108,322,000	\$1,108,322
Enumclaw	\$2,667,155,000	\$2,667,155
Federal Way	\$19,102,220,000	\$19,102,220
Hunts Point	\$160,100,000	\$160,100
Issaquah	\$9,587,897,000	\$9,587,897
Kenmore	\$4,000,207,000	\$4,000,207
Kent	\$33,182,020,000	\$33,182,020
Kirkland	\$22,202,262,000	\$22,202,262
Lake Forest Park	\$2,214,717,000	\$2,214,717
Maple Valley	\$3,129,530,000	\$3,129,530
Medina	\$947,196,000	\$947,196
Mercer Island	\$6,598,328,000	\$6,598,328
Milton	\$140,733,000	\$140,733
Newcastle	\$2,266,792,000	\$2,266,792
Normandy Park	\$1,306,626,000	\$1,306,626
North Bend	\$1,453,593,000	\$1,453,593
Pacific	\$830,743,000	\$830,743
Redmond	\$23,234,414,000	\$23,234,414
Renton	\$25,825,586,000	\$25,825,586
Sammamish	\$9,306,835,000	\$9,306,835
SeaTac	\$7,572,236,000	\$7,572,236
Seattle	\$212,337,688,000	\$212,337,688
Shoreline	\$11,169,471,000	\$11,169,471
Skykomish	\$74,730,000	\$74,730
Snoqualmie	\$2,297,236,000	\$2,297,236
Tukwila	\$11,628,108,000	\$11,628,108
Woodinville	\$4,522,687,000	\$4,522,687
Yarrow Point	\$300,638,000	\$300,638
Unincorporated	\$44,681,548,000	\$556,716,699
Total	\$556,716,699,000.00	\$1,068,751,850.00

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

16.5.3 Critical Facilities and Infrastructure

Lahar

Transportation routes that intersect with the lahar inundation zone are most vulnerable, especially depending on their structural stability. This would include roads, bridges and the BNSF Railway. The most vulnerable spots are those that directly intersect with a lahar outflow area and are not structurally sound. Utilities are vulnerable to damage from lahars due to the debris that may be carried. Most vulnerable are those that are located on or near parcels that intersect with the lahar outflow area or those that receive input from area streams and rivers that lahar flow through. Water treatment plants and wastewater treatment plants are vulnerable to contamination from debris that may be carried by a lahar. Electrical transmission lines that provide a portion of the electrical power to the Seattle-Tacoma metropolitan area may be severed during an eruption.

Tephra or Ash Fall

Ash fall accumulation of less than one-half inch is capable of creating temporary disruptions of transportation operations and sewage disposal and water treatment systems. Highways and roads could be closed for hours, days, or weeks afterwards. The series of eruptions at Mount St. Helens in 1980 caused Interstate 90 from Seattle to Spokane to close for a week. The impact of the ash fall caused the Seattle and Portland International Airports to close for a few days.

The gritty ash can cause substantial problems for internal-combustion engines and other mechanical and electrical equipment. The ash can contaminate oil systems, clog air filters, and scratch moving surfaces. Fine ash can also cause short circuits in electrical transformers, which in turn cause power blackouts.

16.5.4 Environment

The environment is very vulnerable to the effects of a volcanic eruption. A lahar could be very damaging to area rivers and streams and could redirect water flow and cause changes in water courses. Ash fall would expose the local environment to lower air quality and other effects that could harm vegetation and water quality. The sulfuric acid contained in volcanic ash could be very damaging to area vegetation, waters, wildlife and air quality. Rivers and streams are also vulnerable to damage due to ash fall.

16.6 FUTURE TRENDS IN DEVELOPMENT

Lahar

Development in lahar inundation areas is not currently held to more restrictive standards than typically adopted building codes and land use regulations. These areas have been densely settled. Population within King County, including areas susceptible to lahar inundation, continues to grow, so development of these areas is expected to continue.

Tephra or Ash Fall

All future development in the planning area will be susceptible to the potential impacts from volcanic eruptions causing ash fall within the region. While this potential impact on the built environment is not considered to be significant, the economic impact on industries that rely on machinery and equipment such as agriculture or civil engineering projects could be significant. Since the extent and location of this hazard is difficult to gauge because it is dependent upon many variables, the ability to institute land use recommendations based on potential impacts of this hazard is limited. While the impacts of tephra are sufficient to warrant risk assessment for emergency management purposes, they are not sufficient to dictate land use decisions.

16.7 SCENARIO

The worst case scenario for King County would be a massive eruption from Mt. Rainier. The lahar flow along the White River in conjunction with this eruption could have devastating impacts on facilities in the White River basin, similar to those seen along the Toutle River following the Mt. St. Helens eruption in 1980. King County resources would be taxed during such an event with widespread damage in the south portion of the county. Most loss of life is likely to be avoided as a result of adequate warnings.

16.8 ISSUES

Volcanic activity at Mt. Rainier is believed to pose the greatest threat to King County and its residents. Because of the inactivity of Mt. Rainier, people have settled on its slopes and along the paths taken by lahar and mudflow drainage. If Mt. Rainier becomes active and erupts or has large lahars or mudflows, all human life and property located on its slopes and along its drainage systems (rivers) are potentially vulnerable.

Explosive eruptions at Glacier Peak or Mt. St. Helens would produce ash that would pose health concerns for residents, damage property, and cause major problems for transportation, local industry, communication and utilities. Non-magmatic events at other active Cascade volcanoes would not directly impact King County. However, County residents could be vulnerable if visiting a volcano during volcanic activity.

Volcanic eruptions can disrupt the normal flow of commerce and daily human activity without causing severe physical harm or damage. Ash that is a few inches thick can halt traffic, cause rapid wear of machinery, clog air filters, block drains, creeks, and water intakes, and impact agriculture. Removal and disposal of large volumes of deposited ash can also have significant impacts on government and business. The interconnectedness of the region's economy can be disturbed after a volcanic eruption. Roads, railroads, and bridges can be damaged from lahars and mudflows. The Mount St. Helens May 1980 eruption demonstrated the negative effect on the tourism industry. Conventions, meetings, and social gatherings were canceled or postponed in cities and resorts throughout Washington and Oregon in areas not initially affected by the eruption. However, the eruption did lead to the creation of a thriving tourist industry for decades following the event.

Transportation of goods may also be halted. Subsequent airport closures can disrupt airline schedules for travelers. In addition, the movement of goods via major highways can also be halted due to debris and tephra in the air. The Mount St. Helens event in May 1980 cost trade and commerce an estimated \$50 million in only two days, as ships were unable to navigate the Columbia River. Clouds of ash often cause electrical storms that start fires, and damp ash can short-circuit electrical systems and disrupt radio communication. Volcanic activity can also lead to the closure of nearby recreation areas as a safety precaution long before the activity ever culminates into an eruption.

Researchers continue to develop methods to predict volcanic eruptions accurately. Indications that an eruption may be imminent include swarms of small earthquakes as the magma rises up through the volcano, increases in sulfur dioxide emissions, and physical swelling of mountain slopes. The USGS is currently experimenting with a variety of sensors on Mt. Rainier in order to attempt predictions. While these methods have not been perfected, scientists were able to predict the eruptions of Mt. Pinatubo in the Philippines and Mt. Unzen in Japan.

Since volcanic episodes have been fairly predictable in the recent past, there is not as much concern about loss of life, but there is concern with loss of property, infrastructure and severe environmental impacts.

CHAPTER 17. FIRE

17.1 GENERAL BACKGROUND

King County experiences three types of fire threats: structure fires, wildfires and wildland urban interface (WUI) fires where development is adjacent to densely vegetated areas.

17.1.1 Structure Fires

Structure fires are not typically considered an emergency, except when the fire can spread to adjoining structures.

Often, older structures do not conform to modern building and fire codes and do not contain fire detection devices. These structures are also prone to faulty electrical, heating and other utility systems due to age and lack of proper maintenance. Many of these older structures were constructed very close together, enabling fire to spread rapidly from one to another. Older apartment buildings and hotels also face increased risk of rapid fire spread due to inadequate firewall protection and the lack of fire detection and sprinkler systems.

Some newer residential structures are not as vulnerable to fire as older structures. These structures include fire resistive features that conform to modern fire and building codes, as well as fire detection or extinguishing systems. The likelihood of a major fire spreading from these structures to adjoining structures or units before it can be brought under control is significantly reduced.

The storage and use of hazardous materials by commercial and industrial occupancies not only increases the risk of fire but also poses a threat to firefighters and the community if they should become involved in a fire.

Structure fires are a potential secondary hazard of earthquakes. One study estimated that 80 to 100 fires would occur from a large earthquake in the Seattle area.

17.1.2 Wildfires

A wildfire is any uncontrolled fire on undeveloped land that requires fire suppression. Wildfires can be ignited by lightning or by human activity such as smoking, campfires, equipment use, and arson. Controlled burns are not considered hazards unless they escape control.

DEFINITIONS

Conflagration—A fire that grows beyond its original source area to engulf adjoining regions. Wind, extremely dry or hazardous weather conditions, excessive fuel buildup and explosions are usually the elements behind a wildfire conflagration.

Firestorm—A fire that expands to cover a large area, often more than a square mile. A firestorm usually occurs when many individual fires grow together into one. The involved area becomes so hot that all combustible materials ignite, even if they are not exposed to direct flame. Temperatures may exceed 1000°C. Superheated air and gases of combustion rise over the fire zone, drawing surface winds in from all sides, at velocities up to 50 miles per hour. Although firestorms seldom spread because of the inward direction of the winds, once started there is no known way of stopping them. Within the area of the fire, lethal concentrations of carbon monoxide are present; combined with the intense heat, this poses a serious life threat to responding fire forces. In very large events, the rising column of heated air and combustion gases carries enough soot and particulate matter into the upper atmosphere to cause cloud nucleation, creating a locally intense thunderstorm and the hazard of lightning strikes.

Interface Area—An area susceptible to wildfires and where wildland vegetation and urban or suburban development occur together. An example would be smaller urban areas and dispersed rural housing in forested areas.

Wildfire—Fires that result in uncontrolled destruction of forests, brush, field crops, grasslands, and real and personal property in non-urban areas. Because of their distance from firefighting resources, they can be difficult to contain and can cause a great deal of destruction.

Fire hazards present a considerable risk to vegetation and wildlife habitat. Short-term loss caused by a wildfire can include the destruction of timber, wildlife habitat, scenic vistas, and watersheds. Long-term effects include smaller timber harvests, reduced access to affected recreational areas, and destruction of cultural and economic resources and community infrastructure. Vulnerability to flooding increases due to the destruction of watersheds. An average of 905 wildfires burn 6,488 acres annually in Washington State, with a resource loss of \$2,103,884.

The probability of a wildfire in any one locality on a particular day depends on fuel conditions, topography and weather conditions, as described in the following sections.

Fuels

Fuels are classified by weight or volume (fuel loading) and by type, including living and dead vegetation on the ground, brush and small trees on the surface, and tree canopies above the ground. Fuel loading, often expressed in tons per acre, can be used to describe the amount of vegetative material available. If fuel loading doubles, the energy released also can be expected to double. Each fuel type is given a burn index, which is an estimate of the amount of potential energy that may be released, the effort required to contain a fire in a given fuel, and the expected flame length. Different fuels have different burn qualities. Some fuels burn more easily or release more energy than others. Lighter fuels such as grasses, leaves and needles quickly expel moisture and burn rapidly, while heavier fuels such as tree branches, logs and trunks take longer to warm and ignite.

Continuity of fuels is expressed in terms of horizontal and vertical dimensions. Horizontal continuity represents the distribution of fuels over the landscape. Vertical continuity links fuels at the ground surface with tree crowns. Trees killed or defoliated by forest insects and diseases are more susceptible to wildfire. As of 2012, just under 5 percent (more than 1 million acres) of Washington's 22.4 million acres of forestland showed some level of tree mortality, tree defoliation or foliar disease (Washington Department of Natural Resources, 2013).

Fuel moisture is expressed as a percentage of total saturation and varies with antecedent weather. Low fuel moistures indicate the probability of severe fires. Given the same weather conditions, moisture in fuels of different diameters changes at different rates. A 1,000-hour fuel, which has a 3- to 8-inch diameter, changes more slowly than a 1- or 10-hour fuel.

Topography

Topography can have a powerful influence on wildfire behavior. The movement of air over the terrain tends to direct a fire's course. Gulches and canyons can funnel air and act as a chimney, intensifying fire behavior and inducing faster rates of spread. Saddles on ridge tops offer lower resistance to the passage of air and will draw fires. Solar heating of drier, south-facing slopes produces upslope thermal winds that can complicate behavior.

Slope is an important factor. If the percentage of uphill slope doubles, the rate of spread of wildfire will likely double. On steep slopes, fuels on the uphill side of a fire are closer physically to the source of heat. Radiation preheats and dries the fuel, thus intensifying fire behavior. Fire travels downslope much more slowly than it does upslope, and ridge tops often mark the end of wildfire's rapid spread.

Weather

Of all the factors influencing wildfire behavior, weather is the most variable. Extreme weather leads to extreme fire events, and it is often a moderation of the weather that marks the end of a wildfire's growth

and the beginning of successful containment. High temperatures and low humidity can produce vigorous fire activity. The cooling and higher humidity brought by sunset can dramatically quiet fire behavior.

Fronts and thunderstorms can produce winds that are capable of radical and sudden changes in speed and direction, causing similar changes in fire activity. The rate of spread of a fire varies directly with wind velocity. Winds may play a dominant role in directing the course of a fire. Strong, dry winds produce extreme fire conditions. Such winds generally reach peak velocities during the night and early morning. The effect of wind on fire behavior is a primary safety concern for firefighters. In July 1994, a sudden change in wind speed and direction on Storm King Mountain in Colorado led to a blowup that claimed the lives of 14 firefighters. The most damaging firestorms are usually marked by high winds.

17.1.3 Wildland/Urban Interface Fires

WUI fires occur where combustible vegetation meets combustible structures, combining the hazards associated with wildfires and structure fires. These types of fires have increased dramatically in the last two decades as more and more people move to rural areas. Between 1970 and 1980, the rural population of the United States increased 23.4 percent, more than twice the gain of 11.4 percent for the nation as a whole. The hazard is bi-directional, wildfires can burn homes, and home fires can burn into wildlands.

WUI fires are increasing as more vacation homes are built and improved transportation systems allow more people to live outside city centers. The longer response times for these out-of-the-way locations gives the fire more time to get out of control, making these fires difficult to fight. Most firefighters are trained to fight either wildfires or structure fires. WUI fires require both skills, and it is very difficult to balance the two. When a WUI fire breaks out, the threat of extreme property and casualty losses often forces firefighters to focus their efforts on protecting homes and structures, sometimes at the expense of protecting wildland resources or working to slow the fire itself.

17.2 HAZARD PROFILE

17.2.1 Past Events

Structure fires

The largest conflagration in King County history is the 1889 Seattle fire, which is estimated to have consumed 60 acres of downtown.

On August 6, 1992, a series of fires began in the north Seattle area. Ultimately, 76 fires occurred, resulting in losses of over \$30 million. On February 6, 1993, Paul Keller was arrested and charged with arson. He ultimately pled guilty to setting 32 of the fires.

Wildfires

Fire is a normal part of most forest and range ecosystems in temperate regions of the world. Fires historically burn on a fairly regular cycle, recycling carbon and nutrients stored in the ecosystem and strongly affecting the species within the ecosystem. Annual acreage consumed by wildfires in the lower 48 states dropped from about 40 to 50 million acres per year in the 1930s to under 5 million acres by 1970. A Western Washington study estimated that modern wildfires consume only about a tenth of the biomass each year that prehistoric fires burned.

According to the Washington State Emergency Management Division, the wildland fire season in Washington State typically begins in early July and lasts until late September. Climatic conditions such as drought, snowpack and localized weather can expand the length of the fire season. In July through early September, lightning strikes are the cause of most wildland fires in Washington State. Human-caused

fires are more prevalent at the beginning and end of the fire season. Only 30 percent of fires in the state are in Western Washington (EMD, 2013). None of the significant wildland fires since 1900 noted by the Washington State Emergency Management Division have occurred in King County.

The U.S. Department of the Interior maintains a database of federal agency records for 677,000 fires that occurred from 1980 through 2012 (USGS, 2013). There are 332 events listed that occurred in King County. Of these 332 events, 86 percent were attributed to human causes. Only six of the King County fires burned 10 acres or more; these are listed in Table 17-1.

TABLE 17-1. WILDFIRES IN KING COUNTY GREATER THAN 10 ACRES, 1980-2012				
Forest Service Fire ID	Fire Name	Cause	Start Date	Area Burned (acres)
1483448	Crystal Mine	Natural	8/4/2009	25
285295	Unnamed	Human	5/24/1993	16
251146	Falls Creek	Human	7/26/1988	2,600
246258	Unnamed	Human	7/29/1988	70
246146	Unnamed	Human	9/11/1986	40
246145	Unnamed	Human	9/11/1986	40
<i>Source:</i> Federal Wildland Fire Occurrence Data, http://wildfire.cr.usgs.gov/firehistory/data.html				

17.2.2 Location

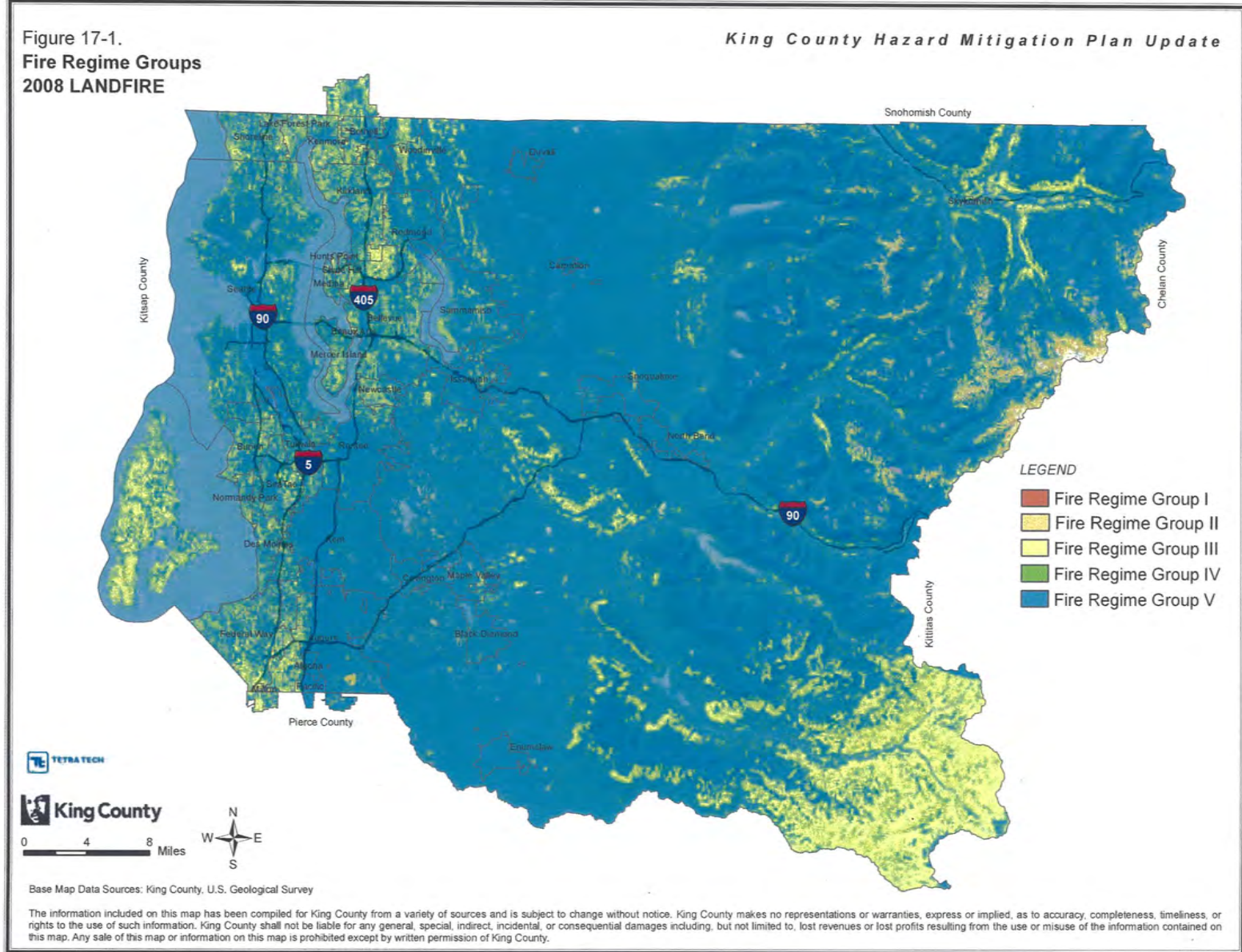
The following sections describe two types of wildfire hazard mapping produced by the U.S. Forest Service and LANDFIRE (a program of the U.S. Forest Service and the U.S. Department of the Interior, under the direction of the Wildland Fire Leadership Council): fire regime mapping and fire behavior fuel model classifications.

Fire Regime Mapping

The LANDFIRE project produces maps of historical fire regimes and vegetation and maps of current vegetation and its departure from historical conditions. The maps categorize mean fire return intervals and fire severities into five fire regimes (Hann et al., 2004):

- Fire Regime I—0 to 35 year frequency, low to mixed severity
- Fire Regime II—0 to 35 year frequency, replacement severity
- Fire Regime III—35 to 200 year frequency, low to mixed severity
- Fire Regime IV—35 to 200 year frequency, replacement severity
- Fire Regime V—200+ year frequency, any severity.

These maps support fire and landscape management planning outlined in the goals of the National Fire Plan, Federal Wildland Fire Management Policy, and the Healthy Forests Restoration Act. Figure 17-1 shows fire regimes in the planning area based on LANDFIRE models.



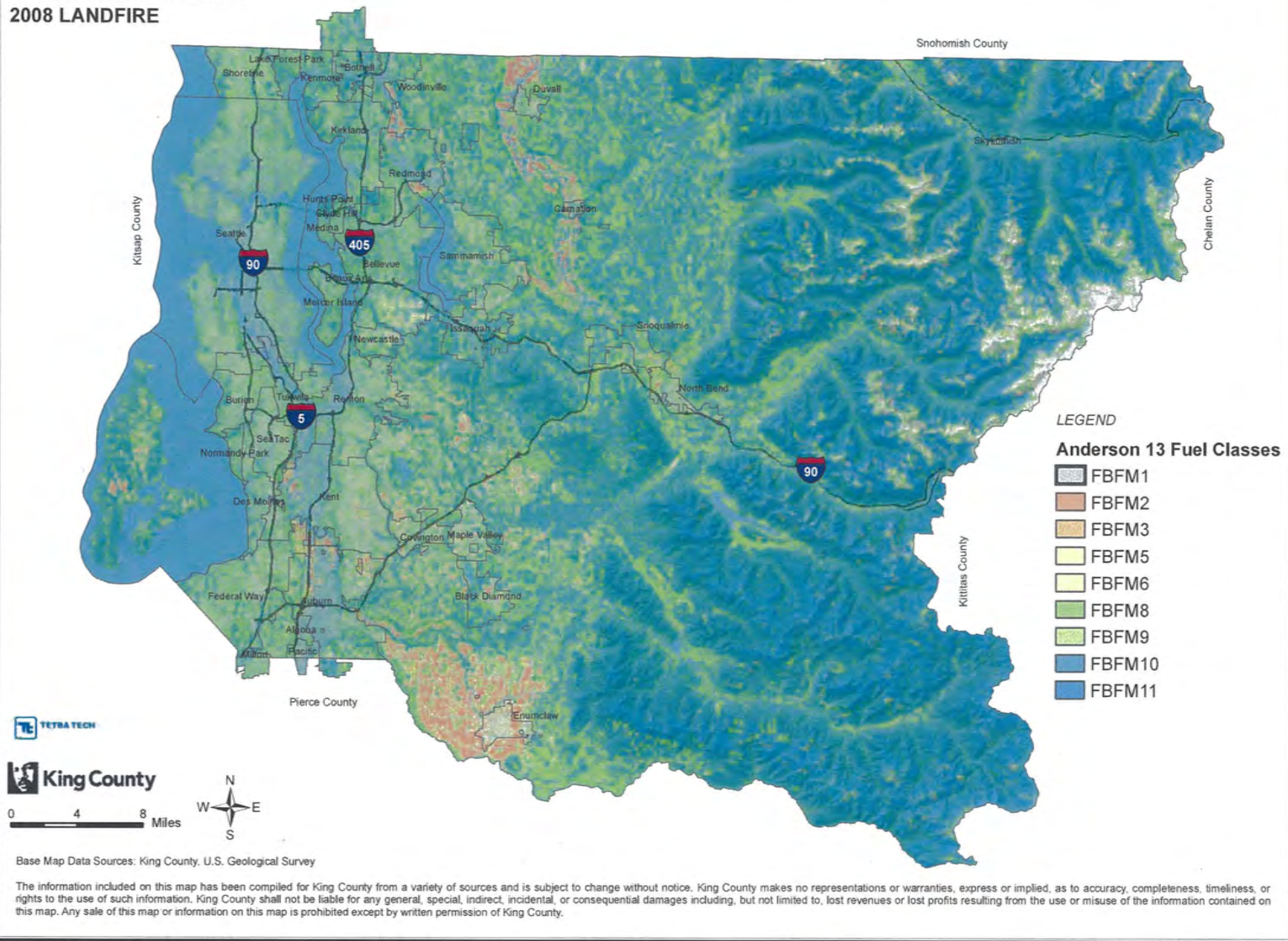
Fire Behavior Fuel Model Classifications

Thirteen standard fire behavior fuel models (FBFM) serve as input to a mathematical model of surface fire behavior and spread. The fire behavior fuel model layer (FBFM13) represents the distribution of fuel loading among live and dead surface fuel components, size classes, and fuel types. The fuel models are described by the most common fire-carrying fuel type (grass, brush, timber litter, or slash), loading and surface area-to-volume ratio by size class and component, fuel bed depth, and moisture of extinction. The FBFM13 layer was produced by fire and fuels specialists based on vegetation type, cover, and height. The 13 classes, shown on Figure 17-2, are defined as follows:

- FBFM 1—Surface fires that burn fine herbaceous fuels, cured and curing fuels, little shrub or timber present, primarily grasslands and savanna
- FBFM 2—Burns fine, herbaceous fuels, stand is curing or dead, may produce fire brands on oak or pine stands
- FBFM 3—Most intense fire of grass group, spreads quickly with wind, one third of stand dead or cured, stands average 3 feet tall
- FBFM 4—Fast spreading fire, continuous overstory, flammable foliage and dead woody material, deep litter layer can inhibit suppression
- FBFM 5—Low intensity fires, young, green shrubs with little dead material, fuels consist of litter from understory
- FBFM 6—Broad range of shrubs, fire requires moderate winds to maintain flame at shrub height, or will drop to the ground with low winds
- FBFM 7—Foliage highly flammable, allowing fire to reach shrub strata levels, shrubs generally 2 to 6 feet high
- FBFM 8—Slow, ground burning fires, closed canopy stands with short needle conifers or hardwoods, litter consisting mainly of needles and leaves, with little undergrowth, occasional flares with concentrated fuels
- FBFM 9—Longer flames, quicker surface fires, closed canopy stands of long-needles or hardwoods, rolling leaves in fall can cause spotting, dead-down material can cause occasional crowning
- FBFM 10—Surface and ground fire more intense, dead-down fuels more abundant, frequent crowning and spotting causing fire control to be more difficult
- FBFM 11—Fairly active fire, fuels consist of slash and herbaceous materials, slash originates from light partial cuts or thinning projects, fire is limited by spacing of fuel load and shade from overstory
- FBFM 12—Rapid spreading and high intensity fires, dominated by slash resulting from heavy thinning projects and clear-cuts, slash is mostly 3 inches or less
- FBFM 13—Fire spreads quickly through smaller material and intensity builds slowly as large material ignites, continuous layer of slash larger than 3 inches in diameter predominates, resulting from clear-cuts and heavy partial cuts, active flames sustained for long periods of time, fire is susceptible to spotting and weather conditions.

Figure 17-2.
Fire Behavior Fuel Model
2008 LANDFIRE

King County Hazard Mitigation Plan Update



WUI Areas

The Washington Department of Natural Resources and its federal and local partners have determined that six areas in King County are at a high risk to wildfire: Black Diamond/Green River, Carnation, Cumberland, Kanaskat/Selleck, Lake Retreat/Rock Creek, North Bend and Snoqualmie Pass. According to the Washington State Emergency Management Division, areas of significant fire hazards are mapped based on fire behavior potential, fire protection capability, and risk to social, cultural and community resources. Risk is determined based on area fire history, type and density of vegetative fuels, extreme weather conditions, topography, number and density of structures and their distance from fuels, location of municipal watershed, and likely loss of housing or business (EMD, 2013). Figure 17-3 shows WUI communities at risk.

17.2.3 Frequency

Natural fire rotation is defined as the number of years necessary for fires to burn over an area equal to that of the study area. Natural fire rotation is calculated from the historical record of fires by dividing the length of the record period in years by the percentage of total area burned during that period. It represents the average period between fires under a presumed historical fire regime. Since 1980, King County has seen an average of 10 wildfires per year. The vast majority of these fires burn less than 10 acres, with an overall average of 8.6 acres per incident. Fires occur annually, although fires that burn more than 10 acres have only occurred once every 5 years, on average.

17.2.4 Severity**Structure Fires**

Injuries and casualties to the occupants of a structure are a primary concern in all structure fires. These events can also cause the release of hazardous materials and disconnect utility lines. Given the immediate response times to reported fires, the likelihood of injuries and casualties is minimal.

Wildfires

Potential losses from wildfire include human life, structures and other improvements, and natural resources. The effects of wildfires vary with intensity, area and time of year. The greatest short-term loss is the complete destruction of valuable resources, such as timber, wildlife habitat, recreation areas, and watersheds. In addition, wildfire can lead to ancillary impacts such as landslides in steep ravine areas and flooding due to the impacts of silt in local watersheds. Severe fires producing high soil temperatures create a water-repellent layer below the soil surface. The soil above this layer becomes highly prone to erosion, often resulting in mudslides. Long-term effects are reduced amounts of timber for commercial purposes and the reduction of travel and recreational activities in the affected area.

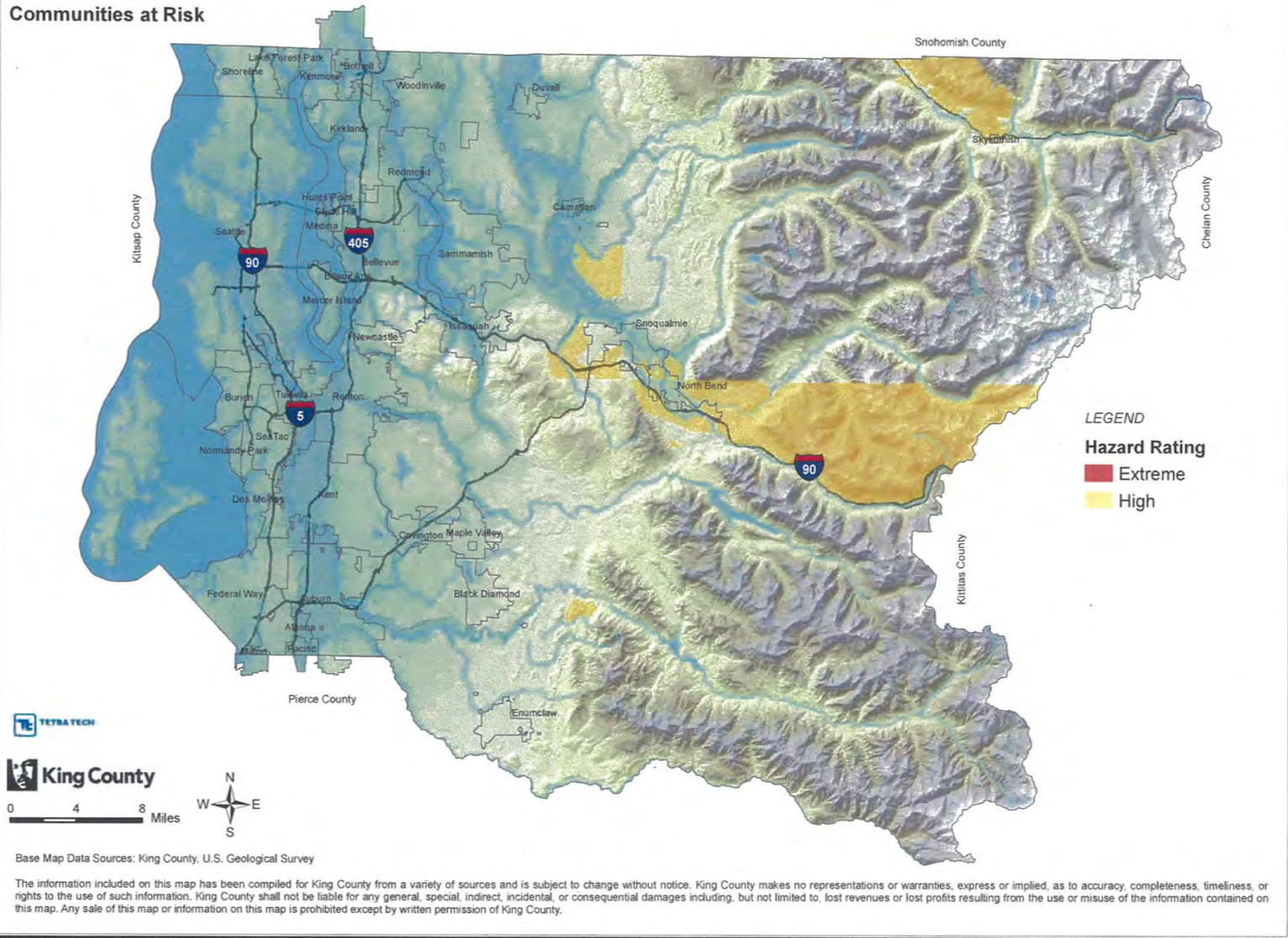
Health impacts, loss of life, and personal property losses occur as well. Smoke and air pollution from wildfires can be a health hazard, especially for sensitive populations including children, the elderly and those with respiratory and cardiovascular diseases. Wildfire may also threaten the health and safety of those fighting the fires. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke. There are no recorded incidents of loss of life from wildfires in the planning area.

WUI Fires

The effects of WUI fires are the combined effects of both structure fires and wildfires.

Figure 17-3.
Wildland Urban Interface
Communities at Risk

King County Hazard Mitigation Plan Update



17.2.5 Warning Time

Wildfires are often caused by humans, intentionally or accidentally. There is no way to predict when one might break out. Since fireworks often cause brush fires, extra diligence is warranted around the Fourth of July when the use of fireworks is highest. Dry seasons and droughts are factors that greatly increase fire likelihood. Dry lightning may trigger wildfires. Severe weather can be predicted, so special attention can be paid during weather events that may include lightning. Reliable National Weather Service lightning warnings are available on average 24 to 48 hours prior to a significant electrical storm. If a fire does break out and spread rapidly, residents may need to evacuate within days or hours. A fire's peak burning period generally is between 1 p.m. and 6 p.m. Once a fire has started, fire alerting is reasonably rapid in most cases. The rapid spread of cellular and two-way radio communications in recent years has further contributed to a significant improvement in warning time.

17.3 SECONDARY HAZARDS

Wildfires can generate a range of secondary effects, which in some cases may cause more widespread and prolonged damage than the fire itself. Fires can cause direct economic losses in the reduction of harvestable timber and indirect economic losses in reduced tourism. Wildfires cause the contamination of reservoirs, destroy transmission lines and contribute to flooding. They strip slopes of vegetation, exposing them to greater amounts of runoff. This in turn can weaken soils and cause failures on slopes. Major landslides can occur several years after a wildfire. Most wildfires burn hot and for long durations that can bake soils, especially those high in clay content, thus increasing the imperviousness of the ground. This increases the runoff generated by storm events, thus increasing the chance of flooding.

17.4 EXPOSURE

17.4.1 Population

Population for three fire behavior fuel model classes was estimated using the structure count of buildings in the those areas and applying the census value for King County of 2.39 persons per household. These estimates are shown in Table 17-2.

17.4.2 Property

Property damage from wildfires can be severe and can significantly alter entire communities. Table 17-3 shows the number of structures in the planning area that are located in FBFM10 areas and their values. Parcels that intersect areas designated as FBFM10 were also analyzed to estimate the types of land uses that are exposed. Table 17-4 shows the total area and percent of the total area of present land uses within the County that are exposed to this hazard. Based on these estimates, the majority of exposed parcels are uncategorized, which includes vacant and resource lands, making up 82.5 percent of the total percentage of exposed acres.

17.4.3 Critical Facilities and Infrastructure

In the event of wildfire, there would likely be little damage to most critical infrastructure. Most roads and railroads would be without damage except in the worst scenarios. Power lines are the most at risk to wildfire because most are made of wood and susceptible to burning. In the event of a wildfire, pipelines could provide a source of fuel and lead to a catastrophic explosion.

Currently there are two registered Tier II hazardous material containment sites in wildfire risk zones. During a fire event, hazardous materials storage containers could rupture due to heat and act as fuel for the fire, escalating the fire to unmanageable levels. In addition they could leak into surrounding areas, saturating soils and seeping into surface waters, and have a disastrous effect on the environment.

FIRE

**TABLE 17-2.
POPULATION WITHIN FIRE BEHAVIOR FUEL MODEL CLASSES**

	FBFM 8			FBFM 9			FBFM 10		
	Population			Population			Population		
	Buildings	Number	% of Total	Buildings	Number	% of Total	Buildings	Number	% of total
Algona	56	133	4.34%	34	80	2.61%	1	2	0.07%
Auburn	2118	5,062	7.87%	1,416	3,384	5.26%	831	1,987	3.09%
Beaux Arts	77	183	63.17%	0	0	0.12%	35	84	28.90%
Bellevue	12387	29,605	22.41%	1,797	4,296	3.25%	3,108	7,428	5.62%
Black Diamond	483	1,154	27.67%	160	382	9.16%	174	417	10.00%
Bothell	1402	3,352	19.22%	318	760	4.36%	805	1,923	11.03%
Burien	3858	9,222	19.20%	776	1,856	3.86%	527	1,261	2.62%
Carnation	73	174	9.75%	33	79	4.43%	20	47	2.63%
Clyde Hill	470	1,123	37.69%	21	51	1.71%	71	169	5.68%
Covington	1139	2,722	15.04%	600	1,435	7.93%	496	1,185	6.55%
Des Moines	2005	4,792	16.12%	578	1,381	4.64%	233	557	1.87%
Duvall	385	920	12.92%	306	732	10.28%	115	274	3.85%
Enumclaw	55	130	1.18%	99	238	2.14%	12	29	0.26%
Federal Way	7387	17,654	19.68%	1,623	3,879	4.32%	1,611	3,851	4.29%
Hunts Point	58	138	34.97%	15	36	9.18%	65	155	39.26%
Issaquah	1550	3,703	11.53%	611	1,459	4.54%	2,323	5,552	17.28%
Kenmore	2418	5,779	27.30%	682	1,630	7.70%	855	2,043	9.65%
Kent	4432	10,592	8.79%	2,268	5,420	4.50%	700	1,672	1.39%
Kirkland	8495	20,304	24.84%	1,101	2,632	3.22%	2,102	5,025	6.15%
Lake Forest Park	1981	4,734	37.33%	392	937	7.39%	606	1,449	11.43%
Maple Valley	1193	2,852	11.93%	696	1,665	6.96%	971	2,321	9.71%
Medina	515	1,231	41.03%	106	254	8.46%	90	215	7.16%
Mercer Island	3219	7,693	33.86%	528	1,263	5.56%	759	1,813	7.98%
Milton	132	315	37.53%	34	80	9.57%	29	69	8.24%
Newcastle	956	2,284	21.46%	327	781	7.34%	555	1,327	12.47%
Normandy Park	869	2,077	32.71%	222	531	8.36%	237	565	8.90%
North Bend	334	798	13.25%	288	688	11.42%	174	415	6.89%
Pacific	140	336	5.03%	83	197	2.96%	26	62	0.92%
Redmond	4151	9,920	17.77%	840	2,007	3.59%	1,438	3,437	6.16%
Renton	4495	10,743	11.24%	1,985	4,744	4.97%	1,187	2,838	2.97%
Sammamish	3054	7,299	15.19%	1,912	4,570	9.51%	3,077	7,354	15.30%
SeaTac	1618	3,866	14.16%	381	911	3.34%	68	163	0.60%
Seattle	35929	85,871	13.70%	4,022	9,613	1.53%	1,866	4,460	0.71%
Shoreline	6994	16,715	31.14%	373	891	1.66%	637	1,523	2.84%
Skykomish	24	58	29.76%	22	52	26.74%	15	36	18.46%
Snoqualmie	513	1,225	10.47%	341	815	6.96%	1,312	3,136	26.80%
Tukwila	1032	2,466	12.87%	403	964	5.03%	78	186	0.97%
Woodinville	1088	2,601	23.66%	229	548	4.99%	607	1,451	13.20%
Yarrow Point	229	547	53.84%	22	49	4.87%	48	114	11.24%
Unincorporated	23,916	57,158	22.58	10,956	26,184	10.35	20,104	48,050	18.98
Total	141,230	337,531	17.03	36,600	87,474	4.41	47,968	114,645	5.78

**TABLE 17-3.
EXPOSURE AND VALUE OF STRUCTURES IN FIRE BEHAVIOR FUEL MODEL 10**

Jurisdiction	Buildings Exposed	Value Exposed			% of Total Assessed Value
		Structure	Contents	Total	
Algona	1	\$559,149	\$501,937	\$1,061,086	0.12%
Auburn	831	\$317,817,737	\$217,531,531	\$535,349,269	2.98%
Beaux Arts	35	\$11,018,669	\$5,673,332	\$16,692,000	27.46%
Bellevue	3,108	\$1,509,230,671	\$945,579,131	\$2,454,809,803	4.99%
Black Diamond	174	\$39,981,778	\$23,062,251	\$63,044,029	10.50%
Bothell	805	\$456,952,481	\$285,205,179	\$742,157,660	14.23%
Burien	527	\$197,142,244	\$111,255,205	\$308,397,449	3.36%
Carnation	20	\$4,659,491	\$2,869,995	\$7,529,486	2.29%
Clyde Hill	71	\$29,187,580	\$15,094,349	\$44,281,929	5.24%
Covington	496	\$115,673,609	\$67,941,899	\$183,615,508	6.44%
Des Moines	233	\$91,168,128	\$59,649,185	\$150,817,314	2.63%
Duvall	115	\$29,637,590	\$16,365,487	\$46,003,077	4.15%
Enumclaw	12	\$5,137,151	\$4,268,753	\$9,405,904	0.35%
Federal Way	1,611	\$819,238,817	\$558,701,605	\$1,377,940,422	7.21%
Hunts Point	65	\$38,564,281	\$19,779,401	\$58,343,682	36.44%
Issaquah	2,323	\$1,424,361,776	\$884,923,306	\$2,309,285,081	24.09%
Kenmore	855	\$308,282,199	\$207,070,791	\$515,352,990	12.88%
Kent	700	\$264,302,588	\$153,916,322	\$418,218,910	1.26%
Kirkland	2,102	\$780,770,408	\$474,554,227	\$1,255,324,636	5.65%
Lake Forest Park	606	\$144,517,863	\$80,526,045	\$225,043,908	10.16%
Maple Valley	971	\$278,084,814	\$163,304,692	\$441,389,506	14.10%
Medina	90	\$52,927,114	\$27,958,454	\$80,885,568	8.54%
Mercer Island	759	\$329,083,653	\$181,161,779	\$510,245,432	7.73%
Milton	29	\$14,143,707	\$7,277,437	\$21,421,144	15.22%
Newcastle	555	\$257,589,652	\$145,776,716	\$403,366,369	17.79%
Normandy Park	237	\$67,415,572	\$37,281,237	\$104,696,809	8.01%
North Bend	174	\$59,810,831	\$35,104,207	\$94,915,038	6.53%
Pacific	26	\$5,710,165	\$2,926,205	\$8,636,370	1.04%
Redmond	1,438	\$877,719,228	\$583,286,938	\$1,461,006,166	6.29%
Renton	1,187	\$499,543,690	\$289,317,099	\$788,860,788	3.05%
Sammamish	3,077	\$1,137,923,516	\$625,304,737	\$1,763,228,253	18.95%
SeaTac	68	\$48,495,237	\$34,690,004	\$83,185,241	1.10%
Seattle	1,866	\$613,534,285	\$370,053,744	\$983,588,029	0.46%
Shoreline	637	\$341,429,774	\$240,860,617	\$582,290,392	5.21%
Skykomish	15	\$2,267,006	\$1,598,125	\$3,865,130	5.17%
Snoqualmie	1,312	\$633,549,137	\$414,235,373	\$1,047,784,510	45.61%
Tukwila	78	\$49,790,892	\$37,038,874	\$86,829,767	0.75%
Woodinville	607	\$313,545,389	\$222,768,946	\$536,314,335	11.86%
Yarrow Point	48	\$19,212,381	\$10,072,547	\$29,284,928	9.74%
Unincorporated	20,104	\$5,592,636,023	\$3,485,087,918	\$9,437,723,941	21.12
Total	47,968	\$17,782,616,276	\$11,049,575,580	\$29,192,191,859	5.24

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

**TABLE 17-4.
PRESENT LAND USE IN WILDFIRE HAZARD AREAS**

Present Use Classification	Area (acres)	% of total
Agriculture	879	0.1%
Church, Welfare or Religious Service	1,095	0.1%
Commercial	7,072	0.6%
Education	4,048	0.4%
Governmental Services	2,143	0.2%
Industrial/Manufacturing	4,875	0.4%
Medical/Dental Services	203	0.0%
Mixed Use Development (Residential & Commercial)	41	0.0%
Mortuary/Cemetery/Crematory	448	0.0%
Nursing Home/Retirement Facility	211	0.0%
Park/Open Space/Golf Course	24,883	2.2%
Residential	139,593	12.5%
Terminal or Marina	2,200	0.2%
Utility/Easement/Right of Way	7949	0.7%
Water/Tideland/Wetland	217	0.0%
Uncategorized (includes vacant and resource lands)	920,792	82.5%
Total	1,116,649	100%

Source: Summarized from King, Pierce and Snohomish County parcel data. Acreage covers only mapped parcel extents and thus excludes many rights of way and major water features.

Table 17-5 and Table 17-6 identify critical facilities and infrastructure exposed to the wildfire hazard in the county. Spatial files of critical facility and infrastructure location and Anderson Fuel Class FBFM10 areas were intersected to determine exposure; however, the resolution of the hazard layer is not fine enough in scale for accurate building by building assessments. The exposure of critical facilities and infrastructure in the planning area is likely overestimated by this analysis.

TABLE 17-5. CRITICAL FACILITIES IN FBFM10 AREAS							
	Medical and Health	Government Functions	Protective Functions	Schools	Hazmat	Other Critical Functions	Total
Algona	0	0	0	0	0	0	0
Auburn	0	1	0	1	0	0	2
Beaux Arts Village	0	0	0	0	0	0	0
Bellevue	0	0	0	1	0	0	1
Black Diamond	0	0	0	0	0	0	0
Bothell	0	0	0	0	0	0	0
Burien	0	0	0	0	0	0	0
Carnation	0	0	0	0	0	0	0
Clyde Hill	0	0	0	0	0	0	0
Covington	0	0	0	0	0	0	0
Des Moines	0	0	0	0	0	0	0
Duvall	0	0	0	0	0	0	0
Enumclaw	0	0	0	0	0	0	0
Federal Way	0	0	0	0	0	1	1
Hunts Point	0	0	0	0	0	0	0
Issaquah	1	0	1	0	0	0	2
Kenmore	0	0	0	0	0	0	0
Kent	0	0	0	0	0	0	0
Kirkland	1	0	1	0	0	0	2
Lake Forest Park	0	0	0	0	0	0	0
Maple Valley	1	1	0	0	0	1	3
Medina	0	0	0	0	0	0	0
Mercer Island	0	0	0	0	0	0	0
Milton	0	0	0	0	0	0	0
Newcastle	0	0	0	0	0	0	0
Normandy Park	0	0	0	0	0	0	0
North Bend	0	0	0	0	0	0	0
Pacific	0	0	0	0	0	0	0
Redmond	0	0	0	0	0	0	0
Renton	0	0	0	0	0	0	0
Sammamish	0	0	0	0	0	0	0
SeaTac	0	0	0	0	0	0	0
Seattle	0	0	0	0	2	0	2
Shoreline	0	0	0	0	0	0	0
Skykomish	0	0	0	0	0	0	0
Snoqualmie	0	0	1	1	0	1	3
Tukwila	0	0	0	0	0	0	0
Woodinville	0	0	0	0	0	0	0
Yarrow Point	0	0	0	0	0	0	0
Unincorporated	0	0	3	5	0	0	8
Total	3	2	6	8	2	3	24

FIRE

**TABLE 17-6.
CRITICAL INFRASTRUCTURE IN FBFM10 AREAS**

	Bridges	Transporta tion	Water Supply	Wastewater	Power	Communications	Dams	Total
Algona	0	0	0	0	0	0	0	0
Auburn	0	0	3	1	0	1	0	5
Beaux Arts Village	0	0	1	0	0	0	0	1
Bellevue	8	0	0	0	0	1	0	9
Black Diamond	0	0	0	0	0	0	0	0
Bothell	0	0	1	0	0	0	3	4
Burien	0	0	3	0	0	0	0	3
Carnation	0	0	0	0	0	0	0	0
Clyde Hill	0	0	0	0	0	0	0	0
Covington	0	0	0	0	0	0	0	0
Des Moines	3	0	0	2	0	0	0	5
Duvall	0	0	0	1	0	0	0	1
Enumclaw	0	0	0	0	0	0	0	0
Federal Way	0	0	0	0	0	0	1	1
Hunts Point	0	0	0	0	0	0	0	0
Issaquah	3	0	3	1	0	0	1	8
Kenmore	5	0	0	0	0	0	0	5
Kent	0	0	2	0	0	0	0	2
Kirkland	0	0	1	0	0	0	0	1
Lake Forest Park	0	0	0	0	0	0	0	0
Maple Valley	0	0	5	1	0	0	0	6
Medina	0	0	0	0	0	0	0	0
Mercer Island	0	0	0	0	0	0	0	0
Milton	0	0	0	0	0	0	0	0
Newcastle	0	0	0	0	0	0	0	0
Normandy Park	0	0	0	0	0	0	0	0
North Bend	0	0	1	0	1	0	0	2
Pacific	0	0	0	0	0	0	0	0
Redmond	0	0	2	1	0	0	0	3
Renton	1	0	0	0	0	0	0	1
Sammamish	1	0	0	0	0	0	1	2
SeaTac	1	0	0	0	0	0	0	1
Seattle	9	0	0	0	0	0	0	9
Shoreline	0	0	0	2	0	0	1	3
Skykomish	0	0	0	0	0	0	0	0
Snoqualmie	4	0	3	5	1	0	1	14
Tukwila	2	0	0	0	0	0	0	2
Woodinville	0	0	0	0	0	0	0	0
Yarrow Point	0	0	0	0	0	0	0	0
Unincorporated	69	3	22	6	0	9	7	116
Total	106	3	47	20	2	11	15	204

17.4.4 Environment

Fire is a natural and critical ecosystem process in most terrestrial ecosystems, dictating in part the types, structure, and spatial extent of native vegetation. However, wildfires can cause severe environmental impacts:

- **Damaged Fisheries**—Critical fisheries can suffer from increased water temperatures, sedimentation, and changes in water quality.
- **Soil Erosion**—The protective covering provided by foliage and dead organic matter is removed, leaving the soil fully exposed to wind and water erosion. Accelerated soil erosion occurs, causing landslides and threatening aquatic habitats.
- **Spread of Invasive Plant Species**—Non-native woody plant species frequently invade burned areas. When weeds become established, they can dominate the plant cover over broad landscapes, and become difficult and costly to control.
- **Disease and Insect Infestations**—Unless diseased or insect-infested trees are swiftly removed, infestations and disease can spread to healthy forests and private lands. Timely active management actions are needed to remove diseased or infested trees.
- **Destroyed Endangered Species Habitat**—Catastrophic fires can have devastating consequences for endangered species.
- **Soil Sterilization**—Topsoil exposed to extreme heat can become water repellant, and soil nutrients may be lost. It can take decades or even centuries for ecosystems to recover from a fire. Some fires burn so hot that they can sterilize the soil.

Many ecosystems are adapted to historical patterns of fire occurrence. These patterns, called “fire regimes,” include temporal attributes (e.g., frequency and seasonality), spatial attributes (e.g., size and spatial complexity), and magnitude attributes (e.g., intensity and severity), each of which have ranges of natural variability. Ecosystem stability is threatened when any of the attributes for a given fire regime diverge from its range of natural variability.

17.5 VULNERABILITY

Structures, above-ground infrastructure, critical facilities and natural environments are all vulnerable to the wildfire hazard. There is currently no validated damage function available to support wildfire mitigation planning. Except as discussed in this section, vulnerable populations, property, infrastructure and environment are assumed to be the same as described in the section on exposure.

17.5.1 Population

Approximately 3,500 to 4,000 people die every year from fire, and thousands of people are injured. In Washington State over the last 20 years 1,195 people lost their lives in fire. King County averages about 11 fire deaths per year. Cooking, smoking, heating, electrical, and arson are some of the major causes of fire in general, and careless smoking is the leading cause of fire deaths. About one-third of all fires occur in residential properties; one-third involves natural vegetation (brush or wildland); and the remaining third involves vehicles, outside equipment and storage, and other locations. Most fires are human-caused and are preventable; only a small percentage of fires are due to natural acts such as lightning.

Smoke and air pollution from wildfires can be a severe health hazard, especially for sensitive populations, including children, the elderly and those with respiratory and cardiovascular diseases. Smoke generated by wildfire consists of visible and invisible emissions that contain particulate matter (soot, tar, water vapor, and minerals), gases (carbon monoxide, carbon dioxide, nitrogen oxides), and toxics

(formaldehyde, benzene). Emissions from wildfires depend on the type of fuel, the moisture content of the fuel, the efficiency (or temperature) of combustion, and the weather. Public health impacts associated with wildfire include difficulty in breathing, odor, and reduction in visibility. Wildfire also threaten the health and safety of those fighting the fires. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke.

17.5.2 Property

Loss estimations for the wildfire hazard are not based on damage functions, because no such damage functions have been generated. Instead, loss estimates were developed representing 10 percent, 30 percent and 50 percent of the assessed value of exposed structures. This allows emergency managers to select a range of economic impact based on an estimate of the percent of damage to the general building stock. Damage in excess of 50 percent is considered to be substantial by most building codes and typically requires total reconstruction of the structure. Table 17-7 lists the loss estimates for the general building stock for assets within jurisdictions that have an exposure to a FBFM10 hazard severity zone.

17.5.3 Critical Facilities and Infrastructure

Critical facilities of wood frame construction are especially vulnerable during wildfire events. In the event of wildfire, there would likely be little damage to most infrastructure. Most roads and railroads would be without damage except in the worst scenarios. Power lines are the most at risk from wildfire because most poles are made of wood and susceptible to burning. Fires can create conditions that block or prevent access and can isolate residents and emergency service providers. Wildfire typically does not have a major direct impact on bridges, but it can create conditions in which bridges are obstructed. Many bridges in areas of high to moderate fire risk are important because they provide the only ingress and egress to large areas and in some cases to isolated neighborhoods.

17.6 FUTURE TRENDS IN DEVELOPMENT

The highly urbanized portions of the planning area have little or no wildfire risk exposure. Urbanization tends to alter the natural fire regime, and can create the potential for the expansion of urbanized areas into wildland areas. The expansion of the wildland urban interface can be managed with strong land use and building codes. The planning area is well equipped with these tools and this planning process has asked each planning partner to assess its capabilities with regards to the tools. As the planning area experiences future growth, it is anticipated that the exposure to this hazard will remain as assessed or even decrease over time due to these capabilities.

Wildfire risk exposure exists in more rural areas of the County and is likely to increase as development continues. Growth Management Act regulations, however, will slow the rate of growth in these areas as most development is targeted in already urbanized areas.

17.7 SCENARIO

A major conflagration in the planning area might begin with a wet spring, adding to fuels already present on the forest floor. Flashy fuels would build throughout the spring. The summer could see the onset of insect infestation. A dry summer could follow the wet spring, exacerbated by dry hot winds. Carelessness with combustible materials or a tossed lit cigarette, or a sudden lighting storm could trigger a multitude of small isolated fires.

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**TABLE 17-7.
LOSS ESTIMATES FOR WILDFIRE**

	Exposed Value	Estimated Loss Potential from Wildfire		
		10% Damage	30% Damage	50% Damage
Algona	\$1,061,086	\$106,109	\$318,326	\$530,543
Auburn	\$535,349,269	\$53,534,927	\$160,604,781	\$267,674,634
Beaux Arts	\$16,692,000	\$1,669,200	\$5,007,600	\$8,346,000
Bellevue	\$2,454,809,803	\$245,480,980	\$736,442,941	\$1,227,404,901
Black Diamond	\$63,044,029	\$6,304,403	\$18,913,209	\$31,522,014
Bothell	\$742,157,660	\$74,215,766	\$222,647,298	\$371,078,830
Burien	\$308,397,449	\$30,839,745	\$92,519,235	\$154,198,725
Carnation	\$7,529,486	\$752,949	\$2,258,846	\$3,764,743
Clyde Hill	\$44,281,929	\$4,428,193	\$13,284,579	\$22,140,964
Covington	\$183,615,508	\$18,361,551	\$55,084,652	\$91,807,754
Des Moines	\$150,817,314	\$15,081,731	\$45,245,194	\$75,408,657
Duvall	\$46,003,077	\$4,600,308	\$13,800,923	\$23,001,539
Enumclaw	\$9,405,904	\$940,590	\$2,821,771	\$4,702,952
Federal Way	\$1,377,940,422	\$137,794,042	\$413,382,127	\$688,970,211
Hunts Point	\$58,343,682	\$5,834,368	\$17,503,105	\$29,171,841
Issaquah	\$2,309,285,081	\$230,928,508	\$692,785,524	\$1,154,642,541
Kenmore	\$515,352,990	\$51,535,299	\$154,605,897	\$257,676,495
Kent	\$418,218,910	\$41,821,891	\$125,465,673	\$209,109,455
Kirkland	\$1,255,324,636	\$125,532,464	\$376,597,391	\$627,662,318
Lake Forest Park	\$225,043,908	\$22,504,391	\$67,513,172	\$112,521,954
Maple Valley	\$441,389,506	\$44,138,951	\$132,416,852	\$220,694,753
Medina	\$80,885,568	\$8,088,557	\$24,265,670	\$40,442,784
Mercer Island	\$510,245,432	\$51,024,543	\$153,073,630	\$255,122,716
Milton	\$21,421,144	\$2,142,114	\$6,426,343	\$10,710,572
Newcastle	\$403,366,369	\$40,336,637	\$121,009,911	\$201,683,184
Normandy Park	\$104,696,809	\$10,469,681	\$31,409,043	\$52,348,405
North Bend	\$94,915,038	\$9,491,504	\$28,474,511	\$47,457,519
Pacific	\$8,636,370	\$863,637	\$2,590,911	\$4,318,185
Redmond	\$1,461,006,166	\$146,100,617	\$438,301,850	\$730,503,083
Renton	\$788,860,788	\$78,886,079	\$236,658,236	\$394,430,394
Sammamish	\$1,763,228,253	\$176,322,825	\$528,968,476	\$881,614,126
SeaTac	\$83,185,241	\$8,318,524	\$24,955,572	\$41,592,620
Seattle	\$983,588,029	\$98,358,803	\$295,076,409	\$491,794,015
Shoreline	\$582,290,392	\$58,229,039	\$174,687,117	\$291,145,196
Skykomish	\$3,865,130	\$386,513	\$1,159,539	\$1,932,565
Snoqualmie	\$1,047,784,510	\$104,778,451	\$314,335,353	\$523,892,255
Tukwila	\$86,829,767	\$8,682,977	\$26,048,930	\$43,414,883
Woodinville	\$536,314,335	\$53,631,434	\$160,894,301	\$268,157,168
Yarrow Point	\$29,284,928	\$2,928,493	\$8,785,478	\$14,642,464
Unincorporated	\$9,437,723,941	\$943,772,394	\$2,831,317,182	\$4,718,861,971
Total	\$29,192,191,859.00	\$2,919,219,188.00	\$8,757,657,558.00	\$14,596,095,929.00

Note: Values in this table are accurate only for purposes of comparison among results presented in this plan. See Section 5.3.5 for a discussion of data limitations.

The embers from these smaller fires could be carried miles by hot, dry winds. The deposition zone for these embers would be deep in the forests and WUI zones. Fires that start in flat areas move slower, but wind still pushes them. It is not unusual for a wildfire pushed by wind to burn the ground fuel and later climb into the crown and reverse its track. This is one of many ways that fires can escape containment, typically during periods when response capabilities are overwhelmed. These new small fires would most likely merge. Suppression resources would be redirected from protecting the natural resources to saving more remote subdivisions.

The worst-case scenario would include an active fire season throughout the American west, spreading resources thin. Firefighting teams would be exhausted or unavailable. Many federal assets would be responding to other fires that started earlier in the season. While local fire districts would be extremely useful in the WUI areas, they have limited wildfire capabilities or experience, and they would have a difficult time responding to the ignition zones. Even though the existence and spread of the fire is known, it may not be possible to respond to it adequately, so an initially manageable fire can become out of control before resources are dispatched.

To further complicate the problem, heavy rains could follow, causing flooding and landslides and releasing tons of sediment into rivers, permanently changing floodplains and damaging sensitive habitat and riparian areas. Such a fire followed by rain could release millions of cubic yards of sediment into streams for years, creating new floodplains and changing existing ones. With the forests removed from the watershed, stream flows could easily double. Floods that could be expected every 50 years may occur every couple of years. With the streambeds unable to carry the increased discharge because of increased sediment, the floodplains and floodplain elevations would increase.

17.8 ISSUES

Factors related to the fighting of fires include access, firebreaks, proximity of water sources, distance from a fire station, and available firefighting personnel and equipment. Reviewing past WUI fires shows that many structures are destroyed or damaged for one or more of the following reasons:

- Combustible roofing material
- Wood construction
- Structures with no defensible space
- Fire department with poor access to structures
- Subdivisions located in heavy natural fuel types
- Structures located on steep slopes covered with flammable vegetation
- Limited water supply
- Winds over 30 miles per hour.

Road access is a major issue for all emergency service providers. As development encroaches into rural areas, the number of houses without adequate turn-around space is increasing. Developers are not required to provide adequate space for emergency vehicles in single-family residential homes, causing emergency workers to have difficulty doing their jobs because they cannot access houses. As fire trucks are large, firefighters are challenged by narrow roads and limited access. When there is doubt concerning the stability of a residential bridge, or adequate turn around space, firefighters can work to remove the occupants but cannot save the structure.

Fires may become conflagration fires caused by reduced setbacks between structures. Narrow setbacks also prevent fire crews from safely laddering the sides of buildings.

Firefighters in remote and rural areas are faced with limited water supply and lack of hydrant taps. Rural areas are adapting to these conditions by developing a secondary water source. Areas that once were considered rural during county control became urban with incorporation and annexation, coupled with development.

The following steps should be accomplished to preclude major loss of life and reduce the actual number of wildfires and WUI fires:

- Citizens should know the proper way to handle fire. Public education programs on fire safety, fire alarms and fire response are important. People should also be encouraged to purchase fire insurance and understand building codes.
- Since people start the vast majority of wildfires, wildfire prevention education and enforcement programs can significantly reduce the total number of wild land fires.
- Arson investigation has been a significant factor in the reduction of urban fires. Investigators and fire crews work together to convict and or deter more arsonists than ever before.
- An effective early fire detection program and an emergency communications system are essential. The importance of immediately reporting any wildfire must be impressed upon local residents and persons using forest areas.
- An effective warning system is essential to notify local inhabitants and persons in the area of the fire. An evacuation plan detailing primary and alternate escape routes is also essential.
- Fire-safe development planning should be done with local government planners to reduce the risk to local residents and businesses.
- Road development criteria should ensure adequate escape routes for new sections of development in forest areas.
- Road closures should be increased during peak fire periods to reduce the access to fire-prone areas.

CHAPTER 18. HAZARDS OF INTEREST

The hazards of concern that are assessed in Chapter 9 through Chapter 17 and rated and ranked in Chapter 19 are those that present significant risks in King County. Additional hazards of interest were identified by the Steering Committee as having some potential to impact the planning area, but at a much lower risk level than the hazards of concern.

This chapter presents a short profile of each hazard of interest, including a qualitative discussion of its potential to impact King County. No formal risk assessment of these hazards was performed, as they are more thoroughly addressed in other emergency management planning efforts. However, County, city and special purpose district staff and residents should be aware of these hazards and should take steps to reduce the risks they present whenever it is practical to do so.

18.1 HEALTH HAZARDS

Health hazards that affect the residents of King County may arise in a variety of situations, such as during a communicable disease outbreak, after a natural disaster, or as the result of a bioterrorism incident. All populations in King County are susceptible to bioterrorism or pandemic events. Populations who are young or elderly or have compromised immune systems are likely to be more vulnerable.

18.1.1 Epidemic or Pandemic

The U.S. Center for Disease Control defines an outbreak as the occurrence of more cases of disease than normally expected within a specific place or group of people over a given period of time. State and local regulations require immediate reporting of any known or suspected outbreaks by health care providers, health care facilities, laboratories, veterinarians, schools, child day care facilities, and food service establishments. An epidemic is a localized outbreak that spreads rapidly and affects a large number of people or animals in a community. A pandemic is an epidemic that occurs worldwide or over a very large area and affects a large number of people or animals.

The Washington Emergency Management Division has identified the following as human diseases that could contribute to a serious epidemic in the area:

- Methicillin-resistant staphylococcus aureus
- West Nile virus
- Influenza
- H1N1 influenza
- Severe acute respiratory syndrome (SARS)
- Measles
- Hepatitis
- Tuberculosis
- E. coli
- Lye disease

- Hantavirus
- HIV/AIDS
- Leptospirosis.

According to Washington State's Hazard Mitigation Plan, factors in Washington that heighten the probability of occurrences of such events include large numbers of travelers arriving via the region's air and sea ports, the transportation of infected animals into the area, contaminated garbage or other waste washing ashore, or disease transmission through individuals transporting or coming into contact with hospitalized or nursing-home-bound patients (EMD, 2013).

18.1.2 Bioterrorism

The federal Centers for Disease Control and Prevention (CDC) defines bioterrorism as the deliberate use of viruses, bacteria or other agents to cause illness or death in people, animals or plants (CDC, 2007). Biological agents pose a serious threat due to their accessibility and the rapid manner in which they can be spread within a population. The most commonly discussed agents include anthrax (sometimes found in sheep and cattle), tularemia (rabbit fever), cholera, the plague (sometimes found in prairie dog colonies), and botulism (found in improperly canned food). A biological incident is likely to be first detected in a hospital emergency room, medical examiner's office, or within the public health community long after the terrorist act. The consequences of such an act will require communities to provide massive reactive and precautionary treatments to exposed populations and to stage mass fatality management and environmental health clean-up operations, procedures and plans.

Categories of Biological Agents

The CDC outlines three categories by which biological agents can be defined (CDC, 2007):

- Category A—These high-priority agents include organisms or toxins that pose the highest risk to the public and national security because:
 - They can be easily spread or transmitted from person to person
 - They result in high death rates and have the potential for major public health impact
 - They might cause public panic and social disruption
 - They require special action for public health preparedness.
- Category B—These agents are the second highest priority because:
 - They are moderately easy to spread
 - They result in moderate illness rates and low death rates
 - They require specific enhancements of CDC's laboratory capacity and enhanced disease monitoring.
- Category C—These third highest priority agents include emerging pathogens that could be engineered for mass spread in the future because:
 - They are easily available
 - They are easily produced and spread
 - They have potential for high morbidity and mortality rates and major health impact.

Event Profile

FEMA characterizes an event profile for a terrorist attack involving a biological agent as follows:

- **Application Mode**—Liquid or solid contaminants can be dispersed using sources such as munitions, covert deposits or moving sprayers. Biological agents may also be introduced into food and water supplies, or through direct application to skin.
- **Duration/Threat Impact**—Biological agents may pose viable threats for hours to years, depending on the agent and the conditions in which it exists.
- **Severity**—Depending on the agent used and the effectiveness with which it is deployed, contamination can be spread via wind and water. Infection can spread via human or animal vectors.
- **Mitigating and Exacerbating Conditions**—The altitude of release can affect dispersion; sunlight is destructive to many bacteria and viruses; light to moderate wind will disperse agents but higher winds can break up aerosol clouds; the micro-meteorological effects of buildings and terrain can influence aerosolization and travel of agents

Seattle and King County Public Health has developed a bioterrorism response plan in partnership with the Washington State Department of Health and the CDC. In the event of an attack in King County, the public would be informed through the news media, the Public Health website and the King County website regarding the best steps to take to protect one's health.

18.2 CYBERSECURITY

A cyber-attack is an attack intended to create physical effects or to manipulate, disrupt or delete data. It might range from a denial-of-service operation that temporarily prevents access to a website, to an attack on a power turbine that causes physical damage and an outage lasting for days. Cyber espionage refers to intrusions into networks to access sensitive diplomatic, military or economic information (Clapper, 2013). Cyber-attacks on infrastructure can originate from adversaries such as hostile governments, criminal organizations, or lone individuals. It is important to differentiate a cyber-attack from cyber-terrorism. While there have been cyber-attacks against governments, they have not been for the purpose of gaining warfare information or access. FEMA characterizes an event profile for a cyber-attack or cyber-espionage as follows:

- **Application Mode**—Unlawful attacks and threats of attack against computers, networks and information stored therein
- **Duration/Threat Impact**—Minutes to days
- **Severity**—Generally no direct effects on built environment; secondary impact from system attacked (e.g., computerized control system regulating water release)
- **Mitigating and Exacerbating Conditions**—Inadequate security can facilitate access to critical computer systems, allowing them to be used to conduct attacks, or gather information to support other terrorist-related activities.

Cyber criminals threaten U.S. economic interests. The Office of the Comptroller of the Currency, which regulates national banks, has issued warnings to banks and business of their potential risk. Since September 2012, attacks have been increasingly aimed at businesses with fewer than 250 employees (Associated Press, 2013). Financial institutions are reluctant to provide details and information about cyber-attacks for fear of becoming a greater target. Software manufacturers estimate that cyber-attacks against U.S. businesses have increased 42 percent over the course of the last year.

Cyber criminals sell tools via a growing black market that enable access to critical infrastructure systems. Some commercial companies sell computer intrusion kits on the open market that can give governments and cyber criminals the ability to steal, manipulate or delete information on targeted systems. Other companies sell professional-quality technologies to support cyber operations—often branding these tools as lawful-intercept or defensive security research products. Many individuals, groups and foreign governments already use some of these tools to target national and local systems.

A March 2013 report by the National Intelligence Agency to the Senate Intelligence Committee indicated only a remote chance over the next two years of a major cyber-attack against U.S. critical infrastructure such as a regional power grid. Less sophisticated attacks, such as denial-of-service attacks against bank websites, could be more likely (Strobel and Wilson, 2013).

18.3 TERRORISM

Acts of terrorism are intentional, criminal, malicious acts. Terrorism is defined as the unlawful use or threatened use of force or violence against people or property with the intention of intimidating or coercing societies or governments. The Federal Bureau of Investigation (FBI) categorizes terrorism in the U.S. primarily as one of two types:

- Domestic terrorism involves groups or individuals whose terrorist activities are directed at elements of our government or population without foreign direction. The bombing of the Alfred P. Murrah federal building in Oklahoma City is an example of domestic terrorism. The FBI is the primary response agency for domestic terrorism. The FBI coordinates domestic preparedness programs and activities of the United States to limit acts posed by terrorists, including the use of weapons of mass destruction.
- International terrorism involves groups or individuals whose terrorist activities are foreign based and/or directed by countries or groups outside the United States, or whose activities transcend national boundaries. Examples include the 1993 bombing of the World Trade Center, the U.S. Capitol, and Mobil Oil's corporate headquarters and the attacks of September 11, 2001 at the World Trade Center and the Pentagon.

Many people equate terrorism with the use of weapons of mass destruction, such as chemical, biological, radiological, nuclear and explosive weapons. However, terrorism also includes arson, incendiary and explosive devices, school shootings, sabotage, hazardous materials releases, agro-terrorism and cyber-terrorism. Terrorism can be distinguished from other types of hazards by three important considerations:

- In the case of chemical, biological, and radioactive agents, their presence may not be immediately obvious, making it difficult to determine when and where they were released, who was exposed, and what danger is present for first responders.
- There is limited scientific understanding of how these agents affect the population at large.
- Terrorism evokes very strong emotional reactions, ranging from anxiety, to fear to anger, to despair to depression.

Terrorists often choose targets that offer limited danger to themselves and areas with relatively easy public access. They look for visible targets where they can avoid detection before and after an attack, such as international airports, large cities, major special events, and high-profile landmarks. Two terrorist techniques of growing concern in the public safety arena are the targeting of first responders employing secondary explosive devices and hoaxes involving weapons of mass destruction.

18.3.1 Past Events

There have been several instances of terrorism in western Washington (King County Office of Emergency Management, 2009):

- In June 2011, the FBI raided a warehouse in Seattle that housed two suspects who had arranged to purchase weapons from an anonymous informant in contact with the Seattle Police Department. The two were seeking to purchase automatic machine guns and grenades in preparation for an attack on a military recruiting station in Seattle (FBI, 2011). The men were charged with conspiracy to murder officers and employees of the U.S. government, conspiracy to use a weapon of mass destruction, and possession of firearms in furtherance of crimes of violence. One was also charged with two counts of illegal possession of firearms.
- In July 2006, a gunman fired on women at the Jewish Federation of Greater Seattle.
- From January 2000 to December 2002 there were numerous reported instances of a biological white powder. Individuals in Seattle, Federal Way, Tukwila, Port of Seattle and other cities were affected. There were no reports of injuries or death, but the incidents did cause financial implications through the payment of overtime and service disruptions.
- In May 2001 an incendiary device was deployed at the University of Washington's Urban Horticultural Center by the domestic terrorist group Earth Liberation Front. The firebomb caused over \$5 million in damage.
- In December 1999, a man was arrested by U.S. Customs officials while entering the United States in Port Angeles, Washington, aboard a ferry from Victoria, British Columbia. He was subsequently charged with smuggling explosive material into the United States. The CIA noted that the timing devices and nitroglycerine in his possession were the "signature devices" of groups affiliated with Al-Qaeda.
- The FBI and Bellingham Police interdicted a group of terrorists affiliated with the Washington State Militia on July 27, 1996. The group planned to bomb various infrastructure targets including a radio tower, bridge, and a train tunnel while the train was inside.
- In 1995 a chemical explosive device was detonated at the Burien District Court.
- The American Front Skinheads detonated pipe bombs in Tacoma on July 20 and 22, 1993.

18.3.2 Incendiary Devices

Incendiary devices are mechanical, electrical, or chemical devices used to intentionally initiate combustion and start fires. Their purpose is to destroy and ignite their target or other nearby materials or structures or to provide a diversion preceding an even larger terrorist or criminal act. These devices are detonated singularly or in series. Bombs are terrorist's weapon of choice. Explosive incidents account for 70 percent of all terrorist attacks worldwide. According to the FBI, 172 improvised explosive devices were reported in the United States between October 2012 and April 2013.

From the standpoint of structural design, the vehicle bomb is the most important consideration and has been a favorite tactic of terrorists. Ingredients for homemade bombs are easily obtained on the open market, as are the techniques for making bombs. The severity of impact is based on the amount and type of explosive materials used. The size of vehicle affects how close it can get to a target and how large an explosive device it can deliver, as shown on Figure 18-1

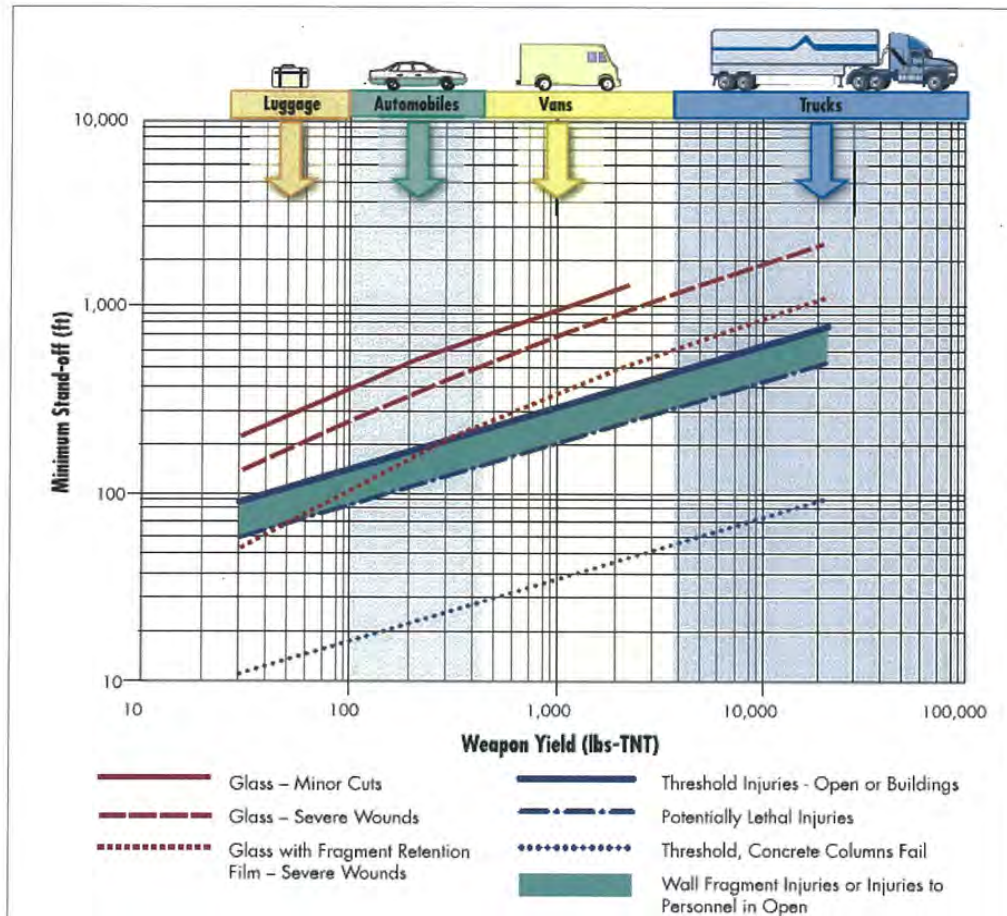


Figure 18-1. Damage Potential from Explosives Based on Delivery Vehicle

FEMA characterizes an event profile for a terrorist attack involving an incendiary attack as follows:

- **Application Mode**—Initiation of fire or explosion on or near target via direct contact or remotely via projectile.
- **Duration/Threat Impact**—Generally minutes to hours.
- **Severity**—Extent of damage is determined by type and quantity of device, accelerant, and materials present at or near target. Effects generally static other than cascading consequences, incremental structural failure, etc.
- **Mitigating and Exacerbating Conditions**—Mitigation factors include built-in fire detection and protection systems and fire-resistive construction techniques, or security measures which reduce exposure. Inadequate security can allow easy access to target, easy concealment of an incendiary device, and undetected initiation of a fire. Non-compliance with fire and building codes, as well as failure to maintain existing fire protection systems, can substantially increase the effectiveness of a fire weapon.

18.3.3 Potential Targets

Terrorist targets are often located near high traffic/high-visibility routes with convenient transportation access. They may become more appealing when high profile personalities and dignitaries visit them. Examples of targets include:

- Government office buildings, courthouses, schools, hospitals, and shopping centers
- Symbolic targets whose operations, practices or associations represent values in conflict with the terrorists ideology
- Dams, water supplies, electrical and gas distribution systems, pipelines, chemical facilities
- Military installations and suppliers
- Railheads, interstate highways, tunnels, airports, ferries, bridges, seaports, overpasses
- Recreational facilities such as sports stadiums, theaters, parks, casinos, concert halls, public venues
- Financial institutions and banks
- Sites of historical and symbolic significance
- Scientific research facilities, academic institutions, museums
- Telecommunications, newspapers, radio and television stations
- Chemical, industrial, and petroleum plants
- Business offices, convention centers
- Law, fire, emergency medical services, and responder facilities and operations centers
- Special events, parades, religious services, festivals, celebrations
- Planned Parenthood facilities and abortion clinics.

King County contains a large number of all of these potential targets.

18.3.4 Potential Economic Impacts

Economic impacts from terrorist events could be significant:

- The cost of a terrorist act would be felt in terms of loss of life and property, disruption of business activity and long-term emotional impacts. Recovery would take significant resources and expense at the local level.
- Utility losses could cause a reduction in employment, wholesale and retail sales, utility repairs, and increased medical risks. Local governments may lose sales tax, and the finances of private utility companies and the businesses that rely on them would be disrupted.
- The economic impact of computer security breaches associated with data and telecommunications losses can be staggering.
- The economic impacts should a transportation facility be rendered impassable would be significant. The loss of a roadway or railway would have serious effects on the economy and local jurisdictions' ability to provide services. Loss of travel routes would result in loss of commerce, and could impact the ability to provide emergency services to citizens by delaying response times or limiting routes for equipment such as fire apparatus, police vehicles, and ambulances. The ability to receive fuel deliveries would also be impacted.

CHAPTER 19. PLANNING AREA RISK RANKING

A risk ranking was performed for the hazards of concern described in this plan. This risk ranking assesses the probability of each hazard's occurrence as well as its likely impact on the people, property, and economy of the planning area. The risk ranking was conducted via facilitated brainstorming sessions with the Steering Committee. Estimates of risk were generated with data from Hazus-MH using methodologies promoted by FEMA. The results are used in establishing mitigation priorities.

19.1.1 Probability of Occurrence

The probability of occurrence of a hazard is indicated by a probability factor based on likelihood of annual occurrence:

- High—Hazard event is likely to occur within 25 years (Probability Factor = 3)
- Medium—Hazard event is likely to occur within 100 years (Probability Factor =2)
- Low—Hazard event is not likely to occur within 100 years (Probability Factor =1)
- No exposure—There is no probability of occurrence (Probability Factor = 0)

The assessment of hazard frequency is generally based on past hazard events in the area. Table 19-1 summarizes the probability assessment for each hazard of concern for this plan.

TABLE 19-1. PROBABILITY OF HAZARDS		
Hazard Event	Probability (high, medium, low)	Probability Factor
Avalanche	High	3
Dam Failure	Low	1
Earthquake	High	3
Flood	High	3
Landslide	High	3
Severe Weather	High	3
Severe Winter Weather	High	3
Tsunami	Low	1
Volcano	Low	1
Wildfire	Medium	2

19.1.2 Impact

Hazard impacts were assessed in three categories: impacts on people, impacts on property and impacts on the local economy. Numerical impact factors were assigned as follows:

- **People**—Values were assigned based on the percentage of the total *population exposed* to the hazard event. The degree of impact on individuals will vary and is not measurable, so the calculation assumes for simplicity and consistency that all people exposed to a hazard because they live in a hazard zone will be equally impacted when a hazard event occurs. It should be noted that planners can use an element of subjectivity when assigning values for impacts on people. Impact factors were assigned as follows:
 - High—30 percent or more of the population is exposed to a hazard (Impact Factor = 3)
 - Medium—15 percent to 29 percent of the population is exposed to a hazard (Impact Factor = 2)
 - Low—14 percent or less of the population is exposed to the hazard (Impact Factor = 1)
 - No impact—None of the population is exposed to a hazard (Impact Factor = 0)
- **Property**—Values were assigned based on the percentage of the total *property value exposed* to the hazard event:
 - High—25 percent or more of the total assessed property value is exposed to a hazard (Impact Factor = 3)
 - Medium—10 percent to 24 percent of the total assessed property value is exposed to a hazard (Impact Factor = 2)
 - Low—9 percent or less of the total assessed property value is exposed to the hazard (Impact Factor = 1)
 - No impact—None of the total assessed property value is exposed to a hazard (Impact Factor = 0)
- **Economy**—Values were assigned based on the percentage of the total *property value vulnerable* to the hazard event. Values represent estimates of the loss from a major event of each hazard in comparison to the total assessed value of the property exposed to the hazard. For some hazards, such as wildfire, landslide and severe weather, vulnerability was considered to be the same as exposure due to the lack of loss estimation tools specific to those hazards. Loss estimates separate from the exposure estimates were generated for the earthquake and flood hazards using Hazus-MH.
 - High—Estimated loss from the hazard is 15 percent or more of the total assessed property value (Impact Factor = 3)
 - Medium—Estimated loss from the hazard is 5 percent to 14 percent of the total assessed property value (Impact Factor = 2)
 - Low—Estimated loss from the hazard is 4 percent or less of the total assessed property value (Impact Factor = 1)
 - No impact—No loss is estimated from the hazard (Impact Factor = 0)

The impacts of each hazard category were assigned a weighting factor to reflect the significance of the impact. These weighting factors are consistent with those typically used for measuring the benefits of hazard mitigation actions: impact on people was given a weighting factor of 3; impact on property was given a weighting factor of 2; and impact on the economy was given a weighting factor of 1.

Table 19-2, Table 19-3 and Table 19-4 summarize the impacts for each hazard.

PLANNING AREA RISK RANKING

TABLE 19-2.
IMPACT ON PEOPLE FROM HAZARDS

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (3)
Avalanche	Low	1	(1x3) = 3
Dam Failure	Low	1	(1x3) = 3
Earthquake	High	3	(3x3) = 9
Flood	Low	1	(1x3) = 3
Landslide	Low	1	(1x3) = 3
Severe Weather	High	3	(3x3) = 9
Severe Winter Weather	High	3	(3x3) = 9
Tsunami	Low	1	(1x3) = 3
Volcano	Low	1	(1x3) = 3
Wildfire	Low	1	(1x3) = 3

TABLE 19-3.
IMPACT ON PROPERTY FROM HAZARDS

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (2)
Avalanche	None	0	(0x2) = 0
Dam Failure	Medium	2	(2x2) = 4
Earthquake	High	3	(3x2) = 6
Flood	Low	1	(1x2) = 1
Landslide	Low	1	(1x2) = 2
Severe Weather	High	3	(3x2) = 6
Severe Winter Weather	High	3	(3x2) = 6
Tsunami	Low	1	(1x2) = 2
Volcano	Low	1	(1x2) = 2
Wildfire	Low	1	(1x2) = 2

**TABLE 19-4.
IMPACT ON ECONOMY FROM HAZARDS**

Hazard Event	Impact (high, medium, low)	Impact Factor	Multiplied by Weighting Factor (1)
Avalanche	None	0	(0x1) = 0
Dam Failure	Medium	2	(2x1) = 2
Earthquake	Medium	2	(2x1) = 2
Flood	Low	1	(1x1) = 1
Landslide	Low	1	(1x1) = 1
Severe Weather	Low	1	(1x1) = 1
Severe Winter Weather	Low	1	(1x1) = 1
Tsunami	Low	1	(1x1) = 1
Volcano	Medium	2	(2x1) = 2
Wildfire	Low	1	(1x1) = 1

19.1.3 Risk Rating and Ranking

The risk rating for each hazard was determined by multiplying the probability factor by the sum of the weighted impact factors for people, property and operations, as summarized in Table 19-5. Based on these ratings, a priority of high, medium or low was assigned to each hazard. The hazards ranked as being of highest concern are earthquake, severe weather and severe winter weather. Hazards ranked as being of medium concern are landslide, flood and wildfire. The hazards ranked as being of lowest concern are avalanche, dam failure, tsunami and volcano. Table 19-6 shows the hazard risk ranking.

**TABLE 19-5.
HAZARD RISK RATING**

Hazard Event	Probability Factor	Sum of Weighted Impact Factors	Total (Probability x Impact)
Avalanche	3	(3+0+0) = 3	(3x3) = 9
Dam Failure	1	(3+4+2) = 9	(1x9) = 9
Earthquake	3	(9+6+2) = 17	(3x17) = 51
Flood	3	(3+2+1) = 6	(3x6) = 18
Landslide	3	(3+2+1) = 6	(3x6) = 18
Severe Weather	3	(9+6+1) = 16	(3x16) = 48
Severe Winter Weather	3	(9+6+1) = 16	(3x16) = 48
Tsunami	1	(3+2+1) = 6	(1x6) = 6
Volcano	1	(3+2+1) = 7	(1x7) = 7
Wildfire	2	(3+2+1) = 6	(2x6) = 12

PLANNING AREA RISK RANKING

TABLE 19-6. HAZARD RISK RANKING		
Hazard Ranking	Hazard Event	Category
1	Earthquake	High
2	Severe Weather	High
3	Severe Winter Weather	High
4	Flood	Medium
5	Landslide	Medium
6	Wildfire	Medium
7	Dam Failure	Low
8	Avalanche	Low
9	Volcano	Low
10	Tsunami	Low

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**PART 3—
MITIGATION STRATEGY**

CHAPTER 20. MITIGATION ALTERNATIVES

Catalogs of hazard mitigation alternatives were developed that present a broad range of alternatives to be considered for use in the planning area, in compliance with 44 CFR (Section 201.6(c)(3)(ii)). One catalog was developed for each hazard of concern evaluated in this plan. The catalogs for each hazard are listed in Table 20-1 through Table 20-8. The catalogs present alternatives that are categorized in two ways:

- By what the alternative would do:
 - Manipulate a hazard
 - Reduce exposure to a hazard
 - Reduce vulnerability to a hazard
 - Increase the ability to respond to or be prepared for a hazard
- By who would have responsibility for implementation:
 - Individuals
 - Businesses
 - Government.

Hazard mitigation initiatives recommended in this plan were selected from among the alternatives presented in the catalogs. The catalogs provide a baseline of mitigation alternatives that are backed by a planning process, are consistent with the planning partners' goals and objectives, and are within the capabilities of the partners to implement. Some of these actions may not be feasible based on the selection criteria identified for this plan. The purpose of the catalog was to equip the planning partners with a list of what could be considered to reduce risk of the flood hazard within the planning area. All actions identified in Volume 2 of this plan were selected based on the selection criteria described in Chapter 1 of Volume 2. Initiatives in the catalog that are not included for the partnership's action plan were not selected for one or more of the following reasons:

- The action is not feasible.
- The action is already being implemented.
- There is an apparently more cost-effective alternative.
- The action does not have public or political support.

No actions were reviewed for the avalanche hazard other than public education actions, since there is very little development exposed to this hazard within the planning area.

TABLE 20-1. CATALOG OF MITIGATION ALTERNATIVES—DAM FAILURE		
Personal Scale	Corporate Scale	Government Scale
Manipulate Hazard		
None	- Remove dams - Remove levees - Harden dams	- Remove dams - Remove levees - Harden dams
Reduce Exposure		
Relocate out of dam failure inundation areas.	Replace earthen dams with hardened structures	- Replace earthen dams with hardened structures - Relocate critical facilities out of dam failure inundation areas. - Consider open space land use in designated dam failure inundation areas.
Reduce Vulnerability		
Elevate home to appropriate levels.	Flood-proof facilities within dam failure inundation areas	- Adopt higher regulatory floodplain standards in mapped dam failure inundation areas. - Retrofit critical facilities within dam failure inundation areas.
Increase Preparation or Response Capability		
- Learn about risk reduction for the dam failure hazard. - Learn the evacuation routes for a dam failure event. - Educate yourself on early warning systems and the dissemination of warnings.	- Educate employees on the probable impacts of a dam failure. - Develop a continuity of operations plan.	- Map dam failure inundation areas. - Enhance emergency operations plan to include a dam failure component. - Institute monthly communications checks with dam operators. - Inform the public on risk reduction techniques - Adopt real-estate disclosure requirements for the re-sale of property located within dam failure inundation areas. - Consider the probable impacts of climate in assessing the risk associated with the dam failure hazard. - Establish early warning capability downstream of listed high hazard dams. - Consider the residual risk associated with protection provided by dams in future land use decisions.

MITIGATION ALTERNATIVES

TABLE 20-2. CATALOG OF MITIGATION ALTERNATIVES—EARTHQUAKE		
Personal Scale	Corporate Scale	Government Scale
Manipulate Hazard		
None	None	None
Reduce Exposure		
• Locate outside of hazard area (off soft soils)	• Locate or relocate mission-critical functions outside hazard area where possible	• Locate critical facilities or functions outside hazard area where possible
Reduce Vulnerability		
1. Retrofit structure (anchor house structure to foundation) 2. Secure household items that can cause injury or damage (such as water heaters, bookcases, and other appliances) 3. Build to higher design	1. Build redundancy for critical functions and facilities 2. Retrofit critical buildings and areas housing mission-critical functions	1. Harden infrastructure 2. Provide redundancy for critical functions 3. Adopt higher regulatory standards
Increase Preparation or Response Capability		
1. Practice “drop, cover, and hold” 2. Develop household mitigation plan, such as creating a retrofit savings account, communication capability with outside, 72-hour self-sufficiency during an event 3. Keep cash reserves for reconstruction 4. Become informed on the hazard and risk reduction alternatives available. 5. Develop a post-disaster action plan for your household	1. Adopt higher standard for new construction; consider “performance-based design” when building new structures 2. Keep cash reserves for reconstruction 3. Inform your employees on the possible impacts of earthquake and how to deal with them at your work facility. 4. Develop a continuity of operations plan	1. Provide better hazard maps 2. Provide technical information and guidance 3. Enact tools to help manage development in hazard areas (e.g., tax incentives, information) 4. Include retrofitting and replacement of critical system elements in capital improvement plan 5. Develop strategy to take advantage of post-disaster opportunities 6. Warehouse critical infrastructure components such as pipe, power line, and road repair materials 7. Develop and adopt a continuity of operations plan 8. Initiate triggers guiding improvements (such as <50% substantial damage or improvements) 9. Further enhance seismic risk assessment to target high hazard buildings for mitigation opportunities. 10. Develop a post-disaster action plan that includes grant funding and debris removal components.

**TABLE 20-3.
CATALOG OF MITIGATION ALTERNATIVES—FLOOD**

Personal Scale	Corporate Scale	Government Scale
Manipulate Hazard		
1. Clear stormwater drains and culverts	1. Clear stormwater drains and culverts	1. Maintain drainage system
2. Institute low-impact development techniques on property	2. Institute low-impact development techniques on property	2. Institute low-impact development techniques on property
		3. Dredging, levee construction, and providing regional retention areas
		4. Structural flood control, levees, channelization, or revetments.
		5. Stormwater management regulations and master planning
		6. Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff
Reduce Exposure		
1. Locate outside of hazard area	1. Locate business critical facilities or functions outside hazard area	1. Locate or relocate critical facilities outside of hazard area
2. Elevate utilities above base flood elevation		2. Acquire or relocate identified repetitive loss properties
3. Institute low impact development techniques on property	2. Institute low impact development techniques on property	3. Promote open space uses in identified high hazard areas via techniques such as: planned unit developments, easements, setbacks, greenways, sensitive area tracks.
		4. Adopt land development criteria such as planned unit developments, density transfers, clustering
		5. Institute low impact development techniques on property
		6. Acquire vacant land or promote open space uses in developing watersheds to control increases in runoff
Reduce Vulnerability		
1. Retrofit structures (elevate structures above base flood elevation)	1. Build redundancy for critical functions or retrofit critical buildings	1. Harden infrastructure, bridge replacement program
2. Elevate items within house above base flood elevation	2. Provide flood-proofing measures when new critical infrastructure must be located in floodplains	2. Provide redundancy for critical functions and infrastructure
3. Build new homes above base flood elevation		3. Adopt appropriate regulatory standards, such as: increased freeboard standards, cumulative substantial improvement or damage, lower substantial damage threshold; compensatory storage, non-conversion deed restrictions.
4. Flood-proof existing structures		4. Stormwater management regulations and master planning.
		5. Adopt “no-adverse impact” floodplain management policies that strive to not increase the flood risk on downstream communities.

MITIGATION ALTERNATIVES

**TABLE 20-3.
CATALOG OF MITIGATION ALTERNATIVES—FLOOD**

Personal Scale	Corporate Scale	Government Scale
Increase Preparation or Response Capability		
1. Buy flood insurance	1. Keep cash reserves for reconstruction	1. Produce better hazard maps
2. Develop household mitigation plan, such as retrofit savings, communication capability with outside, 72-hour self-sufficiency during and after an event	2. Support and implement hazard disclosure for the sale/re-sale of property in identified risk zones.	2. Provide technical information and guidance
	3. Solicit cost-sharing through partnerships with other stakeholders on projects with multiple benefits.	3. Enact tools to help manage development in hazard areas (stronger controls, tax incentives, and information)
		4. Incorporate retrofitting or replacement of critical system elements in capital improvement plan
		5. Develop strategy to take advantage of post-disaster opportunities
		6. Warehouse critical infrastructure components
		7. Develop and adopt a continuity of operations plan
		8. Consider participation in the Community Rating System
		9. Maintain existing data and gather new data needed to define risks and vulnerability
		10. Train emergency responders
		11. Create a building and elevation inventory of structures in the floodplain
		12. Develop and implement a public information strategy
		13. Charge a hazard mitigation fee
		14. Integrate floodplain management policies into other planning mechanisms within the planning area.
		15. Consider the probable impacts of climate change on the risk associated with the flood hazard
		16. Consider the residual risk associated with structural flood control in future land use decisions
		17. Enforce National Flood Insurance Program
		18. Adopt a Stormwater Management Master Plan

TABLE 20-4. CATALOG OF MITIGATION ALTERNATIVES—LANDSLIDE		
Personal Scale	Corporate Scale	Government Scale
Manipulate Hazard		
1. Stabilize slope (dewater, armor toe)	1. Stabilize slope (dewater, armor toe)	1. Stabilize slope (dewater, armor toe)
2. Reduce weight on top of slope	2. Reduce weight on top of slope	2. Reduce weight on top of slope
3. Minimize vegetation removal and the addition of impervious surfaces.		
Reduce Exposure		
• Locate structures outside of hazard area (off unstable land and away from slide-run out area)	• Locate structures outside of hazard area (off unstable land and away from slide-run out area)	1. Acquire properties in high-risk landslide areas. 2. Adopt land use policies that prohibit the placement of habitable structures in high-risk landslide areas.
Reduce Vulnerability		
• Retrofit home.	• Retrofit at-risk facilities.	1. Adopt higher regulatory standards for new development within unstable slope areas. 2. Armor/retrofit critical infrastructure against the impact of landslides.
Increase Preparation or Response Capability		
1. Institute warning system, and develop evacuation plan	1. Institute warning system, and develop evacuation plan	1. Produce better hazard maps
2. Keep cash reserves for reconstruction	2. Keep cash reserves for reconstruction	2. Provide technical information and guidance
3. Educate yourself on risk reduction techniques for landslide hazards.	3. Develop a continuity of operations plan	3. Enact tools to help manage development in hazard areas: better land controls, tax incentives, information
	4. Educate employees on the potential exposure to landslide hazards and emergency response protocol.	4. Develop strategy to take advantage of post-disaster opportunities
		5. Warehouse critical infrastructure components
		6. Develop and adopt a continuity of operations plan
		7. Educate the public on the landslide hazard and appropriate risk reduction alternatives.

MITIGATION ALTERNATIVES

TABLE 20-5. CATALOG OF MITIGATION ALTERNATIVES—SEVERE WEATHER AND SEVERE WINTER WEATHER		
Personal Scale	Corporate Scale	Government Scale
Manipulate Hazard		
None	None	None
Reduce Exposure		
None	None	None
Reduce Vulnerability		
1. Insulate house 2. Provide redundant heat and power 3. Insulate structure 4. Plant appropriate trees near home and power lines (“Right tree, right place” National Arbor Day Foundation Program)	1. Relocate critical infrastructure (such as power lines) underground 2. Reinforce or relocate critical infrastructure such as power lines to meet performance expectations 3. Install tree wire 4. Ensure air-conditioned facilities for institutionalized vulnerable populations.	1. Harden infrastructure such as locating utilities underground 2. Trim trees back from power lines 3. Designate snow routes and strengthen critical road sections and bridges 4. Provide publicly available cooling centers. 5. Disseminate information on public health impacts of severe weather.
Increase Preparation or Response Capability		
1. Trim or remove trees that could affect power lines 2. Promote 72-hour self-sufficiency 3. Obtain a NOAA weather radio. 4. Obtain an emergency generator.	1. Trim or remove trees that could affect power lines 2. Create redundancy 3. Equip facilities with a NOAA weather radio 4. Equip vital facilities with emergency power sources.	1. Support programs such as “Tree Watch” that proactively manage problem areas through use of selective removal of hazardous trees, tree replacement, etc. 2. Establish and enforce building codes that require all roofs to withstand snow loads 3. Increase communication alternatives 4. Modify land use and environmental regulations to support vegetation management activities that improve reliability in utility corridors. 5. Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines 6. Provide NOAA weather radios to the public. 7. Develop an extreme heat program.

**TABLE 20-6.
CATALOG OF MITIGATION ALTERNATIVES—TSUNAMI**

Personal Scale	Corporate Scale	Government Scale
Manipulate Hazard		
• None	• None	• Build wave abatement structures (e.g. the “Jacks” looking structure designed by the Japanese)
Reduce Exposure		
• Locate outside of hazard area	• Locate structure or mission critical functions outside of hazard area whenever possible.	1. Locate structure or functions outside of hazard area whenever possible. 2. Harden infrastructure for tsunami impacts. 3. Relocate identified critical facilities located in tsunami high hazard areas.
Reduce Vulnerability		
• Apply personal property mitigation techniques to your home such as anchoring your foundation and foundation openings to allow flow through.	• Mitigate personal property for the impacts of tsunami	1. Adopt higher regulatory standards that will provide higher levels of protection to structures built in a tsunami inundation area. 2. Utilize tsunami mapping once available, to guide development away from high risk areas through land use planning.
Increase Preparation or Response Capability		
1. Develop and practice a household evacuation plan. 2. Support/participate in the Redwood Coast Tsunami Working Group. 3. Educate yourself on the risk exposure from the tsunami hazard and ways to minimize that risk.	1. Develop and practice a corporate evacuation plan. 2. Support/participate in the Redwood Coast Tsunami Working Group. 3. Educate employees on the risk exposure from the tsunami hazard and ways to minimize that risk.	1. Create a probabilistic tsunami map for the planning area. 2. Provide incentives to guide development away from hazard areas. 3. Develop a tsunami warning and response system. 4. Provide residents with tsunami inundation maps 5. Join NOAA’s Tsunami Ready program 6. Develop and communicate evacuation routes 7. Enhance the public information program to include risk reduction options for the tsunami hazard

MITIGATION ALTERNATIVES

TABLE 20-7. CATALOG OF MITIGATION ALTERNATIVES—VOLCANO		
Personal Scale	Corporate Scale	Government Scale
Manipulate Hazard None	None	Limited success has been experienced with lava flow diversion structures
Reduce Exposure Relocate outside of hazard area, such as lahar zones	Locate mission critical functions outside of hazard area, such as lahar zones whenever possible.	Locate critical facilities and functions outside of hazard area, such as lahar zones, whenever possible.
Reduce Vulnerability None	Protect corporate critical facilities and infrastructure from potential impacts of severe ash fall (air filtration capability)	- Protect critical facilities from potential problems associated with ash fall. - Build redundancy for critical facilities and functions.
Increase Preparation or Response Capability Develop and practice a household evacuation plan.	- Develop and practice a corporate evacuation plan - Inform employees through corporate sponsored outreach - Develop a cooperative	- Public outreach, awareness. - Tap into state volcano warning system to provide early warning to residents of potential ash fall problems

**TABLE 20-8.
CATALOG OF MITIGATION ALTERNATIVES—WILDFIRE**

Personal Scale	Corporate Scale	Government Scale
Manipulate Hazard		
Clear potential fuels on property such as dry overgrown underbrush and diseased trees	Clear potential fuels on property such as dry underbrush and diseased trees	- Clear potential fuels on property such as dry underbrush and diseased trees - Implement best management practices on public lands.
Reduce Exposure		
- Create and maintain defensible space around structures - Locate outside of hazard area - Mow regularly	- Create and maintain defensible space around structures and infrastructure - Locate outside of hazard area	- Create and maintain defensible space around structures and infrastructure - Locate outside of hazard area - Enhance building code to include use of fire resistant materials in high hazard area.
Reduce Vulnerability		
- Create and maintain defensible space around structures and provide water on site - Use fire-retardant building materials - Create defensible spaces around home	- Create and maintain defensible space around structures and infrastructure and provide water on site - Use fire-retardant building materials - Use fire-resistant plantings in buffer areas of high wildfire threat.	- Create and maintain defensible space around structures and infrastructure - Use fire-retardant building materials - Use fire-resistant plantings in buffer areas of high wildfire threat. - Consider higher regulatory standards (such as Class A roofing) - Establish biomass reclamation initiatives
Increase Preparation or Response Capability		
- Employ techniques from the National Fire Protection Association's Firewise Communities program to safeguard home - Identify alternative water supplies for fire fighting - Install/replace roofing material with non-combustible roofing materials.	- Support Firewise community initiatives. - Create /establish stored water supplies to be utilized for firefighting.	- More public outreach and education efforts, including an active Firewise program - Possible weapons of mass destruction funds available to enhance fire capability in high-risk areas - Identify fire response and alternative evacuation routes - Seek alternative water supplies - Become a Firewise community - Use academia to study impacts/solutions to wildfire risk - Establish/maintain mutual aid agreements between fire service agencies. - Create/implement fire plans - Consider the probable impacts of climate change on the risk associated with the wildfire hazard in future land use decisions

CHAPTER 21. AREA-WIDE MITIGATION ACTIONS AND IMPLEMENTATION

21.1 SELECTED COUNTY-WIDE MITIGATION ACTIONS

The planning partners and the Steering Committee determined that some initiatives from the mitigation catalogs could be implemented to provide hazard mitigation benefits countywide. Table 21-1 lists the recommended countywide initiatives, the lead agency for each, and the proposed timeline.

TABLE 21-1. ACTION PLAN—COUNTYWIDE MITIGATION ACTIONS				
Hazards Addressed	Lead Agency	Possible Funding Sources or Resources	Timeline	Objectives
CW-1—Continue to participate in and support the “Resilient King County” initiative.				
All hazards	King County Office of Emergency Management (OEM)	Local, possible grant funding (FEMA, DHS)	Ongoing	1, 3, 4, 7, 13, 14, 15
CW-2—Continue to maintain a website that will house the regional hazard mitigation plan, its progress reports and all components of the plan’s maintenance strategy to provide the planning partners and public ongoing access to the plan and its implementation.				
All Hazards	King County OEM	King County OEM operating budget	Ongoing	4, 6, 7, 11, 15
CW-3—Continue to leverage/support/enhance ongoing, regional public education and awareness programs (such as “Take Winter by Storm and “Make it Through”) as a method to educate the public on risk, risk reduction and community resilience.				
All Hazards	King County and all planning partners	Local	Ongoing	4, 6, 7, 11, 13, 14, 15
CW-4—Continue to support the use, development and enhancement of a regional alert and notification system.				
All Hazards	King County OEM	Local, possible grant funding (FEMA, DHS, NWS, NOAA)	Ongoing	3, 4, 7, 13
CW-5—Strive to capture time-sensitive, perishable data—such as high water marks, extent and location of hazard, and loss information—following hazard events to support future updates to the risk assessment.				
All hazards	All Planning partners	Local, FEMA (PA)	Short-term	4, 7
CW-6—Encourage signatories for the regional coordination framework for disasters and planned events.				
All Hazards	King County OEM	Local	Ongoing	3, 7, 13, 14
CW-7—Continue ongoing communication and coordination in the implementation of the King County Regional Hazard Mitigation Plan and the 2013 King County Flood Hazard Management Plan.				
Flood	King County OEM, King County Department of Natural Resources & Parks, King County Flood Control District	Local	Ongoing	2, 4, 5, 7, 10, 12

The timeline options shown in Table 21-1 are defined as follows:

- Short Term = to be completed in 1 to 5 years
- Ongoing = currently being funded and implemented under existing programs.

21.2 BENEFIT/COST REVIEW

The action plan must be prioritized according to a benefit/cost analysis of the proposed projects and their associated costs (44 CFR, Section 201.6(c)(3)(iii)). The benefits of proposed projects were weighed against estimated costs as part of the project prioritization process. The benefit/cost analysis was not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. A less formal approach was used because some projects may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time. Therefore, a review of the apparent benefits versus the apparent cost of each project was performed. Parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects.

Cost ratings were defined as follows:

- **High**—Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).
- **Medium**—The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
- **Low**—The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.

Benefit ratings were defined as follows:

- **High**—Project will provide an immediate reduction of risk exposure for life and property.
- **Medium**—Project will have a long-term impact on the reduction of risk exposure for life and property, or project will provide an immediate reduction in the risk exposure for property.
- **Low**—Long-term benefits of the project are difficult to quantify in the short term.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) are considered cost-beneficial and are prioritized accordingly.

For many of the strategies identified in this action plan, the partners may seek financial assistance under the HMGP or PDM programs, both of which require detailed benefit/cost analyses. These analyses will be performed on projects at the time of application using the FEMA benefit-cost model. For projects not seeking financial assistance from grant programs that require detailed analysis, the partners reserve the right to define “benefits” according to parameters that meet the goals and objectives of this plan.

21.3 COUNTY-WIDE ACTION PLAN PRIORITIZATION

Table 21-2 lists the priority of each countywide initiative, using the same parameters used by each of the planning partners in selecting their initiatives. A qualitative benefit-cost review was performed for each of these initiatives.

AREA-WIDE MITIGATION ACTIONS AND IMPLEMENTATION

TABLE 21-2.
PRIORITIZATION OF COUNTYWIDE MITIGATION ACTIONS

Initiative #	# of Objectives Met	Benefits	Costs	Do Benefits equal or exceed Costs?	Is project Grant eligible?	Can Project be funded under existing programs/ budgets?	Priority (High, Med., Low)
CW-1	7	High	Medium	Yes	Yes	Yes	High
CW-2	5	Medium	Low	Yes	No	Yes	High
CW-3	7	High	Medium	Yes	Yes	Yes	High
CW-4	4	High	High	Yes	Yes	Yes	High
CW-5	2	Medium	Medium	Yes	Yes	Yes	High
CW-6	4	Medium	Low	Yes	No	Yes	High
CW-7	6	High	High	Yes	Yes	Yes	High

The priorities are defined as follows:

- **High Priority**—A project that meets multiple objectives (i.e., multiple hazards), has benefits that exceed cost, has funding secured or is an ongoing project and meets eligibility requirements for the HMGP or PDM grant program. High priority projects can be completed in the short term (1 to 5 years).
- **Medium Priority**—A project that meets goals and objectives, that has benefits that exceed costs, and for which funding has not been secured but that is grant eligible under HMGP, PDM or other grant programs. Project can be completed in the short term, once funding is secured. Medium priority projects will become high priority projects once funding is secured.
- **Low Priority**—A project that will mitigate the risk of a hazard, that has benefits that do not exceed the costs or are difficult to quantify, for which funding has not been secured, that is not eligible for HMGP or PDM grant funding, and for which the time line for completion is long term (1 to 10 years). Low priority projects may be eligible for other sources of grant funding from other programs.

21.4 PLAN ADOPTION

A hazard mitigation plan must document that it has been formally adopted by the governing body of the jurisdiction requesting federal approval of the plan (44 CFR Section 201.6(c)(5)). For multi-jurisdictional plans, each jurisdiction requesting approval must document that it has been formally adopted. This plan will be submitted for a pre-adoption review prior to adoption to Washington State Emergency Management Division (EMD) and FEMA's Community Rating System contractor, the Insurance Services Office (ISO). Once pre-adoption approval has been provided, all planning partners will formally adopt the plan. All partners understand that DMA compliance and its benefits cannot be achieved until the plan is adopted. Copies of the resolutions adopting this plan for all planning partners can be found in Appendix F of this volume.

21.5 PLAN MAINTENANCE STRATEGY

A hazard mitigation plan must present a plan maintenance process that includes the following (44 CFR Section 201.6(c)(4)):

- A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan over a 5-year cycle
- A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate
- A discussion on how the community will continue public participation in the plan maintenance process.

This chapter details the formal process that will ensure that the King County Hazard Mitigation Plan remains an active and relevant document and that the planning partners maintain their eligibility for applicable funding sources. The plan maintenance process includes a schedule for monitoring and evaluating the plan annually and producing an updated plan every five years. This chapter also describes how public participation will be integrated throughout the plan maintenance and implementation process. It also explains how the mitigation strategies outlined in this plan will be incorporated into existing planning mechanisms and programs, such as comprehensive land-use planning processes, capital improvement planning, and building code enforcement and implementation. The Plan's format allows sections to be reviewed and updated when new data become available, resulting in a plan that will remain current and relevant.

21.5.1 Plan Implementation

The effectiveness of the hazard mitigation plan depends on its implementation and incorporation of its action items into partner jurisdictions' existing plans, policies and programs. Together, the action items in the plan provide a framework for activities that the Partnership can implement over the next 5 years. The planning team and the Steering Committee have established goals and objectives and have prioritized mitigation actions that will be implemented through existing plans, policies, and programs.

King County Office of Emergency Management (OEM) will have lead responsibility for overseeing the plan implementation and maintenance strategy. Plan implementation and evaluation will be a shared responsibility among all planning partnership members and agencies identified as lead agencies in the mitigation action plans (see planning partner annexes in Volume 2 of this plan). The principle point of contact for this role is:

Janice Rahman
Emergency Management Program Manager
Hazard Mitigation | Mass Care | LEAN | Recovery
3511 NE 2nd St
Renton, WA 98056
(206) 205-4061
Janice.Rahman@Kingcounty.gov

21.5.2 Steering Committee

The Steering Committee is a total volunteer body that oversaw the development of the plan and made recommendations on key elements of the plan, including the maintenance strategy. It was the Steering Committee's position that an oversight committee with representation similar to the initial Steering Committee should have an active role in the plan maintenance strategy. Therefore, it is recommended that a steering committee remain a viable body involved in key elements of the plan maintenance strategy. The new steering committee should strive to include representation from the planning partners, as well as other stakeholders in the planning area.

AREA-WIDE MITIGATION ACTIONS AND IMPLEMENTATION

The steering committee will convene to perform annual reviews at a place and time to be determined. The make-up of this committee can be dynamic, which will allow differing views to have a say in the implementation of the plan. OEM will strive for true “stakeholder” representation on this committee. Individuals involved in this plan update process will be contacted and given the option to remain involved in the process.

21.5.3 Annual Progress Report

The minimum task of the new steering committee will be the evaluation of the progress of the plan. This review will include the following:

- Summary of any hazard events that occurred during the prior year and their impact on the planning area
- Review of successful mitigation actions identified in the plan
- Brief discussion about why targeted strategies were not completed
- Re-evaluation of the action plans to determine if the timeline for identified projects needs to be amended (such as changing a long-term project to a short-term project because of funding availability)
- Recommendations for new projects
- Changes in or potential for new funding options (grant opportunities)
- Impact of any other planning programs or initiatives within the partnership that involve hazard mitigation.
- Identification of training needs within the partnership, such as benefit-cost analysis or E-grants
- Grant coordination within the partnership
- A mechanism for data requests from the partnership to OEM.

OEM will assume the responsibility of initiating the annual progress reporting process. OEM will attempt to reach out to the partnership quarterly in order to expedite completion of the final progress report on an annual basis. A template to guide the planning partners in preparing a progress report has been created as part of this planning process (see Appendix G). The plan maintenance steering committee will provide feedback to the planning team on items included in the template. OEM will then prepare a formal annual report on the progress of the plan. This report should be used as follows:

- The reporting period shall cover January to January of each reporting year.
- OEM will strive to facilitate updates to the report quarterly.
- The timeframe for Steering Committee review of the progress report will be August to October of each reporting cycle.
- A final progress report will be produced no later than October 1 of each reporting year.
- The report will be posted on the King County website page dedicated to the hazard mitigation plan.
- The report will be provided to the local media through a press release.
- The report will be provided to all planning partner governing bodies to inform them of the progress of actions implemented during the reporting period.

- For planning partners that participate in the Community Rating System, the report can be provided as part of the CRS annual re-certification package. The CRS requires an annual recertification to be submitted by October 1 of every calendar year for which the community has not received a formal audit.

Uses of the progress report will be at the discretion of each planning partner. Annual progress reporting is not a requirement specified under 44 CFR. However, it may enhance the planning partnership's opportunities for funding. While failure to implement this component of the plan maintenance strategy will not jeopardize a planning partner's compliance under the DMA, it may jeopardize its opportunity to partner and leverage funding opportunities with the other partners. Each planning partner was informed of these protocols at the beginning of this planning process (in the "Planning Partner Expectations" package provided at the start of the process), and each partner acknowledged these expectations when with submittal of a letter of intent to participate in this process.

21.5.4 Plan Update

Local hazard mitigation plans must be reviewed, revised if appropriate, and resubmitted for approval in order to remain eligible for benefits under the DMA (44 CFR Section 201.6.d.3). The planning partnership intends to update the plan on a five-year cycle from the date of initial plan adoption. This cycle may be accelerated to less than five years based on the following triggers:

- A federal disaster declaration that impacts the King County planning area
- A hazard event that causes loss of life
- A comprehensive update of the King County Comprehensive Plan or participating city's comprehensive plan.

It will not be the intent of the update process to start from scratch and develop a complete new hazard mitigation plan for the King County planning area. Based on needs identified by the planning team, this update will, at a minimum, include the elements below:

- The update process will be convened through the new steering committee.
- The hazard risk assessment will be reviewed and, if necessary, updated using best available information and technologies.
- The action plans will be reviewed and revised to account for any initiatives completed, dropped, or changed and to account for changes in the risk assessment or new partnership policies identified under other planning mechanisms, as appropriate (such as the general plan).
- The draft update will be sent to appropriate agencies and organizations for comment.
- The public will be given an opportunity to comment on the update prior to adoption.
- Planning partnership governing bodies will adopt their portions of the updated plan.

21.5.5 Continuing Public Involvement

The public will continue to be apprised of hazard mitigation plan actions through the regional hazard mitigation plan website, and copies of the annual progress reports will be distributed to the media. Copies of the plan will be available within the King County Library System. A new public involvement strategy will be initiated based on guidance from the Steering Committee each time the plan is updated. This strategy will be based on the needs and capabilities of the partners at the time of the update. At a minimum, this strategy will include the use of local media outlets within the planning area.

AREA-WIDE MITIGATION ACTIONS AND IMPLEMENTATION

21.5.6 Incorporation into Other Planning Mechanisms

The information on hazard, risk, vulnerability and mitigation contained in this plan update is based on the best science and technology currently available. This information can be invaluable in making decisions required through other planning efforts, such as critical areas planning, growth management planning, and capital facilities planning. All partners will use information from this updated plan as the best available science and data on natural hazards impacting King County. The planning partnership chose not to extend the scope of this plan update into land-use-based recommendations because other programs in the planning area already have a primary focus on land use. Information in the updated plan can be used as a tool in other programs, such as the following:

- Critical areas regulation
- Growth management
- Capital improvements
- Shorelines master planning
- Water Resource Inventory Area planning
- Basin planning
- Emergency management planning
- Strategic planning.

As information becomes available from other planning mechanisms that can enhance this plan, that information will be incorporated via the update process.

21.5.7 Grant Coordination Protocol

It is anticipated that upon completion of this plan, there will be interest among the Planning Partners in pursuing grant funding under FEMA hazard mitigation grant programs. Given the competitive nature of these grant programs, coordination among partners will ensure the highest degree of success in seeking grant funding. Access to such grants is often limited due to the amount of funds available or the grant administration protocol of the State of Washington. It is not in the best interest of the partnership to dilute the funding pool with a high volume of applications from within the partnership that have not been fully vetted in a coordinated manner by designated representatives from the partnership. To avoid such potential setbacks and identify needs for resources, the grant coordination protocol described below is proposed for this plan.

Grant Coordination Lead

Grant Coordination for the King County Hazard Mitigation Planning partnership will be led by the King County OEM. The Hazard Mitigation Program Manager will be the lead point of contact at the OEM.

Tracking Grant Funding Opportunities

King County OEM will monitor FEMA and EMD websites to track FEMA hazard mitigation grant funding opportunities. OEM will notify EMD personnel that OEM will act as the lead point of contact on behalf of the King County Partnership to ensure that OEM personnel are added to all mailing lists for notification of grant funding opportunities. Once OEM has become aware of a grant funding opportunity, OEM staff will send an e-mail notification to the designated point of contact for all King County Planning Partners, notifying them of the funding opportunity and the grant application protocol to be followed. Numerous scenarios could arise under different FEMA grant funding programs. OEM will apply due diligence in tracking these opportunities and identifying the best ways to notify planning partners.

Notice of Intent to Participate

It is standard practice for EMD to require a notice of intent to participate as part of its administration of FEMA hazard mitigation grant programs. The notice of intent is a standard format submittal to the state that includes basic information on the proposed project. This information is used by the state to screen projects for eligibility and completeness. These notices of intent usually have a deadline, and must be submitted and approved by EMD in order for a potential applicant to apply. Approval of a notice of intent by EMD does not ensure grant funding. Approval simply means that the proposed project has been reviewed and approved to proceed to the next phase of the grant application process. There is usually a 60- to 90-day notice of intent period administered by EMD.

As part of this grant coordination protocol, OEM will ask that all Planning Partners considering participation in a grant funding opportunity provide a copy of the completed notice of intent to the OEM point of contact after submittal to EMD. The purpose for this is twofold:

- This will support future progress reporting on the plan by enabling OEM staff to be aware of planning partners that are actively pursuing grants and those that are not.
- This will allow OEM to identify the need for support resources and partnering opportunities to ensure the success of each grant application.

The deadline for submittal of notices of intent to OEM will be specified in the transmittal to all Planning Partners notifying them of the funding opportunity. It should be noted that this step in the protocol is a courtesy and is not mandatory. The intent is not to establish a hierarchy in the grant approval process but to identify needs for technical support and leveraging of resource opportunities within the partnership.

Planning partners on the north and south borders of the planning area that cross into neighboring counties are advised to fully coordinate with those counties for projects within that County. Since this plan will provide the grant eligibility for the grant funding, adherence to this grant coordination protocol is requested, even for projects that fall outside of King County.

Application Support

For planning partners in need of technical support in the grant application process, a formal request for assistance shall be transmitted to OEM along with the notice of intent discussed above. OEM is not committing to providing technical support for all future grant applications but is committing to tracking the needs for technical assistance and identifying possible resources to meet those needs. For example, if five planning partners say they need technical assistance on benefit-cost analysis for a specific grant opportunity, OEM could submit a request to the state on behalf of the partners for training on benefit-cost analysis. Or OEM may identify people within the planning partnership who have expertise in a discipline associated with these needs. It is anticipated that as more planning partners are successful in the grant arena, the more resources will become available under this step in the grant coordination protocol.

Grant Application Coordination

Submitting a notice of intent will not commit a community to applying for the grant. Moreover, a notice of intent may not be approved by the state. In the interest of coordinating applications to aid in the success of this plan, OEM asks that each planning partner that submits a grant application notify OEM via e-mail that the planning partner has “received approval of its notice of intent and has submitted an application on (date).” This will allow OEM to track grant activity for progress reporting and to identify future needs for resources. Should any planning partner want a courtesy review of its grant application prior to submittal to EMD, OEM staff will provide this service upon request as long as sufficient notice is given to provide time for the review.

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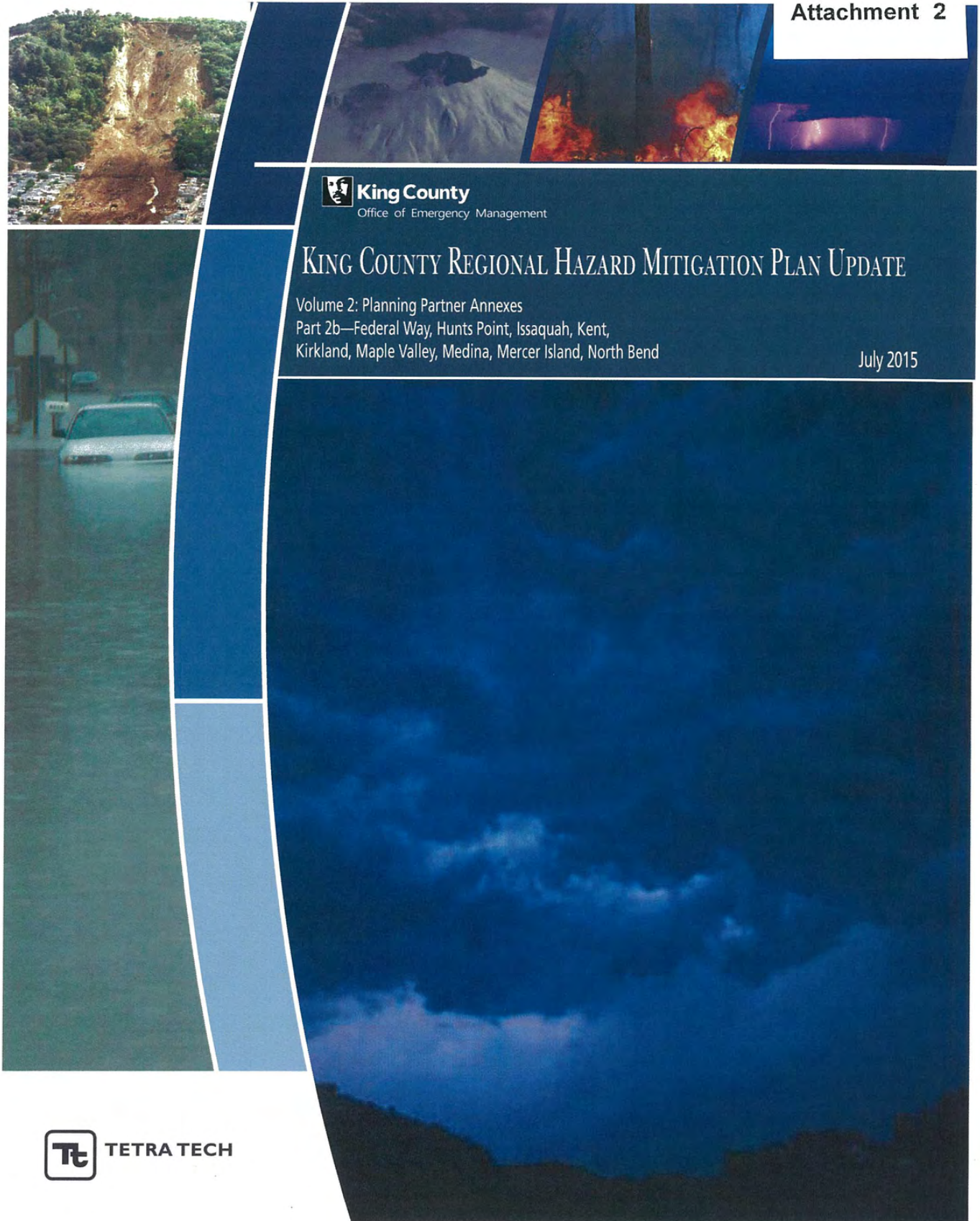
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Attachment 2



**King County
REGIONAL HAZARD MITIGATION PLAN UPDATE
VOLUME 2: PLANNING PARTNER ANNEXES**

JULY 2015

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Project #103S2548

King County
Regional Hazard Mitigation Plan Update;
Volume 2—Planning Partner Annexes

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Note: To reduce document and electronic file size, the Planning Partner annexes presented in Volume 2 of the King County Regional Hazard Mitigation Plan have been separated into five parts. Parts 2a through 2D include the Volume 2 table of contents, the introduction and a limited number of annexes. Municipal annexes are presented alphabetically in the first three parts, followed by special purpose district annexes in the fourth part. See the list below to identify which part contains each annex. Part 2e includes the Volume 2 appendices.

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Appendix A. Planning Partner Expectations

Appendix B. Procedures for Linking to the Regional
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Appendix C. Annex Instructions and Templates

INTRODUCTION

BACKGROUND

The Federal Emergency Management Agency (FEMA) encourages multi-jurisdictional planning for hazard mitigation. All participating jurisdictions must meet the requirements of Chapter 44 of the Code of Federal Regulations (44 CFR):

“Multi-jurisdictional plans (e.g. watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.”
(Section 201.6.a(4))

For the King County Regional Hazard Mitigation Plan Update, a Planning Partnership was formed to leverage resources and to meet requirements of the federal Disaster Mitigation Act (DMA) for as many eligible local governments in King County as possible. The DMA defines a local government as follows:

“Any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.”

There are two types of Planning Partners that participated in this process, with distinct needs and capabilities:

- Incorporated municipalities (cities and the County)
- Special purpose districts.

Each participating planning partner has prepared a jurisdiction-specific annex to this plan. These annexes, as well as information on the process by which they were created, are contained in this volume. This volume also includes brief profiles of the two Native American tribes that have land within King County. The tribes are independent, sovereign nations and were not official Planning Partners in this effort. However, they are important stakeholders in the region, and the King County Planning Partnership recognizes that tribal-level plans can support or enhance hazard mitigation in the planning area.

THE PLANNING PARTNERSHIP

Initial Solicitation and Letters of Intent

The planning team solicited the participation of the County and all County-recognized special purpose districts at the outset of this project. A kickoff meeting was held on January 24, 2013 at King County Office of Emergency Management in Renton to identify potential stakeholders and planning partners for this process. The purpose of the meeting was to introduce the planning process to jurisdictions in the County that could have a stake in the outcome of the planning effort. All eligible local governments within the planning area were invited to attend. Various agency and citizen stakeholders were also invited to this meeting. The goals of the meeting were as follows:

- Provide an overview of the Disaster Mitigation Act.
- Provide an update on the planning grant.

- Outline the King County plan update work plan.
- Describe the benefits of multi-jurisdictional planning.
- Outline planning partner expectations.
- Solicit planning partners.
- Confirm a Steering Committee.

All interested local governments were provided with a list of planning partner expectations developed by the planning team and were informed of the obligations required for participation. Local governments wishing to join the planning effort were asked to provide the planning team with a “notice of intent to participate” that agreed to the planning partner expectations (see Appendix A) and designated a point of contact for their jurisdiction. In all, formal commitment was received from 59 planning partners by the planning team, and the King County Planning Partnership was formed.

Maps for each participating city are provided in the individual annex for that city in Parts 2a through 2c of this volume. Maps showing the location of participating special purpose districts by district type are provided at the beginning of Part 2d, which includes the special purpose district annexes. These maps will be updated periodically as changes to the partnership occur, either through linkage or by a partner dropping out due to a failure to participate.

Planning Partner Expectations

The planning team developed the following list of planning partner expectations, which were confirmed at the kickoff meeting held on January 24, 2013:

- Each partner will provide a “Letter of Intent to Participate.”
- Each partner will support and participate in the selection and function of the Steering Committee overseeing the development of the update. Support includes allowing this body to make decisions regarding plan development and scope on behalf of the partnership.
- Each partner will provide support for the public involvement strategy developed by the Steering Committee in the form of mailing lists, possible meeting space, and media outreach such as newsletters, newspapers or direct-mailed brochures.
- Each partner will participate in plan update development activities such as:
 - Steering Committee meetings
 - Public meetings or open houses
 - Workshops and planning partner training sessions
 - Public review and comment periods prior to adoption.

Attendance will be tracked at such activities, and attendance records will be used to track and document participation for each planning partner. No minimum level of participation will be established, but each planning partner should attempt to attend all such activities.

- Each partner will be expected to perform a “consistency review” of all technical studies, plans, and ordinances specific to hazards identified within the planning area to determine the existence of plans, studies or ordinances not consistent with the equivalent documents reviewed in preparation of the County plan. For example: if a planning partner has a floodplain management plan that makes recommendations that are not consistent with any of the County’s

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basin plans, that plan will need to be reviewed for probable incorporation into the plan for the partner's area.

- Each partner will be expected to review the risk assessment and identify hazards and vulnerabilities specific to its jurisdiction. Contract resources will provide jurisdiction-specific mapping and technical consultation to aid in this task, but the determination of risk and vulnerability will be up to each partner.
- Each partner will be expected to review the mitigation recommendations chosen for the overall county and determine if they will meet the needs of its jurisdiction. Projects within each jurisdiction consistent with the overall plan recommendations will need to be identified, prioritized and reviewed to determine their benefits and costs.
- Each partner will be required to create its own action plan that identifies each project, who will oversee the task, how it will be financed and when it is estimated to occur.
- Each partner will be required to complete its normal pre-adoption process prior to submitting the plan to its governing body for adoption. For example, if it is the community's normal process to submit a planning document to a Planning Commission prior to submittal to council for adoption, then that process must be followed for the adoption of this plan.
- Each partner will be required to formally adopt the plan.

It should be noted that by adopting this plan, each planning partner also agrees to the plan implementation and maintenance protocol established in Volume 1. Failure to meet these criteria may result in a partner being dropped from the partnership by the Steering Committee, and thus losing eligibility under the scope of this plan.

Linkage Procedures

Eligible local jurisdictions that did not participate in development of this regional plan update may comply with DMA requirements by linking to this plan following the procedures outlined in Appendix B.

ANNEX-PREPARATION PROCESS

Templates

Templates were created to help the Planning Partners prepare their jurisdiction-specific annexes. Since special purpose districts operate differently from incorporated municipalities, separate templates were created for the two types of jurisdictions. The templates were created so that all criteria of Section 201.6 of 44 CFR would be met, based on the partners' capabilities and mode of operation. Templates available for the planning partners' use were specific as to whether the partner is a municipality or a special purpose district and whether the annex is an update to a previous hazard mitigation plan or a first-time hazard plan. Each partner was asked to participate in a technical assistance workshop during which key elements of the template were completed by a designated point of contact for each partner and a member of the planning team. The templates were set up to lead each partner through a series of steps that would generate the DMA-required elements that are specific for each partner. The templates and their instructions can be found in Appendix C to this volume of the Regional Hazard Mitigation Plan Update.

Workshop

Workshops were held for Planning Partners to learn about the templates and the overall planning process. Topics included the following:

- DMA
- King County plan background
- The templates
- Risk ranking
- Developing your action plan
- Cost/benefit review.

Separate sessions were held for special purpose districts and municipalities, in order to better address each type of partner's needs. The sessions provided technical assistance and an overview of the template completion process. Attendance at this workshop was mandatory under the planning partner expectations established by the Steering Committee. There was 92-percent attendance of the partnership at these sessions.

In the risk-ranking exercise, each planning partner was asked to rank each risk specifically for its jurisdiction, based on the impact on its population or facilities. Cities were asked to base this ranking on probability of occurrence and the potential impact on people, property and the economy. Special purpose districts were asked to base this ranking on probability of occurrence and the potential impact on their constituency, their vital facilities and the facilities' functionality after an event. The methodology followed that used for the countywide risk ranking presented in Volume 1. A principal objective of this exercise was to familiarize the partnership with how to use the risk assessment as a tool to support other planning and hazard mitigation processes. Tools utilized during these sessions included the following:

- The risk assessment results developed for this plan
- Hazard maps for all hazards of concern
- Special district boundary maps that illustrated the sphere of influence for each special purpose district partner
- Hazard mitigation catalogs
- Federal funding and technical assistance catalogs
- Copies of partners' prior annexes, if applicable.

Prioritization

44 CFR requires actions identified in the action plan to be prioritized (Section 201.c.3.iii). The planning team and steering committee developed a methodology for prioritizing the action plans that meets the needs of the partnership and the requirements of 44 CFR. The actions were prioritized according to the following criteria:

- **High Priority**—Project meets multiple plan objectives, benefits exceed cost, funding is secured under existing programs, or is grant eligible, and project can be completed in 1 to 5 years (i.e., short term project) once funded.
- **Medium Priority**—Project meets at least 1 plan objective, benefits exceed costs, requires special funding authorization under existing programs, grant eligibility is questionable, and project can be completed in 1 to 5 years once funded.
- **Low Priority**—Project will mitigate the risk of a hazard, benefits exceed costs, funding has not been secured, project is not grant eligible, and time line for completion is long term (5 to 10 years).

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These priority definitions are dynamic and can change from one category to another based on changes to a parameter such as availability of funding. For example, a project might be assigned a medium priority because of the uncertainty of a funding source, but be changed to high once a funding source has been identified. The prioritization schedule for this plan will be reviewed and updated as needed annually through the plan maintenance strategy.

Benefit/Cost Review

44 CFR requires the prioritization of the action plan to emphasize a benefit/cost analysis of the proposed actions. Because some actions may not be implemented for up to 10 years, benefit/cost analysis was qualitative and not of the detail required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) grant program. A review of the apparent benefits versus the apparent cost of each project was performed. Parameters were established for assigning subjective ratings (high, medium, and low) to costs and benefits as follows:

- Cost ratings:
 - **High**—Existing funding levels are not adequate to cover the costs of the proposed action; implementation would require an increase in revenue through an alternative source (for example, bonds, grants, and fee increases).
 - **Medium**—The action could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the action would have to be spread over multiple years.
 - **Low**—The action could be funded under the existing budget. The action is part of or can be part of an existing, ongoing program.
- Benefit ratings:
 - **High**—The action will have an immediate impact on the reduction of risk exposure to life and property.
 - **Medium**—The action will have a long-term impact on the reduction of risk exposure to life and property or will provide an immediate reduction in the risk exposure to property.
 - **Low**—Long-term benefits of the action are difficult to quantify in the short term.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) are considered cost-beneficial and are prioritized accordingly.

It should be noted that for many of the strategies identified in this action plan, funding might be sought under FEMA's HMGP or PDM programs. Both of these programs require detailed benefit/cost analysis as part of the application process. These analyses will be performed on projects at the time of application preparation. The FEMA benefit-cost model will be used to perform this review. For projects not seeking financial assistance from grant programs that require this sort of analysis, the Partners reserve the right to define "benefits" according to parameters that meet their needs and the goals and objectives of this plan.

Analysis of Mitigation Initiatives

Each planning partner reviewed its recommended initiatives to classify each initiative based on the hazard it addresses and the type of mitigation it involves. Mitigation types used for this categorization are as follows:

- **Prevention**—Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. Includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
- **Property Protection**—Modification of buildings or structures to protect them from a hazard or removal of structures from a hazard area. Includes acquisition, elevation, relocation, structural retrofit, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness**—Actions to inform citizens and elected officials about hazards and ways to mitigate them. Includes outreach projects, real estate disclosure, hazard information centers, and school-age and adult education.
- **Natural Resource Protection**—Actions that minimize hazard loss and preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Emergency Services**—Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities.
- **Structural Projects**—Actions that involve the construction of structures to reduce the impact of a hazard. Includes dams, setback levees, floodwalls, retaining walls, and safe rooms.

COMPATIBILITY WITH PREVIOUS APPROVED PLANS

Of the 59 committed planning partners, 22 were covered by prior plans approved by FEMA. This does not include local governments covered under the initial 2004 Regional Plan that did not perform and update to that plan in 2009. Table 1 lists those communities, the status of those plans, and the role this regional plan will play in achieving compliance and the CRS status if applicable. These 22 plans identified over 280 initiatives. The progress made on these initiatives has been reviewed in the progress report included in Appendix B of Volume 1 of this plan update.

FINAL COVERAGE UNDER THE PLAN

Of the 59 committed planning partners, 54 fully met the participation requirements specified by the Steering Committee. The principal requirement not met by the other partners was the completion of the jurisdictional annex template following the workshops. All 54 partners that attended the workshop subsequently submitted completed templates. Only those 54 jurisdictions are included in this volume and will seek DMA compliance under this plan. The remaining jurisdictions will need to follow the linkage procedures described in Appendix B of this volume. Table 2 lists the jurisdictions that submitted letters of intent and their ultimate status in this plan.

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**TABLE 1.
PRIOR PLAN STATUS**

Jurisdiction	FEMA Approval Date	Will Be Replaced by King County Regional Hazard Mitigation Plan? (Yes/No)	CRS Community (Yes/No)	King County Regional Hazard Mitigation Plan Will Become CRS Plan of Record?(Yes/No)
City of Auburn	12/2/2009	Yes	Yes	Yes
City of Bothell	6/17/2010	Yes	No	N/A
City of Federal Way	12/2/2009	Yes	No	N/A
City of Issaquah	1/28/2010	Yes	Yes	Yes
City of Kent (including annex for Kent Fire Department/King County Fire District 37)	1/27/2005	Yes	Yes	Yes
City of Mercer Island	6/16/2011	Yes	No	N/A
City of Pacific	12/2/2009	Yes	No	N/A
City of Redmond	1/8/2010	Yes	No	N/A
City of Renton	4/19/2012	Yes	Yes	Yes
City of Shoreline (including annex for Shoreline Fire Department /King County Fire District 4)	12/2/2009	Yes	No	n/a
City of Snoqualmie	4/20/2010	Yes	Yes	Yes
City of Tukwila	2/16/2011	Yes	No	N/A
City of Woodinville (an annex to the North King and South Snohomish Counties Regional Mitigation Plan for Natural Hazards)	11/29/2010	Yes	No	N/A
King County (Unincorporated)	1/28/2010	Yes	Yes	No ^a
Covington Water District	1/28/2010	Yes	N/A	N/A
Highline Water District	12/2/2009	Yes	N/A	N/A
King County Water District 19	12/28/2010	Yes	N/A	N/A
King County Water District 111	4/20/2010	Yes	N/A	N/A
North City Water District (known as Shoreline Water District at the time of the previous hazard mitigation plan ^c)	N/A ^b	Yes	N/A	N/A
Soos Creek Water District	3/18/2010	Yes	N/A	N/A
Sammamish Plateau Water and Sewer District	12/2/2009	Yes	N/A	N/A
Southwest Suburban Sewer District	1/28/2010	Yes	N/A	N/A
South King Fire and Rescue	12/2/2009	No	N/A	N/A

a. For unincorporated King County, the CRS plan of record is the *2013 King County Flood Hazard Management Plan Update and Progress Report*.

b. The 2010 Shoreline Water District Hazard Mitigation Plan was not submitted to FEMA for approval.

TABLE 2. PLANNING PARTNER STATUS				
Jurisdiction	Letter of Intent Date	Attended Workshop?	Completed Template?	Covered by This Plan?
Municipalities				
King County	N/A	Yes	Yes	Yes
City of Algona	1/29/2013	Yes	Yes	Yes
City of Auburn	2/13/2013	Yes	Yes	Yes
City of Bellevue	2/22/2013	No ^a	No	No
City of Bothell	2/12/2013	Yes	Yes	Yes
City of Burien	2/13/2013	Yes	Yes	Yes
City of Carnation	2/11/2013	Yes	Yes	Yes
City of Covington	2/12/2013	No ^a	No	No
City of Clyde Hill	2/21/2013	Yes	Yes	Yes
City of Duvall	2/13/2013	Yes	Yes	Yes
City of Federal Way	1/31/2013	Yes	Yes	Yes
City of Issaquah	1/33/2013	Yes	Yes	Yes
City of Kent	2/21/2013	Yes	Yes	Yes
City of Kirkland	2/21/2013	Yes	Yes	Yes
City of Maple Valley	1/30/2013	Yes	Yes	Yes
City of Medina	2/11/2013	Yes	Yes	Yes
City of Mercer Island	2/21/2013	Yes	Yes	Yes
City of North Bend	2/22/2013	Yes	Yes	Yes
City of Pacific	3/15/2013	Yes	Yes	Yes
City of Redmond	2/19/2013	Yes	Yes	Yes
City of Renton	2/22/2013	Yes	Yes	Yes
City of SeaTac	2/7/2013	Yes	Yes	Yes
City of Shoreline	2/15/2013	Yes	Yes	Yes
City of Snoqualmie	3/14/2013	Yes	Yes	Yes
City of Tukwila	3/1/2013	Yes	Yes	Yes
City of Woodinville	2/28/2013	Yes	Yes	Yes
Town of Beaux Arts Village	2/14/2013	Yes	Yes	Yes
Town of Hunts Point	2/23/2013	Yes	Yes	Yes
Town of Skykomish	3/15/2013	Yes	Yes	Yes
Fire Districts				
Burien Fire (King County Fire District #2)	1/24/2013	Yes	Yes	Yes
Duvall Fire (King County Fire District #45)	2/15/2013	Yes	Yes	Yes
Kent Fire	2/21/2013	Yes	Yes	Yes
Shoreline Fire	2/13/2013	Yes	Yes	Yes
Valley Regional Fire Authority	1/29/2013	Yes	Yes	Yes
South King Co. Fire and Rescue	2/13/2013	No	No	No
Vashon Island Fire & Rescue	1/31/2013	Yes	Yes	Yes

**TABLE 2.
PLANNING PARTNER STATUS**

Jurisdiction	Letter of Intent Date	Attended Workshop?	Completed Template?	Covered by This Plan?
School and Hospital Districts				
Kent School District	2/14/2013	Yes	Yes	Yes
Lake Washington School District	3/15/2013	No	No	No
Riverview School District	1/30/2013	Yes	Yes	Yes
Evergreen Health (Public Hospital District #2)	2/5/2013	Yes	Yes	Yes
Snoqualmie Hospital	2/25/2013	No	No	No
Valley Medical (Public Hospital District #1)	2/21/2013	Yes	Yes	Yes
Water, Sewer and Utility Districts				
Covington Water District	2/12/2013	Yes	Yes	Yes
Highline Water District	2/21/2013	Yes	Yes	Yes
King County Water District 19	2/21/2013	Yes	Yes	Yes
King County Water District 20	2/20/2013	Yes	Yes	Yes
King County Water District 90	2/12/2013	Yes	Yes	Yes
King County Water District 111	2/25/2013	Yes	Yes	Yes
King County Water District 125	2/21/2013	Yes	Yes	Yes
North City Water District (formerly Shoreline Water District)	2/26/2013	Yes	Yes	Yes
Coal Creek Utility District	1/30/2013	Yes	Yes	Yes
Sammamish Plateau Water & Sewer District	2/26/2013	Yes	Yes	Yes
Skyway Water & Sewer District	3/12/2013	Yes	Yes	Yes
Soos Creek Water & Sewer District	2/27/2013	Yes	Yes	Yes
Midway Sewer District	2/21/2013	Yes	Yes	Yes
Ronald Wastewater District	2/13/2013	Yes	Yes	Yes
Southwest Suburban Sewer District	2/21/2013	Yes	Yes	Yes
Valley View Sewer District	2/21/2013	Yes	Yes	Yes
Woodinville Water District	2/20/2013	Yes	Yes	Yes
a. Cities of Bellevue and Covington decided to maintain their own plans after submitting letter of intent				

KING COUNTY TRIBAL STAKEHOLDERS

FEMA's Tribal Multi-Hazard Mitigation Planning Guidance

FEMA's 2010 *Tribal Multi-Hazard Mitigation Planning Guidance* assists Indian tribal governments and other tribal entities in identifying and assessing their risk to natural hazards. The document offers the following types of assistance (44 CFR 201.7):

- It helps Indian tribal governments identify their risks from natural hazards and protect their members and other resources.

- It helps Indian tribal governments develop and adopt new mitigation plans, or revise or update existing mitigation plans, to meet the requirements of 44 CFR 201.7.
- It helps plan reviewers evaluate mitigation plans from different Indian Tribal governments in a fair and consistent manner.
- It helps Indian tribal governments exercise flexibility and apply for assistance as either a grantee or subgrantee under FEMA grant programs with a single plan type.
- It provides guidance and culturally relevant examples to other tribal entities that comply with similar planning requirements under 44 CFR 201.6 as a local government.

Indian tribal governments with an approved tribal mitigation plan in accordance with 44 CFR 201.7 may apply for assistance from FEMA as a grantee. If the Indian tribal government coordinates with the state for review of the tribal mitigation plan, then the Indian tribal government also has the option to apply as a subgrantee through a state or another tribe. A grantee is an entity such as a state, territory, or Indian tribal government to which a grant is awarded and that is accountable for the funds provided. A subgrantee is an entity—such as a community, local or Indian tribal government, state-recognized tribe, or private nonprofit organization—to which a subgrant is awarded and that is accountable to the grantee for use of the funds provided.

If the Indian tribal government is eligible as a grantee or subgrantee because it has an approved tribal mitigation plan and has coordinated with the state for review, it can decide which option it wants to take on a case-by-case basis with respect to each federal disaster declaration, and for each grant program under a declaration, but not on a project-by-project basis within a grant program. For example, an Indian tribal government can participate as a subgrantee for public assistance, but as a grantee for the Hazard Mitigation Grant Program under the same declaration. However, the Indian tribal government would not be able to request grantee status under HMGP for one HMGP project, then request subgrantee status for another HMGP project under the same declaration.

By acknowledging the tribes as stakeholders, the King County regional planning partnership recognizes tribal level plans as existing and potential mechanisms that could support or enhance hazard mitigation in King County. This is a requirement of 44 CFR 201.6.b.3. While the King County regional planning effort and those of the tribal governments are separate and autonomous efforts, tribal plans offer an opportunity to partner and share information that may lead help to leverage resources in the planning area.

The Muckleshoot Indian Tribe

Brief Profile

This section is excerpted from the City of Auburn's 2013 Annex to the King County Regional Hazard Mitigation Plan (<http://www.auburnwa.gov/Assets/EM/AuburnWA/Docs/hazmit2013.pdf>) and the Muckleshoot Indian Tribe website (<http://www.muckleshoot.nsn.us/about-us/overview.aspx>)

The Muckleshoot Indian Tribe is a federally recognized Indian tribe whose membership is composed of descendants of the Duwamish and Upper Puyallup people who inhabited Central Puget Sound for thousands of years before non-Indian settlement. The Tribe's name is derived from the native name for the prairie on which the Muckleshoot Reservation was established. Following the Reservation's establishment in 1857, the Tribe and its members came to be known as Muckleshoot, rather than by the historical tribal names of their Duwamish and Upper Puyallup ancestors. Today, the United States recognizes the Muckleshoot Tribe as a tribal successor to the Duwamish and Upper Puyallup bands from which the Tribe's membership descends.

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The Muckleshoot Reservation consists of six sections situated diagonally, has 20 miles of boundaries, and encompasses 6 square-miles. Three sections (3 square miles) are within the municipal limits of the City of Auburn. The Muckleshoot Tribe is one of Washington's largest tribes, with a membership of about 3,300. Through the Indian Reorganization Act, the Tribe adopted its constitution in 1936. It provides a nine-member council with advice and input of the General Council, consisting of all community members, and it provides a full range of governance services to tribal members and tribal properties in the reservation.

Status of Approved Plan

The Muckleshoot Tribe does not currently have a FEMA-approved, state-level, multi-hazard mitigation plan; however, the Tribe is currently pursuing plan development.

The Snoqualmie Indian Tribe

Brief Profile

The following information is excerpted from the 2011 Snoqualmie Tribe Hazard Mitigation Plan (http://www.snoqualmientribe.us/sites/default/files/linkedfiles/snoqualmie_tribe_hmp_final_11.1.11.pdf).

The people known today as the Snoqualmie Tribe have lived in the Puget Sound region of Washington State since time immemorial, long before the early explorers came to the Northwest. They hunted deer, elk, and other game animals, fished for salmon and gathered berries and wild plants for food and medicinal purposes.

The Snoqualmie Tribe currently has approximately 650 members. Historically, tribal members lived in an area of East King and Snohomish Counties that now contains the communities of Monroe, Carnation, Fall City, Snoqualmie, North Bend, Mercer Island and Issaquah. Tribal members continue to live in each of these communities.

In 1855, Snoqualmie signed the Point Elliott Treaty creating a government-to-government relationship between the United States and the Snoqualmie Tribe. The Tribe ceded to the U.S. government all of its land between Snoqualmie Pass and Marysville. The Tribe lost federal recognition in 1953 when federal policies limited recognition to tribes having reservations.

In October 1999, After 46 years of petitioning, the Bureau of Indian Affairs notified the Tribe's Fall City headquarters that the U.S. government had re-recognized the Snoqualmie Tribe and granted Snoqualmie Nation tribal status based on evidence that the Tribe had maintained a continuous community from historical times to the present. Recognition gave the Tribe the right to acquire its initial reservation land and to develop a casino to help fund tribal governance, administration and services to its members.

In the decade since re-recognition, the Tribe has worked to develop programs and provide services to meet the needs of its members. The Tribe has developed a government, created medical clinics, and promoted economic development, social and health services, and housing programs.

On March 2, 2006 the Snoqualmie Reservation site was officially put into trust status. The Snoqualmie Casino (which opened in 2009) was built on the reservation and is used to pursue economic development and increase the financial resources of the Tribe for government operations.

Status of Approved Plan

The Snoqualmie Tribe has a FEMA-approved, state-level, multi-hazard mitigation plan effective October 2011 through October 11, 2016.

Hazards of Concern

The 2011 plan addressed the following hazards of concern:

- Earthquake
- Flood
- Landslide/mass movement
- Epidemic/pandemic
- Hazardous materials.
- Severe weather
- Wildfire
- Dam failure
- Abandoned mines

ACRONYMS AND ABBREVIATIONS

The following terms are used in the planning partner annexes:

- ATC—Applied Technology Council
- CED—Community and Economic Development (city department)
- CEMP—Comprehensive Emergency Management Plan
- CERT—Citizens Emergency Response Training
- CFR—Code of Federal Regulations
- cfs—cubic feet per second
- CIP—Capital Improvement Plan
- CRS—Community Rating System
- DCD—Department of Community Development
- DI—Ductile iron
- DMA—Disaster Mitigation Act
- DNRP—Department of Natural Resources and Parks (King County)
- DOT—Department of Transportation (King County)
- DPER—Department of Permitting and Environmental Review (King County)
- EOC—Emergency Operations Center
- EPA—U.S. Environmental Protection Agency
- FEMA—Federal Emergency Management Agency
- GIS—Geographic Information System
- GMA—Growth Management Act (Washington State)
- gpm—gallons per minute
- Hazus-MH—Hazards, United States-Multi Hazard
- HDPE—High-density polyethylene
- HMGP—Hazard Mitigation Grant Program
- IBC—International Building Code
- IRC—International Residential Code
- KCFD—King County Fire District
- KCSO—King County Sheriff's Office
- KCWD—King County Water District
- mgd—million gallons per day
- NFIP—National Flood Insurance Program
- NOAA—National Oceanic and Atmospheric Administration
- NPDES—National Pollutant Discharge Elimination System

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- OEM—Office of Emergency Management (King County)
- OFM—Office of Financial Management (Washington State)
- PDM—Pre-Disaster Mitigation Grant Program
- PRV—Pressure-reducing valve
- RCW—Revised Code of Washington
- SCADA—Supervisory Control and Data Acquisition
- SPU—Seattle Public Utilities
- USGS—U.S. Geological Survey
- WSDOT—Washington State Department of Transportation
- WTD—Wastewater Treatment Division (a division of King County Department of Natural Resources and Parks)

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**APPENDIX A.
PLANNING PARTNER EXPECTATIONS**

APPENDIX A. PLANNING PARTNER EXPECTATIONS

One of the goals of the multi-jurisdictional approach to hazard mitigation planning is to achieve compliance with the Disaster Mitigation Act (DMA) for all participating members in the planning effort. There are several different groups who will be involved in this process at different levels. In order to provide clarity, the following is a general breakdown of those groups: the planning team, which is customarily the Tetra Tech Team and those actually responsible for the plan's written development; the Steering Committee, which represent members from the planning partnership that serve as the oversight body, assuming responsibility for many of the planning milestones prescribed for this process to help reduce the burden of time required by each planning partner; the planning partners are those jurisdictions or special purpose districts that are actually developing an annex to the regional plan; and the planning stakeholders, which are the individuals, groups, businesses, academia, etc., from which the planning team gains information to support the various elements of the plan.

DMA compliance requires that participation be defined in order to maintain eligibility with respect to meeting the requirements which allow a jurisdiction or special purpose district to develop an annex to the base plan. To achieve compliance for all partners, the plan must clearly document how each planning partner that is seeking linkage to the plan participated in the plan's development. The best way to do this is to clearly define "participation." For this planning process, "participation" is defined by the following criteria:

- **Estimated Level of Effort.** It is estimated that the total time commitment to meet these "participation" requirements for a planning partner not participating on the Steering Committee would be approximately 40 hours over the 12 to 14 month period. This time is reduced somewhat for special purpose districts.
- **Participate in the Process.** As indicated, it must be documented in the plan that each planning partner "participated" in the process to the best of your capabilities. There is flexibility in defining "participation," which can vary based on the type of planning partner (i.e.: City or County, vs. a Special Purpose District) involved. However, the level of participation must be defined at the on-set of the planning process, and we must demonstrate the extent to which this level of participation has been met for each partner. This planning process will utilize a Steering Committee that will assume responsibility for many of the planning milestones prescribed for this process to help reduce the burden of time required by each planning partner. This committee will be representative of the whole body and you as a planning partner will have input on its makeup. This committee will meet periodically (frequency to be determined by the committee) throughout the process and provide direction and guidance to the planning team. Steering Committee meetings are not mandatory meetings for all planning partners. If you are not on the committee, your attendance is not required; however, it is our hope that all planning partners will attempt to remain engaged with this process. Each committed planning partner will be notified of the date and time for all scheduled steering committee meetings. The planning team will also request support from the partnership during the public involvement phase of the planning process. Support could be in the form of providing venues for public meetings, attending these meetings as meeting participants, providing technical support, etc.
- **Duration of Planning Process.** This process is anticipated to take 12 to 14 months to complete. It will be easy to become disconnected with the process objectives if you do not participate in some of these meetings to some degree. The planning team will keep all planning partners

apprised of plan development milestones via informational bulletins that will be periodically distributed to the entire partnership.

- **Critical Facility Update.** All planning partners will be requested to update their critical facilities/infrastructure lists for use during the risk assessment. The CDMS extension to Hazaus will be used for this process, and guidance will be provided by the planning team. If the list is not updated, Hazus default data will be used. Updating this list provides a much more detailed analysis.
- **Capability Assessment.** All planning partners will be asked to identify their capabilities during this process. This assessment will look at the regulatory, technical, financial and floodplain management capabilities of each municipal partner. Special purpose districts will perform a different type of capability assessment. These capability assessments will require a review of existing plans, studies, ordinances and programs pertinent to each jurisdiction to identify policies or recommendations that can complement the hazard mitigation initiatives selected (e.g., comprehensive plans, basin plans or hazard-specific plans). This step is important because increasing a jurisdiction's capability is a viable mitigation action.
- **Action/Strategy Review.** All previous planning partners will be required to perform a review of the strategies from their respective prior action plan to: determine those that have been accomplished and how they were accomplished; and why those that have not been accomplished were not completed. The planning team will be available to assist with this task.
- **Action Plan Development.** Each planning partner must identify and prioritize an action plan that they will strive to implement to reduce the risks from hazards they have ranked that impact their jurisdiction.
- **Plan Adoption.** The plan must be adopted by each jurisdiction.

One of the benefits to multi-jurisdictional planning is the ability to pool resources. This means more than monetary resources. Resources such as staff time, meeting locations, media resources, technical expertise will all need to be utilized to generate a successful plan. In addition, these resources can be pooled such that decisions can be made by a peer group applying to the whole and thus reducing the individual level of effort of each planning partner. This will be accomplished by the formation of a steering committee made up of planning partners and other "stakeholders" within the planning area. The size and makeup of this steering committee will be determined by the planning partnership during our kick-off meeting. This body will assume the decision-making responsibilities on behalf of the entire partnership. This will streamline the planning process by reducing the number of meetings that will need to be attended by each planning partner. The assembled Steering Committee for this effort will meet monthly (unless decided otherwise) on an as-needed basis as determined by the planning team, and will provide guidance and decision making during all phases of the plan's development.

With the above participation requirements in mind, each planning partner will be asked to aid this process by being prepared to develop its section of the plan. To be an eligible planning partner in this effort, each Planning Partner will be asked to provide the following:

- A "Letter of Intent to participate" or Resolution to participate to the Planning Team (see exhibit A).
- Designate a lead point of contact for this effort. This designee will be listed as the hazard mitigation point of contact for your jurisdiction in the plan.
- Identify an un-burdened billing rate for this point of contact which will be used to calculate the in-kind match for the grant that is funding this project.
- Approve the Steering Committee.

PLANNING PARTNER EXPECTATIONS

- If requested, provide support in the form of mailing list, possible meeting space, and public information materials, such as newsletters, newspapers or direct mailed brochures, required to implement the public involvement strategy developed by the Steering Committee.
- Participate in the process. There will be many opportunities as this plan evolves to participate. Opportunities such as:
 - Steering Committee meetings
 - Public meetings or open houses
 - Workshops/ Planning Partner specific training sessions
 - Public review and comment periods prior to adoption

At each and every one of these opportunities, attendance will be recorded. Attendance records will be used to document participation for each planning partner. No thresholds will be established as minimum levels of participation. However, each planning partner should attempt to attend all possible meetings and events.

- There will be one mandatory workshop that all planning partners will be required to attend. This workshop will cover the proper completion of the jurisdictional annex template, which is the basis for each partner's jurisdictional chapter in the plan. Failure to have a representative at this workshop will disqualify the planning partner from participation in this effort. The schedule for this workshop will be such that all committed planning partners will be able to attend.
- After participation in the mandatory annex workshop, each partner will be required to complete their annex and provide it to the planning team in the time frame established by the Steering Committee. Technical assistance in the completion of these annexes will be available from the planning team. Failure to complete your annex in the required time frame may lead to disqualification from the partnership.
- Each partner will be asked to review the Risk Assessment and identify hazards and vulnerabilities specific to its jurisdiction. Contract resources will provide the jurisdiction specific mapping and technical consultation to aid in this task, but the determination of risk and vulnerability will be up to each partner (through a facilitated process during the mandatory workshop).
- Each partner will be required to create its own action plan that identifies each project, who will oversee the task, how it will be financed and when it is estimated to occur.
- Each partner will be required to formally adopt the plan.

Planning tools and instructions to aid in the compilation of this information will be provided to all committed planning partners. Each partner will be asked to complete their annexes in a timely manner and according to the timeline specified by the Steering Committee.

**** Note**:** Once this plan is completed, and FEMA approval has been determined for each partner, maintaining that eligibility will be dependent upon each partner implementing the plan implementation-maintenance protocol identified in the plan.

Exhibit A
Example Letter of Intent to Participate

King County Hazard Mitigation Planning Partnership

C/O Tetra Tech, Inc.
19803 N. Creek Parkway
Bothell, WA 98011
Via email at: rob.flaner@tetratech.com

Dear King County Planning Partnership,

Please be advised that the _____ (*insert City or district name*) is committed to participating in the update to the King County Regional Multi- Hazard Mitigation Plan. As the _____ (title, e.g., Chief Administrative Official) for this jurisdiction, I certify that I will commit all necessary resources in order to meet Partnership expectations as outlined in the "Planning Partners expectations" document provided by the planning team, in order to obtain Disaster Mitigation Act (DMA) compliance for our jurisdiction.

Mr./Ms. _____ will be our jurisdiction's point of contact for this process and they can be reached at (*insert: address, phone number and e-mail address*). We understand that this designated point of contact's time will be applied to the "in-kind" local match for the grant that is funding this project. To aid in the determination of this local match, we have determined that the fully burdened bill rate for our designated point of contact is \$ _____. The funding source for our point of contact's position within our jurisdiction is _____ / is not _____ through federal funds. If it is through federal funds, what percentage of their salary is federally funded? _____ %

Sincerely,

 PLANNING PARTNER EXPECTATIONS

 Exhibit B
 (Current) Planning Team Contact information

Name	Representing	Address	Phone	e-mail
Janice Rahman	King County OEM	3511 NE 2nd Street Renton, WA 98056	(206) 205-4061	Janice.Rahman@Kingcountv.gov
Sam Ripley	King County OEM	3511 NE 2nd Street Renton, WA 98056	(206) 205-4072	Sam.Ripley@kingcountv.gov
Rob Flaner	Tetra Tech, Inc.	90 S. Blackwood Ave Eagle, ID 83616	(208) 939-4391	Rob.flaner@tetrattech.com

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**APPENDIX B.
PROCEDURES FOR LINKING TO
THE REGIONAL HAZARD MITIGATION PLAN UPDATE**

APPENDIX B. PROCEDURES FOR LINKING TO THE REGIONAL HAZARD MITIGATION PLAN UPDATE

Not all eligible local governments in King County are included in the King County Regional Hazard Mitigation Plan Update. Some or all of these non-participating local governments may choose to “link” to the Plan at some point to gain eligibility for programs under the federal Disaster Mitigation Act (DMA). In addition, some current partners may not continue to meet eligibility requirements due to a lack of participation prescribed by the plan. The following “linkage” procedures define the requirements established by the Planning Team for dealing with an increase or decrease in the number of planning partners linked to this plan. No currently non-participating jurisdiction within the defined planning area is obligated to link to this plan. These jurisdictions can choose to do their own “complete” plan that addresses all required elements of Section 201.6 of Chapter 44 of the Code of Federal Regulations (44 CFR).

INCREASING THE PARTNERSHIP THROUGH LINKAGE

Eligible jurisdictions located in the planning area may link to this plan at any point during the plan’s performance period. It is expected that linking jurisdictions will complete the requirements outlined below and submit their completed template to the lead agency (King County Office of Emergency Management) for review within three months of beginning the linkage process:

- The eligible jurisdiction requests a “Linkage Package” by contacting the Point of Contact (POC) for the plan:
 - Janice Rahman, Project Manager
King County Office of Emergency Management
3511 NE 2nd Street
Renton, WA 98056
(206) 205-4061
Janice.Rahman@kingcounty.gov
- The POC will provide a linkage procedure package that includes linkage information and a linkage tool-kit:
 - Linkage Information
 - ☐ Procedures for linking to the regional hazard mitigation plan update
 - ☐ Planning partner’s expectations for linking jurisdictions
 - ☐ A sample “letter of intent” to link to the Regional Hazard Mitigation Plan
 - ☐ A copy of Section 201.6 of 44 CFR, which defines the federal requirements for a local hazard mitigation plan.
 - Linkage Tool-Kit
 - ☐ Copy of Volume 1 and 2 of the plan
 - ☐ A special purpose district or city template and instructions
 - ☐ A catalog of hazard mitigation alternatives
 - ☐ An annex review check-list
 - ☐ A sample resolution for plan adoption

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- The new jurisdiction will be required to review both volumes of the Regional Hazard Mitigation Plan, which include the following key components for the planning area:
 - Goals and objectives
 - The planning area risk assessment
 - Comprehensive review of alternatives
 - Countywide initiatives
 - Plan implementation and maintenance procedures.

Once this review is complete, the jurisdiction will complete its specific annex using the template and instructions provided by the POC.

- The development of the new jurisdiction's annex must not be completed by one individual in isolation. The jurisdiction must develop, implement and describe a public involvement strategy and a methodology to identify and vet jurisdiction-specific actions. The original partnership was covered under a uniform public involvement strategy and a process to identify actions that covered the planning area described in Volume 1 and Volume 2 of this plan. Since new partners were not addressed by these strategies, they will have to initiate new strategies and describe them in their annex. For consistency, new partners are encouraged to develop and implement strategies similar to those described in this plan.
- The public involvement strategy must ensure the public's ability to participate in the plan development process. At a minimum, the new jurisdiction must solicit public opinion on hazard mitigation at the onset of the linkage process and hold one or more public meetings to present the draft jurisdiction-specific annex for comment at least two weeks prior to adoption by the governing body. The POC will have resources available to aid in the public involvement strategy, including:
 - The questionnaire utilized in the plan development
 - Presentations from public meeting workshops and the public comment period
 - Flyers and information cards that were distributed to the public
 - Press releases used throughout the planning process
 - The plan website.
- The methodology to identify actions should include a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard and a description of the process by which chosen actions were identified. As part of this process, linking jurisdictions should coordinate the selection of actions amongst the jurisdiction's various departments.
- Once their public involvement strategy and template are completed, the new jurisdiction will submit the completed package to the POC for a pre-adoption review to ensure conformance with the Regional plan format and linkage procedure requirements.
- The POC will review for the following:
 - Documentation of public involvement and action plan development strategies
 - Conformance of template entries with guidelines outlined in instructions
 - Chosen initiatives are consistent with goals, objectives and mitigation catalog of the Regional Hazard Mitigation Plan Update

PROCEDURES FOR LINKING TO THE REGIONAL HAZARD MITIGATION PLAN

- A designated point of contact
- Plans will be reviewed by the POC and submitted to Washington State Emergency Management Division (EMD) for review and approval.
- EMD will review plans for federal compliance. Non-compliant plans are returned to the lead agency for correction. Compliant plans are forwarded to FEMA for review with annotation as to the adoption status.
- FEMA reviews the new jurisdiction's plan in association with the approved plan to ensure DMA compliance. FEMA notifies the new jurisdiction of the results of review with copies to EMD and the approved plan lead agency.
- New jurisdiction corrects plan shortfalls (if necessary) and resubmits to EMD through the approved plan lead agency.
- For plans with no shortfalls from the FEMA review that have not been adopted, the new jurisdiction governing authority adopts the plan and forwards adoption resolution to FEMA with copies to lead agency and EMD.
- FEMA regional director notifies the new jurisdiction's governing authority of the plan's approval.

The new jurisdiction plan is then included with the regional plan, and the new jurisdiction is committed to participate in the ongoing plan implementation and maintenance strategies.

DECREASING THE PARTNERSHIP

The eligibility afforded under this process to the planning partnership can be rescinded in two ways. First, a participating planning partner can ask to be removed from the partnership. This may be done because the partner has decided to develop its own plan or has identified a different planning process for which it can gain eligibility. A partner that wishes to voluntarily leave the partnership shall inform the POC of this desire in writing. This notification can occur any time during the calendar year. A jurisdiction wishing to pursue this avenue is advised to make sure that it is eligible under the new planning effort, to avoid any period of being out of compliance with the Disaster Mitigation Act.

After receiving this notification, the POC shall immediately notify both the Washington State Emergency Management Division and FEMA in writing that the partner in question is no longer covered by the Regional Hazard Mitigation Plan Update, and that the eligibility afforded that partner under this plan should be rescinded based on this notification.

The second way a partner can be removed from the partnership is by failure to meet the participation requirements specified in the "Planning Partner Expectations" package provided to each partner at the beginning of the process, or the plan maintenance and implementation procedures specified under Chapter 21 in Volume 1 of the plan. Each partner agreed to these terms by adopting the plan.

Eligibility status of the planning partnership will be monitored by the POC. The determination of whether a partner is meeting its participation requirements will be based on the following parameters:

- Are progress reports being submitted annually by the specified time frames?
- Are partners notifying the POC of changes in designated points of contact?
- Are the partners supporting the Steering Committee by attending designated meetings or responding to needs identified by the body?

- Are the partners continuing to be supportive as specified in the Planning Partners expectations package provided to them at the beginning of the process?

Participation in the plan does not end with plan approval. This partnership was formed on the premise that a group of planning partners would pool resources and work together to strive to reduce risk within the planning area. Failure to support this premise lessens the effectiveness of this effort. The following procedures will be followed to remove a partner due to the lack of participation:

- The POC will advise the Steering Committee of this pending action and provide evidence or justification for the action. Justification may include: multiple failures to submit annual progress reports, failure to attend meetings determined to be mandatory by the Steering Committee, failure to act on the partner's action plan, or inability to reach designated point of contact after a minimum of five attempts.
- The Steering Committee will review information provided by POC, and determine action by a vote. The Steering Committee will invoke the voting process established in the ground rules established during the formation of this body.
- Once the Steering Committee has approved an action, the POC will notify the planning partner of the pending action in writing via certified mail. This notification will outline the grounds for the action, and ask the partner if it is their desire to remain as a partner. This notification shall also clearly identify the ramifications of removal from the partnership. The partner will be given 30 days to respond to the notification.
- Confirmation by the partner that they no longer wish to participate or failure to respond to the notification shall trigger the procedures for voluntary removal discussed above.
- Should the partner respond that they would like to continue participation in the partnership, they must clearly articulate an action plan to address the deficiencies identified by the POC. This action plan shall be reviewed by the Steering Committee to determine whether the actions are appropriate to rescind the action. Those partners that satisfy the Steering Committee's review will remain in the partnership, and no further action is required.
- Automatic removal from the partnership will be implemented for partners where these actions have to be initiated more than once in a 5-year planning cycle.

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**APPENDIX C.
ANNEX INSTRUCTIONS AND TEMPLATES**

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Appendix C1.
Annex Instructions and Templates for Municipalities

Updated November 2013

INSTRUCTIONS FOR COMPLETING MUNICIPALITY ANNEX TEMPLATE

This document provides instructions for city and county governments participating in multi-partner hazard mitigation planning. These instructions are intended for municipalities that do not have a FEMA approved hazard mitigation plan.

Assistance in completing the template will be available in the form of a workshop for all Planning Partners in November and technical assistance as requested and as funding allows. Any questions on completing the template should be directed to:

Rob Flaner
208. 939.4391
Rob.Flaner@TetraTech.com

Fully completed templates must be completed and returned by:

Friday, January 17, 2014.

A NOTE ABOUT FORMATTING

The template for the jurisdiction annex is a Microsoft Word document in a format that will be used in the final plan. Partners are asked to use this template so that a uniform product will be completed for each partner. Partners who do not have Microsoft Word capability may prepare the document in other formats, and the planning team will convert it to the Word format.

Content should be entered within the yellow, highlighted text that is currently in the template, rather than creating text in another document and pasting it into the template. Text from another source will alter the style and formatting of the document.

The numbering in the document will be updated when completed annexes are combined into the final document. Please do not adjust any of this numbering.

Municipality Annex:

This document provides instructions for completing the jurisdictional annex template for city and county governments.

Please refer all questions to:

Rob Flaner
208.939.4391
rob.flaner@tetrattech.com

Please complete and return by:

Friday, January 17, 2014

Please email completed template to:

Kristen Gelino
425.482.7801
kristen.gelino@tetrattech.com

Associated Materials:

Along with the annex template and these instructions, you have been provided with other materials with information that is needed for completing the template. Be sure to review these materials before you begin the process of filling in the template:

- SHELDUS historical event data
- Summary-of-loss matrix for the hazard mitigation plan,
- Results from the hazard mitigation plan questionnaire,
- Catalog of funding programs,
- Catalog of mitigation alternatives, and
- Fact sheet on Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Grant Program (PDM).

CHAPTER NUMBER AND TITLE

In the chapter title at the top of page 1, type in the complete official name of your jurisdiction (The City of Metropolis, Jefferson County, etc.), replacing the yellow, highlighted text.

HAZARD MITIGATION PLAN POINT OF CONTACT

Please provide the name, title, mailing address, telephone number, and e-mail address for the primary point of contact for your jurisdiction. This should be the person responsible for monitoring, evaluating and updating the annex for your jurisdiction. This person should also be the principle liaison between your jurisdiction and the Steering Committee overseeing development of this plan.

In addition, designate an alternate point of contact. This would be a person to contact should the primary point of contact be unavailable or no longer employed by the jurisdiction.

JURISDICTION PROFILE

Provide information specific to your jurisdiction as indicated, in a style similar to the example provided in the box at right. This should be information that was not provided in the overall mitigation plan document. For population data, use the most current population figure for your jurisdiction based on an official means of tracking (e.g., the U.S. Census or state office of financial management).

Please be sure to include information about who will adopt the Plan and who will oversee plan implementation. Consider using the following sentence: _____ assumes responsibility for the adoption of this plan; _____ will oversee its implementation.

For each bullet point, please replace the highlighted, yellow text with your jurisdiction-specific information.

Example Jurisdiction Profile:

- **Date of Incorporation**—1858
- **Current Population**—17,289 as of July 2006
- **Population Growth**—Based on the data tracked by the California Department of Finance, Arcata has experienced a relatively flat rate of growth. The overall population has increased only 3.4% since 2000 and has averaged 0.74% per year from 1990 to 2007
- **Location and Description**—The City of Arcata is located on California's redwood coast, approximately 760 miles north of Los Angeles and 275 miles north of San Francisco. The nearest seaport is Eureka, five miles south on Humboldt Bay. Arcata is the home of Humboldt State University and is situated between the communities of McKinleyville to the north and Blue Lake to the east. It sits at the intersection of US Highway 101 and State Route 299.
- **Brief History**—The Arcata area was settled during the California gold rush in the 1850s as a supply center for miners. As the gold rush died down, timber and fishing became the area's major economic resource. Arcata was incorporated in 1858 and by 1913 the Humboldt Teachers College, a predecessor to today's Humboldt State University was founded in Arcata. Recently, the presence of the college has come to shape Arcata's population into a young, liberal, and educated crowd. In 1981 Arcata developed the Arcata Marsh and Wildlife sanctuary, an innovative environmentally friendly, sewage treatment enhancement system.
- **Climate**—Arcata's weather is typical of the Northern California coast, with mild summers and cool, wet winters. It rarely freezes in the winter and it is rarely hot in the summer. Annual average rainfall is over 40 inches, with 80% of that falling in the six-month period of November through April. The average year-round temperature is 59°F. Humidity averages between 72 and 87 percent. Prevailing winds are from the north, and average 5 mph.
- **Governing Body Format**—The City of Arcata is governed by a five-member City Council. The City consists of six departments: Finance, Environmental Services, Community Development, Public Works, Police and the City Manager's Office. The City has 13 Committees, Commissions and Task Forces, which report to the City Council.
- **Development Trends**—Anticipated development levels for Arcata are low to moderate, consisting primarily of residential development. The majority of recent development has been infill. Residentially, there has been a focus on affordable housing and a push for more secondary mother-in-law units on properties.

The City of Arcata adopted its general plan in July 2000. The plan focuses on issues of the greatest concern to the community. City actions, such as those relating to land use allocations, annexations, zoning, subdivision and design review, redevelopment, and capital improvements, must be consistent with such a plan. Future growth and development in the City will be managed as identified in the general plan.

CAPABILITY ASSESSMENT

NOTE: Please do not attempt to complete this section of the template by yourself. You will need to reach out to other departments within your jurisdiction to find the answers to these questions. Departments such as, Planning, Public Works/Engineering, and Emergency Services are responsible for the implementation of many of the capabilities listed in this assessment. If you find that your jurisdiction does not have any of the listed capabilities, then ask yourself or the responsible department “why?” Remember, increasing capability is a way to reduce risk and is, therefore, a viable mitigation action.

Legal and Regulatory Capability

Describe the legal authorities available to your jurisdiction and/or enabling legislation at the state level affecting planning and land management tools that can support hazard mitigation initiatives. In Table 1-1, indicate “Yes” or “No” for each listed code, ordinance, requirement or planning document in each of the following columns:

- **Local Authority**—Enter “Yes” if your jurisdiction has prepared or adopted the identified item; otherwise, enter “No.” If yes, then enter the code or ordinance number and its date of adoption in the comments column. It is very important that you list the code citation as well as date of adoption. Identification of old codes often are leads to identifying mitigation actions. For example, if your flood damage prevention ordinance has a date of adoption prior to 2004, there is a good chance that the ordinance is out of compliance with the National Flood Insurance Program (NFIP). This should be addressed as an action in your action plan. If a code has been updated since its initial adoption date, please provide the date of the most recent update.
- **State or Federal Prohibitions**—Enter “Yes” if there are any state or federal regulations or laws that would prohibit local implementation of the identified item; otherwise, enter “No.”
- **Other Regulatory Authority**—Enter “Yes” if there are any regulations that may impact your initiative that are enforced or administered by another agency (e.g., a state agency or special purpose district); otherwise, enter “No.”
- **State Mandated**—Enter “Yes” if state laws or other requirements enable or require the listed item to be implemented at the local level; otherwise, enter “No.”

A Note On Planning Documents:

Comprehensive Plans - Jurisdictions that engage in comprehensive planning may wish to link their plan to the hazard mitigation plan. This linkage can occur in many related elements such as the safety element or in the critical areas discussion of the land use element.

Capital Improvement Programs - CIPs may address a variety of infrastructure such as sewer, water, drainage, roads and storm water. Capital Facilities Plans are a required element of the Washington State Growth Management Act; however, counties and municipalities may have differing definitions of “capital.”

Fiscal Capability

Identify what financial resources (other than the Hazard Mitigation Grant Program and the Pre-Disaster Mitigation Grant Program) are available to your jurisdiction for implementing mitigation initiatives.

Complete Table 1-2 by indicating whether each of the listed financial resources is accessible to your jurisdiction. Enter “Yes” if the resource is fully accessible to your jurisdiction. Enter “No” if there are limitations or prerequisites that may hinder your eligibility for this resource.

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Administrative and Technical Capability

This section requires you to take inventory of the staff/personnel resources available to your jurisdiction to help with hazard mitigation planning and the implementation of specific mitigation actions.

Complete Table 1-3 by indicating whether your jurisdiction has access to each of the listed personnel resources. Enter “Yes” or “No” in the column labeled “Available?” If yes, then enter the department and position title in the right-hand column.

National Flood Insurance Program Compliance

For those communities that participate in the National Flood Insurance program (NFIP), this section will aid in meeting the requirements specified in 44CFR 201.6(c)(3)(ii)), dealing with the maintenance of NFIP compliance. This section asks a series of questions aimed at identifying the community’s floodplain management program and any inherent needs within that program. Table 1-4 asks nine questions about the community floodplain management program. To complete this table, you will need to identify the department responsible for floodplain management within your jurisdiction. Guidance on how to respond to each of these questions is as follows:

What department is responsible for floodplain management in your community?	All communities that participate in the NFIP must appoint a department that is responsible for the administration of its floodplain management program. This can be designated in the actual ordinance language. Places to check include; Building Department, Community Development, Public Works or Engineering Department
Who is your Community’s Floodplain Administrator? (Department/Position)	This position will be designated in the Community’s flood damage prevention ordinance. Please confirm that this position is still acting as the designated Flood Plain Administrator. If it is not, then you will need to amend your ordinance.
Do you have any Certified Floodplain Managers (CFM) on staff within your community?	The Association of State Floodplain Managers has established a national program for professional certification of floodplain managers. The program recognizes continuing education and professional development that enhance the knowledge and performance of local, state, federal, and private-sector floodplain managers. The role of the nation’s floodplain managers is expanding due to increases in disaster losses, the emphasis being placed upon mitigation to alleviate the cycle of damage-rebuild-damage, and a recognized need for professionals to adequately address these issues. This certification program lays the foundation for ensuring that highly qualified individuals are available to meet the challenge of breaking the damage cycle and stopping its negative drain on the nation’s human, financial, and natural resources.
What is the date of adoption of your flood damage prevention ordinance?	Check the date your floodplain management ordinance was last adopted/amended. Please site the code number and whether this date reflects the initial adoption date or an amendment date.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	The CAV is the method utilized by FEMA to monitor NFIP compliance. CAV’s are supposed to occur every 3 to 5 years. They can be performed by the FEMA Regional Office or by the State Coordinating Agency. The best source for this information is your

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	Community Floodplain Administrator. If she or he does not know, you should check with the State NFIP Coordinator: Scott McKinney, Washington Department of Ecology 360-407-6131 scott.mckinney@ecy.wa.gov
To the best of your knowledge, does your community have any outstanding NFIP compliance violations that need to be addressed? If so, please state what they are.	If any administrative problems or potential violations are identified during a CAV the community will be notified and given the opportunity to correct those administrative procedures and remedy the violations to the maximum extent possible within established deadlines. The best source for this information is your Community Floodplain Administrator. If she does not know, you should check with the State NFIP Coordinator.
Do your flood hazard maps adequately address the flood risk within your community? (If no, please state why).	If you believe that the flood hazard maps for your community do not adequately address the flood risk, please provide an explanation. If you believe the maps do adequately address the flood risk within your community, please answer "Yes."
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	What do you need to make your floodplain management program better? Do you need staffing, training, better maps? This is the section where you identify needs. Needs result in actions. If you identify needs here, you should identify an action in your action plan to address those needs. It is plausible to answer "nothing" here. But to do so, you need to have a very well established floodplain management program or little or no floodplain to manage.
Does your community participate in the Community Rating System (CRS)? If so, is your community seeking to improve its CRS Classification? If not, is your community interested in joining the CRS program?	The CRS program is a part of the National Flood Insurance Program that rewards participating communities for exceeding the minimum requirements of the NFIP by lowering the cost of flood insurance premiums in participating jurisdictions. The CRS provides credit for 18, non-structural flood mitigation activities. The CRS program is voluntary, and communities must be in full compliance and good standing under the NFIP to be eligible to apply.

Community Mitigation Related Classifications

The Planning Team will complete Table 1-5 to indicate your jurisdiction's participation in various national programs related to natural hazard mitigation. You do not need to provide information for this table.

JURISDICTION-SPECIFIC NATURAL HAZARD EVENT HISTORY

Chronological List of Hazard Events

In Table 1-6, list in chronological order (most recent first) any natural hazard event that has caused damage to your jurisdiction since 1975. Include the date of the event and the estimated dollar amount of

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damage it caused. Please refer to the summary of natural hazard events in the SHELDUS historical data included in your tool kit. Potential sources of damage information include:

- Preliminary damage estimates your jurisdiction filed with the county or state
- Insurance claims data
- Newspaper archives
- Other plans/documents that deal with emergency management (safety element of a comprehensive plan, emergency response plan, etc.)
- Citizen input.

Repetitive Loss Properties

A repetitive loss property is any property for which FEMA has paid two or more flood insurance claims in excess of \$1,000 in any rolling 10-year period since 1978. The Planning Team will provide information regarding repetitive loss properties for your jurisdiction. Please do not worry about completing this portion of the template.

HAZARD RISK RANKING

The risk ranking performed for the overall planning area is presented in the risk assessment section of the overall hazard mitigation plan. However, each jurisdiction has differing degrees of risk exposure and vulnerability and, therefore, needs to rank risk for its own area, using the same methodology as used for the overall planning area. The risk-ranking exercise assesses two variables for each hazard: its probability of occurrence; and its potential impact on people, property and the economy. A detailed discussion of the concepts associated with risk ranking is provided in the overall hazard mitigation plan. The instructions below outline steps for assessing risk in your jurisdiction to develop results that are to be included in the template.

Determine Probability of Occurrence for Each Hazard

A probability factor is assigned based on how often a hazard is likely to occur. In Table 1, list the probability of occurrence for each hazard as it pertains to your jurisdiction, along with its probability factor, as follows:

- **High**—Hazard event is likely to occur within 25 years (Probability Factor = 3)
- **Medium**—Hazard event is likely to occur within 100 years (Probability Factor = 2)
- **Low**—Hazard event is not likely to occur within 100 years (Probability Factor = 1)
- **None**—If there is no exposure to a hazard, there is no probability of occurrence (Probability Factor = 0)

The probability of occurrence of a hazard event is generally based on past hazard events in an area. For example, if your jurisdiction has experienced two damaging floods in the last 25 years, the probability of occurrence is high for flooding and scores a 3 under this category. If your jurisdiction has experienced no damage from landslides in the last 100 years, your probability of occurrence for landslide is low, and scores a 1 under this category.

TABLE 1. HAZARD PROBABILITY OF OCCURRENCE		
Hazard Type	Probability	Probability Factor

Determine Potential Impacts of Each Hazard

The impact of each hazard was divided into three categories: impacts on people, impacts on property, and impacts on the economy. These categories were also assigned weighted values. Impact on people was assigned a weighting factor of 3, impact on property was assigned a weighting factor of 2 and impact on the economy was assigned a weighting factor of 1. Steps to assess each type of impact are described below.

Impacts on People

To assess impacts on people, values are assigned based on the percentage of the total *population exposed* to the hazard event. The degree of impact on individuals will vary and is not measurable, so the calculation assumes for simplicity and consistency that all people exposed to a hazard because they live in a hazard zone will be equally impacted when a hazard event occurs. In Table 2, list the potential impact of each hazard on people in your jurisdiction, along with its impact factor, as follows:

- **High Impact**—30% or more of the population is exposed to a hazard (Impact Factor = 3)
- **Medium Impact**—15% to 29% of the population is exposed to a hazard (Impact Factor = 2)
- **Low Impact**—14% or less of the population is exposed to the hazard (Impact Factor = 1)
- **No Impact**—None of the population is exposed to a hazard (Impact Factor = 0)

TABLE 2. HAZARD IMPACT ON PEOPLE			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 3)

Impacts on Property

To assess impacts on property, values are assigned based on the percentage of the total *property value exposed* to the hazard event. In Table 3, enter the cost estimates for potential damage to exposed structures, taken from the “Summary of Loss” matrix provided with these instructions.

TABLE 3. COST ESTIMATES FOR POTENTIAL DAMAGE TO STRUCTURES	
Hazard type	Estimate of Potential Dollar Losses to Exposed Structures

In Table 4, list the potential impact of each hazard on property in your jurisdiction, along with its impact factor. Determine impact based on damage estimates from Table 3, as follows:

- **High Impact**—25% or more of the total assessed property value is exposed to a hazard (Impact Factor = 3)

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- **Medium Impact**—10% to 24% of the total assessed property value is exposed to a hazard (Impact Factor = 2)
- **Low Impact**—9% or less of the total assessed property value is exposed to the hazard (Impact Factor = 1)
- **No Impact**—None of the total assessed property value is exposed to a hazard (Impact Factor = 0)

TABLE 4. HAZARD IMPACT ON PROPERTY			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 2)

Impacts on the Economy

To assess impacts on the economy, values are assigned based on the percentage of the total *property value vulnerable* to the hazard event. Values represent estimates of the loss from a major event of each hazard in comparison to the total assessed value of property in the county. For some hazards, such as wildland fire, landslide and severe weather, vulnerability is the same as exposure due to the lack of loss estimation tools specific to those hazards. In Table 5, list the potential impact of each hazard on the economy in your jurisdiction, along with its impact factor, as follows:

- **High Impact**—Estimated loss from the hazard is 15% or more of the total assessed property value (Impact Factor = 3)
- **Medium Impact**—Estimated loss from the hazard is 5% to 14% of the total assessed property value (Impact Factor = 2)
- **Low Impact**—Estimated loss from the hazard is 4% or less of the total assessed property value (Impact Factor = 1)
- **No Impact**—No loss is estimated from the hazard (Impact Factor = 0)

TABLE 5. HAZARD IMPACT ON THE ECONOMY			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 1)

Determine Risk Rating for Each Hazard

A risk rating for each hazard is determined by multiplying the assigned probability factor by the sum of the weighted impact factors for people, property and the economy:

- Risk Rating = Probability Factor x Weighted Impact Factor {people + property + economy}

Using the results developed in Tables 1, 2, 4 and 5, complete Table 6 to calculate a risk rating for each hazard of concern.

TABLE 6. HAZARD RISK RATING			
Hazard Type	Probability Factor (P)	Sum of Weighted Impact Factors on People, Property & Economy (I)	Risk Rating (P x I)

Complete Risk Ranking in Template

Once Table 6 has been completed above, complete Table 1-7 in your template. The hazard with the highest risk rating in Table 6 should be listed at the top of Table 1-7 and given a rank of 1; the hazard with the second highest rating should be listed second with a rank of 2; and so on. Two hazards with equal risk ratings should be given the same rank.

It is important to note that this exercise should not override your subjective assessment of relative risk based on your knowledge of the history of natural hazard events in your jurisdiction. If this risk ranking exercise generates results other than what you know based on substantiated data and documentation, you may alter the ranking based on this knowledge. If this is the case, please note this fact in the comments at the end of the template. Remember, one of the purposes of this exercise is to support the selection and prioritization of initiatives in your plan. If you identify an initiative with a high priority that mitigates the risk of a hazard you have ranked low, that project will not be competitive in the grant arena.

HAZARD MITIGATION ACTION PLAN

Action Plan Matrix

Identify the initiatives your jurisdiction would like to pursue with this plan. Refer to the mitigation catalog for mitigation options you might want to consider. Be sure to consider the following factors in your selection of initiatives:

- Select initiatives that are consistent with the overall goals, objectives and vision of the hazard mitigation plan. The approved goals, objectives and vision are included in your tool kit.
- Identify projects where benefits exceed costs.
- Include any project that your jurisdiction has committed to pursuing regardless of grant eligibility.
- Know what is and is not grant-eligible under the HMGP and PDM (see fact sheet provided). Listing HMGP or PDM as a potential funding source for an ineligible project will be a red flag when this plan goes through review. If you have projects that are not HMGP or PDM grant eligible, but do mitigate part or the entire hazard and may be eligible for other grant programs sponsored by other agencies, include them in this section.
- Although you should identify at least one initiative for your highest ranked risk, a hazard-specific project is not required for every hazard. If you have not identified an earthquake related project, and an earthquake occurs that causes damage in your jurisdiction, you are not discounted from HMGP project grant eligibility.

Wording Your Initiative Descriptions:

Descriptions of your initiatives need not provide great detail. That will come when you apply for a project grant. Provide enough information to identify the project's scope and impact. The following are typical descriptions for an action plan initiative:

- **Initiative 1**—Address Repetitive Loss properties. Through targeted mitigation, acquire, relocate or retrofit the five repetitive loss structures in the County as funding opportunities become available.
- **Initiative 2**—Perform a non-structural, seismic retrofit of City Hall.
- **Initiative 3**—Acquire floodplain property in the Smith subdivision.
- **Initiative 4**—Enhance the County flood warning capability by joining the NOAA "Storm Ready" program.

Complete Table 1-8 for all the initiatives you have identified:

- Enter the initiative number and description.

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- Indicate whether the initiative mitigates hazards for new or existing assets.
- Identify the specific hazards the initiative will mitigate.
- Identify by number the mitigation plan objectives that the initiative addresses. The approved goals, objectives and vision are included in your tool kit.
- Indicate who will be the lead in administering the project. This will most likely be your governing body.
- Identify funding sources for the project. If it is a grant, include the funding sources for the cost share. Refer to your fiscal capability assessment (Table 1-2) to identify possible sources of funding.
- Indicate the time line as “short term” (1 to 5 years) or “long term” (5 years or greater).

Technical assistance will be provided upon request.

Prioritization of Mitigation Initiatives

Complete the information in Table 1-9 as follows:

- **Initiative #**—Indicate the initiative number from Table 1-8.
- **# of Objectives Met**—Enter the number of objectives the initiative will meet.
- **Benefits**—Enter “High,” “Medium” or “Low” as follows:
 - **High:** Project will have an immediate impact on the reduction of risk exposure to life and property.
 - **Medium:** Project will have a long-term impact on the reduction of risk exposure to life and property, or project will provide an immediate reduction in the risk exposure to property.
 - **Low:** Long-term benefits of the project are difficult to quantify in the short term.
- **Costs**—Enter “High,” “Medium” or “Low” as follows:
 - **High:** Would require an increase in revenue via an alternative source (e.g., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover the costs of the proposed project.
 - **Medium:** Could budget for under existing work-plan, but would require a reapportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
 - **Low:** Possible to fund under existing budget. Project is part of, or can be part of an existing ongoing program.

If you know the estimated cost of a project because it is part of an existing, ongoing program, indicate the amount.

- **Do Benefits Equal or Exceed the Cost?**—Enter “Yes” or “No.” This is a qualitative assessment. Enter “Yes” if the benefit rating (high, medium or low) is the same as or higher than the cost rating (high benefit/high cost; high benefit/medium cost; medium benefit/low cost; etc.). Enter “No” if the benefit rating is lower than the cost rating (medium benefit/high cost, low benefit/medium cost; etc.)
- **Is the Project Grant-Eligible?**—Enter “Yes” or “No.” Refer to the fact sheet on HMGP and PDM.

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- **Can Project Be Funded Under Existing Program Budgets?**—Enter “Yes” or “No.” In other words, is this initiative currently budgeted for, or would it require a new budget authorization or funding from another source such as grants?
- **Priority**— Enter “High,” “Medium” or “Low” as follows:
 - **High:** Project meets multiple plan objectives, benefits exceed cost, funding is secured under existing programs, or is grant eligible, and project can be completed in 1 to 5 years (i.e., short term project) once funded.
 - **Medium:** Project meets at least 1 plan objective, benefits exceed costs, requires special funding authorization under existing programs, grant eligibility is questionable, and project can be completed in 1 to 5 years once funded.
 - **Low:** Project will mitigate the risk of a hazard, benefits exceed costs, funding has not been secured, project is not grant eligible, and time line for completion is long term (5 to 10 years).

This prioritization is a simple review to determine that the initiatives you have identified meet one of the primary objectives of the Disaster Mitigation Act. It is not the detailed benefit/cost analysis required for HMGP/PDM project grants. The prioritization will identify any projects whose probable benefits will not exceed the probable costs.

Analysis of Mitigation Actions

Complete Table 1-10 by summarizing the mitigation actions by hazard of concern and the following six mitigation types:

- **Prevention**—Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. Includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
- **Property Protection**—Modification of buildings or structures to protect them from a hazard or removal of structures from a hazard area. Includes acquisition, elevation, relocation, structural retrofit, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness**—Actions to inform citizens and elected officials about hazards and ways to mitigate them. Includes outreach projects, real estate disclosure, hazard information centers, and school-age and adult education.
- **Natural Resource Protection**—Actions that minimize hazard loss and preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Emergency Services**—Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities.
- **Structural Projects**—Actions that involve the construction of structures to reduce the impact of a hazard. Includes dams, setback levees, floodwalls, retaining walls, and safe rooms.

This exercise demonstrates that the jurisdiction has selected a comprehensive range of actions.

FUTURE NEEDS TO BETTER UNDERSTAND RISK/VULNERABILITY

In this section, identify any future studies, analyses, reports, or surveys your jurisdiction needs to better understand its vulnerability to identified or currently unidentified risks. These could be needs based on federal or state agency mandates such as EPA's Bio-terrorism assessment requirement for water districts.

ADDITIONAL COMMENTS

Use this section to add any additional information pertinent to hazard mitigation and your jurisdiction not covered in this template.

As you complete your template, please forward it to:

Kristen Gelino, Tetra Tech, Inc.

425.482.7801

Kristen.Gelino@TetraTech.com

CHAPTER 1. INSERT JURISDICTION NAME ANNEX

1.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

Name, Title
Street Address
City, State ZIP
Telephone: Phone #
e-mail Address: email address

Alternate Point of Contact

Name, Title
Street Address
City, State ZIP
Telephone: Phone #
e-mail Address: email address

1.2 JURISDICTION PROFILE

The following is a summary of key information about the jurisdiction and its history:

- **Date of Incorporation**—Insert Date of Incorporation
- **Current Population**—Insert Population as of Insert Date of Population Count
- **Population Growth**—Insert Discussion of Population Growth
- **Location and Description**—Insert Description of Location, Surroundings, Key Geographic Features
- **Brief History**—Insert Summary Discussion of Jurisdiction's History
- **Climate**—Insert Summary Discussion of Climate
- **Governing Body Format**—Insert Summary Description of Governing Body
- **Development Trends**—Insert Summary Description of Development

1.3 CAPABILITY ASSESSMENT

The assessment of the jurisdiction's legal and regulatory capabilities is presented in Table 1-1. The assessment of the jurisdiction's fiscal capabilities is presented in Table 1-2. The assessment of the jurisdiction's administrative and technical capabilities is presented in Table 1-3. Information on the community's National Flood Insurance Program (NFIP) compliance is presented in Table 1-4. Classifications under various community mitigation programs are presented in Table 1-5.

TABLE 1-1. LEGAL AND REGULATORY CAPABILITY					
	Local Authority	State or Federal Prohibitions	Other Jurisdictional Authority	State Mandated	Comments
Codes, Ordinances & Requirements					
Building Code					
Zonings					
Subdivisions					
Stormwater Management					
Post Disaster Recovery					
Real Estate Disclosure					
Growth Management					
Site Plan Review					
Public Health and Safety					
Environmental Protection					
Planning Documents					
General or Comprehensive Plan					<i>Is the plan equipped to provide linkage to this mitigation plan?</i> Yes or No
Floodplain or Basin Plan					
Stormwater Plan					
Capital Improvement Plan					<i>What types of capital facilities does the plan address?</i> <i>How often is the plan revised/updated?</i> Yes or No
Habitat Conservation Plan					
Economic Development Plan					
Shoreline Management Plan					
Community Wildfire Protection Plan					
Response/Recovery Planning					
Comprehensive Emergency Management Plan					
Threat and Hazard Identification and Risk Assessment					
Terrorism Plan					
Post-Disaster Recovery Plan					
Continuity of Operations Plan					
Public Health Plans					

INSERT JURISDICTION NAME ANNEX

TABLE 1-2. FISCAL CAPABILITY	
Financial Resources	Accessible or Eligible to Use?
Community Development Block Grants	
Capital Improvements Project Funding	
Authority to Levy Taxes for Specific Purposes	
User Fees for Water, Sewer, Gas or Electric Service	
Incur Debt through General Obligation Bonds	
Incur Debt through Special Tax Bonds	
Incur Debt through Private Activity Bonds	
Withhold Public Expenditures in Hazard-Prone Areas	
State Sponsored Grant Programs	
Development Impact Fees for Homebuyers or Developers	
Other	

TABLE 1-3. ADMINISTRATIVE AND TECHNICAL CAPABILITY		
Staff/Personnel Resources	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices		
Engineers or professionals trained in building or infrastructure construction practices		
Planners or engineers with an understanding of natural hazards		
Staff with training in benefit/cost analysis		
Surveyors		
Personnel skilled or trained in GIS applications		
Scientist familiar with natural hazards in local area		
Emergency manager		
Grant writers		

**TABLE 1-4.
NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE**

What department is responsible for floodplain management in your community?	
Who is your community's floodplain administrator? (department/position)	
Do you have any certified floodplain managers on staff in your community?	
What is the date of adoption of your flood damage prevention ordinance?	
When was the most recent Community Assistance Visit or Community Assistance Contact?	
To the best of your knowledge, does your community have any outstanding NFIP compliance violations that need to be addressed? If so, please state what they are.	
Do your flood hazard maps adequately address the flood risk within your community? (If no, please state why)	
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	
Does your community participate in the Community Rating System (CRS)? If so, is your community seeking to improve its CRS Classification? If not, is your community interested in joining the CRS program?	

**TABLE 1-5.
COMMUNITY CLASSIFICATIONS**

	Participating?	Classification	Date Classified
Community Rating System			
Building Code Effectiveness Grading Schedule			
Public Protection			
Storm Ready			
Firewise			
Tsunami Ready (if applicable)			

1.4 JURISDICTION-SPECIFIC NATURAL HAZARD EVENT HISTORY

Table 1-6 lists all past occurrences of natural hazards within the jurisdiction. Repetitive flood loss records are as follows:

- Number of FEMA-Identified Repetitive Loss Properties: **Insert #**
- Number of FEMA-Identified Severe Repetitive Loss Properties: **Insert #**
- Number of Repetitive Flood Loss/Severe Repetitive Loss Properties That Have Been Mitigated: **Insert #**

1.5 HAZARD RISK RANKING

Table 1-7 presents the ranking of the hazards of concern.

Hazard area extent and location maps are included at the end of this chapter. These maps are based on the best available data at the time of the preparation of this plan, and are considered to be adequate for planning purposes. **Delete this paragraph if no maps available.**

TABLE 1-7. HAZARD RISK RANKING		
Rank	Hazard Type	Risk Rating Score (Probability x Impact)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

 INSERT JURISDICTION NAME ANNEX

1.6 HAZARD MITIGATION ACTION PLAN AND EVALUATION OF RECOMMENDED INITIATIVES

Table 1-8 lists the initiatives that make up the jurisdiction's hazard mitigation plan. Table 1-9 identifies the priority for each initiative. Table 1-10 summarizes the mitigation initiatives by hazard of concern and the six mitigation types.

TABLE 1-8. HAZARD MITIGATION ACTION PLAN MATRIX						
Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						

1-8

INSERT JURISDICTION NAME ANNEX

TABLE 1-10. ANALYSIS OF MITIGATION INITIATIVES						
Hazard Type	Initiative Addressing Hazard, by Mitigation Type ^a					
	1. Prevention	2. Property Protection	3. Public Education and Awareness	4. Natural Resource Protection	5. Emergency Services	6. Structural Projects
Avalanche						
Dam Failure						
Drought						
Earthquake						
Flood						
Landslide						
Severe Weather						
Tsunami						
Volcano						
Wildfire						
a. See Chapter 1 for explanation of mitigation types.						

1.7 FUTURE NEEDS TO BETTER UNDERSTAND RISK/ VULNERABILITY

Insert text, if any; delete section if not used

1.8 ADDITIONAL COMMENTS

Insert text, if any; delete section if not used

Updated November 2013

INSTRUCTIONS FOR COMPLETING MUNICIPALITY UPDATE ANNEX TEMPLATE

This document provides instructions for city and county governments participating in multi-partner hazard mitigation planning. These instructions are intended for municipalities that currently have a FEMA approved hazard mitigation plan.

Assistance in completing the template will be available in the form of a workshop for all Planning Partners in November and technical assistance as requested and as funding allows. Any questions on completing the template should be directed to:

Rob Flaner
208. 939.4391
Rob.Flaner@TetraTech.com

Fully completed templates must be completed and returned by:

Friday, January 17, 2014.

A NOTE ABOUT FORMATTING

The template for the municipal jurisdiction annex is a Microsoft Word document in a format that will be used in the final plan. Partners are asked to use this template so that a uniform product will be completed for each partner. Partners who do not have Microsoft Word capability may prepare the document in other formats, and the planning team will convert it to the Word format.

Content should be entered within the yellow, highlighted text that is currently in the template, rather than creating text in another document and pasting it into the template. Text from another source will alter the style and formatting of the document.

The numbering in the document will be updated when completed annexes are combined into the final document. Please do not adjust any of this numbering.

Municipality Update Annex:

This document provides instructions for completing the jurisdictional annex template for city and county governments.

Please refer all questions to:

Rob Flaner
208.939.4391
rob.flaner@tetratech.com

Please complete and return by:

Friday, January 17, 2013

Please email completed template to:

Kristen Gelino
425.482.7801
kristen.gelino@tetratech.com

Associated Materials:

Along with the annex template and these instructions, you have been provided with other materials with information that is needed for completing the template. Be sure to review these materials before you begin the process of filling in the template:

- SHELDS historical event data
- Summary-of-loss matrix for the hazard mitigation plan,
- Results from the hazard mitigation plan questionnaire,
- Catalog of funding programs,
- Catalog of mitigation alternatives, and
- Fact sheet on Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Grant Program (PDM).

CHAPTER NUMBER AND TITLE

In the chapter title at the top of page 1, type in the complete official name of your jurisdiction (The City of Metropolis, Jefferson County, etc.), replacing the yellow, highlighted text.

HAZARD MITIGATION PLAN POINT OF CONTACT

Please provide the name, title, mailing address, telephone number, and e-mail address for the primary point of contact for your jurisdiction. This should be the person responsible for monitoring, evaluating and updating the annex for your jurisdiction. This person should also be the principle liaison between your jurisdiction and the Steering Committee overseeing development of this plan.

In addition, designate an alternate point of contact. This would be a person to contact should the primary point of contact be unavailable or no longer employed by the jurisdiction.

JURISDICTION PROFILE

Provide information specific to your jurisdiction as indicated, in a style similar to the example provided in the box at right. This should be information that was not provided in the overall mitigation plan document. For population data, use the most current population figure for your jurisdiction based on an official means of tracking (e.g., the U.S. Census or state office of financial management).

Please be sure to include information about who will adopt the Plan and who will oversee plan implementation. Consider using the following sentence: _____ assumes responsibility for the adoption of this plan; _____ will oversee its implementation.

For each bullet point, please replace the highlighted, yellow text with your jurisdiction-specific information.

Example Jurisdiction Profile:

- **Date of Incorporation**—1858
- **Current Population**—17,289 as of July 2006
- **Population Growth**—Based on the data tracked by the California Department of Finance, Arcata has experienced a relatively flat rate of growth. The overall population has increased only 3.4% since 2000 and has averaged 0.74% per year from 1990 to 2007
- **Location and Description**—The City of Arcata is located on California's redwood coast, approximately 760 miles north of Los Angeles and 275 miles north of San Francisco. The nearest seaport is Eureka, five miles south on Humboldt Bay. Arcata is the home of Humboldt State University and is situated between the communities of McKinleyville to the north and Blue Lake to the east. It sits at the intersection of US Highway 101 and State Route 299.
- **Brief History**—The Arcata area was settled during the California gold rush in the 1850s as a supply center for miners. As the gold rush died down, timber and fishing became the area's major economic resource. Arcata was incorporated in 1858 and by 1913 the Humboldt Teachers College, a predecessor to today's Humboldt State University was founded in Arcata. Recently, the presence of the college has come to shape Arcata's population into a young, liberal, and educated crowd. In 1981 Arcata developed the Arcata Marsh and Wildlife sanctuary, an innovative environmentally friendly, sewage treatment enhancement system.
- **Climate**—Arcata's weather is typical of the Northern California coast, with mild summers and cool, wet winters. It rarely freezes in the winter and it is rarely hot in the summer. Annual average rainfall is over 40 inches, with 80% of that falling in the six-month period of November through April. The average year-round temperature is 59°F. Humidity averages between 72 and 87 percent. Prevailing winds are from the north, and average 5 mph.
- **Governing Body Format**—The City of Arcata is governed by a five-member City Council. The City consists of six departments: Finance, Environmental Services, Community Development, Public Works, Police and the City Manager's Office. The City has 13 Committees, Commissions and Task Forces, which report to the City Council.
- **Development Trends**—Anticipated development levels for Arcata are low to moderate, consisting primarily of residential development. The majority of recent development has been infill. Residentially, there has been a focus on affordable housing and a push for more secondary mother-in-law units on properties.

The City of Arcata adopted its general plan in July 2000. The plan focuses on issues of the greatest concern to the community. City actions, such as those relating to land use allocations, annexations, zoning, subdivision and design review, redevelopment, and capital improvements, must be consistent with such a plan. Future growth and development in the City will be managed as identified in the general plan.

CAPABILITY ASSESSMENT

NOTE: Please do not attempt to complete this section of the template by yourself. You will need to reach out to other departments within your jurisdiction to find the answers to these questions. Departments such as, Planning, Public Works/Engineering, and Emergency Services are responsible for the implementation of many of the capabilities listed in this assessment. If you find that your jurisdiction does not have any of the listed capabilities, then ask yourself or the responsible department “why?” Remember, increasing capability is a way to reduce risk and is, therefore, a viable mitigation action.

Legal and Regulatory Capability

Describe the legal authorities available to your jurisdiction and/or enabling legislation at the state level affecting planning and land management tools that can support hazard mitigation initiatives. In Table 1-1, indicate “Yes” or “No” for each listed code, ordinance, requirement or planning document in each of the following columns:

- **Local Authority**—Enter “Yes” if your jurisdiction has prepared or adopted the identified item; otherwise, enter “No.” If yes, then enter the code or ordinance number and its date of adoption in the comments column. It is very important that you list the code citation as well as date of adoption. Identification of old codes often are leads to identifying mitigation actions. For example, if your flood damage prevention ordinance has a date of adoption prior to 2004, there is a good chance that the ordinance is out of compliance with the National Flood Insurance Program (NFIP). This should be addressed as an action in your action plan. If a code has been updated since its initial adoption date, please provide the date of the most recent update.
- **State or Federal Prohibitions**—Enter “Yes” if there are any state or federal regulations or laws that would prohibit local implementation of the identified item; otherwise, enter “No.”
- **Other Regulatory Authority**—Enter “Yes” if there are any regulations that may impact your initiative that are enforced or administered by another agency (e.g., a state agency or special purpose district); otherwise, enter “No.”
- **State Mandated**—Enter “Yes” if state laws or other requirements enable or require the listed item to be implemented at the local level; otherwise, enter “No.”

A Note On Planning Documents:

Comprehensive Plans - Jurisdictions that engage in comprehensive planning may wish to link their plan to the hazard mitigation plan. This linkage can occur in many related elements such as the safety element or in the critical areas discussion of the land use element.

Capital Improvement Programs - CIPs may address a variety of infrastructure such as sewer, water, drainage, roads and storm water. Capital Facilities Plans are a required element of the Washington State Growth Management Act; however, counties and municipalities may have differing definitions of “capital.”

Fiscal Capability

Identify what financial resources (other than the Hazard Mitigation Grant Program and the Pre-Disaster Mitigation Grant Program) are available to your jurisdiction for implementing mitigation initiatives.

Complete Table 1-2 by indicating whether each of the listed financial resources is accessible to your jurisdiction. Enter “Yes” if the resource is fully accessible to your jurisdiction. Enter “No” if there are limitations or prerequisites that may hinder your eligibility for this resource.

Administrative and Technical Capability

This section requires you to take inventory of the staff/personnel resources available to your jurisdiction to help with hazard mitigation planning and the implementation of specific mitigation actions.

Complete Table 1-3 by indicating whether your jurisdiction has access to each of the listed personnel resources. Enter “Yes” or “No” in the column labeled “Available?” If yes, then enter the department and position title in the right-hand column.

National Flood Insurance Program Compliance

For those communities that participate in the National Flood Insurance program (NFIP), this section will aid in meeting the requirements specified in 44CFR 201.6(c)(3)(ii)), dealing with the maintenance of NFIP compliance. This section asks a series of questions aimed at identifying the community’s floodplain management program and any inherent needs within that program. Table 1-4 asks nine questions about the community floodplain management program. To complete this table, you will need to identify the department responsible for floodplain management within your jurisdiction. Guidance on how to respond to each of these questions is as follows:

What department is responsible for floodplain management in your community?	All communities that participate in the NFIP must appoint a department that is responsible for the administration of its floodplain management program. This can be designated in the actual ordinance language. Places to check include; Building Department, Community Development, Public Works or Engineering Department
Who is your Community’s Floodplain Administrator? (Department/Position)	This position will be designated in the Community’s flood damage prevention ordinance. Please confirm that this position is still acting as the designated Flood Plain Administrator. If it is not, then you will need to amend your ordinance.
Do you have any Certified Floodplain Managers (CFM) on staff within your community?	The Association of State Floodplain Managers has established a national program for professional certification of floodplain managers. The program recognizes continuing education and professional development that enhance the knowledge and performance of local, state, federal, and private-sector floodplain managers. The role of the nation’s floodplain managers is expanding due to increases in disaster losses, the emphasis being placed upon mitigation to alleviate the cycle of damage-rebuild-damage, and a recognized need for professionals to adequately address these issues. This certification program lays the foundation for ensuring that highly qualified individuals are available to meet the challenge of breaking the damage cycle and stopping its negative drain on the nation’s human, financial, and natural resources.
What is the date of adoption of your flood damage prevention ordinance?	Check the date your floodplain management ordinance was last adopted/amended. Please site the code number and whether this date reflects the initial adoption date or an amendment date.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	The CAV is the method utilized by FEMA to monitor NFIP compliance. CAV’s are supposed to occur every 3 to 5 years. They can be performed by the FEMA Regional Office or by the State Coordinating Agency. The best source for this information is your

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	Community Floodplain Administrator. If she or he does not know, you should check with the State NFIP Coordinator: Scott McKinney, Washington Department of Ecology 360-407-6131 scott.mckinney@ecy.wa.gov
To the best of your knowledge, does your community have any outstanding NFIP compliance violations that need to be addressed? If so, please state what they are.	If any administrative problems or potential violations are identified during a CAV the community will be notified and given the opportunity to correct those administrative procedures and remedy the violations to the maximum extent possible within established deadlines. The best source for this information is your Community Floodplain Administrator. If she does not know, you should check with the State NFIP Coordinator.
Do your flood hazard maps adequately address the flood risk within your community? (If no, please state why).	If you believe that the flood hazard maps for your community do not adequately address the flood risk, please provide an explanation. If you believe the maps do adequately address the flood risk within your community, please answer "Yes."
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	What do you need to make your floodplain management program better? Do you need staffing, training, better maps? This is the section where you identify needs. Needs result in actions. If you identify needs here, you should identify an action in your action plan to address those needs. It is plausible to answer "nothing" here. But to do so, you need to have a very well established floodplain management program or little or no floodplain to manage.
Does your community participate in the Community Rating System (CRS)? If so, is your community seeking to improve its CRS Classification? If not, is your community interested in joining the CRS program?	The CRS program is a part of the National Flood Insurance Program that rewards participating communities for exceeding the minimum requirements of the NFIP by lowering the cost of flood insurance premiums in participating jurisdictions. The CRS provides credit for 18, non-structural flood mitigation activities. The CRS program is voluntary, and communities must be in full compliance and good standing under the NFIP to be eligible to apply.

Community Mitigation Related Classifications

The Planning Team will complete Table 1-5 to indicate your jurisdiction's participation in various national programs related to natural hazard mitigation. You do not need to provide information for this table.

JURISDICTION-SPECIFIC NATURAL HAZARD EVENT HISTORY

Chronological List of Hazard Events

In Table 1-6, list in chronological order (most recent first) any natural hazard event that has caused damage to your jurisdiction since 1975. Include the date of the event and the estimated dollar amount of

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damage it caused. Please refer to the summary of natural hazard events in the SHELDUS historical data included in your tool kit. Potential sources of damage information include:

- Preliminary damage estimates your jurisdiction filed with the county or state
- Insurance claims data
- Newspaper archives
- Other plans/documents that deal with emergency management (safety element of a comprehensive plan, emergency response plan, etc.)
- Citizen input.

Repetitive Loss Properties

A repetitive loss property is any property for which FEMA has paid two or more flood insurance claims in excess of \$1,000 in any rolling 10-year period since 1978. The Planning Team will provide information regarding repetitive loss properties for your jurisdiction. Please do not worry about completing this portion of the template.

HAZARD RISK RANKING

The risk ranking performed for the overall planning area is presented in the risk assessment section of the overall hazard mitigation plan. However, each jurisdiction has differing degrees of risk exposure and vulnerability and, therefore, needs to rank risk for its own area, using the same methodology as used for the overall planning area. The risk-ranking exercise assesses two variables for each hazard: its probability of occurrence; and its potential impact on people, property and the economy. A detailed discussion of the concepts associated with risk ranking is provided in the overall hazard mitigation plan. The instructions below outline steps for assessing risk in your jurisdiction to develop results that are to be included in the template.

Determine Probability of Occurrence for Each Hazard

A probability factor is assigned based on how often a hazard is likely to occur. In Table 1, list the probability of occurrence for each hazard as it pertains to your jurisdiction, along with its probability factor, as follows:

- **High**—Hazard event is likely to occur within 25 years (Probability Factor = 3)
- **Medium**—Hazard event is likely to occur within 100 years (Probability Factor = 2)
- **Low**—Hazard event is not likely to occur within 100 years (Probability Factor = 1)
- **None**—If there is no exposure to a hazard, there is no probability of occurrence (Probability Factor = 0)

The probability of occurrence of a hazard event is generally based on past hazard events in an area. For example, if your jurisdiction has experienced two damaging floods in the last 25 years, the probability of occurrence is high for flooding and scores a 3 under this category. If your jurisdiction has experienced no damage from landslides in the last 100 years, your probability of occurrence for landslide is low, and scores a 1 under this category.

TABLE 1. HAZARD PROBABILITY OF OCCURRENCE		
Hazard Type	Probability	Probability Factor

Determine Potential Impacts of Each Hazard

The impact of each hazard was divided into three categories: impacts on people, impacts on property, and impacts on the economy. These categories were also assigned weighted values. Impact on people was assigned a weighting factor of 3, impact on property was assigned a weighting factor of 2 and impact on the economy was assigned a weighting factor of 1. Steps to assess each type of impact are described below.

Impacts on People

To assess impacts on people, values are assigned based on the percentage of the total *population exposed* to the hazard event. The degree of impact on individuals will vary and is not measurable, so the calculation assumes for simplicity and consistency that all people exposed to a hazard because they live in a hazard zone will be equally impacted when a hazard event occurs. In Table 2, list the potential impact of each hazard on people in your jurisdiction, along with its impact factor, as follows:

- **High Impact**—30% or more of the population is exposed to a hazard (Impact Factor = 3)
- **Medium Impact**—15% to 29% of the population is exposed to a hazard (Impact Factor = 2)
- **Low Impact**—14% or less of the population is exposed to the hazard (Impact Factor = 1)
- **No impact**—None of the population is exposed to a hazard (Impact Factor = 0)

TABLE 2. HAZARD IMPACT ON PEOPLE			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 3)

Impacts on Property

To assess impacts on property, values are assigned based on the percentage of the total *property value exposed* to the hazard event. In Table 3, enter the cost estimates for potential damage to exposed structures, taken from the “Summary of Loss” matrix provided with these instructions.

TABLE 3. COST ESTIMATES FOR POTENTIAL DAMAGE TO STRUCTURES	
Hazard type	Estimate of Potential Dollar Losses to Exposed Structures

In Table 4, list the potential impact of each hazard on property in your jurisdiction, along with its impact factor. Determine impact based on damage estimates from Table 3, as follows:

- **High Impact**—25% or more of the total assessed property value is exposed to a hazard (Impact Factor = 3)

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- **Medium Impact**—10% to 24% of the total assessed property value is exposed to a hazard (Impact Factor = 2)
- **Low Impact**—9% or less of the total assessed property value is exposed to the hazard (Impact Factor = 1)
- **No Impact**—None of the total assessed property value is exposed to a hazard (Impact Factor = 0)

TABLE 4. HAZARD IMPACT ON PROPERTY			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 2)

Impacts on the Economy

To assess impacts on the economy, values are assigned based on the percentage of the total *property value vulnerable* to the hazard event. Values represent estimates of the loss from a major event of each hazard in comparison to the total assessed value of property in the county. For some hazards, such as wildland fire, landslide and severe weather, vulnerability is the same as exposure due to the lack of loss estimation tools specific to those hazards. In Table 5, list the potential impact of each hazard on the economy in your jurisdiction, along with its impact factor, as follows:

- **High Impact**—Estimated loss from the hazard is 15% or more of the total assessed property value (Impact Factor = 3)
- **Medium Impact**—Estimated loss from the hazard is 5% to 14% of the total assessed property value (Impact Factor = 2)
- **Low Impact**—Estimated loss from the hazard is 4% or less of the total assessed property value (Impact Factor = 1)
- **No Impact**—No loss is estimated from the hazard (Impact Factor = 0)

TABLE 5. HAZARD IMPACT ON THE ECONOMY			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 1)

Determine Risk Rating for Each Hazard

A risk rating for each hazard is determined by multiplying the assigned probability factor by the sum of the weighted impact factors for people, property and the economy:

- Risk Rating = Probability Factor x Weighted Impact Factor {people + property + economy}

Using the results developed in Tables 1, 2, 4 and 5, complete Table 6 to calculate a risk rating for each hazard of concern.

TABLE 6. HAZARD RISK RATING			
Hazard Type	Probability Factor (P)	Sum of Weighted Impact Factors on People, Property & Economy (I)	Risk Rating (P x I)

Complete Risk Ranking in Template

Once Table 6 has been completed above, complete Table 1-7 in your template. The hazard with the highest risk rating in Table 6 should be listed at the top of Table 1-7 and given a rank of 1; the hazard with the second highest rating should be listed second with a rank of 2; and so on. Two hazards with equal risk ratings should be given the same rank.

It is important to note that this exercise should not override your subjective assessment of relative risk based on your knowledge of the history of natural hazard events in your jurisdiction. If this risk ranking exercise generates results other than what you know based on substantiated data and documentation, you may alter the ranking based on this knowledge. If this is the case, please note this fact in the comments at the end of the template. Remember, one of the purposes of this exercise is to support the selection and prioritization of initiatives in your plan. If you identify an initiative with a high priority that mitigates the risk of a hazard you have ranked low, that project will not be competitive in the grant arena.

STATUS OF PREVIOUS PLAN INITIATIVES

In this section, provide a status report of actions recommended in your previous hazard mitigation plan. You must be able to reconcile your original action plan to meet FEMA requirements for plan updates. Enter all the recommended actions from your previous plan in Table 1-8 and put an ✓ in one of the following three columns for each action to indicate its status:

- **Completed**—If the action has been completed, place a check mark in this column and enter a brief explanation in the “Comments” column (e.g., “Action #WC31 was completed by the Public Works Department on 3/12/2009”). Ongoing actions, such as annual outreach projects or maintenance activities, should also be indicated as “Completed,” with a statement about the ongoing nature of the action provided in the “Comments” column (e.g., “Ongoing action, implemented annually by Community Development Department”).
- **Carry Over to Plan Update**—If you did not complete an action and want to carry it over to your updated action plan, place a check mark in this column, and enter an explanatory statement in the comment section (e.g., “Action carried over as Action #WC14 in updated action plan”).
- **Removed; No Longer Feasible**—If you want to remove an action because you have determined that it is no longer feasible, place a check mark in this column. “No longer feasible” means that you have determined that you do not have the capability to implement the action or that the action does not serve the best interest of your jurisdiction. Lack of funding does not mean that it is no longer feasible, unless the sole source of funding for an action is no longer available. Place a comment in the comment section explaining why the action is no longer feasible (e.g., “Action no longer considered feasible due to lack of political support to complete it.”)

HAZARD MITIGATION ACTION PLAN**Action Plan Matrix**

Identify the initiatives your jurisdiction would like to pursue with this plan. Refer to the mitigation catalog for mitigation options you might want to consider. Be sure to consider the following factors in your selection of initiatives:

- Select initiatives that are consistent with the overall goals, objectives and vision of the hazard mitigation plan. The approved goals, objectives and vision are included in your tool kit.

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- Identify projects where benefits exceed costs.
- Include any project that your jurisdiction has committed to pursuing regardless of grant eligibility.
- Know what is and is not grant-eligible under the HMGP and PDM (see fact sheet provided). Listing HMGP or PDM as a potential funding source for an ineligible project will be a red flag when this plan goes through review. If you have projects that are not HMGP or PDM grant eligible, but do mitigate part or the entire hazard and may be eligible for other grant programs sponsored by other agencies, include them in this section.
- Although you should identify at least one initiative for your highest ranked risk, a hazard-specific project is not required for every hazard. If you have not identified an earthquake related project, and an earthquake occurs that causes damage in your jurisdiction, you are not discounted from HMGP project grant eligibility.

Complete Table 1-9 for all the initiatives you have identified:

- Enter the initiative number and description.
- Indicate whether the initiative mitigates hazards for new or existing assets.
- Identify the specific hazards the initiative will mitigate.
- Identify by number the mitigation plan objectives that the initiative addresses. The approved goals, objectives and vision are included in your tool kit.
- Indicate who will be the lead in administering the project. This will most likely be your governing body.
- Identify funding sources for the project. If it is a grant, include the funding sources for the cost share. Refer to your fiscal capability assessment (Table 1-2) to identify possible sources of funding.
- Indicate the time line as "short term" (1 to 5 years) or "long term" (5 years or greater).
- Enter "Yes" or "No" to indicate whether this initiative was included in the previous version of this hazard mitigation plan.

Wording Your Initiative Descriptions:

Descriptions of your initiatives need not provide great detail. That will come when you apply for a project grant. Provide enough information to identify the project's scope and impact. The following are typical descriptions for an action plan initiative:

- **Initiative 1**—Address Repetitive Loss properties. Through targeted mitigation, acquire, relocate or retrofit the five repetitive loss structures in the County as funding opportunities become available.
- **Initiative 2**—Perform a non-structural, seismic retrofit of City Hall.
- **Initiative 3**—Acquire floodplain property in the Smith subdivision.
- **Initiative 4**—Enhance the County flood warning capability by joining the NOAA "Storm Ready" program.

Technical assistance will be provided upon request.

Prioritization of Mitigation Initiatives

Complete the information in Table 1-10 as follows:

- **Initiative #**—Indicate the initiative number from Table 1-9.
- **# of Objectives Met**—Enter the number of objectives the initiative will meet.
- **Benefits**—Enter "High," "Medium" or "Low" as follows:
 - **High:** Project will have an immediate impact on the reduction of risk exposure to life and property.

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- **Medium:** Project will have a long-term impact on the reduction of risk exposure to life and property, or project will provide an immediate reduction in the risk exposure to property.
- **Low:** Long-term benefits of the project are difficult to quantify in the short term.
- **Costs**—Enter “High,” “Medium” or “Low” as follows:
 - **High:** Would require an increase in revenue via an alternative source (e.g., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover the costs of the proposed project.
 - **Medium:** Could budget for under existing work-plan, but would require a reapportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
 - **Low:** Possible to fund under existing budget. Project is part of, or can be part of an existing ongoing program.

If you know the estimated cost of a project because it is part of an existing, ongoing program, indicate the amount.
- **Do Benefits Exceed the Cost?**—Enter “Yes” or “No.” This is a qualitative assessment. Enter “Yes” if the benefit rating (high, medium or low) is the same as or higher than the cost rating (high benefit/high cost; high benefit/medium cost; medium benefit/low cost; etc.). Enter “No” if the benefit rating is lower than the cost rating (medium benefit/high cost, low benefit/medium cost; etc.)
- **Is the Project Grant-Eligible?**—Enter “Yes” or “No.” Refer to the fact sheet on HMGP and PDM.
- **Can Project Be Funded Under Existing Program Budgets?**—Enter “Yes” or “No.” In other words, is this initiative currently budgeted for, or would it require a new budget authorization or funding from another source such as grants?
- **Priority**— Enter “High,” “Medium” or “Low” as follows:
 - **High:** Project meets multiple plan objectives, benefits exceed cost, funding is secured under existing programs, or is grant eligible, and project can be completed in 1 to 5 years (i.e., short term project) once funded.
 - **Medium:** Project meets at least 1 plan objective, benefits exceed costs, requires special funding authorization under existing programs, grant eligibility is questionable, and project can be completed in 1 to 5 years once funded.
 - **Low:** Project will mitigate the risk of a hazard, benefits exceed costs, funding has not been secured, project is not grant eligible, and time line for completion is long term (5 to 10 years).

This prioritization is a simple review to determine that the initiatives you have identified meet one of the primary objectives of the Disaster Mitigation Act. It is not the detailed benefit/cost analysis required for HMGP/PDM project grants. The prioritization will identify any projects whose probable benefits will not exceed the probable costs.

Analysis of Mitigation Actions

Complete Table 1-11 by summarizing the mitigation actions by hazard of concern and the following six mitigation types:

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- **Prevention**—Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. Includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
- **Property Protection**—Modification of buildings or structures to protect them from a hazard or removal of structures from a hazard area. Includes acquisition, elevation, relocation, structural retrofit, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness**—Actions to inform citizens and elected officials about hazards and ways to mitigate them. Includes outreach projects, real estate disclosure, hazard information centers, and school-age and adult education.
- **Natural Resource Protection**—Actions that minimize hazard loss and preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Emergency Services**—Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities.
- **Structural Projects**—Actions that involve the construction of structures to reduce the impact of a hazard. Includes dams, setback levees, floodwalls, retaining walls, and safe rooms.

This exercise demonstrates that the jurisdiction has selected a comprehensive range of actions.

FUTURE NEEDS TO BETTER UNDERSTAND RISK/VULNERABILITY

In this section, identify any future studies, analyses, reports, or surveys your jurisdiction needs to better understand its vulnerability to identified or currently unidentified risks. These could be needs based on federal or state agency mandates such as EPA's Bio-terrorism assessment requirement for water districts.

ADDITIONAL COMMENTS

Use this section to add any additional information pertinent to hazard mitigation and your jurisdiction not covered in this template.

CHAPTER 1. INSERT JURISDICTION NAME UPDATE ANNEX

1.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

Name, Title
Street Address
City, State ZIP
Telephone: Phone #
e-mail Address: email address

Alternate Point of Contact

Name, Title
Street Address
City, State ZIP
Telephone: Phone #
e-mail Address: email address

1.2 JURISDICTION PROFILE

The following is a summary of key information about the jurisdiction and its history:

- **Date of Incorporation**—Insert Date of Incorporation
- **Current Population**—Insert Population as of Insert Date of Population Count
- **Population Growth**—Insert Discussion of Population Growth
- **Location and Description**—Insert Description of Location, Surroundings, Key Geographic Features
- **Brief History**—Insert Summary Discussion of Jurisdiction's History
- **Climate**—Insert Summary Discussion of Climate
- **Governing Body Format**—Insert Summary Description of Governing Body
- **Development Trends**—Insert Summary Description of Development

1.3 CAPABILITY ASSESSMENT

The assessment of the jurisdiction's legal and regulatory capabilities is presented in Table 1-1. The assessment of the jurisdiction's fiscal capabilities is presented in Table 1-2. The assessment of the jurisdiction's administrative and technical capabilities is presented in Table 1-3. Information on the community's National Flood Insurance Program (NFIP) compliance is presented in Table 1-4. Classifications under various community mitigation programs are presented in Table 1-5.

TABLE 1-1. LEGAL AND REGULATORY CAPABILITY					
	Local Authority	State or Federal Prohibitions	Other Jurisdictional Authority	State Mandated	Comments
Codes, Ordinances & Requirements					
Building Code					
Zonings					
Subdivisions					
Stormwater Management					
Post Disaster Recovery					
Real Estate Disclosure					
Growth Management					
Site Plan Review					
Public Health and Safety					
Environmental Protection					
Planning Documents					
General or Comprehensive Plan					
	<i>Is the plan equipped to provide linkage to this mitigation plan?</i>				Yes or No
Floodplain or Basin Plan					
Stormwater Plan					
Capital Improvement Plan					
	<i>What types of capital facilities does the plan address?</i>				
	<i>How often is the plan revised/updated?</i>				Yes or No
Habitat Conservation Plan					
Economic Development Plan					
Shoreline Management Plan					
Community Wildfire Protection Plan					
Response/Recovery Planning					
Comprehensive Emergency Management Plan					
Threat and Hazard Identification and Risk Assessment					
Terrorism Plan					
Post-Disaster Recovery Plan					
Continuity of Operations Plan					
Public Health Plans					

INSERT JURISDICTION NAME UPDATE ANNEX

TABLE 1-2. FISCAL CAPABILITY	
Financial Resources	Accessible or Eligible to Use?
Community Development Block Grants	
Capital Improvements Project Funding	
Authority to Levy Taxes for Specific Purposes	
User Fees for Water, Sewer, Gas or Electric Service	
Incur Debt through General Obligation Bonds	
Incur Debt through Special Tax Bonds	
Incur Debt through Private Activity Bonds	
Withhold Public Expenditures in Hazard-Prone Areas	
State Sponsored Grant Programs	
Development Impact Fees for Homebuyers or Developers	
Other	

TABLE 1-3. ADMINISTRATIVE AND TECHNICAL CAPABILITY		
Staff/Personnel Resources	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices		
Engineers or professionals trained in building or infrastructure construction practices		
Planners or engineers with an understanding of natural hazards		
Staff with training in benefit/cost analysis		
Surveyors		
Personnel skilled or trained in GIS applications		
Scientist familiar with natural hazards in local area		
Emergency manager		
Grant writers		

**TABLE 1-4.
NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE**

What department is responsible for floodplain management in your community?	
Who is your community's floodplain administrator? (department/position)	
Do you have any certified floodplain managers on staff in your community?	
What is the date of adoption of your flood damage prevention ordinance?	
When was the most recent Community Assistance Visit or Community Assistance Contact?	
To the best of your knowledge, does your community have any outstanding NFIP compliance violations that need to be addressed? If so, please state what they are.	
Do your flood hazard maps adequately address the flood risk within your community? (If no, please state why)	
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	
Does your community participate in the Community Rating System (CRS)? If so, is your community seeking to improve its CRS Classification? If not, is your community interested in joining the CRS program?	

**TABLE 1-5.
COMMUNITY CLASSIFICATIONS**

	Participating?	Classification	Date Classified
Community Rating System			
Building Code Effectiveness Grading Schedule			
Public Protection			
Storm Ready			
Firewise			
Tsunami Ready (if applicable)			

1.4 JURISDICTION-SPECIFIC NATURAL HAZARD EVENT HISTORY

Table 1-6 lists all past occurrences of natural hazards within the jurisdiction. Repetitive flood loss records are as follows:

- Number of FEMA-Identified Repetitive Loss Properties: **Insert #**
- Number of FEMA-Identified Severe Repetitive Loss Properties: **Insert #**
- Number of Repetitive Flood Loss/Severe Repetitive Loss Properties That Have Been Mitigated: **Insert #**

1-5

1.5 HAZARD RISK RANKING

Table 1-7 presents the ranking of the hazards of concern.

Hazard area extent and location maps are included at the end of this chapter. These maps are based on the best available data at the time of the preparation of this plan, and are considered to be adequate for planning purposes. **Delete this paragraph if no maps available.**

TABLE 1-7. HAZARD RISK RANKING		
Rank	Hazard Type	Risk Rating Score (Probability x Impact)
1		
2		
3		
4		
5		
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10		

Table 1-8 summarizes the initiatives that were recommended in the previous version of the hazard mitigation plan and their implementation status at the time this update was prepared.

1-7

1.7 HAZARD MITIGATION ACTION PLAN AND EVALUATION OF RECOMMENDED INITIATIVES

Table 1-9 lists the initiatives that make up the jurisdiction's hazard mitigation plan. Table 1-10 identifies the priority for each initiative. Table 1-11 summarizes the mitigation initiatives by hazard of concern and the six mitigation types.

TABLE 1-9. HAZARD MITIGATION ACTION PLAN MATRIX							
Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							

INSERT JURISDICTION NAME UPDATE ANNEX

TABLE 1-10.
MITIGATION STRATEGY PRIORITY SCHEDULE

[illegible]

TABLE 1-11. ANALYSIS OF MITIGATION INITIATIVES						
Hazard Type	Initiative Addressing Hazard, by Mitigation Type ^a					
	1. Prevention	2. Property Protection	3. Public Education and Awareness	4. Natural Resource Protection	5. Emergency Services	6. Structural Projects
Avalanche						
Dam Failure						
Drought						
Earthquake						
Flood						
Landslide						
Severe Weather						
Tsunami						
Volcano						
Wildfire						
a. See Chapter 1 for explanation of mitigation types.						

1.8 FUTURE NEEDS TO BETTER UNDERSTAND RISK/ VULNERABILITY

Insert text, if any; delete section if not used

1.9 ADDITIONAL COMMENTS

Insert text, if any; delete section if not used

King County Regional Hazard Mitigation Plan Update
Volume 2: Planning Partner Annexes

Appendix C2.
Annex Instructions and Templates for Special-Purpose Districts

Updated November 2013

INSTRUCTIONS FOR COMPLETING SPECIAL-PURPOSE DISTRICT ANNEX TEMPLATE

This document provides instructions for special-purpose districts participating in multi-partner hazard mitigation planning. These instructions are intended for districts that **do not** have a previously approved hazard mitigation plan.

Assistance in completing the template will be available in the form of a workshop for all planning partners in November and technical assistance as requested and as funding allows. Any questions on completing the template should be directed to:

Rob Flaner
208. 939.4391
Rob.Flaner@TetraTech.com

Fully completed templates must be completed and returned by:

Friday, January 17, 2014.

A NOTE ABOUT FORMATTING

The template for the jurisdiction annex is a Microsoft Word document in a format that will be used in the final plan. Partners are asked to use this template so that a uniform product will be completed for each partner. Partners who do not have Microsoft Word capability may prepare the document in other formats, and the planning team will convert it to the Word format.

Content should be entered within the yellow, highlighted text that is currently in the template, rather than creating text in another document and pasting it into the template. Text from another source will alter the style and formatting of the document.

The numbering in the document will be updated when completed annexes are combined into the final document. Please do not adjust any of this numbering.

CHAPTER NUMBER AND TITLE

In the chapter title at the top of page 1, type in the complete official name of your jurisdiction (West County Fire Protection District #1, Burgville Flood Protection District, etc.) replacing the yellow, highlighted text.

Special District Annex:

This document provides instructions for completing the jurisdictional annex template for special purpose districts.

Please refer all questions to:

Rob Flaner
208.939.4391
rob.flaner@tetratech.com

Please complete and return by:

Friday, January 17, 2014

Please email completed template to:

Kristen Gelino
425.482.7801
kristen.gelino@tetratech.com

Associated Materials:

Along with the annex template and these instructions, you have been provided with other materials with information that is needed for completing the template. Be sure to review these materials before you begin the process of filling in the template:

- SHEL DUS historical event data
- Summary-of-loss matrix for the hazard mitigation plan.
- Results from the hazard mitigation plan questionnaire.
- Catalog of funding programs
- Catalog of mitigation alternatives, and
- Fact sheet on Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Grant Program (PDM).

HAZARD MITIGATION PLAN POINT OF CONTACT

Please provide the name, title, mailing address, telephone number, and e-mail address for the primary point of contact for your jurisdiction. This should be the person responsible for monitoring, evaluating and updating the annex for your jurisdiction. This person should also be the principle liaison between your jurisdiction and the Steering Committee overseeing development of this plan.

In addition, designate an alternate point of contact. This would be a person to contact should the primary point of contact be unavailable or no longer employed by the jurisdiction.

JURISDICTION PROFILE

Narrative Profile

Please provide a brief summary to profile your jurisdiction. Include the purpose of the jurisdiction, the date of inception, the type of organization, the number of employees, the mode of operation (i.e., how operations are funded), the type of governing body, and who has adoptive authority. Describe who the jurisdiction's customers are (if applicable, include number of users or subscribers). Include a geographical description of the service area.

Provide information in a style similar to the example provided in the box at right. This should be information that was not provided in the overall mitigation plan document.

Please be sure to include in this profile description who will assume responsibility for the adoption of the plan and who will oversee the implementation of the plan.

Example Jurisdiction Narrative Profile:

Humboldt Community Services District is a special-purpose district created in 1952 to provide water, sewer, and street lighting to the unincorporated area surrounding the City of Eureka known as Pine Hill & Cutten. The District's designated service areas expanded throughout the years to include other unincorporated areas of Humboldt County known as Myrtle town, Humboldt Hill, Fields Landing, King Salmon, and Freshwater. A five-member elected Board of Directors governs the District. The Board assumes responsibility for the adoption of this plan; the General Manager will oversee its implementation. As of April 30, 2007, the District serves 7,305 water connections and 6,108 sewer connections, with a current staff of 21. Funding comes primarily through rates and revenue bonds.

Summary Information

Complete the bulleted list of summary information as follows:

- **Population Served**—List the estimated population that your jurisdiction provides services to. If you do not know this number directly, create an estimate (e.g., the number of service connections times the average household size for the service area based on Census data).
- **Land Area Served**—Enter the service area of your jurisdiction in acres or square miles.
- **Value of Area Served**—Enter the approximate assessed value of your service area. If you do not have this information, the County should be able to provide a number using the County Assessor's database.
- **Land Area Owned**—Enter the area of property owned by the jurisdiction in acres or square miles.
- **List of Critical Infrastructure/ Equipment Owned by the Jurisdiction**—List all infrastructure and equipment that is critical to your jurisdiction's operations and is located in

Instructions for Completing Municipality Annex Template

a natural hazard risk zone. Briefly describe the item and give its estimated replacement-cost value. Examples are as follows:

- Fire Districts—Apparatus and equipment housed in a facility that is located in a natural hazard risk zone. This is the equipment that is essential for you to deliver services to this area should a natural hazard occur. It is not necessary to provide a detailed inventory of each engine and truck and its contents. A summary will suffice, such as “5 Engines, 2 ladders, and their contents”. Do not list reserve equipment.
- Dike/Flood Control Districts—Miles of levees, pump stations, retention/detention ponds, tide gates, miles of ditches, etc., within natural hazard risk zones.
- Water Districts—Total length of pipe (it is not necessary to specify size and type), pump stations, treatment facilities, dams and reservoirs, within natural hazard risk zones.
- Public Utility Districts—Miles of power line (above ground and underground), generators, power generating sub-stations, miles of pipeline, etc., within natural hazard risk zones.
- School Districts—Anything within natural hazard risk zones, besides school buildings, that is critical for you to operate (e.g., school buses if you own a fleet of school buses).
- **Total Value of Critical Infrastructure/Equipment**—Enter total replacement-cost value of the critical infrastructure and equipment listed above.
- **List of Critical Facilities Owned by the Jurisdiction**—List all buildings and other facilities that are critical to your jurisdiction’s operations and are located in a natural hazard risk zone. Briefly describe the facility and give its estimated replacement-cost value.
- **Total Value of Critical Facilities**— Enter total replacement-cost value of the critical facilities listed above.
- **Current and Anticipated Service Trends**— Enter a brief description on how your jurisdiction’s services are projected to expand in the foreseeable future and why. Note any identified capital improvements needed to meet the projected expansion. Examples are as follows:
 - For a Fire District: Portions of the jurisdiction have experienced a 13 percent growth over the last five years. Land use designations allow for an increase in light commercial and residential land uses within the service area. This increase in density of land uses will represent an increase in population and thus a projected increase in call volume. Our District is experiencing an average annual increase in call volume of 13 percent.
 - For Dike/Drainage/Flood Control District: Portions of the jurisdiction have experienced a 13 percent growth over the last five years. Land use designations allow for an increase in light commercial and residential land uses within the service area. This increase in density of land use will result in an increase in impermeable surface within our service area and thus increase the demand on control facilities.
 - For a Water District: Portions of the jurisdiction have experienced a 13 percent growth over the last five years. Land use designations allow for an increase in light commercial and residential land uses within the service area. This increase in density of land use will represent an increase in the number of housing units within the service area and thus represent an expansion of the district’s delivery network.

APPLICABLE REGULATIONS AND PLAN

List any federal, state, local or district laws, ordinances, codes and policies that govern your jurisdiction that include elements addressing hazard mitigation. Describe how these laws may support or conflict with the mitigation strategies of this plan. List any other plans, studies or other documents that address hazard mitigation issues for your jurisdiction or may allow you to support or enhance actions identified in this plan. Note whether the documents could have a positive or a negative impact on the mitigation strategies of this plan. Some examples of plans that may be relevant include Emergency Response Plan, Continuity of Operations Plan, Recovery Plan, and Capital Improvement Program. "None applicable" is a possible answer for this section.

JURISDICTION-SPECIFIC NATURAL HAZARD EVENT HISTORY

In Table 1-1, list in chronological order (most recent first) any natural hazard event that has caused damage to your jurisdiction since 1975. Include the date of the event and the estimated dollar amount of damage it caused. Please refer to the SHELDTUS historical event data included on your cd.. Potential sources of damage information include:

- Preliminary damage estimates your jurisdiction filed with the county or state
- Insurance claims data
- Newspaper archives
- Other plans/documents that deal with emergency management (safety element of a comprehensive plan, emergency response plan, etc.)
- Citizen input.

HAZARD RISK RANKING

The risk ranking performed for the overall planning area is presented in the risk assessment section of the overall hazard mitigation plan. However, each jurisdiction has differing degrees of risk exposure and vulnerability and, therefore, needs to rank risk for its own area, using the same methodology as used for the overall planning area. The risk-ranking exercise assesses two variables for each hazard: its probability of occurrence; and its potential impact on people, property and operations. A detailed discussion of the concepts associated with risk ranking is provided in the overall hazard mitigation plan. The instructions below outline steps for assessing risk in your jurisdiction in order to develop results that are to be included in the template.

Determine Probability of Occurrence for Each Hazard

A probability factor is assigned based on how often a hazard is likely to occur. In Table 1, list the probability of occurrence for each hazard as it pertains to your jurisdiction, along with its probability factor, as follows:

- **High**—Hazard event is likely to occur within 25 years (Probability Factor = 3)
- **Medium**—Hazard event is likely to occur within 100 years (Probability Factor = 2)
- **Low**—Hazard event is not likely to occur within 100 years (Probability Factor = 1)
- **None**—If there is no exposure to a hazard, there is no probability of occurrence (Probability Factor = 0)

The probability of occurrence of a hazard event is generally based on past hazard events in an area. For example, if your jurisdiction has experienced two damaging floods in the last 25 years, the probability of occurrence is high for flooding and scores a 3 under this category. If your jurisdiction has experienced no

Instructions for Completing Municipality Annex Template

damage from landslides in the last 100 years, your probability of occurrence for landslide is low, and scores a 1 under this category.

TABLE 1. HAZARD PROBABILITY OF OCCURRENCE		
Hazard Type	Probability	Probability Factor

Determine Potential Impacts of Each Hazard

The impact of each hazard was divided into three categories: impacts on people, impacts on property, and impacts on your jurisdiction's operations. These categories were also assigned weighted values. Impact on people was assigned a weighting factor of 3, impact on property was assigned a weighting factor of 2 and impact on operations was assigned a weighting factor of 1. Steps to assess each type of impact are described below.

Impacts on People

To assess impacts on people, values are assigned based on the percentage of the total *population exposed* to the hazard event. The degree of impact on individuals will vary and is not measurable, so the calculation assumes for simplicity and consistency that all people exposed to a hazard because they live in a hazard zone will be equally impacted when a hazard event occurs. In Table 2, list the potential impact of each hazard on people in your jurisdiction, along with its impact factor, as follows:

- **High Impact**—30% or more of the population is exposed to a hazard (Impact Factor = 3)
- **Medium Impact**—15% to 29% of the population is exposed to a hazard (Impact Factor = 2)
- **Low Impact**—14% or less of the population is exposed to the hazard (Impact Factor = 1)
- **No Impact**—None of the population is exposed to a hazard (Impact Factor = 0)

TABLE 2. HAZARD IMPACT ON PEOPLE			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 3)

Impacts on Property

To assess impacts on property, values are assigned based on the percentage of the total *value of buildings, equipment and infrastructure that is exposed* to the hazard event. In Table 3, enter the cost estimates for potential damage to the jurisdiction's exposed buildings, equipment and infrastructure, taken from the "Summary of Loss" matrix provided with these instructions.

TABLE 3. COST ESTIMATES FOR POTENTIAL DAMAGE TO STRUCTURES	
Hazard type	Estimate of Potential Dollar Losses to Jurisdiction- Owned Facilities Exposed to the Hazard

In Table 4, list the potential impact of each hazard on property in your jurisdiction, along with its impact factor. Determine impact based on damage estimates from Table 3, as follows:

- **High Impact**—30% or more of the total assessed property value of facilities, equipment and infrastructure is exposed to a hazard (Impact Factor = 3)

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- **Medium Impact**—15% to 29% of the total assessed property value of facilities, equipment and infrastructure is exposed to a hazard (Impact Factor = 2)
- **Low Impact**—14% or less of the total assessed property value of facilities, equipment and infrastructure is exposed to the hazard (Impact Factor = 1)
- **No Impact**—None of the total assessed property value of facilities, equipment and infrastructure is exposed to a hazard (Impact Factor = 0)

TABLE 4. HAZARD IMPACT ON PROPERTY			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 2)

Impacts on the Jurisdiction's Operations

Impact on operations is assessed based on estimates of *how long it will take your jurisdiction to become 100-percent operable* after a hazard event. The estimated functional downtime for critical facilities has been estimated for most hazards within the planning area. In Table 5, list the potential impact of each hazard on the operations of your jurisdiction, along with its impact factor, as follows:

- High = functional downtime of 365 days or more (Impact Factor = 3)
- Medium = Functional downtime of 180 to 364 days (Impact Factor = 2)
- Low = Functional downtime of 180 days or less (Impact Factor = 1)
- No Impact = No functional downtime is estimated from the hazard (Impact Factor = 0)

You will need to consult the risk assessment for this task. The critical facilities exposed to each hazard have been identified, and the impacts on operability have been estimated for most of the hazards within the planning area. If the functional downtime component has not been provided for a hazard in the risk assessment, consider the impact on operability of that hazard to be low.

TABLE 5. HAZARD IMPACT ON OPERATIONS			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 1)

Determine Risk Rating for Each Hazard

A risk rating for each hazard is determined by multiplying the assigned probability factor by the sum of the weighted impact factors for people, property and operations:

- Risk Rating = Probability Factor x Weighted Impact Factor {people + property + operations}

Using the results developed in Tables 1, 2, 4 and 5, complete Table 6 to calculate a risk rating for each hazard of concern.

TABLE 6. HAZARD RISK RATING			
Hazard Type	Probability Factor (P)	Sum of Weighted Impact Factors on People, Property & Operations (I)	Risk Rating (P x I)

Complete Risk Ranking in Template

Once Table 6 has been completed above, complete Table 1-2 in your template. The hazard with the highest risk rating in Table 6 should be listed at the top of Table 1-2 and given a rank of 1; the hazard with the second highest rating should be listed second with a rank of 2; and so on. Two hazards with equal risk ratings should be given the same rank.

It is important to note that this exercise should not override your subjective assessment of relative risk based on your knowledge of the history of natural hazard events in your jurisdiction. If this risk ranking exercise generates results other than what you know based on substantiated data and documentation, you may alter the ranking based on this knowledge. If this is the case, please note this fact in the comments at the end of the template. Remember, one of the purposes of this exercise is to support the selection and prioritization of initiatives in your plan. If you identify an initiative with a high priority that mitigates the risk of a hazard you have ranked low, that project will not be competitive in the grant arena.

HAZARD MITIGATION ACTION PLAN

Action Plan Matrix

Identify the initiatives your jurisdiction would like to pursue with this plan. Refer to the mitigation catalog for mitigation options you might want to consider. Be sure to consider the following factors in your selection of initiatives:

- Select initiatives that are consistent with the overall goals, objectives and guiding principles of the hazard mitigation plan.
- Identify projects where benefits exceed costs.
- Include any project that your jurisdiction has committed to pursuing regardless of grant eligibility.
- Know what is and is not grant-eligible under the HMGP and PDM (see fact sheet provided). Listing HMGP or PDM as a potential funding source for an ineligible project will be a red flag when this plan goes through review. If you have projects that are not HMGP or PDM grant eligible, but do mitigate part or all of the hazard and may be eligible for other grant programs sponsored by other agencies, include them in this section.
- Although you should identify at least one initiative for your highest ranked risk, a hazard-specific project is not required for every hazard. If you have not identified an earthquake related project, and an earthquake occurs that causes damage in your jurisdiction, you are not discounted from HMGP project grant eligibility.

Wording Your Initiative Descriptions:

Descriptions of your initiatives need not provide great detail. That will come when you apply for a project grant. Provide enough information to identify the project's scope and impact. The following are typical descriptions for an action plan initiative:

- **Initiative 1**—Address Repetitive Loss properties. Through targeted mitigation, acquire, relocate or retrofit the five repetitive loss structures in the County as funding opportunities become available.
- **Initiative 2**—Perform a non-structural, seismic retrofit of City Hall.
- **Initiative 3**—Acquire floodplain property in the Smith subdivision.
- **Initiative 4**—Enhance the County flood warning capability by joining the NOAA "Storm Ready" program.

Complete Table 1-3 for all the initiatives you have identified:

- Enter the initiative number and description.
- Indicate whether the initiative mitigates hazards for new or existing assets.
- Identify the specific hazards the initiative will mitigate.

Instructions for Completing Municipality Annex Template

- Identify by number the mitigation plan objectives that the initiative addresses. Approved objectives have been included in your tool kit.
- Indicate who will be the lead in administering the project. This will most likely be your governing body.
- Identify funding sources for the project. If it is a grant, include the funding sources for the cost share.
- Indicate the time line as “short term” (1 to 5 years) or “long term” (5 years or greater).

Technical assistance will provided upon request.

Prioritization of Mitigation Initiatives

Complete the information in Table 1-4 as follows:

- **Initiative #**—Indicate the initiative number from Table 1-3.
- **# of Objectives Met**—Enter the number of objectives the initiative will meet.
- **Benefits**—Enter “High,” “Medium” or “Low” as follows:
 - High: Project will have an immediate impact on the reduction of risk exposure to life and property.
 - Medium: Project will have a long-term impact on the reduction of risk exposure to life and property, or project will provide an immediate reduction in the risk exposure to property.
 - Low: Long-term benefits of the project are difficult to quantify in the short term.
- **Costs**—Enter “High,” “Medium” or “Low” as follows:
 - High: Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover the costs of the proposed project.
 - Medium: Could budget for under existing work-plan, but would require a reapportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
 - Low: Possible to fund under existing budget. Project is part of, or can be part of an existing ongoing program.

If you know the estimated cost of a project because it is part of an existing, ongoing program, indicate the amount.

- **Do Benefits Equal or Exceed the Cost?**—Enter “Yes” or “No.” This is a qualitative assessment. Enter “Yes” if the benefit rating (high, medium or low) is the same as or higher than the cost rating (high benefit/high cost; high benefit/medium cost; medium benefit/low cost; etc.). Enter “No” if the benefit rating is lower than the cost rating (medium benefit/high cost, low benefit/medium cost; etc.)
- **Is the Project Grant-Eligible?**—Enter “Yes” or “No.” Refer to the fact sheet on HMGP and PDM.
- **Can Project Be Funded Under Existing Program Budgets?**—Enter “Yes” or “No.” In other words, is this initiative currently budgeted for, or would it require a new budget authorization or funding from another source such as grants?

Instructions for Completing Municipality Annex Template

- **Priority**— Enter “High,” “Medium” or “Low” as follows:
 - High: Project meets multiple plan objectives, benefits exceed cost, funding is secured under existing programs, or is grant eligible, and project can be completed in 1 to 5 years (i.e., short term project) once funded.
 - Medium: Project meets at least 1 plan objective, benefits exceed costs, requires special funding authorization under existing programs, grant eligibility is questionable, and project can be completed in 1 to 5 years once funded.
 - Low: Project will mitigate the risk of a hazard, benefits exceed costs, funding has not been secured, project is not grant eligible, and time line for completion is long term (5 to 10 years).

This prioritization is a simple review to determine that the initiatives you have identified meet one of the primary objectives of the Disaster Mitigation Act. It is not the detailed benefit/cost analysis required for HMGP/PDM project grants. The prioritization will identify any projects whose probable benefits will not exceed the probable costs.

Analysis of Mitigation Actions

Complete Table 1-5 summarizing the mitigation actions by hazard of concern and the following six mitigation types:

- **Prevention**—Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. Includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
- **Property Protection**—Modification of buildings or structures to protect them from a hazard or removal of structures from a hazard area. Includes acquisition, elevation, relocation, structural retrofit, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness**—Actions to inform citizens and elected officials about hazards and ways to mitigate them. Includes outreach projects, real estate disclosure, hazard information centers, and school-age and adult education.
- **Natural Resource Protection**—Actions that minimize hazard loss and preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Emergency Services**—Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities.
- **Structural Projects**—Actions that involve the construction of structures to reduce the impact of a hazard. Includes dams, setback levees, floodwalls, retaining walls, and safe rooms.

This exercise demonstrates that the jurisdiction has selected a comprehensive range of actions.

FUTURE NEEDS TO BETTER UNDERSTAND RISK/VULNERABILITY

In this section, identify any future studies, analyses, reports, or surveys your jurisdiction needs to better understand its vulnerability to identified or currently unidentified risks. These could be needs based on federal or state agency mandates such as EPA’s Bio-terrorism assessment requirement for water districts.

ADDITIONAL COMMENTS

Use this section add any additional information pertinent to hazard mitigation and your jurisdiction not covered in this template.

As you complete your template, please forward it to:

Kristen Gelino, Tetra Tech, Inc.

425.482.7801

Kristen.Gelino@TetraTech.com

CHAPTER 1. INSERT JURISDICTION NAME ANNEX

1.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

Name, Title
Street Address
City, State ZIP
Telephone: Phone #
e-mail Address: email address

Alternate Point of Contact

Name, Title
Street Address
City, State ZIP
Telephone: Phone #
e-mail Address: email address

1.2 JURISDICTION PROFILE

Insert Narrative Profile Information, per Instructions

The following is a summary of key information about the jurisdiction:

- **Population Served**—Insert Population as of Insert Date of Population Count
- **Land Area Served**—Insert Area
- **Value of Area Served**—The estimated value of the area served by the jurisdiction is Insert Total Value
- **Land Area Owned**—Insert Area
- **List of Critical Infrastructure/Equipment Owned by the Jurisdiction:**
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
- **Total Value of Critical Infrastructure/Equipment**—The total value of critical infrastructure and equipment owned by the jurisdiction is Insert Total Value
- **List of Critical Facilities Owned by the Jurisdiction:**
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
- **Total Value of Critical Facilities**—The total value of critical facilities owned by the jurisdiction is Insert Total Value
- **Current and Anticipated Service Trends**—Insert Summary Description of Service Trends

1.3 APPLICABLE REGULATIONS AND PLANS

The following existing codes, ordinances, policies or plans are applicable to this hazard mitigation plan:

- Insert Name of Code, Ordinance, Policy or Plan

- #### 1.4 JURISDICTION-SPECIFIC NATURAL HAZARD EVENT HISTORY

Table 1-1 lists all past occurrences of natural hazards within the jurisdiction.

[illegible]

INSERT JURISDICTION NAME ANNEX

1.5 HAZARD RISK RANKING

Table 1-2 presents the ranking of the hazards of concern.

TABLE 1-2. HAZARD RISK RANKING		
Rank	Hazard Type	Risk Rating Score (Probability x Impact)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

1.6 HAZARD MITIGATION ACTION PLAN AND EVALUATION OF RECOMMENDED INITIATIVES

Table 1-3 lists the initiatives that make up the jurisdiction's hazard mitigation plan. Table 1-4 identifies the priority for each initiative. Table 1-5 summarizes the mitigation initiatives by hazard of concern and the six mitigation types.

TABLE 1-3. HAZARD MITIGATION ACTION PLAN MATRIX						
Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						

INSERT JURISDICTION NAME ANNEX

TABLE 1-4.
MITIGATION STRATEGY PRIORITY

[illegible]

TABLE 1-5. ANALYSIS OF MITIGATION INITIATIVES						
Hazard Type	Initiative Addressing Hazard, by Mitigation Type ^a					
	1. Prevention	2. Property Protection	3. Public Education and Awareness	4. Natural Resource Protection	5. Emergency Services	6. Structural Projects
Avalanche						
Dam Failure						
Drought						
Earthquake						
Flood						
Landslide						
Severe Weather						
Tsunami						
Volcano						
Wildfire						
a. See Chapter I for explanation of mitigation types.						

1.7 FUTURE NEEDS TO BETTER UNDERSTAND RISK/ VULNERABILITY

Insert text, if any; delete section if not used

1.8 ADDITIONAL COMMENTS

Insert text, if any; delete section if not used

Updated November 2013

INSTRUCTIONS FOR COMPLETING SPECIAL-PURPOSE DISTRICT UPDATE ANNEX TEMPLATE

This document provides instructions for special-purpose districts participating in multi-partner hazard mitigation planning. These instructions are intended for districts that currently have a previously approved hazard mitigation plan.

Assistance in completing the template will be available in the form of a workshop for all planning partners in November and technical assistance as requested and as funding allows. Any questions on completing the template should be directed to:

Rob Flaner
208.939.4391
Rob.Flaner@TetraTech.com

Fully completed templates must be completed and returned by:

Friday, January 17, 2014.

A NOTE ABOUT FORMATTING

The template for the jurisdiction annex is a Microsoft Word document in a format that will be used in the final plan. Partners are asked to use this template so that a uniform product will be completed for each partner. Partners who do not have Microsoft Word capability may prepare the document in other formats, and the planning team will convert it to the Word format.

Content should be entered within the yellow, highlighted text that is currently in the template, rather than creating text in another document and pasting it into the template. Text from another source will alter the style and formatting of the document.

The numbering in the document will be updated when completed annexes are combined into the final document. Please do not adjust any of this numbering.

CHAPTER NUMBER AND TITLE

In the chapter title at the top of page 1, type in the complete official name of your jurisdiction (West County Fire Protection District #1, Burgville Flood Protection District, etc.) replacing the yellow, highlighted text.

Special District Update Annex:

This document provides instructions for completing the jurisdictional annex template for special purpose districts.

Please refer all questions to:

Rob Flaner
208.939.4391
rob.flaner@tetratech.com

Please complete and return by:

Friday, January 17, 2014

Please email completed template to:

Kristen Gelino
425.482.7801
kristen.gelino@tetratech.com

Associated Materials:

Along with the annex template and these instructions, you have been provided with other materials with information that is needed for completing the template. Be sure to review these materials before you begin the process of filling in the template:

- SHEL DUS historical event data
- Summary-of-loss matrix for the hazard mitigation plan.
- Results from the hazard mitigation plan questionnaire,
- Catalog of funding programs
- Catalog of mitigation alternatives, and
- Fact sheet on Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Grant Program (PDM).

HAZARD MITIGATION PLAN POINT OF CONTACT

Please provide the name, title, mailing address, telephone number, and e-mail address for the primary point of contact for your jurisdiction. This should be the person responsible for monitoring, evaluating and updating the annex for your jurisdiction. This person should also be the principle liaison between your jurisdiction and the Steering Committee overseeing development of this plan.

In addition, designate an alternate point of contact. This would be a person to contact should the primary point of contact be unavailable or no longer employed by the jurisdiction.

JURISDICTION PROFILE

Narrative Profile

Please provide a brief summary to profile your jurisdiction. Include the purpose of the jurisdiction, the date of inception, the type of organization, the number of employees, the mode of operation (i.e., how operations are funded), the type of governing body, and who has adoptive authority. Describe who the jurisdiction's customers are (if applicable, include number of users or subscribers). Include a geographical description of the service area.

Provide information in a style similar to the example provided in the box at right. This should be information that was not provided in the overall mitigation plan document.

Please be sure to include in this profile description who will assume responsibility for the adoption of the plan and who will oversee the implementation of the plan.

Example Jurisdiction Narrative Profile:

Humboldt Community Services District is a special-purpose district created in 1952 to provide water, sewer, and street lighting to the unincorporated area surrounding the City of Eureka known as Pine Hill & Cutten. The District's designated service areas expanded throughout the years to include other unincorporated areas of Humboldt County known as Myrtle town, Humboldt Hill, Fields Landing, King Salmon, and Freshwater. A five-member elected Board of Directors governs the District. The Board assumes responsibility for the adoption of this plan; the General Manager will oversee its implementation. As of April 30, 2007, the District serves 7,305 water connections and 6,108 sewer connections, with a current staff of 21. Funding comes primarily through rates and revenue bonds.

Summary Information

Complete the bulleted list of summary information as follows:

- **Population Served**—List the estimated population that your jurisdiction provides services to. If you do not know this number directly, create an estimate (e.g., the number of service connections times the average household size for the service area based on Census data).
- **Land Area Served**—Enter the service area of your jurisdiction in acres or square miles.
- **Value of Area Served**—Enter the approximate assessed value of your service area. If you do not have this information, the County should be able to provide a number using the County Assessor's database.
- **Land Area Owned**—Enter the area of property owned by the jurisdiction in acres or square miles.
- **List of Critical Infrastructure/ Equipment Owned by the Jurisdiction**—List all infrastructure and equipment that is critical to your jurisdiction's operations and is located in

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a natural hazard risk zone. Briefly describe the item and give its estimated replacement-cost value. Examples are as follows:

- Fire Districts—Apparatus and equipment housed in a facility that is located in a natural hazard risk zone. This is the equipment that is essential for you to deliver services to this area should a natural hazard occur. It is not necessary to provide a detailed inventory of each engine and truck and its contents. A summary will suffice, such as “5 Engines, 2 ladders, and their contents”. Do not list reserve equipment.
- Dike/Flood Control Districts—Miles of levees, pump stations, retention/detention ponds, tide gates, miles of ditches, etc., within natural hazard risk zones.
- Water Districts—Total length of pipe (it is not necessary to specify size and type), pump stations, treatment facilities, dams and reservoirs, within natural hazard risk zones.
- Public Utility Districts—Miles of power line (above ground and underground), generators, power generating sub-stations, miles of pipeline, etc., within natural hazard risk zones.
- School Districts—Anything within natural hazard risk zones, besides school buildings, that is critical for you to operate (e.g., school buses if you own a fleet of school buses).
- **Total Value of Critical Infrastructure/Equipment**—Enter total replacement-cost value of the critical infrastructure and equipment listed above.
- **List of Critical Facilities Owned by the Jurisdiction**—List all buildings and other facilities that are critical to your jurisdiction’s operations and are located in a natural hazard risk zone. Briefly describe the facility and give its estimated replacement-cost value.
- **Total Value of Critical Facilities**— Enter total replacement-cost value of the critical facilities listed above.
- **Current and Anticipated Service Trends**— Enter a brief description on how your jurisdiction’s services are projected to expand in the foreseeable future and why. Note any identified capital improvements needed to meet the projected expansion. Examples are as follows:
 - For a Fire District: Portions of the jurisdiction have experienced a 13 percent growth over the last five years. Land use designations allow for an increase in light commercial and residential land uses within the service area. This increase in density of land uses will represent an increase in population and thus a projected increase in call volume. Our District is experiencing an average annual increase in call volume of 13 percent.
 - For Dike/Drainage/Flood Control District: Portions of the jurisdiction have experienced a 13 percent growth over the last five years. Land use designations allow for an increase in light commercial and residential land uses within the service area. This increase in density of land use will result in an increase in impermeable surface within our service area and thus increase the demand on control facilities.
 - For a Water District: Portions of the jurisdiction have experienced a 13 percent growth over the last five years. Land use designations allow for an increase in light commercial and residential land uses within the service area. This increase in density of land use will represent an increase in the number of housing units within the service area and thus represent an expansion of the district’s delivery network.

APPLICABLE REGULATIONS AND PLAN

List any federal, state, local or district laws, ordinances, codes and policies that govern your jurisdiction that include elements addressing hazard mitigation. Describe how these laws may support or conflict with the mitigation strategies of this plan. List any other plans, studies or other documents that address hazard mitigation issues for your jurisdiction or may allow you to support or enhance actions identified in this plan. Note whether the documents could have a positive or a negative impact on the mitigation strategies of this plan. Some examples of plans that may be relevant include Emergency Response Plan, Continuity of Operations Plan, Recovery Plan, and Capital Improvement Program. "None applicable" is a possible answer for this section.

JURISDICTION-SPECIFIC NATURAL HAZARD EVENT HISTORY

In Table 1-1, list in chronological order (most recent first) any natural hazard event that has caused damage to your jurisdiction since 1975. Include the date of the event and the estimated dollar amount of damage it caused. Please refer to the SHELDUS historical event data included on your cd.. Potential sources of damage information include:

- Preliminary damage estimates your jurisdiction filed with the county or state
- Insurance claims data
- Newspaper archives
- Other plans/documents that deal with emergency management (safety element of a comprehensive plan, emergency response plan, etc.)
- Citizen input.

HAZARD RISK RANKING

The risk ranking performed for the overall planning area is presented in the risk assessment section of the overall hazard mitigation plan. However, each jurisdiction has differing degrees of risk exposure and vulnerability and, therefore, needs to rank risk for its own area, using the same methodology as used for the overall planning area. The risk-ranking exercise assesses two variables for each hazard: its probability of occurrence; and its potential impact on people, property and operations. A detailed discussion of the concepts associated with risk ranking is provided in the overall hazard mitigation plan. The instructions below outline steps for assessing risk in your jurisdiction in order to develop results that are to be included in the template.

Determine Probability of Occurrence for Each Hazard

A probability factor is assigned based on how often a hazard is likely to occur. In Table 1, list the probability of occurrence for each hazard as it pertains to your jurisdiction, along with its probability factor, as follows:

- **High**—Hazard event is likely to occur within 25 years (Probability Factor = 3)
- **Medium**—Hazard event is likely to occur within 100 years (Probability Factor = 2)
- **Low**—Hazard event is not likely to occur within 100 years (Probability Factor = 1)
- **None**—If there is no exposure to a hazard, there is no probability of occurrence (Probability Factor = 0)

The probability of occurrence of a hazard event is generally based on past hazard events in an area. For example, if your jurisdiction has experienced two damaging floods in the last 25 years, the probability of occurrence is high for flooding and scores a 3 under this category. If your jurisdiction has experienced no

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damage from landslides in the last 100 years, your probability of occurrence for landslide is low, and scores a 1 under this category.

TABLE 1. HAZARD PROBABILITY OF OCCURRENCE		
Hazard Type	Probability	Probability Factor

Determine Potential Impacts of Each Hazard

The impact of each hazard was divided into three categories: impacts on people, impacts on property, and impacts on your jurisdiction's operations. These categories were also assigned weighted values. Impact on people was assigned a weighting factor of 3, impact on property was assigned a weighting factor of 2 and impact on operations was assigned a weighting factor of 1. Steps to assess each type of impact are described below.

Impacts on People

To assess impacts on people, values are assigned based on the percentage of the total *population exposed* to the hazard event. The degree of impact on individuals will vary and is not measurable, so the calculation assumes for simplicity and consistency that all people exposed to a hazard because they live in a hazard zone will be equally impacted when a hazard event occurs. In Table 2, list the potential impact of each hazard on people in your jurisdiction, along with its impact factor, as follows:

- **High Impact**—30% or more of the population is exposed to a hazard (Impact Factor = 3)
- **Medium Impact**—15% to 29% of the population is exposed to a hazard (Impact Factor = 2)
- **Low Impact**—14% or less of the population is exposed to the hazard (Impact Factor = 1)
- **No Impact**—None of the population is exposed to a hazard (Impact Factor = 0)

TABLE 2. HAZARD IMPACT ON PEOPLE			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 3)

Impacts on Property

To assess impacts on property, values are assigned based on the percentage of the total *value of buildings, equipment and infrastructure that is exposed* to the hazard event. In Table 3, enter the cost estimates for potential damage to the jurisdiction's exposed buildings, equipment and infrastructure, taken from the "Summary of Loss" matrix provided with these instructions.

TABLE 3. COST ESTIMATES FOR POTENTIAL DAMAGE TO STRUCTURES	
Hazard type	Estimate of Potential Dollar Losses to Jurisdiction- Owned Facilities Exposed to the Hazard

In Table 4, list the potential impact of each hazard on property in your jurisdiction, along with its impact factor. Determine impact based on damage estimates from Table 3, as follows:

- **High Impact**—30% or more of the total assessed property value of facilities, equipment and infrastructure is exposed to a hazard (Impact Factor = 3)

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- **Medium Impact**—15% to 29% of the total assessed property value of facilities, equipment and infrastructure is exposed to a hazard (Impact Factor = 2)
- **Low Impact**—14% or less of the total assessed property value of facilities, equipment and infrastructure is exposed to the hazard (Impact Factor = 1)
- **No Impact**—None of the total assessed property value of facilities, equipment and infrastructure is exposed to a hazard (Impact Factor = 0)

TABLE 4. HAZARD IMPACT ON PROPERTY			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 2)

Impacts on the Jurisdiction's Operations

Impact on operations is assessed based on estimates of *how long it will take your jurisdiction to become 100-percent operable* after a hazard event. The estimated functional downtime for critical facilities has been estimated for most hazards within the planning area. In Table 5, list the potential impact of each hazard on the operations of your jurisdiction, along with its impact factor, as follows:

- High = functional downtime of 365 days or more (Impact Factor = 3)
- Medium = Functional downtime of 180 to 364 days (Impact Factor = 2)
- Low = Functional downtime of 180 days or less (Impact Factor = 1)
- No Impact = No functional downtime is estimated from the hazard (Impact Factor = 0)

You will need to consult the risk assessment for this task. The critical facilities exposed to each hazard have been identified, and the impacts on operability have been estimated for most of the hazards within the planning area. If the functional downtime component has not been provided for a hazard in the risk assessment, consider the impact on operability of that hazard to be low.

TABLE 5. HAZARD IMPACT ON OPERATIONS			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 1)

Determine Risk Rating for Each Hazard

A risk rating for each hazard is determined by multiplying the assigned probability factor by the sum of the weighted impact factors for people, property and operations:

- Risk Rating = Probability Factor x Weighted Impact Factor {people + property + operations}

Using the results developed in Tables 1, 2, 4 and 5, complete Table 6 to calculate a risk rating for each hazard of concern.

TABLE 6. HAZARD RISK RATING			
Hazard Type	Probability Factor (P)	Sum of Weighted Impact Factors on People, Property & Operations (I)	Risk Rating (P x I)

Complete Risk Ranking in Template

Once Table 6 has been completed above, complete Table 1-2 in your template. The hazard with the highest risk rating in Table 6 should be listed at the top of Table 1-2 and given a rank of 1; the hazard with the second highest rating should be listed second with a rank of 2; and so on. Two hazards with equal risk ratings should be given the same rank.

It is important to note that this exercise should not override your subjective assessment of relative risk based on your knowledge of the history of natural hazard events in your jurisdiction. If this risk ranking exercise generates results other than what you know based on substantiated data and documentation, you may alter the ranking based on this knowledge. If this is the case, please note this fact in the comments at the end of the template. Remember, one of the purposes of this exercise is to support the selection and prioritization of initiatives in your plan. If you identify an initiative with a high priority that mitigates the risk of a hazard you have ranked low, that project will not be competitive in the grant arena.

STATUS OF PREVIOUS PLAN INITIATIVES

In this section, provide a status report of actions recommended in your previous hazard mitigation plan. You must be able to reconcile your original action plan to meet FEMA requirements for plan updates. Enter all the recommended actions from your previous plan in Table 1-3 and put a ✓ in one of the following three columns for each action to indicate its status:

- **Completed**—If the action has been completed, place a check mark in this column and enter a brief explanation in the “Comments” column (e.g., “Action #WC31 was completed by the Public Works Department on 3/12/2009”). Ongoing actions, such as annual outreach projects or maintenance activities, should also be indicated as “Completed,” with a statement about the ongoing nature of the action provided in the “Comments” column (e.g., “Ongoing action, implemented annually by Community Development Department”).
- **Carry Over to Plan Update**—If you did not complete an action and want to carry it over to your updated action plan, place a check mark in this column, and enter an explanatory statement in the comment section (e.g., “Action carried over as Action #WC14 in updated action plan”).
- **Removed; No Longer Feasible**—If you want to remove an action because you have determined that it is no longer feasible, place a check mark in this column. “No longer feasible” means that you have determined that you do not have the capability to implement the action or that the action does not serve the best interest of your jurisdiction. Lack of funding does not mean that it is no longer feasible, unless the sole source of funding for an action is no longer available. Place a comment in the comment section explaining why the action is no longer feasible (e.g., “Action no longer considered feasible due to lack of political support to complete it.”)

HAZARD MITIGATION ACTION PLAN**Action Plan Matrix**

Identify the initiatives your jurisdiction would like to pursue with this plan. Refer to the mitigation catalog for mitigation options you might want to consider. Be sure to consider the following factors in your selection of initiatives:

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- Select initiatives that are consistent with the overall goals, objectives and guiding principles of the hazard mitigation plan.
- Identify projects where benefits exceed costs.
- Include any project that your jurisdiction has committed to pursuing regardless of grant eligibility.
- Know what is and is not grant-eligible under the HMGP and PDM (see fact sheet provided). Listing HMGP or PDM as a potential funding source for an ineligible project will be a red flag when this plan goes through review. If you have projects that are not HMGP or PDM grant eligible, but do mitigate part or all of the hazard and may be eligible for other grant programs sponsored by other agencies, include them in this section.
- Although you should identify at least one initiative for your highest ranked risk, a hazard-specific project is not required for every hazard. If you have not identified an earthquake related project, and an earthquake occurs that causes damage in your jurisdiction, you are not discounted from HMGP project grant eligibility.

Wording Your Initiative Descriptions:

Descriptions of your initiatives need not provide great detail. That will come when you apply for a project grant. Provide enough information to identify the project's scope and impact. The following are typical descriptions for an action plan initiative:

- **Initiative 1**—Address Repetitive Loss properties. Through targeted mitigation, acquire, relocate or retrofit the five repetitive loss structures in the County as funding opportunities become available.
- **Initiative 2**—Perform a non-structural, seismic retrofit of City Hall.
- **Initiative 3**—Acquire floodplain property in the Smith subdivision.
- **Initiative 4**—Enhance the County flood warning capability by joining the NOAA "Storm Ready" program.

Complete Table 1-4 for all the initiatives you have identified:

- Enter the initiative number and description.
- Indicate whether the initiative mitigates hazards for new or existing assets.
- Identify the specific hazards the initiative will mitigate.
- Identify by number the mitigation plan objectives that the initiative addresses. Approved objectives have been included in your tool kit.
- Indicate who will be the lead in administering the project. This will most likely be your governing body.
- Identify funding sources for the project. If it is a grant, include the funding sources for the cost share.
- Indicate the time line as "short term" (1 to 5 years) or "long term" (5 years or greater).

Technical assistance will provided upon request.

Prioritization of Mitigation Initiatives

Complete the information in Table 1-5 as follows:

- **Initiative #**—Indicate the initiative number from Table 1-4.
- **# of Objectives Met**—Enter the number of objectives the initiative will meet.
- **Benefits**—Enter "High," "Medium" or "Low" as follows:
 - High: Project will have an immediate impact on the reduction of risk exposure to life and property.

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- Medium: Project will have a long-term impact on the reduction of risk exposure to life and property, or project will provide an immediate reduction in the risk exposure to property.
- Low: Long-term benefits of the project are difficult to quantify in the short term.
- **Costs**—Enter “High,” “Medium” or “Low” as follows:
 - High: Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover the costs of the proposed project.
 - Medium: Could budget for under existing work-plan, but would require a reapportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
 - Low: Possible to fund under existing budget. Project is part of, or can be part of an existing ongoing program.

If you know the estimated cost of a project because it is part of an existing, ongoing program, indicate the amount.

- **Do Benefits Exceed the Cost?**—Enter “Yes” or “No.” This is a qualitative assessment. Enter “Yes” if the benefit rating (high, medium or low) is the same as or higher than the cost rating (high benefit/high cost; high benefit/medium cost; medium benefit/low cost; etc.). Enter “No” if the benefit rating is lower than the cost rating (medium benefit/high cost, low benefit/medium cost; etc.)
- **Is the Project Grant-Eligible?**—Enter “Yes” or “No.” Refer to the fact sheet on HMGP and PDM.
- **Can Project Be Funded Under Existing Program Budgets?**—Enter “Yes” or “No.” In other words, is this initiative currently budgeted for, or would it require a new budget authorization or funding from another source such as grants?
- **Priority**— Enter “High,” “Medium” or “Low” as follows:
 - High: Project meets multiple plan objectives, benefits exceed cost, funding is secured under existing programs, or is grant eligible, and project can be completed in 1 to 5 years (i.e., short term project) once funded.
 - Medium: Project meets at least 1 plan objective, benefits exceed costs, requires special funding authorization under existing programs, grant eligibility is questionable, and project can be completed in 1 to 5 years once funded.
 - Low: Project will mitigate the risk of a hazard, benefits exceed costs, funding has not been secured, project is not grant eligible, and time line for completion is long term (5 to 10 years).

This prioritization is a simple review to determine that the initiatives you have identified meet one of the primary objectives of the Disaster Mitigation Act. It is not the detailed benefit/cost analysis required for HMGP/PDM project grants. The prioritization will identify any projects whose probable benefits will not exceed the probable costs.

Analysis of Mitigation Actions

Complete Table 1-6 summarizing the mitigation actions by hazard of concern and the following six mitigation types:

Instructions for Completing Municipality Annex Template

- **Prevention**—Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. Includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
- **Property Protection**—Modification of buildings or structures to protect them from a hazard or removal of structures from a hazard area. Includes acquisition, elevation, relocation, structural retrofit, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness**—Actions to inform citizens and elected officials about hazards and ways to mitigate them. Includes outreach projects, real estate disclosure, hazard information centers, and school-age and adult education.
- **Natural Resource Protection**—Actions that minimize hazard loss and preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Emergency Services**—Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities.
- **Structural Projects**—Actions that involve the construction of structures to reduce the impact of a hazard. Includes dams, setback levees, floodwalls, retaining walls, and safe rooms.

This exercise demonstrates that the jurisdiction has selected a comprehensive range of actions.

FUTURE NEEDS TO BETTER UNDERSTAND RISK/VULNERABILITY

In this section, identify any future studies, analyses, reports, or surveys your jurisdiction needs to better understand its vulnerability to identified or currently unidentified risks. These could be needs based on federal or state agency mandates such as EPA's Bio-terrorism assessment requirement for water districts.

ADDITIONAL COMMENTS

Use this section add any additional information pertinent to hazard mitigation and your jurisdiction not covered in this template.

As you complete your template, please forward it to:

Kristen Gelino, Tetra Tech, Inc.
425.482.7801

Kristen.Gelino@TetraTech.com

CHAPTER 1. INSERT JURISDICTION NAME UPDATE ANNEX

1.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

Name, Title
Street Address
City, State ZIP
Telephone: Phone #
e-mail Address: email address

Alternate Point of Contact

Name, Title
Street Address
City, State ZIP
Telephone: Phone #
e-mail Address: email address

1.2 JURISDICTION PROFILE

Insert Narrative Profile Information, per Instructions

The following is a summary of key information about the jurisdiction:

- **Population Served**—Insert Population as of Insert Date of Population Count
- **Land Area Served**—Insert Area
- **Value of Area Served**—The estimated value of the area served by the jurisdiction is Insert Total Value
- **Land Area Owned**—Insert Area
- **List of Critical Infrastructure/Equipment Owned by the Jurisdiction:**
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
- **Total Value of Critical Infrastructure/Equipment**—The total value of critical infrastructure and equipment owned by the jurisdiction is Insert Total Value
- **List of Critical Facilities Owned by the Jurisdiction:**
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
- **Total Value of Critical Facilities**—The total value of critical facilities owned by the jurisdiction is Insert Total Value
- **Current and Anticipated Service Trends**—Insert Summary Description of Service Trends

1.3 APPLICABLE REGULATIONS AND PLANS

The following existing codes, ordinances, policies or plans are applicable to this hazard mitigation plan:

- Insert Name of Code, Ordinance, Policy or Plan

- #### 1.4 JURISDICTION-SPECIFIC NATURAL HAZARD EVENT HISTORY

Table 1-1 lists all past occurrences of natural hazards within the jurisdiction.

[illegible]

INSERT JURISDICTION NAME UPDATE ANNEX

1.5 HAZARD RISK RANKING

Table 1-2 presents the ranking of the hazards of concern.

TABLE 1-2. HAZARD RISK RANKING		
Rank	Hazard Type	Risk Rating Score (Probability x Impact)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Table 1-3 summarizes the initiatives that were recommended in the previous version of the hazard mitigation plan and their implementation status at the time this update was prepared.

1-4

 INSERT JURISDICTION NAME UPDATE ANNEX

1.7 HAZARD MITIGATION ACTION PLAN AND EVALUATION OF RECOMMENDED INITIATIVES

Table 1-4 lists the initiatives that make up the jurisdiction's hazard mitigation plan. Table 1-5 identifies the priority for each initiative. Table 1-6 summarizes the mitigation initiatives by hazard of concern and the six mitigation types.

TABLE 1-4. HAZARD MITIGATION ACTION PLAN MATRIX							
Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							

1-6

INSERT JURISDICTION NAME UPDATE ANNEX

TABLE 1-6. ANALYSIS OF MITIGATION INITIATIVES						
Hazard Type	Initiative Addressing Hazard, by Mitigation Type ^a					
	1. Prevention	2. Property Protection	3. Public Education and Awareness	4. Natural Resource Protection	5. Emergency Services	6. Structural Projects
Avalanche						
Dam Failure						
Drought						
Earthquake						
Flood						
Landslide						
Severe Weather						
Tsunami						
Volcano						
Wildfire						
a. See Chapter 1 for explanation of mitigation types.						

1.8 FUTURE NEEDS TO BETTER UNDERSTAND RISK/ VULNERABILITY

Insert text, if any; delete section if not used

1.9 ADDITIONAL COMMENTS

Insert text, if any; delete section if not used

*King County Regional Hazard Mitigation Plan Update
Volume 2: Planning Partner Annexes*

Appendix C3.
Annex Instructions and Templates for Fire Districts

Updated November 2013

INSTRUCTIONS FOR COMPLETING FIRE DISTRICT ANNEX TEMPLATE

This document provides instructions for fire districts participating in multi-partner hazard mitigation planning. These instructions are intended for districts that do not currently have a FEMA approved hazard mitigation plan.

Assistance in completing the template will be available in the form of a workshop for all planning partners in November and technical assistance as requested and as funding allows. Any questions on completing the template should be directed to:

Rob Flaner
208.939.4391
Rob.Flaner@TetraTech.com

Fully completed templates must be completed and returned by:

Friday, January 17, 2014.

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Fire District Annex:

This document provides instructions for completing the jurisdictional annex template for fire districts.

Please refer all questions to:

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rob.flaner@tetrattech.com

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Narrative Profile

Please provide a brief summary to profile your jurisdiction. Include the purpose of the jurisdiction, the date of inception, the type of organization, the number of employees, the mode of operation (i.e., how operations are funded), the type of governing body, and who has adoptive authority. Describe who the jurisdiction's customers are (if applicable, include number of users or subscribers). Include a geographical description of the service area.

Provide information in a style similar to the example provided in the box at right. This should be information that was not provided in the overall mitigation plan document.

Please be sure to include who will assume responsibility for the adoption of the plan and who will oversee the implementation of the plan.

Example Jurisdiction Narrative Profile:

Humboldt Community Services District is a special-purpose district created in 1952 to provide water, sewer, and street lighting to the unincorporated area surrounding the City of Eureka known as Pine Hill & Cullen. The District's designated service areas expanded throughout the years to include other unincorporated areas of Humboldt County known as Myrtle town, Humboldt Hill, Fields Landing, King Salmon, and Freshwater. A five-member elected Board of Directors governs the District. The Board assumes responsibility for the adoption of this plan; the General Manager will oversee its implementation. As of April 30, 2007, the District serves 7,305 water connections and 6,108 sewer connections, with a current staff of 21. Funding comes primarily through rates and revenue bonds.

Summary Information

Complete the bulleted list of summary information as follows:

- **Population Served**—List the estimated population that your jurisdiction provides services to. If you do not know this number directly, create an estimate (e.g., the number of service connections times the average household size for the service area based on Census data).
- **Land Area Served**—Enter the service area of your jurisdiction in acres or square miles.
- **Value of Area Served**—Enter the approximate assessed value of your service area. If you do not have this information, the County should be able to provide a number using the County Assessor's database.
- **Land Area Owned**—Enter the area of property owned by the jurisdiction in acres or square miles.
- **List of Critical Infrastructure/ Equipment Owned by the Jurisdiction**—List all infrastructure and equipment that is critical to your jurisdiction's operations and is located in a natural hazard risk zone. Briefly describe the item and give its estimated replacement-cost value. Example is as follows:

Instructions for Completing Municipality Annex Template

- Fire Districts—Apparatus and equipment housed in a facility that is located in a natural hazard risk zone. This is the equipment that is essential for you to deliver services to this area should a natural hazard occur. It is not necessary to provide a detailed inventory of each engine and truck and its contents. A summary will suffice, such as “5 Engines, 2 ladders, and their contents”. Do not list reserve equipment.
- **Total Value of Critical Infrastructure/Equipment**—Enter total replacement-cost value of the critical infrastructure and equipment listed above.
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 - For a Fire District: Portions of the jurisdiction have experienced a 13 percent growth over the last five years. Land use designations allow for an increase in light commercial and residential land uses within the service area. This increase in density of land uses will represent an increase in population and thus a projected increase in call volume. Our District is experiencing an average annual increase in call volume of 13 percent.

APPLICABLE REGULATIONS AND PLAN

List any federal, state, local or district laws, ordinances, codes and policies that govern your jurisdiction that include elements addressing hazard mitigation. Describe how these laws may support or conflict with the mitigation strategies of this plan. List any other plans, studies or other documents that address hazard mitigation issues for your jurisdiction or may allow you to support or enhance actions identified in this plan. Note whether the documents could have a positive or a negative impact on the mitigation strategies of this plan. Some examples of plans that may be relevant include Emergency Response Plan, Continuity of Operations Plan, Recovery Plan, and Capital Improvement Program. “None applicable” is a possible answer for this section.

CLASSIFICATION IN HAZARD MITIGATION PROGRAMS

If you know your jurisdiction’s Public Protection number, please enter it under the “Classification” column in Table 1-1. If you do not know if your jurisdiction participates in this program or do not know the number, please leave it blank and the Planning Team will provide this information for you. No entries are needed for the other items in Table 1-1.

JURISDICTION-SPECIFIC NATURAL HAZARD EVENT HISTORY

In Table 1-2, list in chronological order (most recent first) any natural hazard event that has caused damage to your jurisdiction since 1975. Include the date of the event and the estimated dollar amount of damage it caused. Please refer to the SHELDUS historical event data included on your dvd. Potential sources of damage information include:

- Preliminary damage estimates your jurisdiction filed with the county or state
- Insurance claims data
- Newspaper archives

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- Other plans/documents that deal with emergency management (safety element of a comprehensive plan, emergency response plan, etc.)
- Citizen input.

HAZARD RISK RANKING

The risk ranking performed for the overall planning area is presented in the risk assessment section of the overall hazard mitigation plan. However, each jurisdiction has differing degrees of risk exposure and vulnerability and, therefore, needs to rank risk for its own area, using the same methodology as used for the overall planning area. The risk-ranking exercise assesses two variables for each hazard: its probability of occurrence; and its potential impact on people, property and operations. A detailed discussion of the concepts associated with risk ranking is provided in the overall hazard mitigation plan. The instructions below outline steps for assessing risk in your jurisdiction in order to develop results that are to be included in the template.

Determine Probability of Occurrence for Each Hazard

A probability factor is assigned based on how often a hazard is likely to occur. In Table 1, list the probability of occurrence for each hazard as it pertains to your jurisdiction, along with its probability factor, as follows:

- **High**—Hazard event is likely to occur within 25 years (Probability Factor = 3)
- **Medium**—Hazard event is likely to occur within 100 years (Probability Factor = 2)
- **Low**—Hazard event is not likely to occur within 100 years (Probability Factor = 1)
- **None**—If there is no exposure to a hazard, there is no probability of occurrence (Probability Factor = 0)

TABLE 1. HAZARD PROBABILITY OF OCCURRENCE		
Hazard Type	Probability	Probability Factor

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The probability of occurrence of a hazard event is generally based on past hazard events in an area. For example, if your jurisdiction has experienced two damaging floods in the last 25 years, the probability of occurrence is high for flooding and scores a 3 under this category. If your jurisdiction has experienced no damage from landslides in the last 100 years, your probability of occurrence for landslide is low, and scores a 1 under this category.

Determine Potential Impacts of Each Hazard

The impact of each hazard was divided into three categories: impacts on people, impacts on property, and impacts on your jurisdiction's operations. These categories were also assigned weighted values. Impact on people was assigned a weighting factor of 3, impact on property was assigned a weighting factor of 2 and impact on operations was assigned a weighting factor of 1. Steps to assess each type of impact are described below.

Impacts on People

To assess impacts on people, values are assigned based on the percentage of the total *population exposed* to the hazard event. The degree of impact on individuals will vary and is not measurable, so the calculation assumes for simplicity and consistency that all people exposed to a hazard because they live in a hazard zone will be equally impacted when a hazard event occurs. In Table 2, list the potential impact of each hazard on people in your jurisdiction, along with its impact factor, as follows:

- **High Impact**—30% or more of the population is exposed to a hazard (Impact Factor = 3)
- **Medium Impact**—15% to 29% of the population is exposed to a hazard (Impact Factor = 2)
- **Low Impact**—14% or less of the population is exposed to the hazard (Impact Factor = 1)
- **No Impact**—None of the population is exposed to a hazard (Impact Factor = 0)

TABLE 2. HAZARD IMPACT ON PEOPLE			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 3)

Impacts on Property

To assess impacts on property, values are assigned based on the percentage of the total *value of buildings, equipment and infrastructure that is exposed* to the hazard event. In Table 3, enter the cost estimates for potential damage to the jurisdiction's exposed buildings, equipment and infrastructure, taken from the "Summary of Loss" matrix provided with these instructions.

TABLE 3. COST ESTIMATES FOR POTENTIAL DAMAGE TO STRUCTURES	
Hazard type	Estimate of Potential Dollar Losses to Jurisdiction- Owned Facilities Exposed to the Hazard

In Table 4, list the potential impact of each hazard on property in your jurisdiction, along with its impact factor. Determine impact based on damage estimates from Table 3, as follows:

- **High Impact**—30% or more of the total assessed property value of facilities, equipment and infrastructure is exposed to a hazard (Impact Factor = 3)
- **Medium Impact**—15% to 29% of the total assessed property value of facilities, equipment and infrastructure is exposed to a hazard (Impact Factor = 2)
- **Low Impact**—14% or less of the total assessed property value of facilities, equipment and infrastructure is exposed to the hazard (Impact Factor = 1)
- **No Impact**—None of the total assessed property value of facilities, equipment and infrastructure is exposed to a hazard (Impact Factor = 0)

TABLE 4. HAZARD IMPACT ON PROPERTY			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 2)

Impacts on the Jurisdiction's Operations

Impact on operations is assessed based on estimates of *how long it will take your jurisdiction to become 100-percent operable* after a hazard event. The estimated functional downtime for critical facilities has been estimated for most hazards within the planning area. In Table 5, list the potential impact of each hazard on the operations of your jurisdiction, along with its impact factor, as follows:

- High = functional downtime of 365 days or more (Impact Factor = 3)
- Medium = Functional downtime of 180 to 364 days (Impact Factor = 2)
- Low = Functional downtime of 180 days or less (Impact Factor = 1)
- No Impact = No functional downtime is estimated from the hazard (Impact Factor = 0)

TABLE 5. HAZARD IMPACT ON OPERATIONS			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 1)

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You will need to consult the risk assessment for this task. The critical facilities exposed to each hazard have been identified, and the impacts on operability have been estimated for most of the hazards within the planning area. If the functional downtime component has not been provided for a hazard in the risk assessment, consider the impact on operability of that hazard to be low.

Determine Risk Rating for Each Hazard

A risk rating for each hazard is determined by multiplying the assigned probability factor by the sum of the weighted impact factors for people, property and operations:

- Risk Rating = Probability Factor x Weighted Impact Factor {people + property + operations}

Using the results developed in Tables 1, 2, 4 and 5, complete Table 6 to calculate a risk rating for each hazard of concern.

TABLE 6. HAZARD RISK RATING			
Hazard Type	Probability Factor (P)	Sum of Weighted Impact Factors on People, Property & Operations (I)	Risk Rating (P x I)

Complete Risk Ranking in Template

Once Table 6 has been completed above, complete Table 1-3 in your template. The hazard with the highest risk rating in Table 6 should be listed at the top of Table 1-3 and given a rank of 1; the hazard with the second highest rating should be listed second with a rank of 2; and so on. Two hazards with equal risk ratings should be given the same rank.

It is important to note that this exercise should not override your subjective assessment of relative risk based on your knowledge of the history of natural hazard events in your jurisdiction. If this risk ranking exercise generates results other than what you know based on substantiated data and documentation, you may alter the ranking based on this knowledge. If this is the case, please note this fact in the comments at the end of the template. Remember, one of the purposes of this exercise is to support the selection and prioritization of initiatives in your plan. If you identify an initiative with a high priority that mitigates the risk of a hazard you have ranked low, that project will not be competitive in the grant arena.

HAZARD MITIGATION ACTION PLAN

Action Plan Matrix

Identify the initiatives your jurisdiction would like to pursue with this plan. Refer to the mitigation catalog for mitigation options you might want to consider. Be sure to consider the following factors in your selection of initiatives:

- Select initiatives that are consistent with the overall goals, objectives and guiding principles of the hazard mitigation plan.
- Identify projects where benefits exceed costs.
- Include any project that your jurisdiction has committed to pursuing regardless of grant eligibility.
- Know what is and is not grant-eligible under the HMGP and PDM (see fact sheet provided). Listing HMGP or PDM as a potential funding source for an ineligible project will be a red flag when this plan goes through review. If you have projects that are not HMGP or PDM grant eligible, but do mitigate part or all of the hazard and may be eligible for other grant programs sponsored by other agencies, include them in this section.
- Although you should identify at least one initiative for your highest ranked risk, a hazard-specific project is not required for every hazard. If you have not identified an earthquake related project, and an earthquake occurs that causes damage in your jurisdiction, you are not discounted from HMGP project grant eligibility.

Wording Your Initiative Descriptions:

Descriptions of your initiatives need not provide great detail. That will come when you apply for a project grant. Provide enough information to identify the project's scope and impact. The following are typical descriptions for an action plan initiative:

- **Initiative 1**—Address Repetitive Loss properties. Through targeted mitigation, acquire, relocate or retrofit the five repetitive loss structures in the County as funding opportunities become available.
- **Initiative 2**—Perform a non-structural, seismic retrofit of City Hall.
- **Initiative 3**—Acquire floodplain property in the Smith subdivision.
- **Initiative 4**—Enhance the County flood warning capability by joining the NOAA "Storm Ready" program.

Complete Table 1-4 for all the initiatives you have identified:

- Enter the initiative number and description.
- Indicate whether the initiative mitigates hazards for new or existing assets.
- Identify the specific hazards the initiative will mitigate.
- Identify by number the mitigation plan objectives that the initiative addresses. Approved objectives have been included in your tool kit.
- Indicate who will be the lead in administering the project. This will most likely be your governing body.
- Identify funding sources for the project. If it is a grant, include the funding sources for the cost share.
- Indicate the time line as "short term" (1 to 5 years) or "long term" (5 years or greater).

Technical assistance will provided upon request.

Prioritization of Mitigation Initiatives

Complete the information in Table 1-5 as follows:

- **Initiative #**—Indicate the initiative number from Table 1-4.

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- **# of Objectives Met**—Enter the number of objectives the initiative will meet.
- **Benefits**—Enter “High,” “Medium” or “Low” as follows:
 - High: Project will have an immediate impact on the reduction of risk exposure to life and property.
 - Medium: Project will have a long-term impact on the reduction of risk exposure to life and property, or project will provide an immediate reduction in the risk exposure to property.
 - Low: Long-term benefits of the project are difficult to quantify in the short term.
- **Costs**—Enter “High,” “Medium” or “Low” as follows:
 - High: Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover the costs of the proposed project.
 - Medium: Could budget for under existing work-plan, but would require a reapportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
 - Low: Possible to fund under existing budget. Project is part of, or can be part of an existing ongoing program.

If you know the estimated cost of a project because it is part of an existing, ongoing program, indicate the amount.
- **Do Benefits Equal or Exceed the Cost?**—Enter “Yes” or “No.” This is a qualitative assessment. Enter “Yes” if the benefit rating (high, medium or low) is the same as or higher than the cost rating (high benefit/high cost; high benefit/medium cost; medium benefit/low cost; etc.). Enter “No” if the benefit rating is lower than the cost rating (medium benefit/high cost, low benefit/medium cost; etc.)
- **Is the Project Grant-Eligible?**—Enter “Yes” or “No.” Refer to the fact sheet on HMGP and PDM.
- **Can Project Be Funded Under Existing Program Budgets?**—Enter “Yes” or “No.” In other words, is this initiative currently budgeted for, or would it require a new budget authorization or funding from another source such as grants?
- **Priority**— Enter “High,” “Medium” or “Low” as follows:
 - High: Project meets multiple plan objectives, benefits exceed cost, funding is secured under existing programs, or is grant eligible, and project can be completed in 1 to 5 years (i.e., short term project) once funded.
 - Medium: Project meets at least 1 plan objective, benefits exceed costs, requires special funding authorization under existing programs, grant eligibility is questionable, and project can be completed in 1 to 5 years once funded.
 - Low: Project will mitigate the risk of a hazard, benefits exceed costs, funding has not been secured, project is not grant eligible, and time line for completion is long term (5 to 10 years).

This prioritization is a simple review to determine that the initiatives you have identified meet one of the primary objectives of the Disaster Mitigation Act. It is not the detailed benefit/cost analysis required for HMGP/PDM project grants. The prioritization will identify any projects whose probable benefits will not exceed the probable costs.

Analysis of Mitigation Actions

Complete Table 1-6 summarizing the mitigation actions by hazard of concern and the following six mitigation types:

- **Prevention**—Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. Includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
- **Property Protection**—Modification of buildings or structures to protect them from a hazard or removal of structures from a hazard area. Includes acquisition, elevation, relocation, structural retrofit, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness**—Actions to inform citizens and elected officials about hazards and ways to mitigate them. Includes outreach projects, real estate disclosure, hazard information centers, and school-age and adult education.
- **Natural Resource Protection**—Actions that minimize hazard loss and preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Emergency Services**—Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities.
- **Structural Projects**—Actions that involve the construction of structures to reduce the impact of a hazard. Includes dams, setback levees, floodwalls, retaining walls, and safe rooms.

This exercise demonstrates that the jurisdiction has selected a comprehensive range of actions.

FUTURE NEEDS TO BETTER UNDERSTAND RISK/VULNERABILITY

In this section, identify any future studies, analyses, reports, or surveys your jurisdiction needs to better understand its vulnerability to identified or currently unidentified risks. These could be needs based on federal or state agency mandates such as EPA's Bio-terrorism assessment requirement for water districts.

ADDITIONAL COMMENTS

Use this section to add any additional information pertinent to hazard mitigation and your jurisdiction not covered in this template.

As you complete your template, please forward it to:

Kristen Gelino, Tetra Tech, Inc.
425.482.7801
Kristen.Gelino@TetraTech.com

CHAPTER 1. INSERT JURISDICTION NAME ANNEX

1.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

Name, Title
Street Address
City, State ZIP
Telephone: Phone #
e-mail Address: email address

Alternate Point of Contact

Name, Title
Street Address
City, State ZIP
Telephone: Phone #
e-mail Address: email address

1.2 JURISDICTION PROFILE

Insert Narrative Profile Information, per Instructions

The following is a summary of key information about the jurisdiction:

- **Population Served**—Insert Population as of Insert Date of Population Count
- **Land Area Served**—Insert Area
- **Value of Area Served**—The estimated value of the area served by the jurisdiction is Insert Total Value
- **Land Area Owned**—Insert Area
- **List of Critical Infrastructure/Equipment Owned by the Jurisdiction:**
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
- **Total Value of Critical Infrastructure/Equipment**—The total value of critical infrastructure and equipment owned by the jurisdiction is Insert Total Value
- **List of Critical Facilities Owned by the Jurisdiction:**
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
- **Total Value of Critical Facilities**—The total value of critical facilities owned by the jurisdiction is Insert Total Value
- **Current and Anticipated Service Trends**—Insert Summary Description of Service Trends

1.3 APPLICABLE REGULATIONS AND PLANS

The following existing codes, ordinances, policies or plans are applicable to this hazard mitigation plan:

- Insert Name of Code, Ordinance, Policy or Plan

- ## 1.4 CLASSIFICATION IN HAZARD MITIGATION PROGRAMS

	Participating?	Classification	Date Classified
Public Protection			
Storm Ready			
Firewise			
Tsunami Ready			

Table 1-2 lists all past occurrences of natural hazards within the jurisdiction.

[illegible]

INSERT JURISDICTION NAME ANNEX

1.6 HAZARD RISK RANKING

Table 1-3 presents the ranking of the hazards of concern.

TABLE 1-3. HAZARD RISK RANKING		
Rank	Hazard Type	Risk Rating Score (Probability x Impact)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

1.7 HAZARD MITIGATION ACTION PLAN AND EVALUATION OF RECOMMENDED INITIATIVES

Table 1-4 lists the initiatives that make up the jurisdiction's hazard mitigation plan. Table 1-5 identifies the priority for each initiative. Table 1-6 summarizes the mitigation initiatives by hazard of concern and the six mitigation types.

TABLE 1-4. HAZARD MITIGATION ACTION PLAN MATRIX						
Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						
Initiative #—Description						

[illegible]

TABLE 1-6. ANALYSIS OF MITIGATION INITIATIVES						
Hazard Type	Initiative Addressing Hazard, by Mitigation Type ^a					
	1. Prevention	2. Property Protection	3. Public Education and Awareness	4. Natural Resource Protection	5. Emergency Services	6. Structural Projects
Avalanche						
Dam Failure						
Drought						
Earthquake						
Flood						
Landslide						
Severe Weather						
Tsunami						
Volcano						
Wildfire						
a. See Chapter I for explanation of mitigation types.						

1.8 FUTURE NEEDS TO BETTER UNDERSTAND RISK/ VULNERABILITY

Insert text, if any; delete section if not used

1.9 ADDITIONAL COMMENTS

Insert text, if any; delete section if not used

Updated November 2013

INSTRUCTIONS FOR COMPLETING FIRE DISTRICT UPDATE ANNEX TEMPLATE

This document provides instructions for fire districts participating in multi-partner hazard mitigation planning. These instructions are intended for districts that currently have a previously approved hazard mitigation plan.

Assistance in completing the template will be available in the form of a workshop for all planning partners in November and technical assistance as requested and as funding allows. Any questions on completing the template should be directed to:

Rob Flaner
208.939.4391
Rob.Flaner@TetraTech.com

Fully completed templates must be completed and returned by Friday, January 17, 2014.

A NOTE ABOUT FORMATTING

The template for the jurisdiction annex is a Microsoft Word document in a format that will be used in the final plan. Partners are asked to use this template so that a uniform product will be completed for each partner. Partners who do not have Microsoft Word capability may prepare the document in other formats, and the planning team will convert it to the Word format.

Content should be entered within the yellow, highlighted text that is currently in the template, rather than creating text in another document and pasting it into the template. Text from another source will alter the style and formatting of the document.

The numbering in the document will be updated when completed annexes are combined into the final document. Please do not adjust any of this numbering.

CHAPTER NUMBER AND TITLE

In the chapter title at the top of page 1, type in the complete official name of your jurisdiction (West County Fire Protection District #1, Burgville Flood Protection District, etc.) replacing the yellow, highlighted text.

Fire District Update Annex:

This document provides instructions for completing the jurisdictional annex template for fire districts.

Please refer all questions to:

Rob Flaner
208.939.4391
rob.flaner@tetrattech.com

Please complete and return by:

Friday, January 17, 2014

Please email completed template to:

Kristen Gelino
425.482.7801
kristen.gelino@tetrattech.com

Associated Materials:

Along with the annex template and these instructions, you have been provided with other materials with information that is needed for completing the template. Be sure to review these materials before you begin the process of filling in the template:

- SHELDUS historical event data
- Summary-of-loss matrix for the hazard mitigation plan,
- Results from the hazard mitigation plan questionnaire,
- Catalog of funding programs
- Catalog of mitigation alternatives, and
- Fact sheet on Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation Grant Program (PDM).

HAZARD MITIGATION PLAN POINT OF CONTACT

Please provide the name, title, mailing address, telephone number, and e-mail address for the primary point of contact for your jurisdiction. This should be the person responsible for monitoring, evaluating and updating the annex for your jurisdiction. This person should also be the principle liaison between your jurisdiction and the Steering Committee overseeing development of this plan.

In addition, designate an alternate point of contact. This would be a person to contact should the primary point of contact be unavailable or no longer employed by the jurisdiction.

JURISDICTION PROFILE

Narrative Profile

Please provide a brief summary to profile your jurisdiction. Include the purpose of the jurisdiction, the date of inception, the type of organization, the number of employees, the mode of operation (i.e., how operations are funded), the type of governing body, and who has adoptive authority. Describe who the jurisdiction's customers are (if applicable, include number of users or subscribers). Include a geographical description of the service area.

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CLASSIFICATION IN HAZARD MITIGATION PROGRAMS

If you know your jurisdiction’s Public Protection number, please enter it under the “Classification” column in Table 1-1. If you do not know if your jurisdiction participates in this program or do not know the number, please leave it blank and the Planning Team will provide this information for you. No entries are needed for the other items in Table 1-1.

JURISDICTION-SPECIFIC NATURAL HAZARD EVENT HISTORY

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- Insurance claims data
- Newspaper archives

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- Other plans/documents that deal with emergency management (safety element of a comprehensive plan, emergency response plan, etc.)
- Citizen input.

HAZARD RISK RANKING

The risk ranking performed for the overall planning area is presented in the risk assessment section of the overall hazard mitigation plan. However, each jurisdiction has differing degrees of risk exposure and vulnerability and, therefore, needs to rank risk for its own area, using the same methodology as used for the overall planning area. The risk-ranking exercise assesses two variables for each hazard: its probability of occurrence; and its potential impact on people, property and operations. A detailed discussion of the concepts associated with risk ranking is provided in the overall hazard mitigation plan. The instructions below outline steps for assessing risk in your jurisdiction in order to develop results that are to be included in the template.

Determine Probability of Occurrence for Each Hazard

A probability factor is assigned based on how often a hazard is likely to occur. In Table 1, list the probability of occurrence for each hazard as it pertains to your jurisdiction, along with its probability factor, as follows:

- **High**—Hazard event is likely to occur within 25 years (Probability Factor = 3)
- **Medium**—Hazard event is likely to occur within 100 years (Probability Factor = 2)
- **Low**—Hazard event is not likely to occur within 100 years (Probability Factor = 1)
- **None**—If there is no exposure to a hazard, there is no probability of occurrence (Probability Factor = 0)

TABLE 1. HAZARD PROBABILITY OF OCCURRENCE		
Hazard Type	Probability	Probability Factor

The probability of occurrence of a hazard event is generally based on past hazard events in an area. For example, if your jurisdiction has experienced two damaging floods in the last 25 years, the probability of occurrence is high for flooding and scores a 3 under this category. If your jurisdiction has experienced no

Instructions for Completing Municipality Annex Template

damage from landslides in the last 100 years, your probability of occurrence for landslide is low, and scores a 1 under this category.

Determine Potential Impacts of Each Hazard

The impact of each hazard was divided into three categories: impacts on people, impacts on property, and impacts on your jurisdiction's operations. These categories were also assigned weighted values. Impact on people was assigned a weighting factor of 3, impact on property was assigned a weighting factor of 2 and impact on operations was assigned a weighting factor of 1. Steps to assess each type of impact are described below.

Impacts on People

To assess impacts on people, values are assigned based on the percentage of the total *population exposed* to the hazard event. The degree of impact on individuals will vary and is not measurable, so the calculation assumes for simplicity and consistency that all people exposed to a hazard because they live in a hazard zone will be equally impacted when a hazard event occurs. In Table 2, list the potential impact of each hazard on people in your jurisdiction, along with its impact factor, as follows:

- **High Impact**—30% or more of the population is exposed to a hazard (Impact Factor = 3)
- **Medium Impact**—15% to 29% of the population is exposed to a hazard (Impact Factor = 2)
- **Low Impact**—14% or less of the population is exposed to the hazard (Impact Factor = 1)
- **No Impact**—None of the population is exposed to a hazard (Impact Factor = 0)

TABLE 2. HAZARD IMPACT ON PEOPLE			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 3)

Impacts on Property

To assess impacts on property, values are assigned based on the percentage of the total *value of buildings, equipment and infrastructure that is exposed* to the hazard event. In Table 3, enter the cost estimates for potential damage to the jurisdiction's exposed buildings, equipment and infrastructure, taken from the "Summary of Loss" matrix provided with these instructions.

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TABLE 3. COST ESTIMATES FOR POTENTIAL DAMAGE TO STRUCTURES	
Hazard type	Estimate of Potential Dollar Losses to Jurisdiction- Owned Facilities Exposed to the Hazard

In Table 4, list the potential impact of each hazard on property in your jurisdiction, along with its impact factor. Determine impact based on damage estimates from Table 3, as follows:

- **High Impact**—30% or more of the total assessed property value of facilities, equipment and infrastructure is exposed to a hazard (Impact Factor = 3)
- **Medium Impact**—15% to 29% of the total assessed property value of facilities, equipment and infrastructure is exposed to a hazard (Impact Factor = 2)
- **Low Impact**—14% or less of the total assessed property value of facilities, equipment and infrastructure is exposed to the hazard (Impact Factor = 1)
- **No Impact**—None of the total assessed property value of facilities, equipment and infrastructure is exposed to a hazard (Impact Factor = 0)

TABLE 4. HAZARD IMPACT ON PROPERTY			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 2)

Impacts on the Jurisdiction's Operations

Impact on operations is assessed based on estimates of *how long it will take your jurisdiction to become 100-percent operable* after a hazard event. The estimated functional downtime for critical facilities has been estimated for most hazards within the planning area. In Table 5, list the potential impact of each hazard on the operations of your jurisdiction, along with its impact factor, as follows:

- High = functional downtime of 365 days or more (Impact Factor = 3)
- Medium = Functional downtime of 180 to 364 days (Impact Factor = 2)
- Low = Functional downtime of 180 days or less (Impact Factor = 1)
- No Impact = No functional downtime is estimated from the hazard (Impact Factor = 0)

TABLE 5. HAZARD IMPACT ON OPERATIONS			
Hazard Type	Impact	Impact Factor	Weighted Impact Factor (Unweighted Factor x 1)

You will need to consult the risk assessment for this task. The critical facilities exposed to each hazard have been identified, and the impacts on operability have been estimated for most of the hazards within the planning area. If the functional downtime component has not been provided for a hazard in the risk assessment, consider the impact on operability of that hazard to be low.

Determine Risk Rating for Each Hazard

A risk rating for each hazard is determined by multiplying the assigned probability factor by the sum of the weighted impact factors for people, property and operations:

- Risk Rating = Probability Factor x Weighted Impact Factor {people + property + operations}

Using the results developed in Tables 1, 2, 4 and 5, complete Table 6 to calculate a risk rating for each hazard of concern.

TABLE 6. HAZARD RISK RATING			
Hazard Type	Probability Factor (P)	Sum of Weighted Impact Factors on People, Property & Operations (I)	Risk Rating (P x I)

Complete Risk Ranking in Template

Once Table 6 has been completed above, complete Table 1-3 in your template. The hazard with the highest risk rating in Table 6 should be listed at the top of Table 1-3 and given a rank of 1; the hazard with the second highest rating should be listed second with a rank of 2; and so on. Two hazards with equal risk ratings should be given the same rank.

It is important to note that this exercise should not override your subjective assessment of relative risk based on your knowledge of the history of natural hazard events in your jurisdiction. If this risk ranking exercise generates results other than what you know based on substantiated data and documentation, you may alter the ranking based on this knowledge. If this is the case, please note this fact in the comments at the end of the template. Remember, one of the purposes of this exercise is to support the selection and prioritization of initiatives in your plan. If you identify an initiative with a high priority that mitigates the risk of a hazard you have ranked low, that project will not be competitive in the grant arena.

STATUS OF PREVIOUS PLAN INITIATIVES

In this section, provide a status report of actions recommended in your previous hazard mitigation plan. You must be able to reconcile your original action plan to meet FEMA requirements for plan updates. Enter all the recommended actions from your previous plan in Table 1-4 and put a ✓ in one of the following three columns for each action to indicate its status:

- **Completed**—If the action has been completed, place a check mark in this column and enter a brief explanation in the “Comments” column (e.g., “Action #WC31 was completed by the Public Works Department on 3/12/2009”). Ongoing actions, such as annual outreach projects or maintenance activities, should also be indicated as “Completed,” with a statement about the ongoing nature of the action provided in the “Comments” column (e.g., “Ongoing action, implemented annually by Community Development Department”).
- **Carry Over to Plan Update**—If you did not complete an action and want to carry it over to your updated action plan, place a check mark in this column, and enter an explanatory statement in the comment section (e.g., “Action carried over as Action #WC14 in updated action plan”).

- **Removed; No Longer Feasible**—If you want to remove an action because you have determined that it is no longer feasible, place a check mark in this column. “No longer feasible” means that you have determined that you do not have the capability to implement the action or that the action does not serve the best interest of your jurisdiction. Lack of funding does not mean that it is no longer feasible, unless the sole source of funding for an action is no longer available. Place a comment in the comment section explaining why the action is no longer feasible (e.g., “Action no longer considered feasible due to lack of political support to complete it.”)

HAZARD MITIGATION ACTION PLAN

Action Plan Matrix

Identify the initiatives your jurisdiction would like to pursue with this plan. Refer to the mitigation catalog for mitigation options you might want to consider. Be sure to consider the following factors in your selection of initiatives:

- Select initiatives that are consistent with the overall goals, objectives and guiding principles of the hazard mitigation plan.
 - Identify projects where benefits exceed costs.
 - Include any project that your jurisdiction has committed to pursuing regardless of grant eligibility.
 - Know what is and is not grant-eligible under the HMGP and PDM (see fact sheet provided). Listing HMGP or PDM as a potential funding source for an ineligible project will be a red flag when this plan goes through review. If you have projects that are not HMGP or PDM grant eligible, but do mitigate part or all of the hazard and may be eligible for other grant programs sponsored by other agencies, include them in this section.
 - Although you should identify at least one initiative for your highest ranked risk, a hazard-specific project is not required for every hazard. If you have not identified an earthquake related project, and an earthquake occurs that causes damage in your jurisdiction, you are not discounted from HMGP project grant eligibility.
- Complete Table 1-5 for all the initiatives you have identified:
- Enter the initiative number and description.
 - Indicate whether the initiative mitigates hazards for new or existing assets.
 - Identify the specific hazards the initiative will mitigate.
 - Identify by number the mitigation plan objectives that the initiative addresses. Approved objectives have been included in your tool kit.
 - Indicate who will be the lead in administering the project. This will most likely be your governing body.
 - Identify funding sources for the project. If it is a grant, include the funding sources for the cost share.

Wording Your Initiative Descriptions:

Descriptions of your initiatives need not provide great detail. That will come when you apply for a project grant. Provide enough information to identify the project's scope and impact. The following are typical descriptions for an action plan initiative:

- **Initiative 1**—Address Repetitive Loss properties. Through targeted mitigation, acquire, relocate or retrofit the five repetitive loss structures in the County as funding opportunities become available.
- **Initiative 2**—Perform a non-structural, seismic retrofit of City Hall.
- **Initiative 3**—Acquire floodplain property in the Smith subdivision.
- **Initiative 4**—Enhance the County flood warning capability by joining the NOAA "Storm Ready" program.

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- Indicate the time line as “short term” (1 to 5 years) or “long term” (5 years or greater).

Technical assistance will provided upon request.

Prioritization of Mitigation Initiatives

Complete the information in Table 1-6 as follows:

- **Initiative #**—Indicate the initiative number from Table 1-5.
- **# of Objectives Met**—Enter the number of objectives the initiative will meet.
- **Benefits**—Enter “High,” “Medium” or “Low” as follows:
 - High: Project will have an immediate impact on the reduction of risk exposure to life and property.
 - Medium: Project will have a long-term impact on the reduction of risk exposure to life and property, or project will provide an immediate reduction in the risk exposure to property.
 - Low: Long-term benefits of the project are difficult to quantify in the short term.
- **Costs**—Enter “High,” “Medium” or “Low” as follows:
 - High: Would require an increase in revenue via an alternative source (i.e., bonds, grants, fee increases) to implement. Existing funding levels are not adequate to cover the costs of the proposed project.
 - Medium: Could budget for under existing work-plan, but would require a reappropriation of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
 - Low: Possible to fund under existing budget. Project is part of, or can be part of an existing ongoing program.

If you know the estimated cost of a project because it is part of an existing, ongoing program, indicate the amount.
- **Do Benefits Exceed the Cost?**—Enter “Yes” or “No.” This is a qualitative assessment. Enter “Yes” if the benefit rating (high, medium or low) is the same as or higher than the cost rating (high benefit/high cost; high benefit/medium cost; medium benefit/low cost; etc.). Enter “No” if the benefit rating is lower than the cost rating (medium benefit/high cost, low benefit/medium cost; etc.)
- **Is the Project Grant-Eligible?**—Enter “Yes” or “No.” Refer to the fact sheet on HMGP and PDM.
- **Can Project Be Funded Under Existing Program Budgets?**—Enter “Yes” or “No.” In other words, is this initiative currently budgeted for, or would it require a new budget authorization or funding from another source such as grants?
- **Priority**— Enter “High,” “Medium” or “Low” as follows:
 - High: Project meets multiple plan objectives, benefits exceed cost, funding is secured under existing programs, or is grant eligible, and project can be completed in 1 to 5 years (i.e., short term project) once funded.
 - Medium: Project meets at least 1 plan objective, benefits exceed costs, requires special funding authorization under existing programs, grant eligibility is questionable, and project can be completed in 1 to 5 years once funded.

Instructions for Completing Municipality Annex Template

- Low: Project will mitigate the risk of a hazard, benefits exceed costs, funding has not been secured, project is not grant eligible, and time line for completion is long term (5 to 10 years).

This prioritization is a simple review to determine that the initiatives you have identified meet one of the primary objectives of the Disaster Mitigation Act. It is not the detailed benefit/cost analysis required for HMGP/PDM project grants. The prioritization will identify any projects whose probable benefits will not exceed the probable costs.

Analysis of Mitigation Actions

Complete Table 1-7 summarizing the mitigation actions by hazard of concern and the following six mitigation types:

- **Prevention**—Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. Includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
- **Property Protection**—Modification of buildings or structures to protect them from a hazard or removal of structures from a hazard area. Includes acquisition, elevation, relocation, structural retrofit, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness**—Actions to inform citizens and elected officials about hazards and ways to mitigate them. Includes outreach projects, real estate disclosure, hazard information centers, and school-age and adult education.
- **Natural Resource Protection**—Actions that minimize hazard loss and preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Emergency Services**—Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities.
- **Structural Projects**—Actions that involve the construction of structures to reduce the impact of a hazard. Includes dams, setback levees, floodwalls, retaining walls, and safe rooms.

This exercise demonstrates that the jurisdiction has selected a comprehensive range of actions.

FUTURE NEEDS TO BETTER UNDERSTAND RISK/VULNERABILITY

In this section, identify any future studies, analyses, reports, or surveys your jurisdiction needs to better understand its vulnerability to identified or currently unidentified risks. These could be needs based on federal or state agency mandates such as EPA's Bio-terrorism assessment requirement for water districts.

ADDITIONAL COMMENTS

Use this section add any additional information pertinent to hazard mitigation and your jurisdiction not covered in this template.

As you complete your template, please forward it to:

Kristen Gelino, Tetra Tech, Inc.
425.482.7801
Kristen.Gelino@TetraTech.com

CHAPTER 1. INSERT JURISDICTION NAME UPDATE ANNEX

1.1 HAZARD MITIGATION PLAN POINT OF CONTACT

Primary Point of Contact

Name, Title
Street Address
City, State ZIP
Telephone: Phone #
e-mail Address: email address

Alternate Point of Contact

Name, Title
Street Address
City, State ZIP
Telephone: Phone #
e-mail Address: email address

1.2 JURISDICTION PROFILE

Insert Narrative Profile Information, per Instructions

The following is a summary of key information about the jurisdiction:

- **Population Served**—Insert Population as of Insert Date of Population Count
- **Land Area Served**—Insert Area
- **Value of Area Served**—The estimated value of the area served by the jurisdiction is Insert Total Value
- **Land Area Owned**—Insert Area
- **List of Critical Infrastructure/Equipment Owned by the Jurisdiction:**
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
- **Total Value of Critical Infrastructure/Equipment**—The total value of critical infrastructure and equipment owned by the jurisdiction is Insert Total Value
- **List of Critical Facilities Owned by the Jurisdiction:**
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
 - Insert Description of Item Insert Value of Item
- **Total Value of Critical Facilities**—The total value of critical facilities owned by the jurisdiction is Insert Total Value
- **Current and Anticipated Service Trends**—Insert Summary Description of Service Trends

1.3 APPLICABLE REGULATIONS AND PLANS

The following existing codes, ordinances, policies or plans are applicable to this hazard mitigation plan:

- Insert Name of Code, Ordinance, Policy or Plan

- ## 1.4 CLASSIFICATION IN HAZARD MITIGATION PROGRAMS

TABLE 1-1. COMMUNITY CLASSIFICATIONS			
	Participating?	Classification	Date Classified
Public Protection			
Storm Ready			
Firewise			
Tsunami Ready			

Table 1-2 lists all past occurrences of natural hazards within the jurisdiction.

1-2

1.6 HAZARD RISK RANKING

Table 1-3 presents the ranking of the hazards of concern.

TABLE 1-3. HAZARD RISK RANKING		
Rank	Hazard Type	Risk Rating Score (Probability x Impact)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

TABLE 1-4.
PREVIOUS ACTION PLAN IMPLEMENTATION STATUS

1-5

1.8 HAZARD MITIGATION ACTION PLAN AND EVALUATION OF RECOMMENDED INITIATIVES

Table 1-5 lists the initiatives that make up the jurisdiction's hazard mitigation plan. Table 1-6 identifies the priority for each initiative. Table 1-7 summarizes the mitigation initiatives by hazard of concern and the six mitigation types.

TABLE 1-5. HAZARD MITIGATION ACTION PLAN MATRIX							
Applies to new or existing assets	Hazards Mitigated	Objectives Met	Lead Agency	Estimated Cost	Sources of Funding	Timeline	Included in Previous Plan?
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							
Initiative #—Description							

INSERT JURISDICTION NAME UPDATE ANNEX

TABLE 1-6.
MITIGATION STRATEGY PRIORITY

[illegible]

TABLE 1-7. ANALYSIS OF MITIGATION INITIATIVES						
Hazard Type	Initiative Addressing Hazard, by Mitigation Type ^a					
	1. Prevention	2. Property Protection	3. Public Education and Awareness	4. Natural Resource Protection	5. Emergency Services	6. Structural Projects
Avalanche						
Dam Failure						
Drought						
Earthquake						
Flood						
Landslide						
Severe Weather						
Tsunami						
Volcano						
Wildfire						
a. See Chapter 1 for explanation of mitigation types.						

1.9 FUTURE NEEDS TO BETTER UNDERSTAND RISK/ VULNERABILITY

Insert text, if any; delete section if not used

1.10 ADDITIONAL COMMENTS

Insert text, if any; delete section if not used

Attachment 4

**CITY OF KENMORE
WASHINGTON
RESOLUTION NO. 15-266**

**A RESOLUTION OF THE CITY OF KENMORE,
WASHINGTON, ADOPTING ALL OF VOLUME 1
AND THE INTRODUCTION, APPENDICES AND
THE CITY OF KENMORE'S PORTION OF
VOLUME 2 OF THE KING COUNTY REGIONAL
HAZARD MITIGATION PLAN UPDATE, JULY 2015
AS DEVELOPED IN COOPERATION WITH THE
KING COUNTY OFFICE OF EMERGENCY
MANAGEMENT**

WHEREAS, all of King County has exposure to natural hazards that increase the risk to life, property, environment and the County's economy; and

WHEREAS, pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property; and

WHEREAS, The Disaster Mitigation Act of 2000 (Public Law 106-390) established new requirements for pre- and post-disaster hazard mitigation programs; and

WHEREAS, the Federal Emergency Management Agency requires each local jurisdiction to adopt and have in place a Hazard Mitigation Plan in order to minimize loss of life and recurring property damage; and

WHEREAS, the Federal Emergency Management Agency has indicated that future mitigation grant monies will not be made available to jurisdictions without a current and adopted Hazard Mitigation Plan; and

WHEREAS, a coalition of King County, Cities, Towns and Special Purpose Districts with like planning objectives formed to pool resources and create consistent mitigation strategies within the King County planning area; and

WHEREAS, the City of Kenmore has joined this coalition and has completed a planning process that engages the public, assesses the risk and vulnerability to the impacts of natural hazards, develops a mitigation strategy consistent with a set of uniform goals and objectives, and creates a plan for implementing, evaluating and revising this strategy; and

WHEREAS, this Regional Hazard Mitigation Plan maintains consistency with existing emergency response plans, promotes regional cooperation, and meets the Federal Emergency Management Agency's requirements; and

WHEREAS, Volume 2 of this Regional Hazard Mitigation Plan includes localized, jurisdiction-specific information, including a Kenmore Annex; and

WHEREAS, the City desires to coordinate strategies identified in the Regional Hazard Mitigation Plan with other planning programs and mechanisms under its authority; and

WHEREAS, the City Council desires to approve and adopt certain sections of the Regional Hazard Mitigation Plan to guide the City's pre- and post-disaster mitigation of the hazards identified therein;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF KENMORE, WASHINGTON, DOES RESOLVE AS FOLLOWS:

Section 1. Adoption. The City Council hereby approves and adopts the following sections of the King County Regional Hazard Mitigation Plan Update, July 2015: The entirety of Volume 1, the introduction, appendices, and the City of Kenmore's portion of Volume 2 (RHMP), which are herein incorporated by reference as if set forth in full.

PASSED BY THE CITY COUNCIL AT A REGULAR MEETING THEREOF ON THE ____TH DAY OF _____, 2015.

CITY OF KENMORE

David Baker, Mayor

ATTEST/AUTHENTICATED:

Patty Safrin, City Clerk

Approved as to form:

Rod P. Kaseguma, City Attorney

Filed with the City Clerk:
Passed by the City Council:
Resolution No.: 15-266
Date of Publication:

Subject/Topic: A Regional Coalition for Housing (ARCH): Proposed Approach for Enhancing Funding for ARCH Housing Trust Fund	For Council Meeting Agenda of: 23 November 2015 Department: Executive Prepared by: Nancy Ousley, Assistant City Manager	
Proposed Council Action/Motion: Discussion	Initial & Date Approved by Department Head: <u>Niko 13 Nov 2015</u> Approved by City Attorney: _____ Approved by Finance Director: <u>[Signature] 11/13/15</u> Approved by City Manager: <u>[Signature]</u> Exhibits/Attachments: 1. Summary of September 2015 Council Workshop 2. Background Information	
Expenditure Required \$n/a	Amount Budgeted \$	Appropriation Required \$

Any of the tools would be used at the discretion of the local jurisdiction. Some ideas discussed include: fee for demolition of housing units; condominium conversion fee; and the authorization to increase Real Estate Excise Tax (REET) up to an additional .25%. The potential for an Eastside Property Tax levy was also briefly discussed but there were reservations expressed at the workshop about a levy ballot measure.

The demolition, conversion and REET options all require State authorization. The City's Legislative Agenda for 2016 speaks to supporting general efforts to increase funding support for affordable housing. Following the 2016 Legislative Session, it is proposed that the Workshop reconvene to discuss the potential to reexamine the goals for program funding allocation among the members, recognizing that contribution levels are at the discretion of each city.

Arthur Sullivan, Executive Director of ARCH, will be present to discuss the issue and answer questions from the Council.

FISCAL CONSIDERATION:

The City will evaluate options for policy actions, incentives and funding for affordable housing in the next biennial budget. The City staff, with technical assistance from ARCH staff, will develop a proposed Housing Strategy for Council consideration in the next two years. Council's decision on the annual work plan for Comprehensive Plan and related regulatory amendments is expected in early 2016.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

Kenmore "offers a diversity of housing types to provide a choice of attractive living accommodations for all residents" --Kenmore Vision Statement

FUNDING STRATEGY FOR THE ARCH HOUSING TRUST FUND

- **Trust Fund has been an effective tool.** As one of many tools used by members to address local housing needs, the ARCH Trust Fund has been 'efficient' and 'effective', not only for member cities being able to participate in supporting a range of affordable housing, but also for housing providers to have a stable, consistent local source. The Trust Fund has allowed members to collectively fund the best affordable housing opportunities throughout East King County.
- **Decreased impact over time.** The relative impact of the ARCH Trust Fund has decreased over the past 15 years due to a combination of factors including: city general fund contributions have remained relatively flat while housing costs have essentially doubled. The Trust Fund has gone from funding about 190 units annually in the first 10 years of ARCH, to just over 100 units annually the last 10 years.
- **Grow the Trust Fund.** Some level of growth of the Trust Fund is needed. The goal is to balance meeting growing needs and increasing housing costs, with maintaining reasonable leverage of local funds with other public and private funds. The following chart illustrates potential impacts of various levels of funding for the Trust Fund.

APPROACH	Annual Funding Level	Annual Number of Units	Local Dollars per Unit*
Existing Level	\$1.3 - \$1.5 million	<100	\$20,000 - \$30,000
Existing Plus Inflation	\$2 - \$3 million	100 - 120	\$20,000 - \$35,000
Leveraging 'Sweet Spot'**	\$5 - \$6 million	140 - 160	\$35,000 - \$45,000
Exceed Previous Peak	\$17+ million	200 - 220+	\$75,000 - \$85,000

* The amount of ARCH Trust funds per unit increases as the Trust Fund increases primarily because of decreased ability to leverage other public funds which have fixed amounts available.

** Leveraging 'Sweet Spot' is a level that attempts to balance the goals of increasing production with leveraging other public and private resources.

It is proposed that a strategy that achieves at least the 'leveraging sweet spot' be pursued. Potential approaches to achieving this are described below.

- **Three Legged Stool for Funding Trust Fund.**
Potential ways to grow the Trust Fund consist of three basic approaches (see table below):
 - Continued use of general fund and CDBG funds;
 - One or more new 'Dedicated Funding Source' that each city would decide how to use (ones listed are ones with strongest linkage to housing of those considered);
 - Voter approved housing levy at either the local or countywide level.

The potential sources and potential range of funding for each of these is summarized in the following table:

Source	Low Estimate	High Estimate
I. General Funds and CDBG Funds		
A. Existing	\$1.3 million	\$1.5 million
B. Existing plus inflation (Depends on inflation formula)	\$2 million	\$3 million
II. Dedicated Source (Housing Link) *		
A. Demolition Fee ** Fee per demolished unit	\$400,000 \$3,000	\$1.3 million \$10,000
B. Condo Conversion Fee ** Fee per converted unit	\$810,000 \$3,000	\$2.7 million \$10,000
C. Real Estate Excise Tax Tax on sale price of property	\$6.1 million 0.10%	\$15.25 million 0.25%
III. Voter Housing Levy		
Property Tax Levy (East King County)*** Tax rate / \$1,000 property value	\$10.4 million \$0.10	\$52 million \$0.50

* Estimates based on historic averages and all members adopting fund source.

** Actual revenue from these sources would vary significantly from year to year based on actual activity. For example, there have been very few condo conversions in recent years.

*** Current Seattle Levy is approximately \$0.18. Bellingham levy approximately \$0.35. Potential maximum under state law is \$0.50.

- **Steps for Proceeding.** Over the next 12- 18 months, work on the following:
 - State Legislation. First, members include on their legislative agenda to pursue necessary state authority in 2016 for state 'enabling' legislation to allow cities to utilize the dedicated fund sources listed above. (E.g. REET which Seattle plans to include on their legislative agenda.). ARCH staff would support these efforts.
 - Reconvene Workshop after Legislative Session. Members reconvene at the end of the legislative session to assess the results of the legislative session, and to consider updates to the ARCH 'Parity' goals for overall funding and allocation among members. Also assess feasibility and interest of a voter approved levy. (Note: A number of reservations were expressed about a local levy during the workshop.)
 - City Budgets. Councils deliberate as part of their 2016 – 2017 budget. Levels of contributions would remain at the discretion of each city. This process will be informed by the results of the legislative session and the follow up workshop. (i.e. availability of a new dedicated source, could impact if increased general fund contributions are part of moving toward the Trust Fund long term goals).
 - Advocate other Public Sources. In order to be able to continue to leverage local resources, continue to advocate for growth of other county/state/federal funding sources for affordable housing.
- **Maintain Local Flexibility.** An historic element of the ARCH Trust Fund has been to provide guidance to members regarding level of participation, but leaving flexibility to cities on the actual level of participation. This proposal maintains this historic flexibility, but potentially provides more tools for cities to consider, as well as updated goals on level of participation.

LOCAL HOUSING NEEDS - DEMAND FROM LOCAL WORKFORCE

A primary demand for housing comes from a community's workforce.

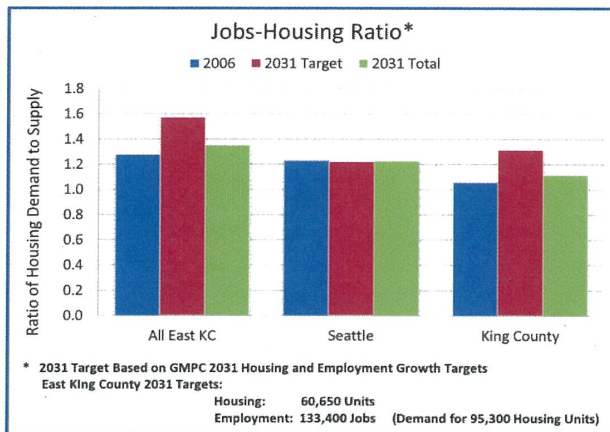
Over the last 30 years East King County has gone from being an area with a 'surplus' of housing based on demand from local jobs to an area with a 'shortage' of housing relative to demand from local jobs. (Workforce now creates a demand for housing 25% greater than housing available)

Planned future employment and housing growth will further increase this imbalance.

Over the next 20 years, in East King County there is planned employment growth of over 133,000 jobs which creates a demand for about 95,000 housing units. Total planned housing growth in East King County is 60,650 homes. This means a demand for housing from employment growth 50% greater than planned housing growth (a jobs-housing demand ratio of over 1.5) (see chart)

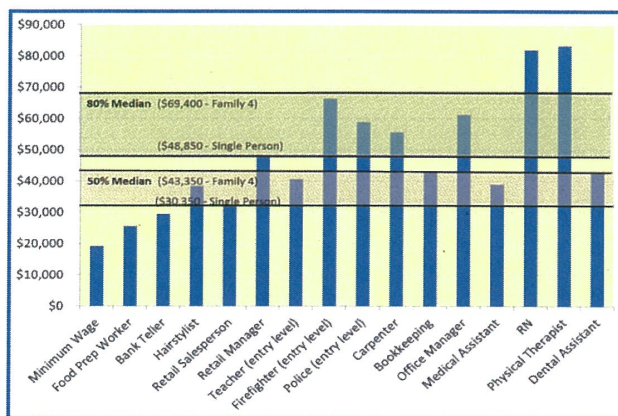
A high proportion of local jobs have salaries in the low and moderate income level.

This is illustrated by noting the jobs held by residents of a local affordable housing development (see chart).



Time and money spent on commuting have financial and quality of life impacts on households as well as potentially impacting businesses ability to recruit employees.

Issaquah employers ranked housing affordability as the number one issue to recruit and retain employees. (Issaquah Business Survey 2012)



SAMPLE EMPLOYMENT ISSAQUAH FAMILY VILLAGE

(Rent Levels: 30% - 60% Median Income)

Employment Field Sample employers	Residents employed by:
Medical Swedish Hospital/ Aegis Senior Living Pediatrics Assoc. / VCA animal hospital	9
Education / Child support Issaquah SD / UW Eastside Academy / Bellevue College / Childcare/nanny	14
Retail/Restaurant Fred Meyers / Costco Ben&Jerry's / Ridge Supermarket Starbucks / Walgreens / XXX Restaurant	39
Office / Financial / Administrative Wells Fargo Bank / Pacific Legal Services Raidan Auto Group	11

HOUSING COSTS AND IMPACT ON HOUSEHOLDS

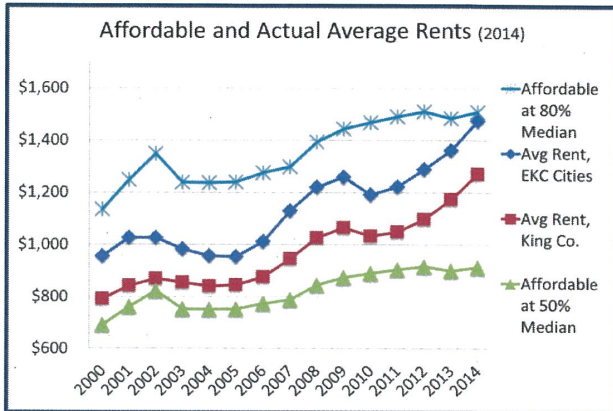
Housing Costs

Historically, costs of rental and ownership housing have been higher in EKC than countywide.

14% of rental housing in EKC is affordable to very low and low income households, compared to 32% countywide.

Ownership prices which dropped significantly during the recession have essentially returned to pre-recession levels.

Increases in EKC Rents the last few years have outpaced increase in income. As a result average rents in EKC are affordable at ~80% median income, historically high levels relative to median income.



Cost Burdened Households

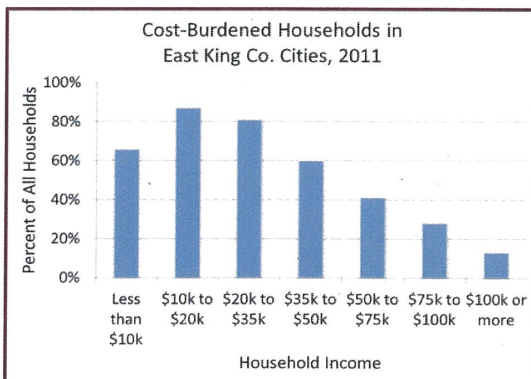
75% of lower income households are cost burdened (pay more than 30% of income for housing) compared to less than 10% of higher income households being cost burdened (see chart).

About 1/2 of cost burdened renter households and 1/3 of cost burdened owner households are severely cost burdened (>50% of income for housing). This translates to about 25,000 households in East King County pay more than 50% of their income for housing split pretty evenly between renters and homeowners.

A higher proportion of young households and senior households are cost burdened.

Cost burdened households struggle to meet other daily living expenses such as food and medical costs, leading to an unstable lifestyle.

Children's stability and ability to succeed in school is impacted when families move frequently seeking more affordable housing.



Homelessness. Efforts have been made to address homelessness. However, homelessness still persists indicated by the usage of the emergency winter shelters in East King County and the increase in the homeless student population in EKC school districts.

**KING COUNTY INCOME AND HOUSING AFFORDABILITY GUIDELINES
2015**

	Studio (1 Person)	1-Bedroom (2 People)	2-Bedroom (3 People)	3-Bedroom (4 People)
POVERTY				
Average poverty thresholds for 2015 by size of family*				
Household Income	\$11,770	\$15,930	\$20,090	\$24,250
Pct of County Median Income	19%	22%	25%	27%
VERY LOW INCOME: 30% of Median Income				
Household Income	\$18,816	\$21,504	\$24,192	\$26,880
Max. Affordable Rent**	\$429	\$476	\$523	\$569
LOW INCOME: 50% of Median Income				
Household Income	\$31,360	\$35,840	\$40,320	\$44,800
Max. Affordable Rent**	\$743	\$834	\$926	\$1,017
Max. Affordable Purchase***	\$103,635	\$118,440	\$137,499	\$156,559
MODERATE INCOME: 80% of Median Income				
Household Income	\$50,176	\$57,344	\$64,512	\$71,680
Max. Affordable Rent**	\$1,213	\$1,372	\$1,531	\$1,689
Max. Affordable Purchase***	\$183,684	\$209,925	\$240,420	\$270,914
MEDIAN INCOME				
Household Income	\$62,720	\$71,680	\$80,640	\$89,600
Max. Affordable Rent**	\$1,527	\$1,730	\$1,934	\$2,137
Max. Affordable Purchase***	\$237,050	\$270,914	\$304,779	\$338,643

* Source: U.S. Health and Human Services, 2015 Poverty Guidelines.

<http://aspe.hhs.gov/poverty/15poverty.cfm>

King County Median Family Income: \$89,600

Source: U.S. Housing and Urban Development Income Limits

**Rents are net of deducting for a utility allowance.

***Price estimates assume:

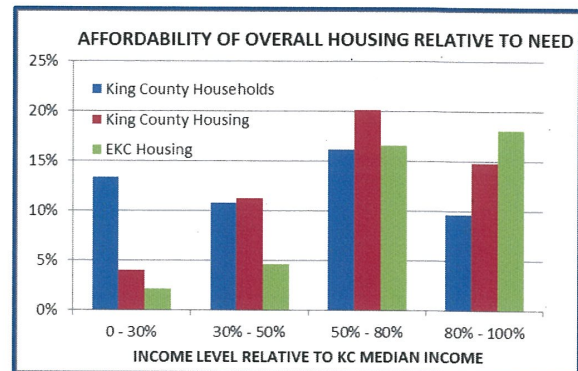
- 10% Downpayment
- 30-yr fixed mortgage at 4.2%
- Property taxes at 1%
- Mortgage insurance, homeowner dues/insurance \$175- \$250

OVERALL HOUSING AFFORDABILITY AND CREATION OF AFFORDABLE HOUSING

OVERALL HOUSING AFFORDABILITY. EKC has a low proportion of overall housing supply affordable to low and very low income households (7%) compared to the overall need (24%) and to housing available countywide (15%). (see chart)



Element Condos, Redmond, Intracorp



Ways of Addressing Affordable Housing

Cities have used a variety of approaches and strategies to address a range of needs.

City strategies group into 3 areas:

- o Allowing a diversity of housing through the private market (e.g. mixed use, cottages, micro-housing)
- o Incentives for the market to provide affordable housing (e.g. density increases, permitting ADUs)
- o Direct Assistance (e.g. ARCH Trust Fund, land donation, fee waivers)

Low income housing has almost always needed some form of direct assistance.

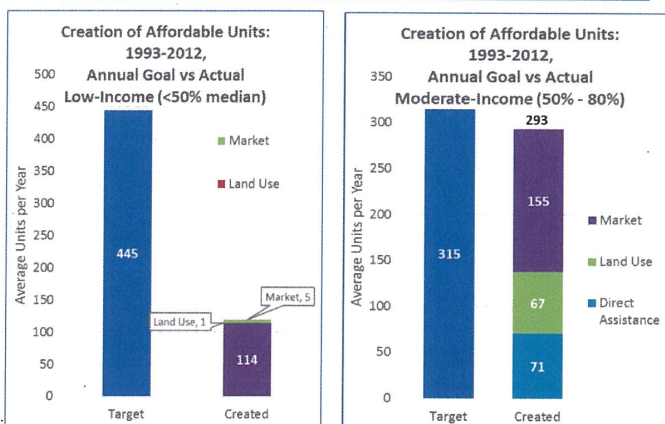
Moderate income housing has been created through all these approaches (See chart).

This multifaceted approach is illustrated by the attached graphic (pg 5) and the matrix (pg 6) which summarizes strategies used by ARCH members.

This overall approach is consistent with community resident preferences for policies and programs that assist a broad range of incomes and involve a variety of players.

Creation of Affordable Housing. In EKC, cumulatively over the past 20 years, EKC cities have achieved just over 25% of their low income housing goal and about 90% of their moderate income goal.

(Note: a good portion of the moderate income housing has been smaller rental units.)

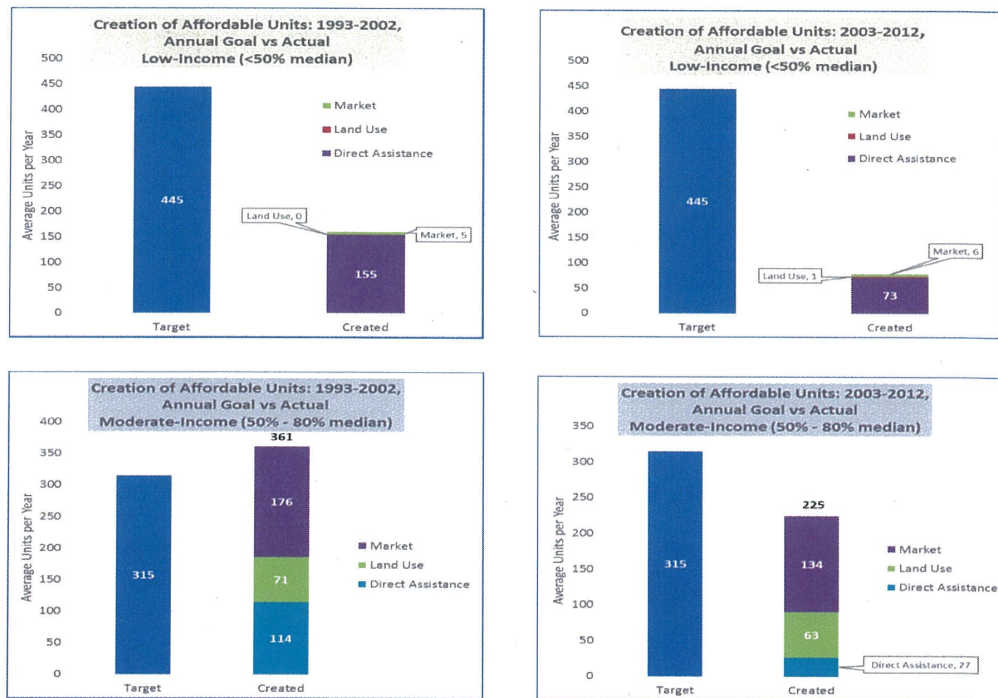


DECREASED PRODUCTION TRENDS OF AFFORDABLE HOUSING

In the past decade there has been a decrease in the creation of affordable units – especially in the creation through the general market and direct incentives. (See Trust Fund for more detail)

Use of incentives has been the most consistent over time, and with the number of new incentive programs adopted by cities in the last 5 -10 years, could be an area of increased opportunity. It may also help offset the decrease in affordability in the private market. Incentive programs can also provide for a wider range of types of housing than the market has historically provided. Most new market rate housing affordable to moderate income is smaller rental housing. Incentive programs create affordable units of a similar mix as the overall market (e.g. both rental and ownership, and mix of unit sizes).

ANNUAL AVERAGE CREATION OF AFFORDABLE HOUSING BY DECADE

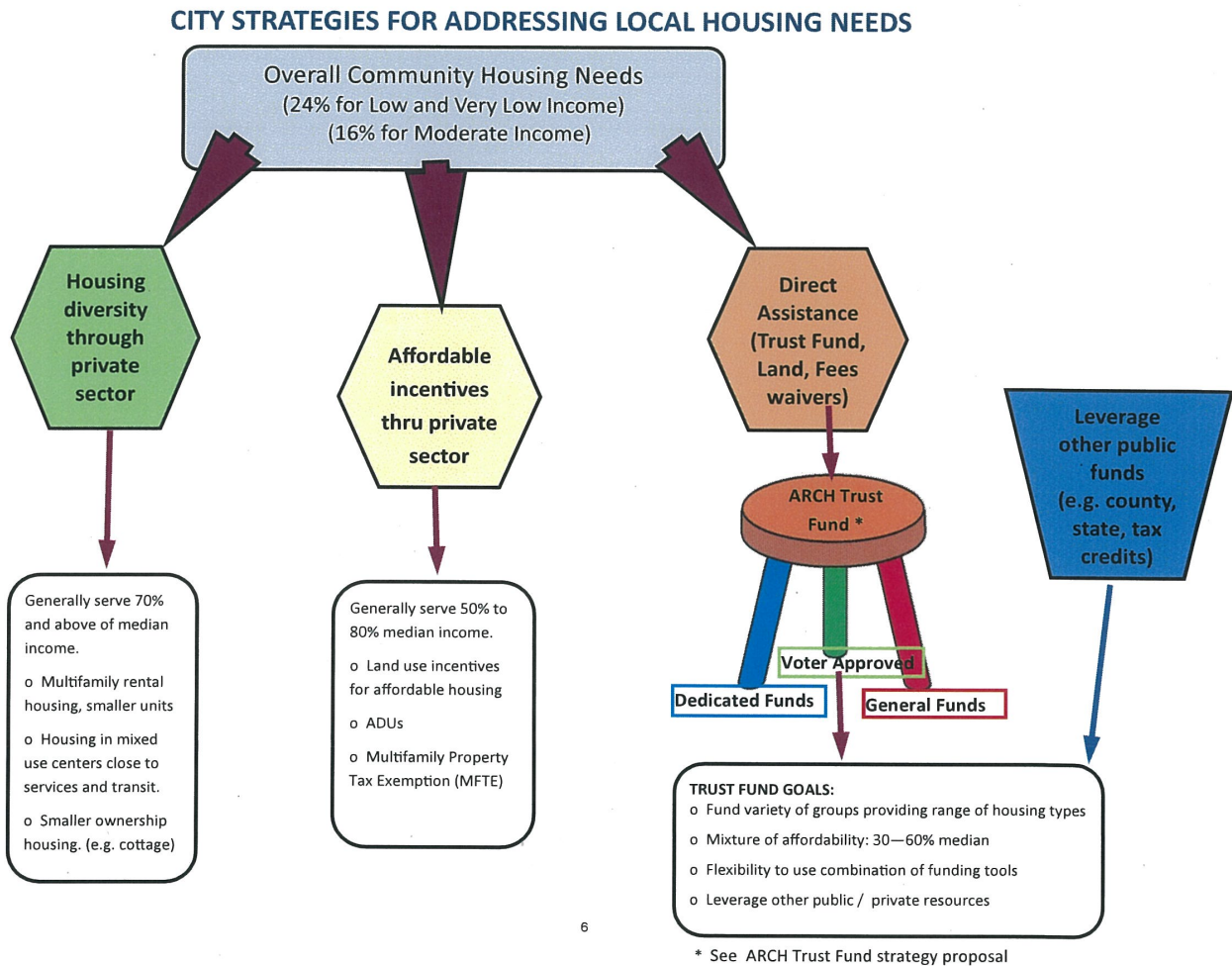


CREATION OF AFFORDABLE HOUSING 1993 - 2012: BY DECADE

East King County

	Low-Income (Below 50% Median Income)					Moderate-Income (51% - 80% Median Income)				
	Direct Assistance	Incentives	Market	Sub-Total	% of Goal	Direct Assistance	Incentives	Market	Sub-Total	% of Goal
1993-2002	1,550	-	51	1,601	36%	1,143	711	1,758	3,612	115%
2003-2012	728	10	55	793	18%	271	630	1,344	2,245	71%
Total	2,278	10	106	2,394	27%	1,414	1,341	3,102	5,857	93%

	Total	Annualized		Total	Annualized
1992-2012 Goal	8,900	445		6,300	315



6

SAMPLE HOUSING STRATEGIES USED IN EAST KING COUNTY

Tools	Bellevue	Bothell	Issaquah	Kenmore	Kirkland	Mercer Is.	Newcastle	Redmond	Sammamish	Woodinville
Land Use: Housing Supply and Diversity										
Increase Development Capacity										
<i>Voluntary Approaches</i>	•		•			•			•	•
<i>Mandatory Approaches</i>			•	•	•		•	•	•	
Development Agreements										
<i>On-site affordable units</i>			•			•		•		
<i>Site Control / In-lieu</i>	•		•							
Dimension Standards Flexibility	•		•		•					
Reduce Parking Requirement ¹	•				•					
Reduce Open Space Requirement			•							
Smaller Ownership Housing ²					•		•	•	•	
Mobile Home Park Preservation		•								
Micro Units (renter housing)								•		
SEPA - Planned Action EIS										
Regulatory: Incentives for Affordable Housing										
ADUs ³					•	•	•			
MFTE ⁴				•	•	•				
Impact Fee Waivers	•		•	•	•		•		•	
Permit Fee Waivers	•		•		•		•		•	
Direct Support										
ARCH Trust Fund ⁵	•		•	•	•	•	•	•	•	•
Underutilized Land										
<i>City Land, Market Value</i>	•	•		•				•		
<i>City Land, Donation</i>	•		•		•			•	•	
<i>Other Public Agencies</i>	•			•	•			•		
<i>Private Land⁶</i>	•		•		•					
Other Strategies										
Community Outreach										
<i>Education: Class / Tours</i>					•			•	•	
<i>Neighborhood Plans</i>				•	•			•		
<i>Media/City Newsletters</i>										
Preserve Existing Housing										
<i>Preserve Federally assisted⁷</i>	•	•	•		•	•		•		
<i>'Sending' TDR credit</i>										
<i>Proactive outreach to owners</i>					•					
Relocation Assistance										
Section 8 Anti-discrimination	•				•			•		

¹ All cities allow Accessory Dwelling Units. This indicates cities that have permitted 10 or more ADUs per 1,000 single-family homes.

² Only lists cities with explicit reduced standards for affordable housing. Many cities allow special studies to reduce parking.

³ E.g., cottages, multi-plexes.

⁴ All cities allow Accessory Dwelling Units. This indicates cities that have permitted 10 or more ADUs per 1,000 single-family homes.

⁵ Multi-family Property Tax Exemption.

⁶ All cities have contributed CDBG funds. This indicates cities that have also given from general funds.

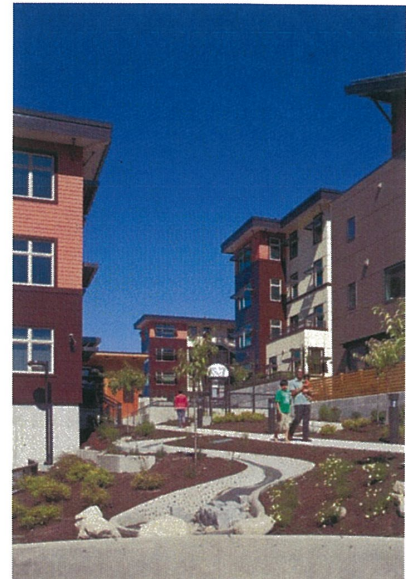
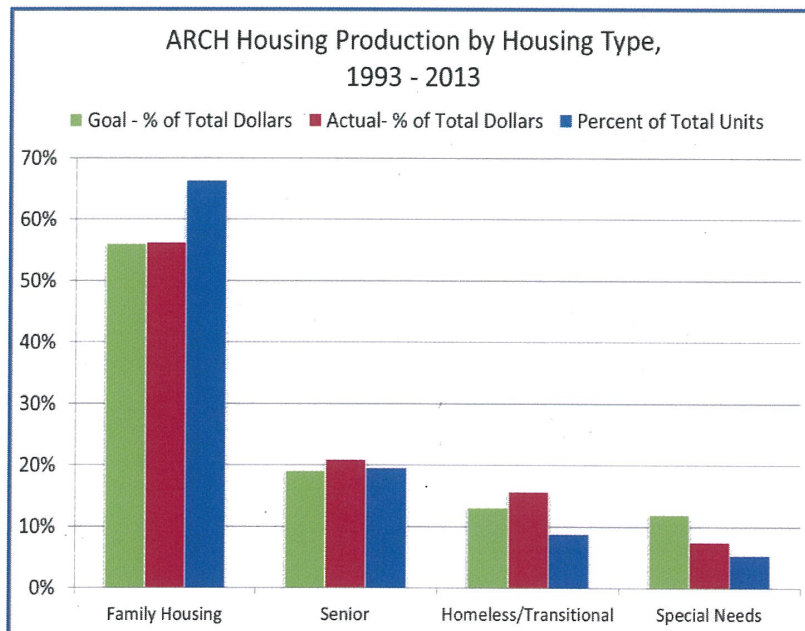
⁷ E.g., churches, private donations to non-profits.

⁸ Funding to preserve privately owned federally (HUD) assisted project-based housing that could convert to market rate.

ARCH TRUST FUND: OVERALL RESULTS

Over time the ARCH Trust fund has been able to achieve the objective of funding a range of needs.

- Funded over 3,000 housing units that serve a range of incomes and households including families, seniors, homeless households and persons with special needs. (see chart)
- Since 1993, over \$42 million of city resources have been made available. This includes a combination of general funds (~40%), federal CDBG funds (~20%), and 'Other' (e.g. land donations, fee waivers, loan repayments) (~40%).
- Preserved 600 units federally assisted housing serving our most vulnerable seniors and families, and preserved and rehabilitated a number of market properties.
- Have supported housing that serves those with the greatest needs (e.g homeless, persons with disabilities), which can help stabilize their life and prevent needing to utilize high cost community facilities (e.g. hospitals, institutionalized housing).
- Agencies receiving support through the ARCH Trust Fund have been able to secure a significant amount of private and public (County, State, federal) resources. Cumulatively ARCH has provided approximately 10% of total project costs, and over the past 5 years provided on average over \$23,000 per affordable unit.
- Funds in many projects have been made available as contingent loans where over time projects may return resources to cities to support future housing efforts.



Issaquah Family Village, YWCA

ARCH TRUST FUND: HISTORIC USE (FINANCING)

The amount of housing assisted in the last decade is significantly less (see table).

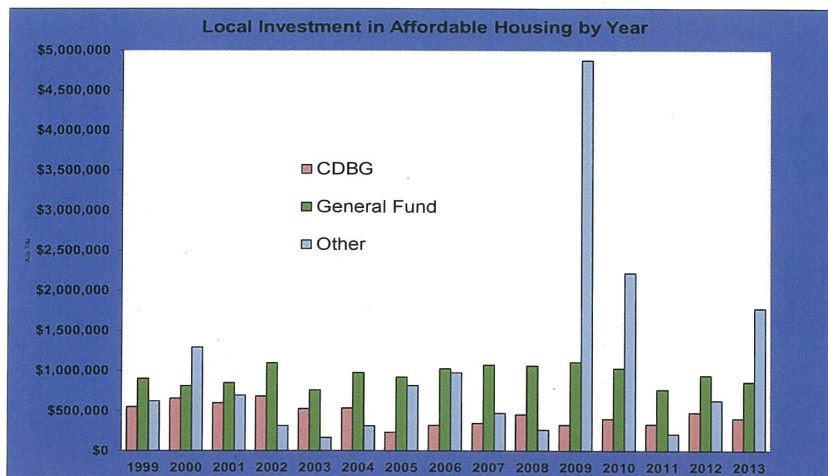
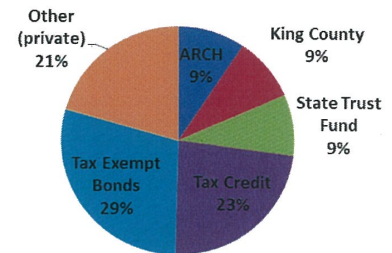
Potential factors include:

- Real estate costs have almost doubled between the two decades.
- While funding through ARCH has increased about 20% from the previous decade, the increase is significantly less than cost inflation.
 - Much of this increase is due to several one-time land donations. CDBG funds have decreased and general fund contributions have been essentially flat (see chart below).
- The overall affordability mix has shifted with a higher proportion of units serving very low income households (from 23% to 50%).
- A higher proportion of units in the last decade have been new construction. (ARCH has an informal policy to strive for 30% or more of units being preservation.)
- In the last decade a notable change of overall funding sources is that Tax Credits are a significantly larger portion of overall funding and Tax Exempt Bonds a much smaller portion.

ARCH TRUST FUND HISTORY

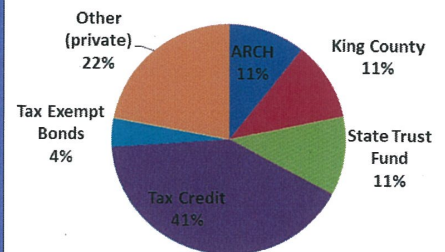
	1993-2002	2003-2013
Units Funded	1,892	1,054
Overall Cost	\$206,257,000	\$221,363,000
Overall Cost Per Unit	\$109,016	\$210,022
ARCH Total Assistance	\$19,216,188	\$23,133,833
ARCH Cost Per Unit	\$12,172	\$21,949

Funding Sources 1993-2002



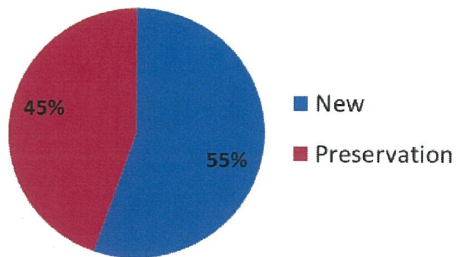
Note: Other = Land donations, fee waivers, In-lieu payments by developers using land use incentives.

Funding Sources 1993-2002

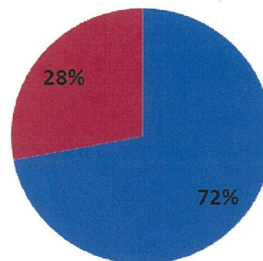


ARCH TRUST FUND: HISTORIC USE (TYPE OF HOUSING)

Type of Unit 1993-2002



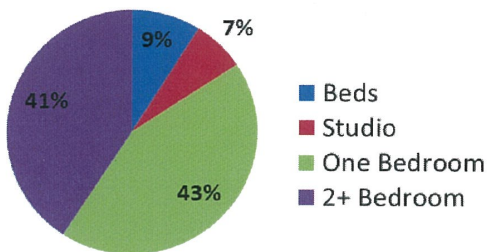
2003-2013



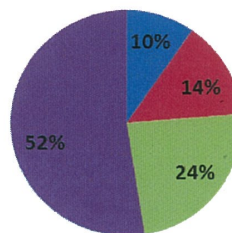
Wildwood Court, Bellevue, DASH

- A higher proportion of units in the last decade have been new construction. (One objective of the ARCH Trust fund is preservation of existing housing.)

Unit Sizes 1993-2002



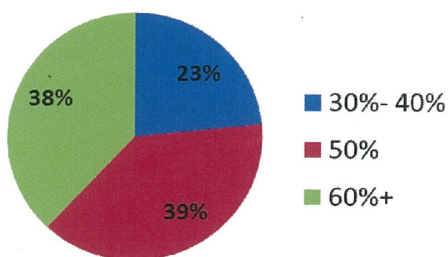
2003-2013



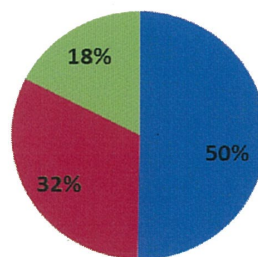
Coal Creek, Newcastle, Habitat

- A greater proportion of units in the last decade have been 2 or more bedrooms

Income Level 1993-2002



2003-2013



Francis Village, Kirkland, Imagine Housing

- A greater proportion of units in the last decade target lower income levels.
- There is a correlation to the increased proportion of 9% tax credits to the shifts in unit mix, affordability levels, and new construction.

ARCH: EAST KING COUNTY TRUST FUND SUMMARY
LIST OF CONTRACTED PROJECTS FUNDED (1993 - Spring 2014)

Project	Location	Owner	Units/Beds	Funding	Pct of Total Allocation	Distribution Target
1. Family Housing						
Andrews Heights Apartments	Bellevue	Imagine Housing	24	\$400,000		
Garden Grove Apartments	Bellevue	DASH	18	\$180,000		
Overlake Townhomes	Bellevue	Habitat of EKC	10	\$120,000		
Glendale Apartments	Bellevue	DASH	82	\$300,000		
Wildwood Apartments	Bellevue	DASH	36	\$270,000		
Somerset Gardens (Kona)	Bellevue	KC Housing Authority	198	\$700,000		
Pacific Inn	Bellevue *	Pacific Inn Assoc. *	118	\$600,000		
Eastwood Square	Bellevue	Park Villa LLC	48	\$600,000		
Chalet Apts	Bellevue	Imagine Housing	14	\$163,333		
Andrew's Glen	Bellevue	Imagine Housing	10 /11	\$387,500		
Bellevue Apartments	Bellevue ***	LIHI ***	45	\$800,000		
YWCA Family Apartments	K.C. (Bellevue Sphere)	YWCA	12	\$100,000		
Highland Gardens (Klahanie)	K.C. (Issaquah Sphere)	Imagine Housing	54	\$291,281		
Crestline Apartments	K.C. (Kirkland Sphere)	Shelter Resources	22	\$195,000		
Parkway Apartments	Redmond	KC Housing Authority	41	\$100,000		
Habitat - Patterson	Redmond **	Habitat of EKC **	24	\$446,629		
Avon Villa Mobile Home Park	Redmond **	MHCP **	93	\$525,000		
Terrace Hills	Redmond	Imagine Housing	18	\$442,000		
Village at Overlake Station	Redmond **	KC Housing Authority **	308	\$1,645,375		
Summerwood	Redmond	DASH	166	\$1,187,265		
Coal Creek Terrace	Newcastle **	Habitat of EKC **	12	\$240,837		
RoseCrest (Talus)	Issaquah **	Imagine Housing **	40	\$918,846		
Mine Hill	Issaquah	Imagine Housing	28	\$450,000		
Clark Street	Issaquah	Imagine Housing	30	\$355,000		
Lauren Heights (Iss Highlands)	Issaquah **	Imagine Housing/SRI **	45	\$657,343		
Habitat Issaquah Highlands	Issaquah **	Habitat of EKC **	10	\$318,914		
Issaquah Family Village I	Issaquah **	YWCA **	87	\$4,382,584		
Issaquah Family Village II	Issaquah **	YWCA **	47	\$2,760,000		
Greenbrier Family Apts	Woodinville **	DASH **	50	\$286,892		
Plum Court	Kirkland	DASH	61 /66	\$1,000,000		
Francis Village	Kirkland	Imagine Housing	15	\$375,000		
South Kirkland Park n Ride	Kirkland **	Imagine Housing **	46	\$901,395		
Copper Lantern	Kenmore	LIHI **	33	\$452,321		
Habitat Sammamish	Sammamish ** ***	Habitat of KC ***	10	\$853,000		
Homeowner Downpayment Loan	Various	KC/WSHFC/ARCH	87 est	\$615,000		
SUB-TOTAL			1,942	\$24,020,516	54.5% (56%)	
2. Senior Housing						
Cambridge Court	Bellevue	Resurrection Housing	20	\$160,000		
Ashwood Court	Bellevue *	DASH/Shelter Resources *	50	\$1,070,000		
Evergreen Court (Assisted Living)	Bellevue	DASH/Shelter Resources	64 /84	\$2,480,000		
Bellevue Manor / Harris Manor	Bellevue / Redmond	KC Housing Authority	105	\$1,334,749		
Vasa Creek	K.C. (Bellevue Sphere)	Shelter Resources	50	\$190,000		
Riverside Landing	Bothell **	Shelter Resources	50	\$225,000		
Kirkland Plaza	Kirkland	Imagine Housing	24	\$610,000		
Totem Lake Phase 2	Kirkland ***	Imagine Housing ***	80	\$736,842		
Heron Landing	Kenmore	DASH/Shelter Resources	50	\$65,000		
Ellsworth House Apts	Mercer Island	Imagine Housing	59	\$900,000		
Providence Senior Housing	Redmond **	Providence **	74	\$2,239,000		
Greenbrier Sr Apts	Woodinville **	DASH/Shelter Resources **	50	\$196,192		
SUB-TOTAL			676	\$10,206,783	23.2% (19%)	

FIGURE 1
ARCH: EAST KING COUNTY TRUST FUND SUMMARY
 LIST OF CONTRACTED PROJECTS FUNDED (1993 - Spring 2014)

Project	Location	Owner	Units/Beds	Funding	Pct of Total Allocation	Distribution Target
3. Homeless/Transitional Housing						
Hopelink Place	Bellevue **	Hopelink **	20	\$500,000		
Chalet	Bellevue	Imagine Housing	4	\$46,667		
Kensington Square	Bellevue	Housing at Crossroads	6	\$250,000		
Andrew's Glen	Bellevue	Imagine Housing	30	\$1,162,500		
Bellevue Apartments	Bellevue ***	LIHI ***	12	\$200,000		
Sophia Place	Bellevue	Sophia Way	20	\$250,000		
Dixie Price Transitional Housing	Redmond	Hopelink	4	\$71,750		
Avondale Park	Redmond	Hopelink (EHA)	18	\$280,000		
Avondale Park Redevelopment	Redmond **	Hopelink (EHA) **	60	\$1,502,469		
Petter Court	Kirkland	KITH	4	\$100,000		
Francis Village	Kirkland	Imagine Housing	45	\$1,125,000		
South Kirkland Park n Ride	Kirkland ***	Imagine Housing ***	12	\$225,349		
Totem Lake Phase 2	Kirkland	Imagine Housing	15	\$138,158		
Rose Crest (Talus)	Issaquah **	Imagine Housing **	10	\$229,712		
Lauren Heights (Iss Highlands)	Issaquah **	SRI **	5	\$73,038		
Issaquah Family Village I	Issaquah **	YWCA **	10	\$503,745		
SUB-TOTAL			257	\$6,658,387	15.1% (13%)	
4. Special Needs Housing						
My Friends Place	K.C.	EDVP	6 Beds	\$65,000		
Stillwater	Redmond	Eastside Mental Health	19 Beds	\$187,787		
Foster Care Home	Kirkland	Friends of Youth	4 Beds	\$35,000		
FOY New Ground	Kirkland	Friends of Youth	6 Units	\$250,000		
DD Group Home 7	Kirkland	Community Living	5 Beds	\$100,000		
Youth Haven	Kirkland	Friends of Youth	10 Beds	\$332,133		
FOY Transitional Housing	Kirkland **	Friends of Youth **	10 Beds	\$252,624		
FOY Extended Foster Care	Kirkland **	Friends of Youth **	10 Beds	\$112,624		
DD Group Home 4	Redmond	Community Living	5 Beds	\$111,261		
DD Group Homes 5 & 6	Redmond/KC (Bothell)	Community Living	10 Beds	\$250,000		
United Cerebral Palsy	Bellevue/Redmond	UCP	9 Beds	\$25,000		
DD Group Home	Bellevue	Residence East	5 Beds	\$40,000		
AIDS Housing	Bellevue/Kirkland	AIDS Housing of WA	10 Units	\$130,000		
Harrington House	Bellevue	AHA/CCS	8 Beds	\$290,209		
DD Group Home 3	Bellevue	Community Living	5 Beds	\$21,000		
Parkview DD Condos III	Bellevue	Parkview	4	\$200,000		
IERR DD Home	Issaquah	IERR	6 Beds	\$50,209		
FFC DD Homes	NE KC	FFC	8 Beds	\$300,000		
Oxford House	Bothell	Oxford/Compass Ctr.	8 Beds	\$80,000		
Parkview DD Homes VI	Bothell/Bellevue	Parkview	6 Beds	\$150,000		
FFC DD Home II	TBD	FFC	4 Beds	\$168,737		
SUB-TOTAL			158 Beds/Units	\$3,151,584	7.2% (12%)	
TOTAL			3,033	\$44,037,270	100.0%	
* Funded through Bellevue Downtown Program				10%		
** Also, includes in-kind contributions (e.g. land, fee waivers, infrastructure improvements)						
*** Amount of Fee Waiver still to be finalized						

ARCH Parity Program - Goals / Annual Commitments / Annual Average

CITY	2008	2009	2010	2011	2012	2013	15 Year Average	ANNUAL GOALS *	
								LOW	HIGH
Bellevue	\$717,089	\$779,616	\$601,177	\$510,538	\$397,827	\$256,000	\$781,614	\$395,000	\$605,000
Bothell	\$68,786	\$46,415	\$53,862	\$43,504	\$63,086	\$56,079	\$70,317	\$78,000	\$152,000
Clyde Hill	\$17,647	\$16,786	\$16,295	\$16,501	\$17,297	\$16,324	\$12,895	\$0	\$17,420
Hunts Point	\$308	\$2,708	\$2,804	\$2,798	\$2,963	\$2,816	\$1,382	\$0	\$3,020
Issaquah	\$118,336	\$4,742,122	\$2,132,149	\$31,330	\$143,226	\$138,425	\$548,502	\$55,000	\$135,000
Kenmore	\$113,342	\$100,872	\$104,394	\$101,613	\$114,746	\$80,604	\$84,137	\$50,000	\$108,000
Kirkland	\$304,035	\$284,503	\$284,201	\$277,885	\$426,657	\$412,280	\$269,512	\$159,000	\$269,000
Medina		\$1,205	\$14,419	\$14,158	\$14,775	\$14,504	\$9,227	\$0	\$17,780
Mercer Is.	\$45,585	\$37,264	\$47,373	\$38,233	\$46,582	\$42,683	\$74,367	\$32,000	\$124,000
Newcastle	\$65,597	\$53,457	\$3,000	\$9,576	\$39,356	\$36,043	\$47,644	\$47,000	\$75,000
Redmond	\$181,748	\$208,036	\$220,784	\$206,247	\$238,872	\$1,912,774	\$444,095	\$244,000	\$552,000
Sammamish	\$107,513	\$5,070	\$123,956	\$20,454	\$499,354	\$34,942	\$61,170	Est: \$25,000	\$196,000
Woodinville	\$33,791	\$23,560	\$30,473	\$24,431	\$29,872	\$27,190	\$29,492	\$37,000	\$83,000
Yarrow Point	\$847	\$572	\$4,513	\$4,453	\$4,711	\$4,536	\$2,107	\$0	\$5,880
Beaux Arts	\$273	\$184	\$208	\$168	\$244	\$217	\$146	\$0	\$1,660
TOTAL	\$1,774,897	\$6,302,370	\$3,639,608	\$1,301,889	\$2,039,568	\$3,035,417	\$2,610,650	\$1,097,000	\$2,344,760

*Annual Goals are based on several factors including population, planned housing growth and planned employment growth

PARITY PROGRAM DESCRIPTION (1998)

The overall objective of the Parity program is to establish a means for members to attain a proportional distribution of resources being contributed for affordable housing.

State goal for each city as a range rather than as a single figure.

Formulas used to establish each city's range are based on several factors: Current Population / Projected Housing Growth / Projected Job Growth

Establish an overall range of \$1 million annually (past levels of contribution) to \$2 million annually (an acknowledgment of the levels of need in the community).

Measure accomplishments over a 5-year period: Years of relatively low commitment can be offset by years with higher commitments

Encourage a variety of means for cities to accomplish their goal:

- o Direct monetary assistance from general funds or CDBG funds
- o Indirect monetary assistance such as fee waivers
- o In-kind contributions such as donated land

ARCH Parity Program - Goals / Annual Commitments / Annual Average

CITY	1999	2000	2001	2002	2003	2004	2005	2006	2007
Bellevue	\$1,161,100	\$1,047,776	\$1,056,384	\$612,828	\$503,135	\$605,668	\$1,309,445	\$1,394,756	\$770,873
Bothell	\$106,977	\$80,758	\$77,101	\$81,160	\$115,503	\$148,889	\$23,330	\$41,327	\$47,985
Clyde Hill	\$167	\$10,980	\$11,038	\$11,106	\$10,239	\$10,364	\$10,239	\$11,590	\$16,846
Hunts Point	\$41	\$224	\$238	\$243	\$52	\$80	\$52	\$2,685	\$2,715
Issaquah	\$20,000	\$89,200	\$92,692	\$83,469	\$32,046	\$250,627	\$39,939	\$182,312	\$131,656
Kenmore				\$100,326	\$80,469	\$83,342	\$80,469	\$98,036	\$203,844
Kirkland	\$214,628	\$253,525	\$235,446	\$213,109	\$237,913	\$217,413	\$194,824	\$256,853	\$229,413
Medina	\$218	\$16,075	\$10,273	\$10,273	\$10,000	\$10,000	\$10,000	\$10,000	\$2,500
Mercer Is.	\$225,165	\$81,224	\$81,095	\$136,767	\$85,851	\$98,050	\$79,510	\$32,271	\$37,848
Newcastle	\$47,698	\$73,255	\$79,632	\$51,775	\$48,591	\$48,573	\$48,031	\$56,281	\$53,793
Redmond	\$290,000	\$1,050,816	\$404,606	\$741,881	\$278,756	\$324,948	\$150,888	\$201,124	\$249,942
Sammamish				\$16,511				\$4,514	\$105,241
Woodinville	\$1,722	\$48,029	\$83,166	\$23,210	\$39,813	\$16,028	\$14,813	\$22,348	\$23,935
Yarrow Point	\$51	\$2,298	\$2,314	\$2,345	\$74	\$113	\$74	\$509	\$4,194
Beaux Arts	\$21	\$117	\$132	\$152	\$33	\$50	\$33	\$164	\$190
TOTAL	\$2,067,788	\$2,754,277	\$2,134,117	\$2,085,155	\$1,442,475	\$1,814,145	\$1,961,647	\$2,314,770	\$1,880,975

Subject/Topic: Resolution No. 15-267 Approving Contract No. 15-C1487 Regional Equitable Development Initiative (REDI) Fund Interlocal Agreement Proposed Council Action/Motion: Approve Resolution No. 15-267 to Authorize the City Manager to Execute on behalf of the City, Contract No. 15-C1487, an Interlocal Agreement with: A Regional Coalition for Housing (ARCH) cities; City of Seattle; King County; Snohomish County; and Pierce County to establish the Regional Equitable Development Initiative Fund	For Council Meeting Agenda of: 23 November 2015 Department: Executive & Community Development Prepared by: Nancy Ousley, Assistant City Manager <u>Initial & Date</u> Approved by Department Head: <i>NKO 13 Nov 2015</i> Approved by City Attorney: <i>D. Rertan/email</i> Approved by Finance Director: <i>[Signature] 11/13/15</i> Approved by City Manager: <i>[Signature]</i> Exhibits/Attachments: 1) Resolution No.15-267 and Proposed Contract No 15-C1487 2) Background Information 3) February 9, 2015 Agenda Bill
Expenditure Required \$0 Amount Budgeted \$60,000 for 2015-2016 ARCH Trust Fund Appropriation Required \$0	
<u>INFORMATION/BACKGROUND</u> As part of its approved 2015 Work Program, A Regional Coalition for Housing (ARCH) staff have continued working with the Growing Transit Communities project led through the Puget Sound Regional Council to develop financing tools for Transit Oriented Housing. The Growing Transit Communities Strategy (2013) includes this goal. The proposed mission statement for the fund is: <i>To promote equitable transit communities throughout the central Puget Sound region through strategic property acquisition lending that supports the development and preservation of housing and community facilities that meet the needs of low-income households and are located within walking distance of high-capacity transit services and stations.</i> The proposed Interlocal Agreement is between the public funders of a new revolving loan fund, named the Regional Equitable Development Initiative (REDI) Fund. This fund is expected to have \$18 Million at the outset to be available to secure strategic properties for development of Transit Oriented Development. Public funds are intended to leverage funding from foundations and private lenders. Other public funders providing seed money for the fund are the WA Department of Transportation; City of Seattle; and King County. ARCH jurisdictions	

have contributed \$500,000 through ARCH Trust Fund annual contributions—in this case, Kenmore's investment is \$25,000. Other ARCH cities participating are: Bellevue; Issaquah; Kirkland; Mercer Island; Redmond; and Woodinville.

The REDI Fund is a revolving loan program funded through a combination of public and private funds that will proportionally fund properties in King, Pierce and Snohomish counties. It will allow strategic early investment in well served transit oriented neighborhood by providing low interest loans to non-profit and private developers to secure land or existing residential properties for the purpose of creating housing that includes affordable housing. It also encourages incorporating other community facilities into resulting developments.

ARCH's funding combined with several other public funders (King County, Seattle, State Department of Transportation) is intended to then leverage funds from foundations and lenders. The three funding tiers are:

- first tier seed money from public sources;
- second tier from foundations and mission driven investors;
- third tier from banks and community development financial institutions.

The program is being set up to be able to add additional funds with a long term goal of having \$25 million available. The revolving loan is expected to be in place for at least ten years. When the revolving fund is stopped, funds would be returned to investors with private investors being paid first, and any remaining funds returned to public funders based on their proportional investment. The basic program follows models used in other parts of the country including the Denver Transit Oriented Development Fund, and the Bay Area Transit Oriented Affordable Housing (TOAH) Fund.

The Interlocal Agreement features geographic distribution goals for the REDI Fund investments based on the level of public investment. Based on current public funding commitments, 28% of program funds would be targeted to eligible areas of East King County. This translates to about \$5 million or more depending on the level of private funds in the program. Minimum affordability requirements and covenants to ensure long term affordability are also built into the Agreement, along with governance and administrative requirements. The REDI Fund Master Credit Agreement will document more detailed aspects of the program. The Interlocal authorizes executives of the public funders (ARCH Executive Board, ARCH Administering Agency for ARCH members) to review and enter the Master Credit Agreement so long as it is consistent with the provisions of the Interlocal. The Interlocal (Section VI) has language listing items that at a minimum must be addressed in the Master Credit Agreement, which are consistent with criteria used for ARCH Trust Fund projects.

Kenmore's participation in the initial funding of this project was approved through the Council's February 2015 approval of 2014 ARCH Trust Fund Fall 2014 projects. This new revolving loan fund will complement the City's recent actions to establish a Transit Oriented Development area in downtown Kenmore and advocacy for enhanced investments in high capacity transit in the area being included in the ST 3 ballot measure project list.

Arthur Sullivan, ARCH Executive Director, will be present at the Council meeting to provide additional information and answer questions from the Council. The City Attorney has reviewed and approved the Interlocal Agreement as to form.

FISCAL CONSIDERATION:

The Interlocal Agreement contribution from the City of Kenmore is one of three projects approved by the Council for Fall 2014 ARCH Trust Fund funding. The City's Trust Fund contribution balance after the 2014 approved Trust Fund projects, and the 2015 City contribution of \$30,000, is \$53,572.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

- To focus on and emphasize multimodal transportation safety in the City of Kenmore with a specific focus on pedestrian, bicycle, and other means of travel.
- Create a vibrant, walkable Downtown.

CITY OF KENMORE, WASHINGTON

RESOLUTION NO. 2015-267

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF KENMORE, WASHINGTON, APPROVING AN INTERLOCAL AGREEMENT REGARDING THE ESTABLISHMENT AND ADMINISTRATION OF A REGIONAL EQUITABLE DEVELOPMENT INITIATIVE FUND AND AUTHORIZING THE CITY MANAGER TO ENTER INTO AND EXECUTE THE AGREEMENT

WHEREAS, A Regional Coalition for Housing (ARCH) was created in 1992 by an interlocal agreement to help coordinate the efforts of Eastside cities to provide affordable housing; and

WHEREAS, ARCH is comprised of 15 Eastside cities and King County; and

WHEREAS, the ARCH cities of Bellevue, Issaquah, Kenmore, Kirkland, Mercer Island, Redmond, and Woodinville desire to enter into an interlocal agreement for the establishment and administration of a Regional Equitable Development Initiative Fund (REDI Fund) with the jurisdictions of King County, the City of Seattle, Pierce County, and Snohomish County;

WHEREAS, the REDI Fund is a financing tool designed to promote equitable development within transit communities; and

WHEREAS, Kenmore, as a community with regional transit service, is eligible to be included in and benefit from the REDI Fund; and

WHEREAS, the REDI Fund will support strategic acquisition of land and buildings within walking distance of high quality transit for development and preservation of affordable housing;

NOW THEREFORE, BE IT RESOLVED by the City Council of the City of Kenmore as follows:

Section 1. The Kenmore City Council hereby approves the Interlocal Agreement regarding the establishment and administration of a regional equitable development initiative fund which is attached hereto as Exhibit A and incorporated herein by this reference, and authorizes the City Manager to enter into and execute the agreement.

PASSED by the City Council this _____ day of November, 2015.

APPROVED:

DAVID BAKER, MAYOR

ATTEST/AUTHENTICATED:

PATTY SAFRIN, CITY CLERK

APPROVED AS TO FORM:

BY: _____
CITY ATTORNEY

RESOLUTION NO: 2015-267

**INTERLOCAL AGREEMENT REGARDING THE ESTABLISHMENT
AND ADMINISTRATION OF A REGIONAL
EQUITABLE DEVELOPMENT INITIATIVE FUND**

This Interlocal Agreement regarding the Establishment and Administration of a Regional Equitable Development Initiative Fund ("Agreement") is entered into by and among the jurisdictions of King County, The City of Seattle, Pierce County, Snohomish County and the cities of Bellevue, Issaquah, Kenmore, Kirkland, Mercer Island, Redmond, and Woodinville, who for purposes of this Agreement are jointly referred to as A Regional Coalition for Housing (ARCH) [collectively "the Parties"]. This Agreement is made pursuant to the Interlocal Cooperation Act, Chapter 39.34 RCW, in order to create and operate a Regional Equitable Development Initiative Fund (REDI Fund) for the Puget Sound Region, encompassing King, Pierce and Snohomish Counties.

RECITALS

WHEREAS, the Parties desire to further the following goals:

- Expand and preserve affordable housing choices for low and moderate-income households in proximity to frequent and/or high-capacity transit services that connect riders with job, economic, educational, cultural, health and other opportunities;
- Advance transit ridership through support of nearby population densities, including household types that use transit most heavily, including Low- and Moderate-Income households;
- Support equitable transit-oriented residential and mixed-use development projects throughout the region that address disparities in access to healthy sustainable communities and provide opportunities for lower income people, small local businesses and community facilities to thrive;
- Overcome barriers to site acquisition for developers of affordable housing in proximity to frequent and high-capacity transit services with high and/or increasing real estate demand;
- Enable the acquisition of residential properties for long-term affordability in locations with current or anticipated risk of displacement and loss of affordable units;
- Finance projects that achieve transit-supportive densities, use community building and sustainable design principles, provide a mix of uses and minimize negative impacts on existing residents or businesses; and

WHEREAS, the Parties desire to act cooperatively in order to efficiently and expeditiously establish and administer a Regional Equitable Development Initiative (REDI)

Fund, which will be jointly administered by an administrative agent, as set forth in this Agreement; and

WHEREAS, the Parties have combined responsibility and authority for local and regional planning and funding for the provision of housing affordable to people that work and/or live in the counties of King, Pierce and Snohomish; and

WHEREAS, the Parties desire to cooperatively establish clear requirements of the REDI Fund and clear expectations regarding their participation in and oversight of the REDI Fund.

NOW, THEREFORE, in consideration of the foregoing circumstances, and the mutual promises and undertakings contained herein, the Parties agree as follows:

I. PURPOSE AND DESCRIPTION

The Parties join in this Agreement in order to: declare their joint support for equitable development that primarily creates and preserves affordable housing in locations near transit stations and stops that provide frequent and/or high capacity transit services within the Sound Transit service area in King, Pierce and Snohomish Counties; contribute public funds from or on behalf of the respective jurisdictions into a public/private REDI Loan Fund that will enable land to be purchased for such equitable development; and effectively utilize and share funds granted from Washington State to the region for such a loan fund.

II. REDI FUND REQUIREMENTS, AGREEMENTS, ELIGIBLE PROPERTIES AND FUND STRUCTURE

A. REDI Fund Requirements. The REDI Fund is designed primarily for property acquisition to create and preserve housing that will include affordable housing units in areas near frequent and/or high capacity transit services. The Parties agree to the following minimum requirements:

- 1) Minimum affordability for all projects. A minimum of 10% of the units in a project seeking a REDI Fund loan must have monthly rent or multi-family for-sale prices set at least 20% below the level of the average rent or multi-family for-sale prices for the Area Market in which the acquired property is located, for a minimum period of 50 years. The rents or multi-family for-sale prices of the affordable housing units may not exceed rents or prices affordable to households at or below 80% of area median income (AMI)¹. Greater affordability will be encouraged for projects seeking publicly subsidized Permanent Financing, consistent with the requirements of such funding. The intent of the Parties is to

¹ Current area median income as determined by HUD on an annual basis.

encourage and approve loans for projects that exceed the minimum affordability of this Sub-section, to the extent feasible.

- 2) Requirements for projects that will preserve existing housing. Applicants proposing to acquire existing housing must clearly demonstrate how they will create or preserve affordability relative to housing in the Area Market of the same age and quality. Enforcement of the REDI affordability requirements for preservation projects may be deferred until after Permanent Financing is acquired per the Affordable Housing Regulatory Agreement.
- 3) All projects must demonstrate best efforts to minimize displacement of residential and/or commercial tenants during and after the term of the REDI Fund loan. Efforts may include agreements not to increase rents of existing tenants during the term of the REDI Fund loan beyond a reasonable annual inflationary amount based on the consumer price index or agreements to offer income-eligible residential and/or commercial tenants a right to return to a newly renovated property. Such agreements may be expressed as loan conditions in a REDI Fund loan agreement.
- 4) For a project that will cause displacement of residential or commercial tenants, relocation assistance may be required. The relocation assistance amount per tenant household will be established by the local relocation policy of the city where the project is located; or the county where the project is located if the city does not have a local relocation policy; or the nearest county of the Parties if the county where the project is located does not have a local relocation policy.
- 5) An Affordable Housing Regulatory Agreement (as defined in Section VI) that runs with the land will be recorded in first lien position for each property obtained through the REDI Fund. The Affordable Housing Regulatory Agreement will be granted in favor of the local jurisdiction and/or county in which the property is located. Upon repayment of the REDI Fund loan, the REDI Fund and local jurisdiction or county may re-convey their interest in the Affordable Housing Regulatory Agreement in order to replace it with a new Affordable Housing Regulatory Agreement, so long as it operates as a covenant that runs with the land and contains the minimum the level of affordability required by this section. For projects that preserve existing housing and propose to reduce some or all of the unit rents, the Affordable Housing Regulatory Agreement will define eviction for cause and will specify that current tenants will not be evicted other than for cause during the term of the REDI Fund loan, and that the start date for reduced rent levels will begin after the receipt of Permanent Financing and/or funding to support the ongoing operations of the project.

B. Other REDI Fund Agreements.

- 1) Coordination. The Parties agree to release their individual fund contributions to the REDI Fund into public top loss fund account(s) to be administered and coordinated by the “Administrative Agent” (as set forth in Section IV). All Parties agree to proactively coordinate their respective public funding processes with the REDI Fund project pipeline.
- 2) Application Process and Eligible Applicants. REDI Fund loans will be awarded through an application process that is open and available on a rolling basis. Eligible applicants include non-profit and for-profit housing developers, public development authorities, housing authorities and non-profit land banking agencies. Properties acquired with REDI funds may include properties that are one hundred percent affordable, mixed-income properties and mixed-use properties with affordability components.
- 3) Geographic Distribution. The Parties agree to work together and with the Administrative Agent and other REDI Fund investors to achieve the specific percentages of the REDI Fund to be spent in sub-regions of King County, Seattle and the ARCH sub-region, and in Pierce and Snohomish Counties, consistent with applicable law, over the ten-year duration of the REDI Fund, as set forth in Appendix A, Table of Percentages for Distribution of REDI.
- 4) Other Goals and Priorities. While the primary purpose of REDI is for the creation and preservation of housing projects with affordable housing located near frequent and/or high capacity transit services, the Parties will work together to further the goals set forth at page one of this Agreement, and will work with partners to encourage and approve projects that are committed to equitable development, healthy, resilient communities near frequent and/or high capacity transit services, and community benefits in the allowable non-housing portion of projects, including facilities that meet community needs and community desired spaces for small business development and business incubation, such as business innovations districts.

C. Eligible Properties and Uses. Lending from the REDI Fund shall be for the following :

- 1) Acquisition of vacant, improved or unimproved land for new development. Primary use must be for housing at transit supportive densities, with at least the minimum amount of affordable housing on site as defined in this Agreement. A project that will acquire improved and occupied property for demolition or substantial rehabilitation and may result in tenant displacement will be required to demonstrate net equitable public benefit.

- 2) Acquisition of existing multi-family housing with the goal of minimizing displacement of residents of such housing in transit oriented locations, rehabilitating such housing, as needed, and preserving it as affordable. This category of eligibility may be exempted from the transit supportive densities requirement and will be reviewed on a case by case basis.
- 3) Pre-development funds to support the development of properties acquired with a REDI Fund loan. Pre-development fund requests will be reviewed on a case by case basis and will be reserved for circumstances where other sources of pre-development funds are not available or are not feasible for a project.

REDI Fund Structure. The REDI Fund shall be established as a “Syndicated Loan” structure, a loan fund offered by a group of lenders (a syndicate) who work together to provide blended funds for a single borrower, with an Administrative Agent appointed as the lead.

The REDI Fund has three tiers of capital. The first tier is comprised of the public “top loss” funds. The second tier is comprised of second loss and subordinate investors, including Program Related Investments (PRI) and flexible debt from mission-driven investors. The third tier is comprised of senior debt investors. The tiers will be administered as a cohesive fund by the Administrative Agent, who will package the fund sources into individual REDI Fund loans.

The first tier funds are contributed to the fund without interest. The second and third tier funds are contributed at a variety of interest rates. For each loan, the Administrative Agent will blend funds from each of the tiers into one blended rate loan. The Master Credit Agreement (as set forth in Section V) will detail the blending of the capital of individual funders and investors from the three tiers for each loan.

The Master Credit Agreement will detail how public funds will be allocated to individual projects. To the extent practical, while accounting for any requirement of specific fund sources, projects will receive funds from multiple public fund sources. The Administrative Agent will track, retain and share records with the funders regarding the amount of each fund source contributed to each REDI loan so that the parties have a record of the percentage of their funds in each loan.

III. PUBLIC FUNDER CONTRIBUTIONS AND FUND RELEASE REQUIREMENTS

A. Public Funder Contributions

- 1) King County. Subject to the provisions of Subsection III.B., King County will contribute \$1 million to the REDI Fund. King County's requirement for the use of this investment mirrors the minimum affordable housing unit requirements, as described in Section II.A., for each REDI loan. In addition, within 7 years of capitalization of the fund, some combination of projects that will create and/or preserve a minimum of 5 units affordable to 50% AMI and below, and a minimum of 15 units affordable to 30% AMI and below, must have received a REDI Fund loan within King County.

In addition, through an agreement with the Puget Sound Regional Council (PSRC), King County will contribute a pass-through grant from the State of Washington in the amount of \$2.5 million. The State is granting the funds for a revolving loan fund to support affordable housing opportunities near transit stations and stops that provide frequent and/or high capacity transit services and are located within the Sound Transit service area. The \$2.5 million is contributed to the first tier (public top loss tier) on behalf of three participating counties, King, Pierce and Snohomish.

- 2) The City of Seattle. Subject to the provisions of Subsection III.B., The City of Seattle will contribute \$1 million to the REDI Fund. Within five years of capitalization of the fund, a minimum of 10 units affordable to households earning up to 80% AMI for a period of fifty years must have received a REDI Fund loan within Seattle city limits. The City of Seattle reserves the right to withdraw its investment at the end of five years if this minimum requirement has not been met.
- 3) A Regional Coalition for Housing (ARCH). Subject to the provisions of Subsection III.B., those cities collectively referred to as ARCH will contribute \$500,000 to the REDI Fund in the following amount for each individual city:

Bellevue:	\$250,000
Issaquah	\$ 36,500
Kenmore	\$ 25,000
Kirkland	\$120,000
Mercer Island	\$ 11,500
Redmond	\$ 50,000
Woodinville	\$ 7,000

ARCH's requirement for the use of these investments mirrors the minimum affordable housing unit requirements for each REDI loan, described in Section II.

- B. Release of Public Funds to REDI Fund Account(s).** The funds of the Parties will be released to the REDI account(s) established by the Administrative Agent only after each of the following has occurred: (1) execution of this Interlocal Agreement; (2) execution of the Master Credit Agreement by the Executives of the Parties and by all initial investors in the REDI Fund; (3) constitution of an Oversight Committee and confirmation by the REDI Fund Staff Work Group that all documents necessary to administer the REDI Fund have been approved by that Committee; and (4) at least \$18 million has been committed to the REDI Fund through a combination of all investment tiers.

IV. ADMINISTRATION AND OVERSIGHT OF THE REDI FUND

- A. Administrative Agent.** Day-to-day REDI Fund activities and operations will be administered by an Administrative Agent chosen by the Executives of the Parties.
- 1) The role and duties of the Administrative Agent and the process for selecting and replacing the Administrative Agent, if necessary, will be specified in the Master Credit Agreement.
 - 2) The Administrative Agent will maintain all REDI Fund financial records and submit all reports required by the REDI Oversight Committee in a form that is acceptable to that Committee.
 - 3) The Administrative Agent will staff the REDI committees and provide regular reports for such committees and for fund investors, as specified in the Master Credit Agreement. Annual reports, including a report in an acceptable format for the State of Washington, will be available to the REDI Fund public funders, committees and the Executives of the Parties, to deliver to the State and their stakeholders.
 - 4) The Administrative Agent will have the lead role in obtaining second and third tier mission investors and senior debt investors to the fund, maintaining investor relations and exploring options to expand and/or replace capital as needed.
 - 5) Compensation of the Administrative Agent through the REDI Fund shall be detailed in the Master Credit Agreement.

B. Governance and Oversight.

- 1) **Advisory Committee.** The REDI Fund will receive advice and feedback through an Advisory Committee, whose members will include major regional affordable housing and transportation stakeholders, representatives from all investor entities and the REDI Fund Administrative Agent. While all investors may participate, this is not mandatory. The Advisory Committee will provide high-level advice, feedback and recommendations to the Oversight Committee and the

Administrative Agent. The Advisory Committee shall meet at least once per year. The total number of members and composition of this committee shall be specified in the Master Credit Agreement. The Parties agree to communicate and coordinate so that at least one public funder representative attends each of these committee meetings.

- 2) Oversight Committee. The REDI Fund will be governed by an Oversight Committee. The Oversight Committee will always be chaired by a first tier public top loss investor, and the Parties agree to rotate this role as the Chair. Details of the rotation process will be specified in the Master Credit Agreement.

The Oversight Committee members will include the following: one permanent seat for each direct public funder of the first tier (top loss); one permanent seat for the Administrative Agent; one rotating seat for jurisdictions that share in the REDI Fund indirectly through funds granted from the State of Washington; one or two rotating seats for Tier 2 lenders, depending on the number of such lenders; and, one or two rotating seats for senior Tier 3 lenders, depending on the number of such lenders. The total number of committee members, selection process and seat rotation process will be specified in the Master Credit Agreement.

The Oversight Committee will oversee the details of the direction and business of the REDI Fund to ensure that the fund is meeting its stated purpose, mission and goals, including oversight of a REDI Fund evaluation process that will recognize and account for the goals and priorities of the respective Parties. Such oversight includes reviewing the cumulative activities of the REDI Fund, and, on an as needed basis, amending REDI Fund policies and procedures. The Oversight Committee may discuss potential revisions to REDI Fund underwriting criteria and policies/procedures contained in the Master Credit Agreement, and if such revision(s) are deemed necessary, initiate a process for all investors to sign a revised Master Credit Agreement. The Oversight Committee will meet at least twice per year, and may meet more frequently if determined necessary.

- 3) Credit Committee. A Credit Committee will be convened periodically, and as needed, by the Administrative Agent to review loan applications, and to take action to approve such applications based on criteria established by the Oversight Committee. As needed, the Credit Committee may also evaluate requests for amendments or loan extensions. The membership of the Credit Committee will include: a) one regularly rotating seat for first tier funders; b) one seat for the Most Local Public Funder of the application (s) being reviewed by the committee; c) one regularly rotating seat for second tier investors; d) one regularly rotating

seat for third tier investors; and, e) a seat for the Administrative Agent. The details of the credit committee processes, including seat rotation, will be specified in the Master Credit Agreement.

The Parties agree to communicate with each other regarding project applications within a jurisdiction that does not currently have a representative sitting on the credit committee in order to protect each other's interests. The Parties agree to support the minimum requirements of fellow public funders contained in Section III when projects are otherwise equally qualified. All written correspondence and minutes from Credit Committee meetings will be provided promptly to all members of the Oversight Committee.

V. REDI FUND MASTER CREDIT AGREEMENT.

All investors in the REDI Fund will sign and enter into a Master Credit Agreement that is consistent with this Interlocal Agreement and establishes the following, at a minimum:

- A. The roles, responsibilities, duties and processes, as applicable of investors, committees, and the Administrative Agent;
- B. Procedures for the Oversight Committee to initiate a process to replace the Administrative Agent, if determined necessary;
- C. Amounts and terms of capital contributions by the investors and capital flow through the life of the fund, i.e. the manner in which the capital from the individual lenders will be layered into individual loans and the operating approach of the fund;
- D. Eligible borrowers, eligible project location areas, and other relevant qualification criteria for project selection;
- E. Details of REDI Fund policies and procedures, including the REDI Fund application, relocation and displacement;
- F. Percentages for the sub-regional distribution of loans per Appendix A;
- G. Terms and conditions to ensure that the Parties' public funds are used for their intended purpose;
- H. Provisions for mitigating losses to the first tier public funds;
- I. Provisions for administering fund resources and obligations upon expiration of the Agreement, if the Agreement is not renewed.
- J. Provisions requiring the Administrative Agent to track, retain and share records with the funders regarding the amount of each fund source contributed to each REDI loan so that the parties have a record of the percentage of their funds in each loan.

The elements, policies and conditions of the Master Credit Agreement shall be guided by the principles and requirements of this Agreement and signed by the Executives of the Parties.

VI. DEFINITIONS

- A. **Affordable Housing Regulatory Agreement.** Affordable Housing Regulatory Agreement means a recorded agreement that runs with the land regulating the minimum number of affordable housing units required by the REDI Fund for an acquired property. An Affordable Housing Regulatory Agreement is recorded at the time a REDI Fund loan is closed and runs with the land for a period of fifty years, unless released and replaced per the provisions of Section II.A.
- B. **Area Market.** Area Markets for the purpose of determining average rents and average multi-family for-sale prices for the area in which an applicant's project is located shall be determined by local rental research information and for-sale listing service publications, and shall be detailed in the Master Credit Agreement.
- C. **Executive.** Executive means the appropriate designated authority of each of the Parties (e.g. County Executive, Mayor). The Parties collectively referred to as ARCH appoint the designated authority of the Administering Agency of ARCH, as designated and defined in the Amended and Restated Interlocal Agreement for ARCH to act as their Executive. The Executive for the ARCH Parties will consult with the ARCH Executive Board prior to acting on behalf of the ARCH Parties.
- D. **Low-Income Household.** A Low Income Household is a household whose income is at or below 50% of area median income (AMI), as determined and published by HUD on an annual basis, for the area in which a REDI project is located.
- E. **Moderate-Income Household.** A Moderate Income Household is a household whose income is at or below 80% AMI, and more than 50% AMI, as determined and published by HUD on an annual basis, for the area in which a REDI project is located.
- F. **Most Local Public Funder.** The Most Local Public Funder is the first tier public funder with the smallest jurisdictional boundary in which a project application is located; e.g. for a project in Seattle, Seattle is the Most Local Public Funder, for a project in Bellevue, ARCH is the Most Local Public Funder, and for a project in SeaTac or Shoreline, King County is the Most Local Public Funder.
- G. **Permanent Financing.** Permanent Financing means long-term debt or equity financing that supports the development or acquisition/rehabilitation of a housing asset.
- H. **REDI Fund Staff Work Group.** The REDI Fund Work Group consists of the lead staff of the three direct public investors, King County, Seattle and ARCH; the Administrative Agent; staff from the Puget Sound Regional Council; and staff representatives from Pierce County and Snohomish County.

VIII. CONTACT PERSONS

For purposes of this Agreement, the following persons shall serve as contact persons for their respective jurisdictions:

REDI Fund Interlocal Cooperation Agreement
Page | 10

King County:

Snohomish County:

Pierce County:

The City of Seattle:

ARCH:

IX. EFFECTIVE DATE OF AGREEMENT

This Agreement shall be effective on _____, 2015.

X. DURATION OF AGREEMENT

- A. Duration. Unless otherwise renewed as provided herein, this Agreement shall remain in effect until _____.
- B. Renewal. The Executives of the Parties agree to have discussions with the other REDI Fund investors no later than December 31, 2022 to determine if the Parties wish to renew this Agreement and continue the Fund beyond the initial ten-year period. The Agreement may be renewed for an additional ten year term, or for such other lesser period as the parties may agree.
- C. Termination. The Oversight Committee shall review and discuss whether the Master Credit Agreement should include provisions that would allow for the termination of the REDI Fund before the ten year period of this Agreement if there is no activity in the fund for a prescribed period of time.

XI. ADDITIONAL PARTIES, REVISIONS

- A. Additional jurisdictions may become a Party to this Agreement upon investment of the jurisdiction's public funds into the first tier of the REDI Fund, and approval and signature of this Agreement.
- B. Revisions to the Appendix A, Table of Percentages for Distribution of REDI, may be made in order to reflect the addition of Parties to this Agreement, failure of a Party to sign this Agreement or additional public fund contributions made. Such revisions shall be approved by the Executives of the Parties. Revisions to Appendix A shall be

considered to be approved in writing when the revised Appendix A is signed by all the Executives of the Parties.

XII. GENERAL MATTERS AND RECORDING

- A. Entire Agreement. This Agreement is the complete expression of the terms hereof, and any representations or understandings, whether written or oral, not incorporated herein are excluded.
- B. No Assignment. No party shall have the right to transfer or assign its rights or obligations under this Agreement without the prior written consent of all other parties.
- C. No Separate Legal Entity. No separate legal entity is created by this Agreement.
- D. Venue. Any action filed under or related to this Agreement must be brought in King County Superior Court.
- E. Recording. This Agreement shall be filed with King County Records or otherwise made public in accordance with the Interlocal Cooperation Act.
- F. Dispute Resolution. If any dispute arises among the Parties which is not resolved by routine meetings or communications, the disputing parties agree to seek resolution of such dispute in good faith by meeting, as soon as feasible. If the parties do not come to an agreement on the dispute, the parties may agree to pursue mediation through a process to be mutually agreed upon, with the parties to the dispute sharing equally the costs of mediation and assuming their own costs.
- G. No Third Party Beneficiaries. This Agreement is for the benefit of the Parties only, and no third party shall have any rights hereunder.
- H. Retained Responsibility and Authority. Except as expressly provided for herein, the Parties retain the responsibility and authority for managing and maintaining their own respective systems and programs related to affordable housing activities.

The invalidity of any clause, sentence, paragraph, section, or portion thereof shall not affect the validity of the remaining provisions of the Agreement. In the event the provision invalidated is necessary for any Party to continue to receive the benefit it was receiving under the Agreement before the invalidation, the Parties agree to consider amending the Agreement to provide a substitute provision that enables the affected Party or Parties to continue to receive that benefit. If such an amendment cannot be agreed upon, the Agreement will be deemed terminated as of any date required by the invalidation.

XIII. COUNTERPARTS

A. This Agreement may be signed in counterparts and, if so signed, shall be deemed one integrated Agreement.

Approved and executed this ____ day of _____, 20XX

Jurisdiction: _____

Signature: _____

By: _____
Printed Name

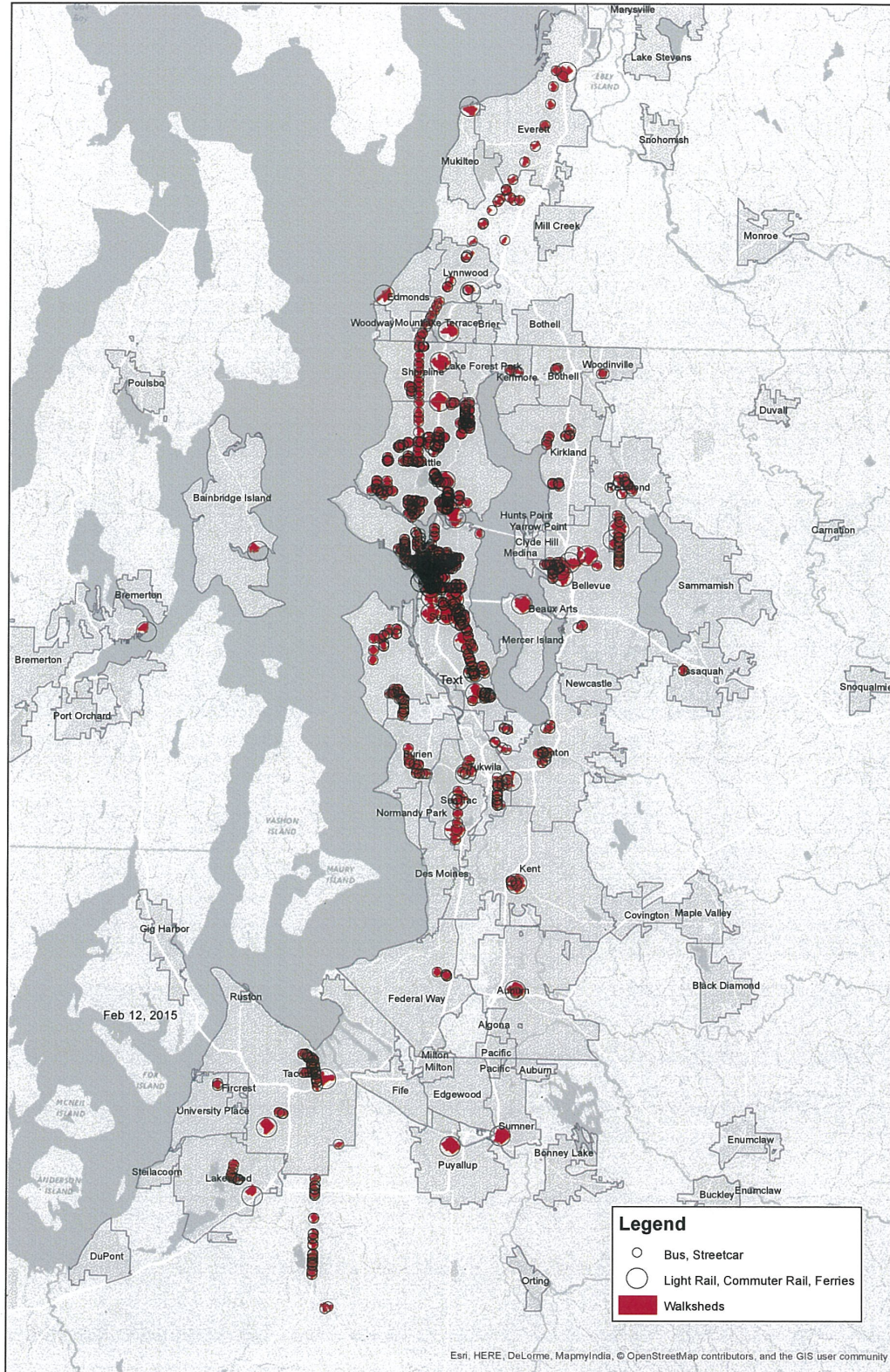
Title: _____

Approved as to form:

City/County Attorney

SHARES CONTRIBUTED / RECEIVED BY JURISDICTION					
Amounts Contributed			Goal for Distribution		
Source	Amount*	Share	Distribution	Amount*	Share
ARCH	500,000	10%	E KING	6,000,000	24%
KC	1,000,000	20%	OTHER KC	4,500,000	18%
SEA	1,000,000	20%	SEA	9,500,000	38%
STATE	2,500,000	50%	SNO	2,250,000	9%
total	5,000,000		PRC	2,750,000	11%
			total	25,000,000	
*Amounts based on initial investment of \$25 million. In the event loans revolve and the fund continues, the amount of capital distributed may ultimately exceed \$25 million; the goals for distribution would be applied on an ongoing basis to the total capital lent over the life of the fund.					

Eligible Locations for REDI Fund 2015 DRAFT





Business of the City Council
City of Kenmore, WA

Subject/Topic: Resolution 15-252 authorizing execution of documents necessary to fund housing projects recommended by A Regional Coalition for Housing (ARCH) Executive Board. Proposed Council Action/Motion: Council motion to approve Resolution 15-252	For Council Meeting Agenda of: 2/9/15 Department: Executive Prepared by: Debbie Bent, Community Development Director Initial & Date Approved by Department Head: <u>AKO 3/6/15</u> Approved by City Attorney: Approved by Finance Director: <u>[Signature] 1/20/15</u> Approved by City Manager: <u>[Signature]</u> Exhibits/Attachments: 1. Resolution 15-252 with Exhibit A, Memo dated 12/12/14 Fall 2014 Housing Trust Fund Recommendation, from the ARCH Executive Board	
Expenditure Required \$0	Amount Budgeted \$60,000	Appropriation Required \$0
INFORMATION/BACKGROUND: The City of Kenmore approved an Amended and Restated Interlocal Agreement with ARCH on 3/8/10 (Contract 10-C866) with an effective date of 7/1/10. One outcome of the Interlocal agreement was that the City of Bellevue would keep in trust and administer the accumulated funds annually set aside by the City of Kenmore. The ARCH Executive Board Fall 2014 Housing Trust Fund recommendation (See Exhibit A of Attachment 1) includes funding for three projects, with a funding total of \$1,400,800. The actual amount will depend on final action by City Councils. The City of Kenmore requested funding contribution is \$49,285 to assist in funding three projects: \$20,000 for the Congregation for the Homeless/King County Housing Authority EKC Men's Winter Shelter project; \$25,000 for the Regional Equitable Development Initiative Fund project; and \$4,285 for the Parkview Homes XI project. Staff recommends that Council approve Resolution 15-252 (Attachment 1) providing authorization for the duly appointed administering agency for ARCH (City of Bellevue) to execute all documents necessary to enter into agreements for the funding of affordable housing projects in the amount of \$49,285 as recommended by the ARCH Executive Board, utilizing funds from the City's Housing Trust Fund. This action has no budgetary impact as the funds have already been budgeted. The City's Housing Trust Fund cash balance at the end of 2014 (preliminary pending final year end accounting) is \$216,942. There is also \$144,085 committed to projects in development but not yet paid which would reduce the Trust Fund Balance to \$72,857. The \$49,285 funding contribution would be withdrawn from this balance. This balance does not include the City's 2015 \$30,000 contribution committed in the adopted budget which has yet to be transferred to ARCH. FISCAL CONSIDERATION: The City's adopted 2015-2016 biennial budget includes \$60,000 in the General Fund as a commitment to the ARCH Housing Trust Fund. COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED: Consistent with the ARCH Interlocal Agreement (Contract 10-C866). Consistent with adopted 2015-2016 budget.		

Attachment 1

**CITY OF KENMORE
WASHINGTON
RESOLUTION NO. 15-252**

A RESOLUTION authorizing the duly-appointed Administering agency for ARCH to execute all documents necessary to enter into Agreements for the funding of affordable housing projects, as recommended by the ARCH Executive Board, utilizing funds from the City's Housing Trust Fund.

WHEREAS, A Regional Coalition for Housing (ARCH) was created by interlocal agreement to help coordinate the efforts of Eastside cities to provide affordable housing; and

WHEREAS, the ARCH Executive Board has recommended that the City of Kenmore participate in the funding of certain affordable housing projects and programs hereinafter described; and

WHEREAS, the ARCH Executive Board has developed a number of recommended conditions to ensure that the City's affordable housing funds are used for their intended purpose and that projects maintain their affordability over time; and

WHEREAS, the City Council took action on March 8, 2010 approving the Amended and Restated Interlocal Agreement for ARCH; and

WHEREAS, the City Council desires to use \$49,285 from City funds as designated below to finance the projects recommended by the ARCH Executive Board; now, therefore,

THE CITY COUNCIL OF THE CITY OF KENMORE, WASHINGTON, DOES RESOLVE AS FOLLOWS:

Section 1. The City Council authorizes the duly-appointed administering agency of ARCH pursuant to the Amended and Restated Interlocal Agreement for ARCH to execute all documents and take all necessary actions to enter into Agreements on behalf of the City with: the Regional Equitable Development Initiative (REDI) revolving loan fund for an amount not to exceed \$25,000; with Congregations for the Homeless East King County Men's Permanent Winter Shelter for an amount not to exceed \$20,000; and with Parkview Services Home XI for an amount not to exceed \$4,285.

Section 2. The Agreements entered into pursuant to Section 1 of this resolution shall include terms and conditions to ensure that the City's funds are used for their intended purpose and that the projects maintain affordability over time. In determining what conditions should be included in the Agreements, the duly-appointed administering agency of ARCH shall be guided by the recommendations set forth in the ARCH

Executive Board's memorandum of December 12, 2014, a copy of which is attached hereto as Exhibit A.

**PASSED BY THE CITY COUNCIL OF THE CITY OF KENMORE,
WASHINGTON, AT A REGULAR MEETING THEREOF THIS 9th DAY OF FEBRUARY
2015.**

CITY OF KENMORE

Mayor David Baker

Attest/Authenticated:

Patty Safrin, City Clerk

EXHIBIT
A



Together Center
16225 NE 87th Street, Suite A-3 ♦ Redmond, Washington 98052
(425) 861-3677 ♦ Fax: (425) 861-4553 ♦ www.archhousing.org

MEMORANDUM

TO: City of Bellevue Council Members
City of Clyde Hill Council Members
Town of Hunts Point Council Members
City of Issaquah Council Members
City of Kenmore Council Members
City of Kirkland Council Members
City of Medina Council Members
City of Mercer Island Council Members
City of Newcastle Council Members
City of Redmond Council Members
City of Sammamish Council Members
City of Woodinville Council Members
Town of Yarrow Point Council Members

FROM: Lyman Howard, Chair, and ARCH Executive Board

DATE: December 12, 2014

RE: Fall 2014 Housing Trust Fund (HTF) Recommendation

The ARCH Executive Board has completed its review of the four applications for the Fall 2014 Housing Trust Fund round. The CAB recommends funding for three projects. Recommendations total \$1,400,800 as summarized in the attached table, Proposed Funding Sources. The actual amount will depend on final action by the City Councils.

Following is a summary of the applications, the CAB recommendation and rationale, and proposed contract conditions for the three proposals recommended for funding at this time. Also enclosed is a project summary table, a chart summarizing overall funding sources, an economic summary for each projects, and a summary of funded projects to date.

1. Congregations for the Homeless/King County Housing Authority EKC Men's Winter Shelter

Funding Request:	\$700,000 (Secured Grant) 50 beds
CAB Recommendation:	\$700,000 (Secured Grant) See attached Funding Chart for distribution of City Funds

ARCH Members

BEAUX ARTS VILLAGE ♦ BELLEVUE ♦ BOTHELL ♦ CLYDE HILL ♦ HUNTS POINT ♦ ISSAQUAH ♦ KENMORE ♦ KIRKLAND
MEDINA ♦ MERCER ISLAND ♦ NEWCASTLE ♦ REDMOND ♦ SAMMAMISH ♦ WOODINVILLE ♦ YARROW POINT ♦ KING COUNTY

Project Summary:

Congregations for the Homeless (CFH) with the support of King County Housing Authority (KCHA) is applying to ARCH for the acquisition of a property to be developed as a permanent winter shelter for men. For the past six years East King County cities have funded two winter shelters: one for unaccompanied men and one for women and families. CFH has operated the men's emergency winter shelter during that time, at non-permanent locations usually churches or civic buildings, which have sometimes been in single family neighborhoods. The emergency shelter is a low barrier shelter which means few requirements on the shelter guests other than they don't pose a danger to other guests. The emergency shelter started out being open only on severe winter nights, but moved to being open all nights from November through March. This application takes the project a next step to a permanent location better located for shelter guests, and also be able to house daytime services and drop in center. ARCH-member planning staff have already identified a number of locations generally in or near transit-served centers and near services which would be appropriate for siting the shelter. Initially the shelter and daytime services could operate on a similar schedule as the current facilities – night time shelter during winter months and daytime services weekdays throughout the year. To the extent there is additional private and/or public funding support, it could expand the period shelter and day services are available.

The proposed shelter is sized to house at least 50 men. It would include kitchen and dining facilities, gathering space, computer lab, staff and counseling offices, a hygiene center including washrooms, showers and laundry, staff laundry, bedding storage area and sleeping areas. Ultimately the goal is to create a second similar facility for women/families. The acquisition could include a building shell which could be renovated for the purpose of the shelter/day center, or it could mean new construction. The ARCH funding in conjunction with an interim Loan from King County would be used to acquire the property. After acquisition, a final budget will be prepared and other permanent funding will be sought including permanent funding from King County and State Housing Trust Fund and a capital campaign by CFH.

Funding Rationale:

The CAB supported the intent of this application for the following reasons:

- Provides shelter during winter months for at least 50 men and part time daytime services year round which has been a demonstrated need over the past 5 years in East King County.
- Is consistent with Countywide Committee to End Homelessness priorities.
- Operator is respected, and has been successful for six years of operation in serving this population in a winter shelter.
- Would help address challenges of siting a temporary shelter on an annual basis.
- Permanent location would allow it to be better located close to transit and services and not impact single family neighborhoods.
- Permanent facility would provide opportunity to expand period shelter and day services are available with additional operating funds
- KCHA as interim owner will allow CFH to act to secure and hold potential site.

While it is not typical to recommend funding prior to a specific site is identified, it is recognized that there are special circumstances associated with this proposal. First, there is a temporary location for the shelter that is only available the next two winters and a new location needed by winter 2016. Second, acquiring properties in the areas being targeted can be competitive and require relatively quick action to

secure an option. In the recommended conditions, there are several special conditions intended to address these circumstances.

Potential Conditions:

Standard Conditions: Refer to list of standard conditions found at end of this memo

Special Conditions:

1. Prior to September 1, 2015, CFH shall provide to City or Administering Agency an update on the status of the project which will include: update on status of a site search, updates on the status of the capital campaign and applications for other public funding; updated capital and operating budgets (including reflecting federal funding requirements); and progress toward being able to meet all funding conditions within the 18 month period specified in Condition 2. If the City or Administering Agency evaluation indicates that funding conditions cannot be met within the 18 month funding condition period, (e.g. status of site search, progress on the capital campaign, application for other funding, updated budgets), then the ARCH Executive Board will be authorized to have the funding award expire and CFH will have to reapply to ARCH for funding.
2. In the event the first funding condition is met, the funding commitment shall be extended to eighteen (18) months from the date of Council approval and shall expire thereafter if all conditions are not satisfied. An extension may be requested to City or Administering Agency no later than sixty (60) days prior to the expiration date. City or Administering Agency will consider an extension only on the basis of documented, meaningful progress in bringing the project to readiness or completion.
3. CFH will provide a capital campaign strategy by March 2015 which includes key activities and campaign funding target milestones. Sustain operation over time through fundraising and other efforts.
4. With the approval of the ARCH Executive Board, up to \$50,000 of funds may be released for predevelopment expenses including Option money for securing a site, due diligence associated with securing the site and project management during the predevelopment phase. The remaining funds could be released upon all other public funding commitment.
5. Funds shall be used by CFH toward acquisition and related due diligence, construction, design and relocation costs. Final designation of use of funds, including any other project related purpose, must receive written authorization from ARCH staff.
6. Funds will be in the form of a secured grant with no repayment, so long as affordability and target population is maintained, and the service funds necessary to provide services to this population are available.
7. A covenant is recorded ensuring affordability for at least fifty (50) beds for fifty (50) years at 30% AMI maximum income.
8. Upon identification of any specific site being considered CFH shall notify ARCH and the City where the site is located for review and approval. In addition CFH shall furnish to ARCH, for

review by the Citizen Advisory Board, terms for the site acquisition and updated development and operating budgets.

9. By March 2015, an outreach plan will be submitted to ARCH staff for review and approval. The outreach plan will include provisions such as:
 - Provide written notification to neighbors upon identification of a suitable site to include description of the project, and information regarding CFH that will include the website and contact number
 - Send out invitations and provide an opportunity for neighbors to individually and/or as a group to meet with CFH in an Open House or other format regarding the project during the site feasibility stage.
 - Strategies for maintaining community communication after development of a specific site, including information about what to do in case something out of the ordinary occurs.
10. As part of the quarterly monitoring report, CFH shall explicitly include any activities related to the neighborhood outreach plan; and progress of the Capital Campaign including active solicitations, amounts pledged and secured against campaign targets and how funds are allocated to the different projects covered by the campaign.
11. Prior to release of funds, the Agency shall submit to ARCH staff for review and approval the winter shelter operating plan including how the facility will be managed and maintained, maintaining the safety and security of shelter guests as well as neighbors, and the financial operations of the shelter.
12. In the event that any operating support funding levels will be reduced, the Agency shall inform ARCH Staff about the impacts the proposed reduction will have on the budget and plan for services to clients, and what steps shall be taken to address the impacts. A new budget or services plan must be approved by ARCH.

2. REDI (Regional Equitable Development Initiative) Fund

Funding Request: \$500,000 (Deferred Loan)
Unknown number of affordable units

CAB Recommendation: \$500,000 (Deferred Loan)
See attached Funding Chart for distribution of City Funds

Project Summary:

This application is for \$500,000 in seed funding for capitalizing a \$25 million revolving loan fund for the purpose of acquiring sites within a four-county region. The goal is for the program to be operational in 2015. The proposed mission statement for the fund is: "to promote equitable transit communities throughout the central Puget Sound region through strategic property acquisition lending that supports the development and preservation of housing and community facilities that meet the needs of low-income households and are located within walking distance of high-capacity transit services and stations." ARCH's funding combined with several other public funders (King County, Seattle, State Department of Transportation) is intended to then leverage funds from foundations and lenders. The three funding tiers are:

- \$5 million in first tier seed money from public sources;

- \$7.5 million second tier from foundations and mission driven investors;
- \$12.5 million third tier from banks and community development financial institutions.

The revolving loan is expected to be in place for at least ten years and when stopped, funds would be returned to investors with private investors being paid first, and principal returned to public funders as remains. The basic program follows models used in other parts of the country including the Denver Transit Oriented Development Fund, and the Bay Area Transit Oriented Affordable Housing (TOAH) Fund.

The REDI Fund proposal emerges from the work of the Growing Transit Communities (GTC) Partnership, a consortium of public, private, and non-profit stakeholders led by the Puget Sound Regional Council (PSRC). A framework and draft business plan for this project was developed by Enterprise Community Partners and Impact Capital, both of which are Community Development Finance Institutions (CDFIs) that are active in the central Puget Sound region.

Funding Rationale:

The CAB supported the intent of this application for the following reasons:

Would allow acquisition in areas evolving as supported by transit ahead of escalating property values

- Would leverage significant funding from banks and mission-driven organizations. The relatively small public investment by ARCH would give East King County developers access to acquisition loans to the order of several million dollars.
- The REDI fund will fill the gap in the spectrum of financial products currently available to developers interested in equitable TOD by allowing mixed income projects, providing longer term loans for land banking purposes, and providing larger loans for larger sites and completed properties.
- Revolving loan means potential for funds being made available to several projects in succession, and a return to city if the program is ended.
- Loans would be secured by real estate which could be sold at future value should individual projects not move forward.

While the CAB supports the intent of the REDI fund, because it is in its formative stage, it is not as evolved as many other programs. In addition, the program is unique in that it will support a wide range of types of housing with different financing and affordability levels. While these circumstances provide challenges, it is still recommended to make a conditioned funding award at this time because of the important intent of the program, and it would also allow ARCH members to be involved with the development of the program and better insure that ARCH member interests are accounted for in the program. The conditions clarify program issues that at a minimum must be addressed prior to program implementation and also provide for the ARCH Executive Board final review.

Potential Conditions:

Special / Revised Conditions:

1. The funding commitment shall continue for nine (9) months from the date of Council approval and shall expire thereafter if all conditions are not satisfied. An extension may be requested to City staff no later than sixty (60) days prior to the expiration date. At that time, the applicant will provide a status report on progress to date, and expected schedule for start of construction and project completion. City staff will consider an extension only on the basis of documented, meaningful progress in bringing the project to readiness or completion. At a minimum, the applicant will demonstrate that all capital

funding has been secured or is likely to be secured within a reasonable period of time. City staff will grant up to a 12 month extension.

2. Funds shall be used by the Agency toward seed money for loan fund.
3. Completion of an Interlocal Agreement and Credit Agreement that is reviewed and approved through the ARCH Executive Board and that at a minimum address:
 - Program and project criteria including:
 - Geographic balance for use of the fund, with goals for sub-regions including East King County.
 - Defined transit oriented neighborhood areas eligible for use of the fund with flexibility over time to account for changes in land use and transit service.
 - Criteria for eligible borrowers.
 - Overall affordability goals for housing created through fund. This should allow for different levels of affordability to encourage a range of types of developments and variety of financing approaches.
 - Criteria for establishing loan terms (e.g. amount, interest rate, duration) for individual projects.
 - Guidelines regarding eligible types of development, with the primary objective being the development of housing that includes affordable housing in stand-alone or mixed use development. Also provisions to help benefit other non-housing uses (e.g. community facilities; small businesses) as a secondary use in mixed use developments to encourage vibrant urban centers.
 - Minimum developer contributions and how REDI funds could be blended with other funding sources.
 - Review/underwriting criteria for evaluating individual sites, including establishing milestones to be able to evaluate appropriate progress on individual sites. Include some level of flexibility in these criteria to be responsive to different market conditions throughout the region.
 - Procedures for disposition or other use of properties that are not able to proceed as proposed.
 - Clear direction/policy regarding relocation.
 - Governance issues including:
 - Committee structure (Oversight and/or Loan), membership, frequency of meetings and responsibilities. Address ARCH Representation in governance structure.
 - Process for identifying a fund manager and the roles and responsibilities of the fund manager.
 - Procedures/process the fund will use to review individual applications and develop funding recommendation.
 - The amounts and terms of funds from each investor, including minimum funding levels needed from each funding tier for program to become operational.
 - How losses are allocated.
 - Process for regular review and evaluation of REDI Fund activity and revisions to fund priorities and structure
4. Submit monitoring reports quarterly through completion of the project, and annually thereafter. Submit a final budget upon project completion.

5. Funds will be in the form of a deferred 0% interest loan with repayment upon closing the loan pool.

3. Parkview Homes XI

Funding Request: \$200,800 (Secured Grant)
3 Beds

CAB Recommendation: \$200,800 (Secured Grant)
See attached Funding Chart for distribution of City Funds

Project Summary:

Parkview Services, a Shoreline-based non-profit organization which to date has done 158 beds in 53 properties in the region, with this project is proposing to develop two homes in King County. The ARCH application is to help fund one of those homes, a Supportive Living Services Home in Bothell or Kirkland. The other home will be in Federal Way. For the ARCH sphere home they plan to acquire and remodel a three-bedroom house that will serve three (3) low-income individuals with developmental disabilities. A specific home will be identified once all funding is committed. Improvements will include remodeling to meet both Evergreen sustainability and ADA (Americans with Disabilities Act) accessibility standards, and a monitored fire suppression system.

There currently is no site control. The house to be bought will be remodeled to include accessibility features necessary for the initial tenants and for future tenants. Parkview will be looking to acquire suitably laid out minimum 1,500 square foot rambler-style houses that can easily be modified for accessibility.

Funding Rationale:

The CAB supported the intent of this application for the following reasons:

- Serves neediest developmentally disabled residents by relying on referrals from the State DDD for new residents
- Provides housing for a population (Special Needs housing) that currently is below long term ARCH Trust Fund goals
- Property will have 24/7 non-resident care provider coverage
- Acquisitions to be done near transit and community amenities
- Developer has long track record with properties in King County and good reputation with funders and Department of Developmental Disabilities
- Is on the Department of Commerce Trust Fund LEAP (Legislative Evaluation and Accountability Program) list in the special needs set aside

Potential Conditions:

Standard Conditions: Refer to list of standard conditions found at end of this memo

Special / Revised Conditions:

1. The funding commitment shall continue for six (6) months from the date of Council approval and shall expire thereafter if all conditions are not satisfied. An extension may be requested to ARCH staff no later than sixty (60) days prior to the expiration date. At that time, the applicant will

provide a status report on progress to date, and expected schedule for start of construction and project completion. ARCH staff will consider an extension only on the basis of documented, meaningful progress in bringing the project to readiness or completion. At a minimum, the applicant will demonstrate that all capital funding has been secured or is likely to be secured within a reasonable period of time. ARCH staff will grant up to a 12 month extension. If necessary a second extension of up to 6 months may be requested by following the same procedures as the first extension.

2. Funds shall be used by the Agency toward acquisition and closing costs and developer fee. Funds may not be used for any other purpose unless ARCH staff has given written authorization for the alternate use.
3. Parkview shall not proceed with searching for a home until all funding commitments have been received. The Agency shall only purchase unoccupied homes or owner occupied homes in order to not trigger local and federal relocation regulations.
4. Prior to acquisition, the Agency shall submit an appraisal by a qualified appraiser. The appraisal shall be equal to or greater than the purchase price.
5. If CDBG is a funding source, site control cannot be entered into until the completion of the HUD required Environmental Assessment. The option agreement shall contain language that addresses federal funds' "choice-limiting" restrictions.
6. Funds will be in the form of a secured grant with no repayment, so long as affordability and target population is maintained, and the service/care providers have a contract with DDD for funds necessary to provide services to this population.
7. A covenant is recorded ensuring affordability for at least 50 years, with three beds for developmentally disabled individuals at or below 30% of area median income at move in.
8. Unless otherwise approved by ARCH staff the development budget for the ARCH sphere house shall include:
 - The development budget will include a minimum of \$3,000 of private sources provided by the applicant.
 - \$467,500 combined for acquisition and construction cost. In the event that total acquisition and rehab costs, including contingency, exceeds this amount, additional costs shall be covered by private sources from the applicant.
 - Developer fee shall not exceed \$55,000.
9. Replacement Reserves will be funded out of operations at \$1,500 for the first year with an annual increase of 3.5% per year for replacement reserves and \$500 for the first year with an annual increase of 3.5% per year for operating reserves.
10. Residents referred from DDD will not receive Section 8 assistance.

11. All cash flow after payment of operating expenses shall be placed into a project reserve account that can be used by the applicant for project related operating, maintenance or services expenses. Any other use of these reserves funds must be approved by ARCH staff.
12. In the event that any operating support funding levels will be reduced, the Agency shall inform ARCH Staff about the impacts the proposed reduction will have on the budget and plan for services to the DD clients, and what steps shall be taken to address the impacts. A new budget or services plan must be approved by ARCH. Parkview must find other sources to make up shortfall.
13. The Agency will notify ARCH when they enter into an option or purchase and sale agreement for any home, providing information on the location of the home and terms for acquiring the home. No home considered for acquisition will be within two blocks of another home owned by Agency unless otherwise approved by ARCH staff. The option and purchase and sales agreement shall contain language that addresses federal funds' "choice-limiting" restrictions.
14. Prior to closing on a home, an individualized outreach plan will be submitted to ARCH staff for review and approval. The outreach plan will include provisions such as:
 - At time of a mutually accepted purchase and sales agreement, provide written notification to neighbors to include Parkview's intention to purchase the house, description of the project, and information regarding Parkview, property manager and the service provider that will include their websites and contact names/numbers;
 - At time when the home is ready to open and after tenants move in, provide invitations to neighbors for an opportunity such as an open house to individually and/or as a group to meet with Parkview and the service provider regarding the project. Provide contact information for service provider, property manager and Parkview.
15. Once home is selected the Agency shall include ARCH Staff in the inspection of the property and development of the final scope of work for the rehab. The final scope of work for the basic construction budget shall include, at a minimum, all work necessary for licensing of the home and correction of substandard health and safety conditions. Prior to start of construction, the Agency shall submit the final scope of work for ARCH Staff approval, along with evidence that construction costs have been confirmed by a qualified contractor and are within the basic construction budget. All uses of construction contingency funds must be approved by ARCH staff prior to authorization to proceed with such work.
16. Prior to release of funds, the Agency shall submit to ARCH staff for review and approval drafts of all documents related to the provision of services to residents and management of the property, including the Memorandum of Understanding with the service provider, form of lease agreement with residents, and services agreement between DDD and the Service Provider. These documents shall at a minimum address: tenant selection procedures through DDD; management procedures to address tenant needs; services provided for or required of tenants; management and operation of the premises; community and neighbor relations procedures; a summary of ARCH's affordability requirements as well as annual monitoring procedure requirements. The plan shall also detail policies and procedures regarding resident turnover with the express purpose placing new residents in available beds and limiting vacancies.

Standard Conditions:

1. The Applicant shall provide revised development and operating budgets based upon actual funding commitments, which must be approved by city staff. If the Applicant is unable to adhere to the budgets, City or Administering Agency must be immediately notified and (a) new budget(s) shall be submitted by the Applicant for the City's approval. The City shall not unreasonably withhold its approval to (a) revised budget(s), so long as such new budget(s) does not materially adversely change the Project. This shall be a continuing obligation of the Applicant. Failure to adhere to the budgets, either original or as amended may result in withdrawal of the City's commitment of funds.
2. The Applicant shall submit evidence of funding commitments from all proposed public sources. In the event commitment of funds identified in the application cannot be secured in the time frame identified in the application, the Applicant shall immediately notify City or Administering Agency, and describe the actions it will undertake to secure alternative funding and the timing of those actions subject to City or Administering Agency's review and approval.
3. In the event federal funds are used, and to the extent applicable, federal guidelines must be met, including but not limited to: contractor solicitation, bidding and selection; wage rates; and Endangered Species Act (ESA) requirements. CDBG funds may not be used to repay (bridge) acquisition finance costs.
4. The Applicant shall maintain documentation of any necessary land use approvals and permits required by the city where the projects are located.
5. Submit monitoring reports quarterly through completion of the project, and annually thereafter. Submit a final budget upon project completion. If applicable, submit initial tenant information as required by City or Administering Agency.

**ARCH HOUSING TRUST FUND (HTF) APPLICATIONS
2014**

Applicant	Funds Requested (Grant/Loan) / Recommendation	Housing Type/ # of units/ bdrms	Income Served	Project Location	Duration of benefit	Total cost per unit	HTF cost per affordable unit	Project completion
ARCH REDI Fund (TOD Land Banking)	\$500,000 Loan	Acquisition of Properties suitable for development as affordable housing TBD	Will vary from 30% to market rate	4 County Area Sites to be determined Geographic distribution targets, including ARCH sphere	30 years or more presumed	Unknown	Unknown	
KCHA/ Congregations for the Homeless	\$700,000 Secured Grant	Acquisition/ Rehab or New Construction 50	50 beds @ 30% Homeless	ARCH Sphere of Influence	50 Years	\$64,000/bed	\$14,000	Nov 2017
Parkview Services DD Home	\$200,800 Secured Grant	Acq/Rehab of Home for Developmentally Disabled 3	3 @ 30%	ARCH Sphere of Influence – Kirkland/Bothell Site to be determined	50 Years	\$184,836	\$66,933	Fall 2015

2014 HOUSING TRUST FUND: PROPOSED FUNDING SOURCES
EXECUTIVE BOARD 12/11/14

		PROJECT				
SOURCE		CFH / KCHA Winter Shelter	REDI Land Fund	Parkview DD Home		TOTAL
Request		\$ 700,000	\$ 500,000	\$ 200,800		\$ 1,400,800
CAB Recommendation		\$ 700,000	\$ 500,000	\$ 200,800		\$ 1,400,800
Current Funding						
Sub-Regional CDBG						\$ -
Bellevue						
	CDBG					\$ -
	General Fund	\$ 383,500	\$ 250,000	\$ 55,900		\$ 689,400
Issaquah						
	General Fund	\$ 20,000	\$ 36,500	\$ 5,291		\$ 61,791
Kirkland						
	General Fund	\$ 160,000	\$ 120,000	\$ -		\$ 280,000
	CDBG			\$ 80,152		\$ 80,152
Mercer Is.						
	General Fund	\$ 7,000	\$ 11,500	\$ 1,500		\$ 20,000
Redmond						
	General Fund	\$ 50,000	\$ 50,000	\$ -		\$ 100,000
	CDBG			\$ 47,232		\$ 47,232
Newcastle						
	General Fund	\$ 7,800		\$ 700		\$ 8,500
Kenmore						
	General Fund	\$ 20,000	\$ 25,000	\$ 4,285		\$ 49,285
Woodinville						
	General Fund	\$ 4,000	\$ 7,000	\$ 1,500		\$ 12,500
Sammamish						
	General Fund	\$ 18,000		\$ 1,600		\$ 19,600
Clyde Hill						
	General Fund	\$ 13,800		\$ 1,200		\$ 15,000
Medina						
	General Fund	\$ 11,300		\$ 1,040		\$ 12,340
Yarrow Point						
	General Fund	\$ 2,300		\$ 200		\$ 2,500
Hunts Point						
	General Fund	\$ 2,300		\$ 200		\$ 2,500
TOTAL		\$ 700,000	\$ 500,000	\$ 200,800		\$ 1,400,800
	CDBG	\$ -	\$ -	\$ 127,384		\$ 127,384
	General Fund	\$ 700,000	\$ 500,000	\$ 73,416		\$ 1,273,416

ARCH HOUSING TRUST FUND, 2014

Leveraging Funds - -

	ARCH REDI Fund		KCHA/Congregations EKC Perm Winter Shelter		Parkview Services ARCH Sphere Home		TOTAL
Prior ARCH Commitment							\$0
New ARCH Request	\$500,000		\$700,000		\$200,800		\$1,400,800
ARCH TOTAL	\$ 500,000	2%	\$ 700,000	22%	\$ 200,800	36%	\$ 1,400,800
King County							
Prior KC Commitment			\$1,000,000		\$175,308		\$0
HOF/HOME/CDBG							\$1,175,308
2060/2163							\$0
Veterans/Human Services							\$0
Other	\$ 1,000,000						\$1,000,000
KC TOTAL	\$ 1,000,000	4%	\$ 1,000,000	31%	\$ 175,308	32%	\$2,175,308
Prior WA Commitment							\$0
WA HAP							\$0
WA HTF	\$0 *		\$900,000		\$175,400		\$1,075,400
WA HFC (Equity Fund)							\$0
WSHFC Washington Works							\$0
WA TOTAL	\$ -	0%	\$ 900,000	28%	\$ 175,400	32%	\$1,075,400
Federal/HUD							\$0
Section 811							\$0
McKinney							\$0
Other (Mobility Grant)	\$ 2,500,000						\$2,500,000
FEDERAL TOTAL	\$ 2,500,000	0%	\$ -	0%	\$ -	0%	\$2,500,000
Tax Credits		0%		0%		0%	\$0
Prior Tax Credit Commitment		0%		0%		0%	\$0
Other Prior							
TCAP		0%		0%		0%	\$0
Bonds		0%		0%		0%	\$0
Bank Loans	\$ 12,500,000	50%		0%		0%	\$12,500,000
Deferred Developer Fee		0%		0%		0%	\$0
Private	\$7,500,000	30%	\$600,000	19%	\$3,000	1%	\$8,103,000
Other (City of Seattle)	\$1,000,000	4%		0%		0%	\$1,000,000
TOTAL COST	\$ 25,000,000	90%	\$ 3,200,000	100%	\$ 554,508	100%	\$ 28,754,508
Total New							

ECONOMIC SUMMARY: EKC Men's Permanent Winter Shelter

1. Applicant/Description: Congregations for the Homeless/KCHA / Development of shelter to serve a minimum of 50 homeless men, plus serve as day center

2. Project Location: ARCH Sphere of Influence

3. Financing Information:

Funding Source	Funding Amount	Commitment
ARCH	\$700,000	Applied for Fall 2014
King County	\$1,000,000	Applied for Interim Fall 2014 Applying for Permanent in Fall 2015
Commerce Trust Fund	\$900,000	Applying in Fall 2015
Capital Campaign	\$600,000	Committed
TOTAL	\$3,200,000	

4. Conceptual Development Budget:

ITEM	TOTAL	PER BED	HTF
Acquisition	\$1,337,000	\$26,740	\$680,000
Relocation	\$20,000	\$400	\$20,000
Construction	\$1,556,600	\$31,132	
Design	\$52,000	\$1,040	
Development Consultant	\$50,000	\$1,000	
Other consultants	\$14,000	\$280	
Permits/Fees/Hookups	\$83,200	\$1,664	
Finance costs	\$48,000	\$960	
Reserves	\$25,000	\$500	
Other development costs*	\$14,200	\$284	
TOTAL	\$3,200,000	\$64,000	\$700,000

*Insurance, Bidding, Development Period Utilities and Accounting

5. Debt Service Coverage: Secured grant, no repayment if in compliance.

6. Security for City Funds:

- A recorded covenant to ensure affordability and use for targeted population for 50 years.
- A promissory note secured by a deed of trust. The promissory note will require repayment of the grant amount upon non-compliance with any of the funding conditions.

7. Rental Subsidy: None

ECONOMIC SUMMARY: PARKVIEW XI

1. Applicant/Description: Parkview Services / Acquisition and remodeling of home to serve 3 persons living with developmental disabilities

2. Project Location: Bothell/Kirkland area

3. Financing Information:

Funding Source	Funding Amount	Commitment
ARCH	\$200,800	Applied for Fall 2014
King County	\$175,308	Applied for Fall 2014
Commerce Trust Fund	\$175,400	Applied for Fall 2014
Owner Equity	\$3,000	Committed
TOTAL	\$554,508	

4. Development Budget:

ITEM	TOTAL	PER BED	HTF
Acquisition	\$412,000	\$137,333	\$180,800
Construction	\$57,500	\$19,167	
Design	\$16,000	\$5,333	
Consultants	\$2,950	\$983	
Developer fee	\$55,000	\$18,333	\$20,000
Finance costs	\$3,508	\$1,169	
Reserves	\$3,000	\$1,000	
Other development costs*	\$4,550	\$1,517	
TOTAL	\$554,508	\$184,836	\$200,800

* Development Period Utilities, Insurance, Accounting

5. Debt Service Coverage: Secured grant, no repayment if in compliance.

6. Security for City Funds:

- A recorded covenant to ensure affordability and use for targeted population for 50 years.
- A promissory note secured by a deed of trust. The promissory note will require repayment of the grant amount upon non-compliance with any of the funding conditions.

7. Rental Subsidy: None

FIGURE 1
ARCH: EAST KING COUNTY TRUST FUND SUMMARY
 LIST OF CONTRACTED PROJECTS FUNDED (1993 - Spring 2014)

Project	Location	Owner	Units/Beds	Funding	Pct of Total Allocation	Distribution Target
1. Family Housing						
Andrews Heights Apartments	Bellevue	Imagine Housing	24	\$400,000		
Garden Grove Apartments	Bellevue	DASH	18	\$180,000		
Overlake Townhomes	Bellevue	Habitat of EKC	10	\$120,000		
Glendale Apartments	Bellevue	DASH	82	\$300,000		
Wildwood Apartments	Bellevue	DASH	36	\$270,000		
Somerset Gardens (Kona)	Bellevue	KC Housing Authority	198	\$700,000		
Pacific Inn	Bellevue *	Pacific Inn Assoc. *	118	\$600,000		
Eastwood Square	Bellevue	Park Villa LLC	48	\$600,000		
Chalet Apts	Bellevue	Imagine Housing	14	\$163,333		
Andrew's Glen	Bellevue	Imagine Housing	10 /11	\$387,500		
Bellevue Apartments	Bellevue ***	LIHI ***	45	\$800,000		
YWCA Family Apartments	K.C. (Bellevue Sphere)	YWCA	12	\$100,000		
Highland Gardens (Klahanie)	K.C. (Issaquah Sphere)	Imagine Housing	54	\$291,281		
Crestline Apartments	K.C. (Kirkland Sphere)	Shelter Resources	22	\$195,000		
Parkway Apartments	Redmond	KC Housing Authority	41	\$100,000		
Habitat - Patterson	Redmond **	Habitat of EKC **	24	\$446,629		
Avon Villa Mobile Home Park	Redmond **	MHCP **	93	\$525,000		
Terrace Hills	Redmond	Imagine Housing	18	\$442,000		
Village at Overlake Station	Redmond **	KC Housing Authority **	308	\$1,645,375		
Summerwood	Redmond	DASH	166	\$1,187,265		
Coal Creek Terrace	Newcastle **	Habitat of EKC **	12	\$240,837		
RoseCrest (Talus)	Issaquah **	Imagine Housing **	40	\$918,846		
Mine Hill	Issaquah	Imagine Housing	28	\$450,000		
Clark Street	Issaquah	Imagine Housing	30	\$355,000		
Lauren Heights (Iss Highlands)	Issaquah **	Imagine Housing/SRI **	45	\$657,343		
Habitat Issaquah Highlands	Issaquah **	Habitat of EKC **	10	\$318,914		
Issaquah Family Village I	Issaquah **	YWCA **	87	\$4,382,584		
Issaquah Family Village II	Issaquah **	YWCA **	47	\$2,760,000		
Greenbrier Family Apts	Woodinville **	DASH **	50	\$286,892		
Plum Court	Kirkland	DASH	61 /66	\$1,000,000		
Francis Village	Kirkland	Imagine Housing	15	\$375,000		
South Kirkland Park n Ride	Kirkland **	Imagine Housing **	46	\$901,395		
Copper Lantern	Kenmore **	LIHI **	33	\$452,321		
Habitat Sammamish	Sammamish ** ***	Habitat of KC ***	10	\$853,000		
Homeowner Downpayment Loan	Various	KC/WSHFC/ARCH	87 est	\$615,000		
SUB-TOTAL			1,942	\$24,020,516	54.5% (56%)	
2. Senior Housing						
Cambridge Court	Bellevue	Resurrection Housing	20	\$160,000		
Ashwood Court	Bellevue *	DASH/Shelter Resources *	50	\$1,070,000		
Evergreen Court (Assisted Living)	Bellevue	DASH/Shelter Resources	64 /84	\$2,480,000		
Bellevue Manor / Harris Manor	Bellevue / Redmond	KC Housing Authority	105	\$1,334,749		
Vasa Creek	K.C. (Bellevue Sphere)	Shelter Resources	50	\$190,000		
Riverside Landing	Bothell **	Shelter Resources	50	\$225,000		
Kirkland Plaza	Kirkland	Imagine Housing	24	\$610,000		
Totem Lake Phase 2	Kirkland ***	Imagine Housing ***	80	\$736,842		
Heron Landing	Kenmore	DASH/Shelter Resources	50	\$65,000		
Ellsworth House Apts	Mercer Island	Imagine Housing	59	\$900,000		
Providence Senior Housing	Redmond **	Providence **	74	\$2,239,000		
Greenbrier Sr Apts	Woodinville **	DASH/Shelter Resources **	50	\$196,192		
SUB-TOTAL			676	\$10,206,783	23.2% (19%)	

FIGURE 1
ARCH: EAST KING COUNTY TRUST FUND SUMMARY
LIST OF CONTRACTED PROJECTS FUNDED (1993 - Spring 2014)

Project	Location	Owner	Units/Beds	Funding	Pct of Total Allocation	Distribution Target
3. Homeless/Transitional Housing						
Hopelink Place	Bellevue	** Hopelink **	20	\$500,000		
Chalet	Bellevue	Imagine Housing	4	\$46,667		
Kensington Square	Bellevue	Housing at Crossroads	6	\$250,000		
Andrew's Glen	Bellevue	Imagine Housing	30	\$1,162,500		
Bellevue Apartments	Bellevue	LIHI ***	12	\$200,000		
Sophia Place	Bellevue	Sophia Way	20	\$250,000		
Dixie Price Transitional Housing	Redmond	Hopelink	4	\$71,750		
Avondale Park	Redmond	Hopelink (EHA)	18	\$280,000		
Avondale Park Redevelopment	Redmond	Hopelink (EHA) **	60	\$1,502,469		
Petter Court	Kirkland	KITH	4	\$100,000		
Francis Village	Kirkland	Imagine Housing	45	\$1,125,000		
South Kirkland Park n Ride	Kirkland	Imagine Housing ***	12	\$225,349		
Totem Lake Phase 2	Kirkland	Imagine Housing	15	\$138,158		
Rose Crest (Talus)	Issaquah	Imagine Housing **	10	\$229,712		
Lauren Heights (Iss Highlands)	Issaquah	SRI **	5	\$73,038		
Issaquah Family Village I	Issaquah	YWCA **	10	\$503,745		
SUB-TOTAL			257	\$6,658,387	15.1% (13%)	
4. Special Needs Housing						
My Friends Place	K.C.	EDVP	6 Beds	\$65,000		
Stillwater	Redmond	Eastside Mental Health	19 Beds	\$187,787		
Foster Care Home	Kirkland	Friends of Youth	4 Beds	\$35,000		
FOY New Ground	Kirkland	Friends of Youth	6 Units	\$250,000		
DD Group Home 7	Kirkland	Community Living	5 Beds	\$100,000		
Youth Haven	Kirkland	Friends of Youth	10 Beds	\$332,133		
FOY Transitional Housing	Kirkland	Friends of Youth **	10 Beds	\$252,624		
FOY Extended Foster Care	Kirkland	Friends of Youth **	10 Beds	\$112,624		
DD Group Home 4	Redmond	Community Living	5 Beds	\$111,261		
DD Group Homes 5 & 6	Redmond/KC (Bothell)	Community Living	10 Beds	\$250,000		
United Cerebral Palsy	Bellevue/Redmond	UCP	9 Beds	\$25,000		
DD Group Home	Bellevue	Residence East	5 Beds	\$40,000		
AIDS Housing	Bellevue/Kirkland	AIDS Housing of WA	10 Units	\$130,000		
Harrington House	Bellevue	AHA/CCS	8 Beds	\$290,209		
DD Group Home 3	Bellevue	Community Living	5 Beds	\$21,000		
Parkview DD Condos III	Bellevue	Parkview	4	\$200,000		
IERR DD Home	Issaquah	IERR	6 Beds	\$50,209		
FFC DD Homes	NE KC	FFC	8 Beds	\$300,000		
Oxford House	Bothell	Oxford/Compass Ctr.	8 Beds	\$80,000		
Parkview DD Homes VI	Bothell/Bellevue	Parkview	6 Beds	\$150,000		
FFC DD Home II	TBD	FFC	4 Beds	\$168,737		
SUB-TOTAL			158 Beds/Units	\$3,151,584	7.2% (12%)	
TOTAL			3,033	\$44,037,270	100.0%	
* Funded through Bellevue Downtown Program				10%		
** Also, includes in-kind contributions (e.g. land, fee waivers, infrastructure improvements)						
*** Amount of Fee Waiver still to be finalized						



City Council Business Agenda Item
City of Kenmore, WA

Subject/Topic: Puget Sound Energy Discussion on System Reliability Proposed Council Action/Motion: Discussion	For Council Meeting Agenda of: 23 November 2015 Department: Executive Prepared by: Nancy Ousley, Assistant City Manager <u>Initial & Date</u> Approved by Department Head: <u>NKO 13 Nov 2015</u> Approved by City Attorney: Approved by Finance Director: <u>[Signature] 11/13/15</u> Approved by City Manager: <u>[Signature]</u> Exhibits/Attachments:			
<table style="width: 100%; border: none;"> <tr> <td style="width: 33%; border: none;">Expenditure Required \$n/a</td> <td style="width: 33%; border: none;">Amount Budgeted \$</td> <td style="width: 33%; border: none;">Appropriation Required \$</td> </tr> </table>		Expenditure Required \$n/a	Amount Budgeted \$	Appropriation Required \$
Expenditure Required \$n/a	Amount Budgeted \$	Appropriation Required \$		
<u>INFORMATION/BACKGROUND:</u> RaeLynn Asah, Interim Manager for Community Engagement-Municipal Relations for Puget Sound Energy (PSE), will provide information to the Council on Puget Sound Energy's efforts to improve system reliability in Kenmore. The City Manager and Assistant City Manager met with PSE officials in October 2015 to discuss numerous complaints from residents on the frequency and duration of power outages, particularly in the northwest section of Kenmore. Negotiations with Puget Sound Energy for a new Franchise Agreement have recently commenced.				
<u>FISCAL CONSIDERATION:</u> System reliability is vital for residents, public agencies and businesses in Kenmore.				
<u>COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:</u> "A community that is attentive to, and seeks to provide for, the health, safety and welfare of all its citizens"—Kenmore Vision Statement				



**City Council Business Agenda Item
City of Kenmore, WA**

Subject/Topic: 2015-2016 Mid Biennium Budget Amendment

Proposed Council Action/Motion:
Adopt Ordinance 15-0413 Amending the 2015-2016 Biennial Budget

For Council Meeting Agenda of: November 23, 2015

Department: Finance and Administration

Prepared by: Joanne M. Gregory

Approved by Department Head:

Approved by City Attorney:

Approved by Finance Director:

Approved by City Manager:

Initial & Date

[Signature] 11/12/15

[Signature] 11/12/15

[Signature] RJK

Exhibits/Attachments:

Ordinance No. 15-0413 with Exhibit A
Memorandum dated November 12, 2015

Expenditure Required

Amount Budgeted

Appropriation Required

N/A

\$52,089,453 All Funds Revenue

\$59,750,318 All Funds Expenditures

\$7,603,344 Adjustment to Revenues

\$9,515,031 Adjustment to Expenditures

INFORMATION/BACKGROUND:

On December 8, 2015 the City of Kenmore adopted the 2015-2016 biennial budget which included revenue and expenditure estimates for both years which support the City Council priorities, departmental work programs, capital program, various municipal obligations, as well as Federal and State mandates. The budget, because it is prepared and adopted prior to the close of 2014, included only projections of 2014 revenues and expenditures. Also certain actions, such as an amended Capital Improvement Program in February, 2015, need to be incorporated into the new biennial budget.

At this time the mid biennial review of the biennial budget as prescribed by State law is complete. Per RCW 35A.34.130, cities that budget on a biennial basis must adopt an ordinance providing for a mid biennial review and any modifications of the biennial budget. This must occur no sooner than eight months after the start (September 1, 2015) and no later than the end of the first year of the biennium (December 31, 2015). Another requirement of the mid biennial review process is a public hearing at a City Council meeting, which was held November 9, 2015. The budget amendment ordinance will be presented for adoption at the November 23, 2015 City Council meeting.

Exhibit A of Ordinance No. 15-0413 is a modified 2015-2016 Salary Plan which creates two new position titles, that of Permit and Administrative Specialist and Public Records Officer/Administrative Assistant. The Plan combines these two positions and the Accounting Technician position into one salary band that applied to the previously titled Building Permit Specialist. The salary band is \$3,806 - \$5,256 per month.

FISCAL CONSIDERATION:

See attached November 12, 2015 Memorandum for detail of proposed revenue and expenditure adjustments.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

Per RCW 35A the budget is the legal authority to expend public funds and controls those expenditures by setting the amount of the appropriation at the fund level by ordinance.

i:\admin & finance\budget\2015-2016\mid biennium and other amendments\ab mid bi budget amend.docx

**CITY OF KENMORE
WASHINGTON**

ORDINANCE NO. 15-0413

AN ORDINANCE OF THE CITY OF KENMORE, WASHINGTON, AMENDING ORDINANCE 14-0389 ADOPTING THE 2015-2016 BIENNIAL BUDGET, TO ADJUST REVENUES AND APPROPRIATIONS FOR THE GENERAL FUND, THE STREET FUND, THE PARK IMPACT FEE FUND, THE STRATEGIC OPPORTUNITIES FUND, THE REAL ESTATE EXCISE TAX FUND, THE KENMORE VILLAGE FUND, THE PARK CAPITAL FUND, THE TRANSPORTATION CAPITAL FUND, THE EQUIPMENT REPLACEMENT FUND, AND THE SURFACE WATER MANAGEMENT FUND; AND ESTABLISHING POSITIONS AND SALARY SCHEDULES FOR 2016; PROVIDING FOR SEVERABILITY; AND ESTABLISHING AN EFFECTIVE DATE.

WHEREAS, the City Council (the "Council") of the City of Kenmore, Washington, (the "City"), is required by applicable state law to finalize its biennial budget prior to the commencement of the first fiscal year of the biennium; and

WHEREAS, the amount of revenue and expenditures can only be estimated at the time of finalization of the budget; and

WHEREAS, the City is required by applicable state law to conduct a mid-biennial review of the budget prior to the end of the first fiscal year of the biennium; and

WHEREAS, the City Council scheduled and held a Public Hearing on the amendments to the 2015-2016 Biennial Budget on November 9, 2015; and

WHEREAS, the City Council finds it in the best interest of the City to adjust revenues and expenditures in the General Fund, the Street Fund, the Park Impact Fee Fund, the Strategic Opportunities Fund, the Real Estate Excise Tax Fund, the Kenmore Village Fund, the Park Capital Fund, the Transportation Capital Fund, the Equipment Replacement Fund, and the Surface Water Management Fund;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF KENMORE, WASHINGTON, DO ORDAIN AS FOLLOWS:

Section 1. Funds Appropriated. The 2015-2016 Biennial Budget, adopted by Ordinance No. 14-0389, for the period January 1, 2015 through December 31, 2016, is hereby amended by fund to reflect the adjustments to revenues and expenditures as follows:

FUND	2015-2016 Revenue Budget	Change	Amended 2015-2016 Revenue Budget
General Fund	\$20,553,270	\$495,000	\$21,048,270
Street Fund	2,359,531	0	2,359,531
Public Art Fund	200	0	200
Park Impact Fee Fund	234,063	0	234,063
Transportation Impact Fee Fund	1,397,257	0	1,397,257
Strategic Reserve Fund	0	0	0
Strategic Opportunities Fund	37,160	1,180,786	1,217,946
Sammamish River Bridge Fund	0	0	0
Real Estate Excise Tax Fund	1,827,000	0	1,827,000
Kenmore Village Fund	1,326,900	920,000	2,246,900
Park Capital Fund	1,240,400	364,774	1,605,174
Transportation Capital Fund	17,208,172	4,642,784	21,850,956
Surface Water Management Fund	3,540,000	0	3,540,000
Surface Water Capital Fund	2,139,500	0	2,139,500
Swamp Creek Basin Fund	20,000	0	20,000
Equipment Replacement Fund	206,000	0	206,000
Total Budget	\$52,089,453	\$7,603,344	\$59,692,797

FUND	2015-2016 Expenditure Budget	Change	Amended 2015-2016 Expenditure Budget
General Fund	\$20,538,934	\$2,233,786	\$22,772,720
Street Fund	2,371,277	400,000	2,771,277
Public Art Fund	1,000	0	1,000
Park Impact Fee Fund	490,000	213,416	703,416
Transportation Impact Fee Fund	2,760,000	0	2,760,000
Strategic Reserve Fund	0	0	0
Strategic Opportunities Fund	911,200	660,000	1,571,200
Sammamish River Bridge Fund	0	0	0
Real Estate Excise Tax Fund	3,528,719	458,587	3,987,306
Kenmore Village Fund	3,517,240	1,113,929	4,631,169
Park Capital Fund	1,238,000	453,233	1,691,233
Transportation Capital Fund	17,308,172	4,534,205	21,842,377
Surface Water Management Fund	4,652,276	-686,500	3,965,776
Surface Water Capital Fund	2,209,500	0	2,209,500
Swamp Creek Basin Fund	0	0	0
Equipment Replacement Fund	224,000	134,375	358,375
Total Budget	\$59,750,318	\$9,515,031	\$69,265,349

The City Manager is hereby authorized and instructed to effectuate the necessary changes to the 2015-2016 Biennial Budget and to make any necessary and appropriate line item entries and adjustments in order to reflect the amendments of this ordinance.

Section 2. Positions and Salary Schedules. The various positions and salary ranges for City employees for 2016 are attached to this Ordinance as Exhibit A.

Section 3. Severability. Should any section, paragraph, sentence, clause or phrase of this Ordinance, or its application to any person or circumstance, be declared unconstitutional or otherwise invalid for any reason, or should any portion of this Ordinance be preempted by state or federal law or regulation, such decision or preemption shall not affect the validity of the remaining portions of this Ordinance or its application to other persons or circumstances.

Section 4. Effective Date. This ordinance shall be published in the official newspaper of the City, and shall take effect and be in full force five (5) days after the date of the publication.

ADOPTED BY THE CITY COUNCIL AT A REGULAR MEETING THEREOF ON THE 23th DAY OF NOVEMBER, 2015.

CITY OF KENMORE

David Baker, Mayor

ATTEST/AUTHENTICATED:

Patty Safrin, City Clerk

Approved as to form:

Rod Kaseguma, City Attorney

Filed with the City Clerk:
Passed by the City Council:
Ordinance No.:
Date of Publication:
Effective Date:

Exhibit A

City of Kenmore
2015-2016 Salary Plan

Salaries are shown as Monthly

Classification	2015-2016 Salary Range		
	Low	Mid	High
Finance and Administration Director	8,333	9,920	11,507
Assistant City Manager	8,333	9,920	11,507
Public Works Director/City Engineer	7,906	9,412	10,917
Community Development Director	7,811	9,299	10,786
Development Services Director	7,281	8,668	10,055
Public Works Operations Manager	6,668	7,938	9,208
Senior Engineer	6,235	7,423	8,610
Traffic Engineer - Senior	6,235	7,423	8,610
Project Manager	6,235	7,423	8,610
Senior Planner	5,924	7,052	8,180
Surface Water Program Manager	5,924	7,052	8,180
Civil Engineer	5,693	6,778	7,862
Planner	5,506	6,555	7,604
City Clerk	5,429	6,463	7,497
Building Inspector/Plans Examiner	5,309	6,320	7,332
Community Relations Mgr/Policy Analyst	5,287	6,294	7,301
Associate Civil Engineer	5,152	6,133	7,114
Associate Planner	5,088	6,057	7,026
Accountant	4,838	5,760	6,681
Bldg. Inspector/Code Compliance Officer	4,838	5,760	6,681
Management Analyst	4,687	5,580	6,472
ROW Inspector	4,375	5,208	6,041
Surface Water Technician	4,319	5,142	5,965
Executive Assistant	4,278	5,093	5,908
Assistant Planner	4,261	5,073	5,884
Volunteer & Events Supervisor	4,070	4,846	5,621
Maintenance Worker	3,850	4,583	5,316
Permit and Administrative Specialist	3,806	4,531	5,256
Accounting Technician	3,806	4,531	5,256
Public Records Officer/Administrative Asst.	3,806	4,531	5,256
Administrative Assistant	3,670	4,369	5,068
Receptionist	2,948	3,510	4,071
Maintenance Custodian	2,867	3,414	3,960
Intern	13/hr	14/hr	15/hr
Part time/Seasonal MW	11/hr	13/hr	15/hr

11/12/2015 2:51 PM



The City of Kenmore

PO Box 82607
KENMORE, WASHINGTON 98028

MEMORANDUM

TO: Mayor, Members of the City Council

FROM: Rob Karlinsey, City Manager;
Joanne Gregory, Finance Director

DATE: November 12, 2015

RE: Recommended 2015-2016 Mid Biennium Budget Amendments

On December 8, 2014, the City of Kenmore adopted the 2015-2016 biennial budget. The city wide budget (excluding the Transportation Benefit District) included revenue (\$52,089,453) and expenditure (\$59,750,318) estimates for both years which support the City Council priorities, departmental work programs, various municipal obligations, as well as Federal and State mandates.

This is the mid biennial review of the biennial budget as prescribed by State law. Per RCW 35A.34.130, cities that budget on a biennial basis must adopt an ordinance providing for a mid biennial review and any modifications of the biennial budget. This must occur no sooner than eight months after the start (September 1, 2015) and no later than the end of the first year of the biennium (December 31, 2015). Another requirement of the mid biennial review process is a public hearing at a City Council meeting, which was held November 9, 2015. The budget amendments were reviewed by the City Council on November 9 and the Budget Amendment Ordinance is scheduled for adoption on November 23, 2015.

The management team has reviewed the budgets and recommends the adjustments outlined below. During the course of the current year, the City Council has discussed and authorized certain actions, including acknowledgement of the costs and amendments to the Capital Improvement Program, not yet budgeted, which should now be adopted as budget amendments. The recommended adjustments were reviewed at the November 9 meeting.

General Fund revenues have been better than anticipated (about 7%), especially the sales taxes and development revenues such as permit fees and plan review fees. General Fund expenditures across departments are reasonably close to or below budget with only a few exceptions. Although the economic situation is positive at this time, and inflationary pressures are low, the City will continue to be conservative and ready to react if conditions change.

At adoption, the General Fund budget was balanced with \$20,553,270 in budgeted revenues and \$20,538,937 in budgeted expenditures.

Mid Biennium Budget Amendment
November 12, 2015

The 2013-2014 budget period was closed with an ending fund balance of \$4,221,475 which exceeded the budget projection of \$2,682,689. This favorable fund balance enables the City to transfer \$1,180,786 to the Strategic Opportunities Fund. With the \$495,000 recommended revenue adjustments below, General Fund budgeted revenues will be \$21,048,270. General Fund budgeted expenditures, with the recommended increase of \$2,233,876 (includes the \$1,180,786 one-time transfer to Strategic Opportunities) will be \$22,772,813. Overall, the total of the proposed adjustments to the General Fund reduce the projected ending fund balance by \$200,000 to \$2,497,022. This balance continues to exceed the \$2,111,550 minimum general fund balance required for 2016 by the City's financial policies.

The 2015-2016 biennial budget will continue to be closely monitored as the City moves into the second year of the biennium. With the nature of the ongoing projects and work programs, additional budget adjustments may be required or proposed in 2016.

All adjustments recommended at this time are presented in the table below. The adjustments are grouped by fund. **Those adjustments already authorized for action at a City Council meeting are identified by an asterisk *.** This formal adoption process at the mid biennium period completes, for municipal accounting and budgeting purposes, actions presented to the Council that the Council may have already discussed and approved. All adjustments are one-time in nature, meaning the expenditure is not expected to re-occur or affect future budgets. Updated budget book pages have been attached so that the effects of budget amendments can be seen at the fund level.

Each fund with a budget adjustment is displayed in a table on separate pages which follow. Revenue accounts are shaded in green and expenditure accounts are shaded in pink. The net effect of the updated beginning fund balances plus budget amendments are shown as a net adjustment to the ending fund balance at the end of each table.

Mid Biennium Budget Amendment
November 12, 2015

Description	2015-2016 Original Budget	Proposed Increase (Decrease)	2015-2016 Amended Budget	Explanation
General Fund				
Beginning Fund Balance	\$2,682,689	\$1,538,786	\$4,221,475	2014 Ending Fund Balance better than budgeted
Sales Tax Revenue	\$3,449,580	\$300,000	\$3,749,580	Favorable year to date results of sales tax from construction, wholesale and retail
Building Permit Revenue	\$604,004	\$130,000	\$734,004	Better than anticipated building and construction activity
Review and Inspection Fees Revenue	\$765,285	\$65,000	\$830,285	Better than anticipated building and construction activity
Total Additional Resources		\$2,033,786		
City Manager Dept General Consulting	\$379,500	\$53,000	\$432,500	Additional professional services for Sound Transit 3 impact on Kenmore
*City Manager Dept Mural Project	\$0	\$12,000	\$12,000	City share of mural project on 73 rd Avenue
*Interfund Transfer To Kenmore Village	\$60,000	\$800,000	\$860,000	\$600,000 toward Town Green Project as approved at 3/16/15 Council Meeting; \$200,000 more due to higher bids.
*Interfund Transfer To Transportation Capital Fund	\$0	\$188,000	\$188,000	T6 West A SR522 as approved in 2/23/15 CIP Amendment
Interfund Transfer To Strategic Opportunity Fund	\$0	\$1,180,786	\$1,180,786	Recommended transfer of General Fund Reserves in Excess of 2016 Budgeted Ending Fund Balance
Total Additional Expenditures		(\$2,233,786)		
Ending Fund Balance	\$2,697,022	(\$200,000) net change	\$2,497,022	

Mid Biennium Budget Amendment
November 12, 2015

Description	2015-2016 Original Budget	Proposed Increase (Decrease)	2015-2016 Amended Budget	Explanation
Street Fund				
Beginning Fund Balance	\$463,500	\$435,788	\$899,288	2014 Ending Fund Balance better than budgeted
Total Additional Resources		\$435,788		
* Interfund Transfer to Transportation Capital Fund	\$0	\$400,000	\$400,000	T27 Sidewalk Program for grant match as approved in 2/23/15 CIP Amendment
Total Additional Expenditures		(400,000)		
Ending Fund Balance	\$451,754	\$35,788 net change	\$487,542	

Mid Biennium Budget Amendment
November 12, 2015

Description	2015-2016 Original Budget	Proposed Increase (Decrease)	2015-2016 Amended Budget	Explanation
Park Impact Fee Fund				
Beginning Fund Balance	\$531,408	\$221,366	\$752,774	2014 Ending Fund Balance better than budgeted
Total Additional Resources		\$221,366		
Interfund Transfer To Park Capital Fund	\$490,000	\$213,416	\$703,416	\$121,000 from 2017 to 2016 for P6 Moorlands Park - project accelerated due to successful grant award; \$42,146 carryover from 2014 for P11 Log Boom Park Pedestrian Bridge; \$50,000 toward P28 Log Boom Park Conceptual Plan
Total Additional Expenditures		(\$213,416)		
Ending Fund Balance	\$275,471	\$7,950 net change	\$283,421	

Mid Biennium Budget Amendment
November 12, 2015

Description	2015-2016 Original Budget	Proposed Increase (Decrease)	2015-2016 Amended Budget	Explanation
Strategic Opportunities Fund				
Beginning Fund Balance	\$2,942,864	(\$795,977)	\$2,146,887	2014 Ending Fund Balance less than budgeted
Interfund Transfer from General Fund	\$0	\$1,180,786	\$1,180,786	Recommended to transfer the balance of General Fund Reserves that exceeds the 2016 Budgeted Ending Fund Balance.
Total Additional Resources		\$384,809		
Interfund Transfer To Park Capital Fund	\$85,000	\$50,000	\$135,000	\$50,000 toward P28 Log Boom Park Conceptual Plan using funds from \$250K Imagine Kenmore budget (see offset below)
*Interfund Transfer To Kenmore Village Fund	\$0	\$100,000	\$100,000	Town Green Project additional funding as approved at 3/16/15 Council Meeting
* Interfund Transfer To Transportation Capital Fund	\$0	\$764,000	\$764,000	\$204,000 for grant match NE 202 nd St (using funds from Pedestrian Safety budget below); \$560,000 "loaned" to Sidewalk Undergrounding and Contingency (only as needed) – to be repaid from Real Estate Excise Tax 2017-2020
*Pedestrian Safety Improvement	\$350,000	(\$204,000)	\$146,000	To fund grant match NE 202 nd St (included in transfer above)
Imagine Kenmore	\$250,000	(\$50,000)	\$200,000	P28 Log Boom Park Conceptual Plan (included in transfer above)
Total Additional Expenditures		(\$660,000)		
Ending Fund Balance	\$2,068,825	(\$275,191) net change	\$1,793,634	

Mid Biennium Budget Amendment
November 12, 2015

Description	2015-2016 Original Budget	Proposed Increase (Decrease)	2015-2016 Amended Budget	Explanation
Real Estate Excise Tax Fund				
Beginning Fund Balance	\$1,947,280	\$466,934	\$2,414,214	2014 Ending Fund Balance better than budgeted
Total Additional Resources		\$466,934		
Interfund Transfer Out to Park Capital Fund	\$0	\$87,699	\$87,699	Transfer additional King County Trail Levy balance to the Park Capital; \$207,699 was received; only transferred \$120,000. Levy ended 2013
Interfund Transfer Out to Transportation Capital Fund	\$2,628,719	\$370,888	\$2,999,607	\$235,000 for T6 West A SR522 as approved in 2/23/15 CIP Amendment; \$135,888 for T40 Roundabout
Total Additional Expenditures		(\$458,587)		
Ending Fund Balance	\$245,561	\$8,347 net change	\$253,908	

Mid Biennium Budget Amendment
November 12, 2015

Description	2015-2016 Original Budget	Proposed Increase (Decrease)	2015-2016 Amended Budget	Explanation
Kenmore Village Fund				
Beginning Fund Balance	\$2,352,795	\$33,454	\$2,386,249	2014 Ending Fund Balance better than budgeted
Grant for Public Square (Town Green)	\$270,000	\$20,000	\$290,000	Grant should be 97% of \$300,000 (3% vs 10%) Admin fee)
* Interfund Transfer From Strategic Opportunity Fund	\$0	\$100,000	\$100,000	Town Green Project additional funding as approved at 3/16/15 Council Meeting
* Interfund Transfer From General Fund	\$60,000	\$800,000	\$860,000	Town Green Project additional \$600K funding as approved at 3/16/15 Council Meeting plus \$200K due to higher bids
Total Additional Resources		\$953,454		
6700 Building Maintenance	\$0	\$79,000	\$79,000	Unbudgeted roof repair to Post Office building
*Town Green Public Square/Pavilion	\$3,365,000	\$900,000	\$4,265,000	\$700,000 approved for budget at 3/16/15 Council meeting; \$200,000 as required due to higher bids.
Interfund Transfer To Park Capital Fund	\$0	\$134,929	\$134,929	Town Green expenditures from 2014 paid from Park Capital Fund that were not reimbursed from Kenmore Village Fund as budgeted.
Total Additional Expenditures		(\$1,113,929)		
Ending Fund Balance	\$162,455	(\$160,475) net change	\$1,980	

Mid Biennium Budget Amendment
November 12, 2015

Description	2015-2016 Original Budget	Proposed Increase (Decrease)	2015-2016 Amended Budget	Explanation
Park Capital Fund				
Beginning Fund Balance	\$223,919	(\$222,352)	\$567	2014 Ending Fund Balance less than budgeted
RCO Grant Reimbursement for Twedt Acquisition	\$0	\$100,000	\$100,000	Allocate \$100,000 of the \$340,000 RCO Grant Reimbursement for Squires Conceptual Plan. Grant funds expected in 2016. Balance of \$240,000 not yet budgeted.
Interfund Transfer From Kenmore Village Fund	\$0	\$134,929	\$134,929	Town Green expenditures from 2014 paid from Park Capital Fund that were not reimbursed from Kenmore Village Fund as budgeted.
Interfund Transfer From Strategic Opportunity Fund	\$85,000	\$50,000	\$135,000	P28 Log Boom Park Conceptual Plan
Interfund Transfer From Park Impact Fee Fund	\$490,000	\$213,146	\$703,146	\$121,000 from 2017 to 2016 for P6 Moorlands Park - project accelerated due to successful grant award; \$42,146 carryover from 2014 for P11 Log Boom Park Pedestrian Bridge; \$50,000 toward P28 Log Boom Park Conceptual Plan
King County Park Levy Proceeds	\$128,000	(\$36,000) Revenue reduction	\$92,000	Budget error for 2015; budgeted revenue of \$84,000, should have been \$48,000
Interfund Transfer of King County Trail Levy Proceeds from REET Fund	\$185,000	(\$97,301) Revenue reduction	\$87,699	To correct budget error and transfer additional King County Trail Levy balance to the Park Capital; \$207,699 was received; only transferred \$120,000 to date. \$185,000 was incorrect. Trail levy ended 2013.
Total Additional Resources		\$141,422		

Mid Biennium Budget Amendment
November 12, 2015

Park Capital Fund (continued)				
P2 Tolt Pipeline Trail Phase I	\$210,000	\$24,294	\$234,294	Increase due to carryover of unused funds from 2014 budget
P6 Moorlands Park Improvements	\$30,000	\$121,000	\$151,000	\$121,000 from 2017 to 2016 for P6 Moorlands Park - project accelerated due to successful grant award
P11 Log Boom Park Pedestrian Bridge	\$200,000	\$42,146	\$242,146	Increase due to carryover of unused funds from 2014 budget
P26 Squires Landing Park Expansion	\$100,000	\$65,793	\$165,793	Increase due to carryover of unused funds from 2014 budget
P27 Squire's Landing Conceptual Plan	\$0	\$100,000	\$100,000	New project: Squires Conceptual Plan funded with \$100,000 of the \$340,000 RCO Grant Award. Grant funds expected in 2016. Balance of \$240,000 not yet budgeted.
P28 Log Boom Park Conceptual Plan	\$0	\$100,000	\$100,000	New project funded with \$50,000 Strategic Opp. Fund and \$50,000 Park Impact Fees
Total Additional Expenditures		(\$453,233)		
Ending Fund Balance	\$226,319	(\$311,811) net change	(\$85,492)	

Mid Biennium Budget Amendment
November 12, 2015

Description	2015-2016 Original Budget	Proposed Increase (Decrease)	2015-2016 Amended Budget	Explanation
Transportation Capital Fund				
Beginning Fund Balance	\$892,645	(\$892,247)	\$398	2014 Ending Fund Balance less than budgeted
*Federal Funds West A SR522-Construction	\$0	\$587,100	\$587,100	Funding per 2/23/15 CIP Amendment; reallocated from ROW to construction
*State TIB Grant West A SR522	\$4,432,358	\$500,000	\$4,932,358	New funding per 2/23/15 CIP Amendment
*CDBG Grant NE 181 st Sidewalk Southside	\$0	\$254,960	\$254,960	New funding per 2/23/15 CIP Amendment
*State TIB Grant NE 181 st Sidewalk Northside	\$0	\$189,793	\$189,793	New funding per 2/23/15 CIP Amendment
*WSDOT Safe Routes to School Grant NE 202 nd Sidewalk	\$0	\$814,056	\$814,056	New funding per 2/23/15 CIP Amendment
*WSDOT Highway Safety Improvement Program 62 nd Ave NE Sidewalk	\$0	\$813,200	\$813,200	New funding per 2/23/15 CIP Amendment
*WSDOT Grant West A SR522	\$0	\$50,000	\$50,000	New funding per 2/23/15 CIP Amendment
TIB Grant T40 Roundabout NE 193 rd /61 st Ave	\$0	\$284,732	\$284,732	Application has been made for this new project, total project cost \$2,225,420. Current budget would be for design engineering.
* Interfund Transfer From General Fund	\$140,885	\$188,000	\$328,885	T6 West A SR522 as approved in 2/23/15 CIP Amendment
* Interfund Transfer From Street Fund	\$0	\$400,000	\$400,000	T27 Sidewalk Program for grant match as approved in 2/23/15 CIP Amendment

Mid Biennium Budget Amendment
November 12, 2015

Transportation Capital Fund (continued)				
* Interfund Transfer From Strategic Opportunities Fund	\$0	\$764,000	\$764,000	\$204,000 for grant match NE 202 nd St (using funds from budget for Pedestrian Safety line item below); \$560,000 "loaned" to Sidewalk Undergrounding and Contingency (only as needed) – to be repaid from Real Estate Excise Tax 2017-2020
* Interfund Transfer From Real Estate Excise Tax Fund	\$3,178,719	\$370,888	\$3,549,607	\$235,000 T6 West A SR522 as approved in 2/23/15 CIP Amendment; \$135,888 T40 Roundabout
*Federal TAP Grant NE 181st Sidewalk Southside	\$666,915	(\$573,945) Revenue reduction	\$92,970	New funding per 2/23/15 CIP Amendment; original budget included estimate for construction but not applicable now.
Total Additional Resources		\$3,750,537		
*T6 West A SR522	\$10,986,257	\$1,560,100	\$12,546,357	Adjust SR 522 West A project budget per 2/23/15 CIP Amendment
*Sidewalk Program: NE 181 st (both sides), 62 nd Ave NE, NE 202 nd , sidewalk gaps, undergrounding, contingency	\$1,026,915	\$2,553,485	\$3,580,400	Establish budgets for Sidewalk Program per 2/23/15 CIP Amendment
T40 Roundabout NE 193 rd /61 st Ave	\$0	\$420,620	\$420,620	Application has been made for this new project, total project cost \$2,225,420. Current budget would be for design engineering.
Total Additional Expenditures		(\$4,534,205)		
Ending fund Balance	\$792,645	(\$783,668) net change	\$8,977	

Mid Biennium Budget Amendment
November 12, 2015

Description	2015-2016 Original Budget	Proposed Increase (Decrease)	2015-2016 Amended Budget	Explanation
Equipment Replacement Fund				
Beginning Fund Balance	\$362,417	\$92,256	\$454,673	2014 Ending Fund Balance better than budgeted
Total Additional Resources		\$92,256		
Permitting Software	\$0	\$134,375	\$134,375	Remaining costs required to complete CRW Permitting implementation, integration with City Works and data conversion from City View (old system). \$66,650 was unspent from 2014 budget and represents carryover; plus \$67,725 new funding required. CRW total cost= \$172,000 Conversion costs = \$35,000 Prior year payment to RNR for development and planning of permitting software requirements = \$15,000
Total Additional Expenditures		(\$134,375)		
Ending Fund Balance	\$344,417	(\$42,119) net change	\$302,298	

Mid Biennium Budget Amendment
November 12, 2015

Description	2015-2016 Original Budget	Proposed Increase (Decrease)	2015-2016 Amended Budget	Explanation
Surface Water Management Fund				
Beginning Fund Balance	\$1,222,414	\$260,998	\$1,483,412	2014 Ending Fund Balance better than budgeted
Total Additional Resources		\$260,998		
Interfund Transfer To Surface Water Capital Fund	\$1,506,000	(\$686,500) expenditure reduction	\$819,500	To correct this budget line item for interfund transfers to the Surface Water Capital Fund; this was a budgeting error and didn't balance with corresponding entry in the Surface Water Capital Fund.
Total Additional Expenditures		\$686,500		
Ending Fund Balance	\$110,138	\$947,498 net change	\$1,057,636	

SUMMARY OF ALL FUNDS

The proposed expenditure adjustments, for all funds, represent an increase of \$9,515,031 to the 2015-2016 adopted biennial expenditure budget of \$59,750,318 bringing the total amended expenditure budget to \$69,265,349. Of the total expenditure adjustments, interfund transactions represent \$3,602,948.

The proposed revenue adjustments (not including changes in beginning fund balances) represent an increase of \$7,603,344 from the 2015-2016 adopted biennial revenues of \$52,089,453 bringing the total adjusted revenues, for all funds, to \$59,692,797. Interfund transactions of \$4,104,448 are included in the proposed revenue adjustments.

This represents the first amendment to the adopted 2015-2016 biennial budget. Going forward into 2016, the budget will continue to be closely monitored, and additional adjustments to the budget may be required or recommended. It is not unusual to modify a biennial budget at least once during the second year of the biennium, prior to closing the period as the City did in 2014.

Please let me know if there are questions that can be addressed prior to the November 9, 2015 City Council meeting.

VII. E. Adopt Ordinance No. 15-0412 Amending the 2015-2020 C...

- **Park Project P-2 Tolt Pipeline Ph 1:** It is proposed to carryover unspent funds from 2014 of \$77,770 and increase the budget to \$234,294.
- **Park Project P-11 Log Boom Park Pedestrian Bridge:** It is proposed to carryover unspent funds from 2014 of \$42,146 and increase the budget to \$242,146.
- **Park Project P-26 Squires Landing Dock & Float:** It is proposed to carryover unspent funds from 2014 of \$65,793 and increase the budget to \$165,793.
- **Park Project P-6 Moorlands Park:** It is proposed to accelerate the project one year and increase the 2016 budget by \$121,000 which had been programmed for 2017.
- **Park Project P-27 Squires Landing Concept:** This is a new proposed project to develop a bigger picture plan for the manufactured home and improved access and parking; budget would be \$100,000.
- **Park Project P-28 Log Boom Park Concept:** This is a new proposed project to study the best configuration for the beach, environmental mitigation, and permitting considerations; budget would be \$100,000.

FISCAL CONSIDERATION:

The City's goal is to adopt and maintain a fiscally balanced Capital Improvement Program that can be used by staff to prioritize and pursue projects. The CIP balances City resources including Park and Transportation Impact Fees, Real Estate Excise Tax, General Fund revenues, Surface Water Utility fees, and grant funds. While a project may show need in future years for grant funds to complete, the project and budget is considered "balanced" and provides a tool to pursue outside funding. The CIP should be considered a programming document with the City of Kenmore adopted budget being the document that actually appropriates funds for project expenditures.

The changes currently proposed will increase the six year Transportation CIP by \$1,775,420, the Park CIP by \$332,233, and the Surface Water CIP by \$0.

City resources to be programmed over the six year period, as described above in the amendments to the Capital Improvement Program, are summarized as follows:

General Fund Match for T-40	\$583,069
Transportation Impact Fees	(250,000)
Real Estate Excise Tax -Transportation	(64,112)
Park Impact Fees	503,939
King County Trail Levy	209,294
RCO Grant Reimbursement	100,000
Strategic Opportunities Fund	<u>50,000</u>
	\$1,132,190

The Ordinance 15- 0412 with attached Exhibit A reflects the amendments to the 2015-2020 Capital Improvement Program.

The mid biennium Budget Ordinance No. 15-0413 will appropriate the funds necessary for these projects as they affect the 2015-2016 Biennial Budget in the amount of \$873,853.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

The proposed Capital Improvement Program is consistent with Council Goals, specifically:

- To focus and emphasize multimodal transportation safety in the City of Kenmore with a specific focus on pedestrian, bicycle, and other means of travel.
- To advance the public's access and connection to the waterfront.
- To continue to implement a Parks Improvement and Financial Plan.

**CITY OF KENMORE
WASHINGTON
ORDINANCE NO. 15-0412**

**AN ORDINANCE OF THE CITY OF KENMORE, WASHINGTON,
RELATING TO THE 2015-2020 SIX-YEAR CAPITAL
IMPROVEMENT PROGRAM; AMENDING THE 2015-2020 SIX-
YEAR CAPITAL IMPROVEMENT PROGRAM; PROVIDING FOR
SEVERABILITY; AND ESTABLISHING AN EFFECTIVE DATE.**

WHEREAS, on December 8, 2014, the City Council adopted Ordinance No. 14-0387, which adopted the 2015-2020 Six-Year Capital Improvement Program ("CIP"); and

WHEREAS, by Ordinance 15-0396 the City Council amended the 2015-2020 Six-Year Capital Improvement Program to reflect revised amounts of revenue and appropriations; and

WHEREAS, the City Council desires to further amend the 2015-2020 CIP to reflect a change in project budgets and funding for Transportation Project T-8 SR 522 West B; Project T-40 the Roundabout Project at 61st Ave NE and NE 193rd; Project P-2 the Tolt Pipeline; Project P-11 Log Boom Park Pedestrian Bridge; Project P-26 Squires Landing Dock & Float; P-6 Moorlands Park; P-27 Squires Landing Concept; and P-28 Log Boom Park Concept;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF KENMORE, WASHINGTON, DO ORDAIN AS FOLLOWS:

Section 1. Amendment. The 2015-2020 Capital Improvement Program is amended to reflect the adjustments set forth on Exhibit "A," entitled "City of Kenmore, Washington Capital Improvement Program for the Years 2015-2020," attached hereto and incorporated by reference.

Section 2. Severability. Should any section, paragraph, sentence, clause or phrase of this Ordinance, or its application to any person or circumstance, be declared unconstitutional or otherwise invalid for any reason, or should any portion of this Ordinance be preempted by state or federal law or regulation, such decision or preemption shall not affect the validity of the remaining portions of this Ordinance or its application to other persons or circumstances.

Section 3. Effective Date. This Ordinance shall be published in the official newspaper of the City, and shall take effect and be in full force five (5) days after the date of publication.

ADOPTED BY THE CITY COUNCIL AT A REGULAR MEETING THEREOF ON THE 23rd DAY OF NOVEMBER, 2015.

CITY OF KENMORE

Mayor David Baker

ATTEST/AUTHENTICATED:

Patty Safrin, City Clerk

Approved as to form:

Rod P. Kaseguma, City Attorney

FILED WITH THE CITY CLERK:
PASSED BY THE CITY COUNCIL:
PUBLISHED:
EFFECTIVE DATE:
ORDINANCE NO.

EXHIBIT A

**CITY OF KENMORE, WASHINGTON
CAPITAL IMPROVEMENT PROGRAM
FOR THE YEARS 2015-2020
Updates November 23, 2015**

EXPENDITURES	2015 Adopted	2016 Adopted	2017 Adopted	2018 Adopted	2019 Adopted	2020 Adopted	2015-2020 Totals
<u>PARKS</u>							
Parks Project Manager	\$99,000	\$64,000	\$65,000	\$0	\$0	\$0	\$228,000
P 1 Twin Springs Interim Use Plan	40,000	0	0	0	0	0	40,000
P 2 Tolt Pipeline Trail Phase One	234,294	0	0	0	0	0	234,294
P 6 Moorlands Park Improvements	10,000	141,000	1,273,000	0	0	0	1,424,000
P 11 Log Boom Park Pedestrian New Bridge	242,146	0	0	0	0	0	242,146
P 13 City Hall Park Ph I: Skate Park Improvements	350,000	0	0	0	0	0	350,000
P18a Rhododendron Park Float	30,000	115,000	0	0	0	0	145,000
P 26 Squires Landing Dock/Float	100,793	65,000	0	0	0	0	165,793
P 27 Squires Landing Concept	100,000	0	0	0	0	0	100,000
P 28 Log Boom Park Concept	100,000	0	0	0	0	0	100,000
Total Parks	\$1,306,233	\$385,000	\$1,338,000	\$0	\$0	\$0	\$3,029,233
<u>TRANSPORTATION</u>							
T 6 SR 522 West A 61st to 65th	\$8,994,950	\$3,551,407	\$0	\$0	\$0	\$0	\$12,546,357
T 27 Sidewalk Program:							
South side NE 181st ST Design	109,480	0	0	0	0	0	\$109,480
South side NE 181st ST Construction	487,826	0	0	0	0	0	\$487,826
North side NE 181st ST	277,524	0	0	0	0	0	\$277,524
NE 202nd ST	1,017,570	0	0	0	0	0	\$1,017,570
62nd Ave NE	828,000	0	0	0	0	0	\$828,000
Contingency	300,000	0	0	0	0	0	\$300,000
Undergrounding	400,000	0	0	0	0	0	\$400,000
Sidewalk Gaps	160,000	0	0	0	0	0	\$160,000
T 35 Overlay	585,000	585,000	450,000	450,000	450,000	450,000	\$2,970,000
T 37 West Samm Bridge	1,270,000	2,280,000	1,140,000	7,630,000	7,630,000	50,000	\$20,000,000
T 38 175th St/ Swamp Creek Bridge Study	75,000	0	0	0	0	0	\$75,000
T 39 Neighborhood Traffic Calming Improvements	250,000	100,000					\$350,000
T 40 Roundabout 61st Ave NE/NE 193rd St	0	420,620		1,804,800			\$2,225,420
Total Transportation	\$14,755,350	\$6,937,027	\$1,590,000	\$9,884,800	\$8,080,000	\$500,000	\$41,747,177
<u>SURFACE WATER</u>							
SW 8 61st Ave NE Sidewalk Embankment Repair	\$383,470	\$727,530	\$0	\$0	\$0	\$0	\$1,111,000
SW 8 Trust Fund Loan Repayment	0	0	140,000	140,000	140,000	140,000	560,000
SW 19 NE 192nd ST Culvert Replacement	122,796	272,204	0	0	0	0	395,000
T 6 Surface Water Component of SR 522 West A	0	633,500	0	0	0	0	633,500
Total Surface Water	\$506,266	\$1,633,234	\$140,000	\$140,000	\$140,000	\$140,000	\$2,699,500
TOTAL EXPENDITURES	\$16,567,849	\$8,955,261	\$3,068,000	\$10,024,800	\$8,220,000	\$640,000	\$47,475,910

EXHIBIT A

**CITY OF KENMORE, WASHINGTON
CAPITAL IMPROVEMENT PROGRAM
FOR THE YEARS 2015-2020**

REVENUES	2015 Adopted	2016 Adopted	2017 Adopted	2018 Adopted	2018 Adopted	2018 Adopted	2013-2018 Totals
Real Estate Excise Tax (Transportation)	\$2,067,671	\$1,373,357	\$528,000	\$450,000	\$450,000	\$450,000	\$5,319,028
Real Estate Excise Tax (Parks)	350,000	0	380,000	0	0	0	730,000
Transportation Impact Fee Revenue	1,904,780	855,220	200,000	330,000	330,000	50,000	3,670,000
Park Impact Fee Revenue	482,939	286,000	268,000	0	0	0	1,036,939
Transportation Benefit District	75,000	75,000	0	0	0	0	150,000
General Fund	188,000	140,885	0	583,069	0	0	911,954
Street Fund	400,000	0	0	0	0	0	400,000
Surface Water Management Fund	890,611	532,389	140,000	140,000	140,000	140,000	1,983,000
Strategic Opportunities Fund	844,000	55,000	150,000	0	0	0	1,049,000
Federal Allocation SR 522 West A ROW/Const	1,046,020	0	0	0	0	0	1,046,020
DOE Grant SR 522 West A	427,875	0	0	0	0	0	427,875
TIB Grant SR 522 West A	3,469,680	1,462,678	0	0	0	0	4,932,358
TIB Application T40 Roundabout 61st Ave NE/193rd	0	284,732		1,221,731			1,506,463
WSDOT Funds SR 522 West A	50,000	0	0	0	0	0	50,000
Federal Transportation Funds SR 522/61st Signal	737,000	363,000	0	0	0	0	1,100,000
Federal Preservation Grant	60,000	410,000	0	0	0	0	470,000
TAP Grant - Sidewalks	92,970	0	0	0	0	0	92,970
CDBG Program - Sidewalks	254,960	0	0	0	0	0	254,960
TIB Grant - Sidewalks	189,793	0	0	0	0	0	189,793
WSDOT Safe Routes to School - Sidewalks	814,056	0	0	0	0	0	814,056
Federal Highway Safety Impr Program - Sidewalks	813,200	0	0	0	0	0	813,200
BRAC Grant West Samm Bridge Replacement	996,000	1,773,000	862,000	7,300,000	1,069,000	0	12,000,000
Other Park Grants	100,000	0	500,000		0	0	600,000
King County Levy	293,294	44,000	40,000		0	0	377,294
King County Flood District Grant	0	300,000	0	0	0	0	300,000
Public Works Trust Fund Loan	0	1,000,000	0	0	0	0	1,000,000
Other Agencies Reimbursements	20,000	0	0	0	0	0	20,000
Unfunded West Samm Bridge Replacement Resources	0	0	0	0	6,231,000	0	6,231,000
TOTAL REVENUES	\$16,567,849	\$8,955,261	\$3,068,000	\$10,024,800	\$8,220,000	\$640,000	\$47,475,910

CITY OF KENMORE, WASHINGTON
TRANSPORTATION CAPITAL IMPROVEMENT PROGRAM
FOR THE YEARS 2015-2020
November 9, 2015

Project Description	2015 Adopted	2016 Adopted	2017 Adopted	2018 Adopted	2019 Adopted	2020 Adopted	2015-2020 Totals
T 6 SR 522 West A 61st to 65th	\$8,994,950	\$3,551,407	\$0	\$0	\$0	\$0	\$12,546,357
T 27 Sidewalk Program							
South side NE 181st ST Design	109,480	0	0	0	0	0	109,480
South side NE 181st ST Construction	487,826	0	0	0	0	0	487,826
North side NE 181st ST	277,524	0	0	0	0	0	277,524
NE 202nd ST	1,017,570	0	0	0	0	0	1,017,570
62nd Ave NE	828,000	0	0	0	0	0	828,000
Contingency	300,000	0	0	0	0	0	300,000
Undergrounding	400,000	0	0	0	0	0	400,000
Sidewalk Gaps	160,000	0	0	0	0	0	160,000
T 35 Overlay	585,000	585,000	450,000	450,000	450,000	450,000	2,970,000
T 37 West Samm Bridge	1,270,000	2,280,000	1,140,000	7,630,000	7,630,000	50,000	20,000,000
T 38 175th St/ Swamp Creek Bridge Study	75,000	0	0	0	0	0	75,000
T 39 Neighborhood Traffic Calming Improvements	250,000	100,000	0	0	0	0	350,000
T 40 Roundabout 61st Ave NE/NE 193rd St	0	420,620	0	1,804,800	0	0	2,225,420
Total Project Costs	\$14,755,350	\$6,937,027	\$1,590,000	\$9,884,800	\$8,080,000	\$500,000	\$41,297,177
Funding as Proposed:							
Real Estate Excise Tax	\$1,742,250	\$1,066,357	\$450,000	\$450,000	\$450,000	\$450,000	\$4,608,607
Real Estate Excise Tax - Set Aside Sidewalks	251,421	0	0	0	0	0	251,421
Real Estate Excise Tax - West Samm Bridge	74,000	307,000	78,000	0	0	0	459,000
Transportation Impact Fee Revenue	1,704,780	655,220	0	0	0	250,000	2,610,000
Transportation Impact Fee Revenue - West Samm Bridge	200,000	200,000	200,000	330,000	330,000	50,000	1,310,000
Transportation Benefit District	75,000	75,000	0	0	0	0	150,000
General Fund	188,000	140,885	0	583,069	0	0	911,954
Street Fund - Sidewalks	400,000	0	0	0	0	0	400,000
Surface Water Fund	404,345	199,155	0	0	0	0	603,500
Strategic Opportunities Fund	764,000	0	0	0	0	0	764,000
Federal Allocation SR 522 West A ROW/Const	1,046,020	0	0	0	0	0	1,046,020
DOE Grant SR 522 West A	427,875	0	0	0	0	0	427,875
TIB Grant SR 522 West A	3,469,680	1,462,678	0	0	0	0	4,932,358
WSDOT Funds SR 522 West A	50,000	0	0	0	0	0	50,000
Federal Transportation Funds SR 522/61st Signal	737,000	363,000	0	0	0	0	1,100,000
Federal Preservation Grant	60,000	410,000	0	0	0	0	470,000
TAP Grant - Sidewalks	92,970	0	0	0	0	0	92,970
CDBG Program - Sidewalks	254,960	0	0	0	0	0	254,960
TIB Grant - Sidewalks	189,793	0	0	0	0	0	189,793
WSDOT Safe Routes to School - Sidewalks	814,056	0	0	0	0	0	814,056
Federal Highway Safety Impr Program - Sidewalks	813,200	0	0	0	0	0	813,200
BRAC Grant West Samm Bridge Replacement	996,000	1,773,000	862,000	7,300,000	1,069,000	0	12,000,000
Unfunded West Samm Bridge Replacement	0	0	0	0	6,231,000	0	6,231,000
TIB Application T40 Roundabout 61st Ave NE/193rd	0	284,732	0	1,221,731	0	0	1,506,463
Total Project Funding	\$14,755,350	\$6,937,027	\$1,590,000	\$9,884,800	\$8,080,000	\$500,000	\$41,747,177

**CITY OF KENMORE, WASHINGTON
PARK CAPITAL IMPROVEMENT PROGRAM
FOR THE YEARS 2015-2020
Updates November 23, 2015**

Project Description	2015 Adopted	2016 Adopted	2017 Adopted	2018 Adopted	2019 Adopted	2020 Adopted	2015-2020 Totals
Parks Project Manager*	\$99,000	\$64,000	\$65,000	\$0	\$0	\$0	\$228,000
P 1 Twin Springs Interim Use Plan	40,000	0	0	0	0	0	40,000
P 2 Tolt Pipeline Trail Phase One	234,294	0	0	0	0	0	234,294
P 6 Moorlands Park Improvements	10,000	141,000	1,273,000	0	0	0	1,424,000
P 11 Log Boom Park New Pedestrian Bridge	242,146	0	0	0	0	0	242,146
P 13 City Hall Park Ph I: Skate Park Improvements	350,000	0	0	0	0	0	350,000
P 18a Rhododendron Park Float	30,000	115,000	0	0	0	0	145,000
P 26 Squires Landing Dock/Float	100,793	65,000	0	0	0	0	165,793
P 27 Squires Landing Concept	100,000	0	0	0	0	0	100,000
P 28 Log Boom Park Concept	100,000	0	0	0	0	0	100,000
Total Project Costs	\$1,306,233	\$385,000	\$1,338,000	\$0	\$0	\$0	\$3,029,233
Funding As Proposed:							
Park Impact Fees	\$482,939	\$286,000	\$268,000	\$0	\$0	\$0	\$1,036,939
Real Estate Excise Tax	350,000	0	380,000	0	0	0	730,000
Strategic Opportunity Fund	80,000	55,000	150,000	0	0	0	285,000
Grants	100,000	0	500,000	0	0	0	600,000
King County Trail Levy	209,294	0	0	0	0	0	209,294
King County Park Levy	84,000	44,000	40,000	0	0	0	168,000
Total Project Funding	\$1,306,233	\$385,000	\$1,338,000	\$0	\$0	\$0	\$3,029,233

* A portion of Parks Project Mgr funding is already included in Tolt, and Log Boom Ped Bridge
The balance will be allocated to other budgeted projects.

**CITY OF KENMORE, WASHINGTON
SURFACE WATER CAPITAL IMPROVEMENT PROGRAM
FOR THE YEARS 2015-2020**

Project Description	2015 Adopted	2016 Adopted	2017 Adopted	2018 Adopted	2019 Adopted	2020 Adopted	2015-2020 Totals
SW 8 61st Ave NE Sidewalk Embankment Repair	\$383,470	\$727,530	\$0	\$0	\$0	\$0	\$1,111,000
SW 8 Trust Fund Loan Repayment	0	0	140,000	140,000	140,000	140,000	560,000
SW 19 NE 192nd ST Culvert Replacement	122,796	272,204	0	0	0	0	395,000
T 6 Surface Water Component of SR 522 West A	0	633,500	0	0	0	0	633,500
Total Project Costs	\$506,266	\$1,633,234	\$140,000	\$140,000	\$140,000	\$140,000	\$2,699,500
Funding As Proposed:							
KC Flood Control District Grant (SW19) Secured	0	300,000	0	0	0	0	300,000
Reimbursement from Other Agencies	20,000	0	0	0	0	0	20,000
Public Works Trust Fund 10Year Loan (SW8)	0	1,000,000	0		0	0	1,000,000
Surface Water Utility Funds	486,266	333,234	140,000	140,000	140,000	140,000	1,379,500
Total Project Funding	\$506,266	\$1,633,234	\$140,000	\$140,000	\$140,000	\$140,000	\$2,699,500



City Council Business Agenda Item
City of Kenmore, WA

Subject/Topic: Adopt Ordinance No. 15-0411 of the City of Kenmore, Washington, Relating to the 2016 Regular Property Tax Levy Proposed Council Action/Motion: Adopt Ordinance No. 15-0411 of the City of Kenmore, Washington, Relating to the 2016 Regular Property Tax Levy; Providing for Severability; and Establishing an Effective Date	For Council Meeting Agenda of: November 23, 2015 Department: Finance and Administration Prepared by: Joanne Gregory <table style="width: 100%;"> <tr> <td style="width: 70%;"></td> <td style="width: 30%; text-align: center;"><u>Initial & Date</u></td> </tr> <tr> <td>Approved by Department Head:</td> <td style="text-align: center;">[Signature] 11-18-15</td> </tr> <tr> <td>Approved by City Attorney:</td> <td style="text-align: center;">[Signature]</td> </tr> <tr> <td>Approved by Finance Director:</td> <td style="text-align: center;">[Signature] 11-18-15</td> </tr> <tr> <td>Approved by City Manager:</td> <td style="text-align: center;">[Signature]</td> </tr> </table> Exhibits/Attachments: Ordinance No. 15-0411 Powerpoint Presentation from November 16, 2015 Public Hearing		<u>Initial & Date</u>	Approved by Department Head:	[Signature] 11-18-15	Approved by City Attorney:	[Signature]	Approved by Finance Director:	[Signature] 11-18-15	Approved by City Manager:	[Signature]
	<u>Initial & Date</u>										
Approved by Department Head:	[Signature] 11-18-15										
Approved by City Attorney:	[Signature]										
Approved by Finance Director:	[Signature] 11-18-15										
Approved by City Manager:	[Signature]										
<table style="width: 100%;"> <tr> <td style="width: 33%;">Expenditure Required None</td> <td style="width: 33%; text-align: center;">Amount Budgeted 2016 Property Tax Levy: \$4,521,519</td> <td style="width: 33%; text-align: right;">Appropriation Required N/A</td> </tr> </table>		Expenditure Required None	Amount Budgeted 2016 Property Tax Levy: \$4,521,519	Appropriation Required N/A							
Expenditure Required None	Amount Budgeted 2016 Property Tax Levy: \$4,521,519	Appropriation Required N/A									
<u>INFORMATION/BACKGROUND:</u> A presentation and public hearing was held November 16, 2015 regarding the proposed tax levy for 2016.											
<u>FISCAL CONSIDERATION:</u> The 2015 property tax levy was \$4,440,079 (the adopted budget was \$4,427,247). The budgeted levy for 2016 is \$4,521,519. Each year the City is allowed to increase its levy by the lesser of one (1) percent or the percentage increase in the July IPD (Implicit Price Deflator). The IPD this year is .25% (which is less than 1%). The County Assessor has only released preliminary levy information at this time. Based on what has been received, the proposed property tax levy for 2016 would be \$4,556,217 if there is NO increase over 2015. This includes new construction, which adds about \$114,143 (or 2.6%) to the tax rolls, and \$1,995 of refunds to be re-levied. A re-levy of refunds is how the City is allowed to recoup any refunds that occurred in the prior year due to appeals, errors, etc. This levy will exceed our budgeted levy by \$34,690 which anticipated a 1% increase and \$50,000 of new construction. If the City takes no increase in the tax levy, and passes a Resolution of Substantial Need, the levy limit factor of 101% can be applied and will result in the City maintaining its banked capacity at \$590,346. If the City were to take the allowable .25% increase in the property tax levy, which would only add \$11,100 to the levy, the banked capacity would be reduced to \$541,686. The City is currently experiencing good revenue growth in other areas and with new construction will receive more property tax revenue than budgeted. Therefore it seems prudent to bank the 1% for future needs and that is											

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the Staff recommendation. With the increase in assessed valuation for the entire City, the levy rate will decline from \$1.36 to \$1.26 for each \$1,000 of assessed value.

To pass a Resolution of Substantial Need, a majority of the Council, plus one, must approve the Resolution.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

RCW. 84.55.120 The legislative body must hold a public hearing for the coming year's budget including consideration of possible increases in property tax revenues, before taking action on the property tax levy.

**CITY OF KENMORE
WASHINGTON**

ORDINANCE NO. 15-0411

**AN ORDINANCE OF THE CITY OF KENMORE, WASHINGTON,
RELATING TO THE 2016 REGULAR PROPERTY TAX LEVY;
PROVIDING FOR SEVERABILITY; AND ESTABLISHING AN
EFFECTIVE DATE.**

WHEREAS, the City Council of the City of Kenmore, Washington, has met and considered its biennial budget for calendar years 2015-2016; and

WHEREAS, the City Council held Public Hearings on November 9 and November 16, 2015 to consider the City's current expense budget and revenue sources pursuant to RCW 84.55.120; and

WHEREAS, after a Public Hearing, and after duly considering all relevant evidence and testimony presented, the City Council determined that the City of Kenmore requires an estimated regular tax levy in the amount of \$4,556,217 which includes no increase (\$0.00) from the previous year and amounts resulting from the addition of new construction and improvements to property and any increase in the value of state-assessed property, and amounts authorized by law as a result of any annexations that have occurred and refunds made, in order to discharge the expected expenses and obligations of the City and in its best interest (the actual levy to be calculated by the King County Assessor's Office once the City's assessed value is certified by the Assessor);

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF KENMORE, WASHINGTON, DO ORDAIN AS FOLLOWS:

Section 1. Regular Tax Levy. An increase in the regular property tax levy is hereby authorized for the 2016 levy in the amount of \$0.00 which is a zero percent (0.00%) from the previous year. This increase is exclusive of additional revenue resulting from the addition of new construction and improvements to property and any increase in the value of state-assessed property, and any additional amounts resulting from any annexations that have occurred and refunds made.

Section 2. Transmittal. The City Clerk is directed to transmit a certified copy of this Ordinance to the Office of the Auditor of the State of Washington, Division of Municipal Corporations, to the King County Assessor, to the Clerk of the King County Council, and to any other agency required by law to receive a copy of this Ordinance.

Section 3. Severability. Should any section, paragraph, sentence, clause or phrase of this Ordinance, or its application to any person or circumstance, be declared unconstitutional or

otherwise invalid for any reason, or should any portion of this Ordinance be preempted by state or federal law or regulation, such decision or preemption shall not affect the validity of the remaining portions of this Ordinance or its application to other persons or circumstances.

Section 4. Effective Date. This Ordinance shall be published in the official newspaper of the City, and shall take effect and be in full force five (5) days after the date of publication.

ADOPTED BY THE CITY COUNCIL AT A REGULAR MEETING THEREOF ON THE 23th DAY OF NOVEMBER, 2015.

CITY OF KENMORE

David Baker, Mayor

ATTEST/AUTHENTICATED:

Patty Safrin, City Clerk

Approved as to form:

Rod P. Kaseguma

FILED WITH THE CITY CLERK:
PASSED BY THE CITY COUNCIL:
PUBLISHED:
EFFECTIVE DATE:
ORDINANCE NO.

City of Kenmore Public Hearing 2016 Property Tax Levy



City Council Meeting November 16, 2015

Key dates...

November 9,
2015

- Public Hearing on
 - 2015-2020 Capital Improvement Program (CIP) Amendments
 - 2015-2016 Mid Biennial Budget Amendment

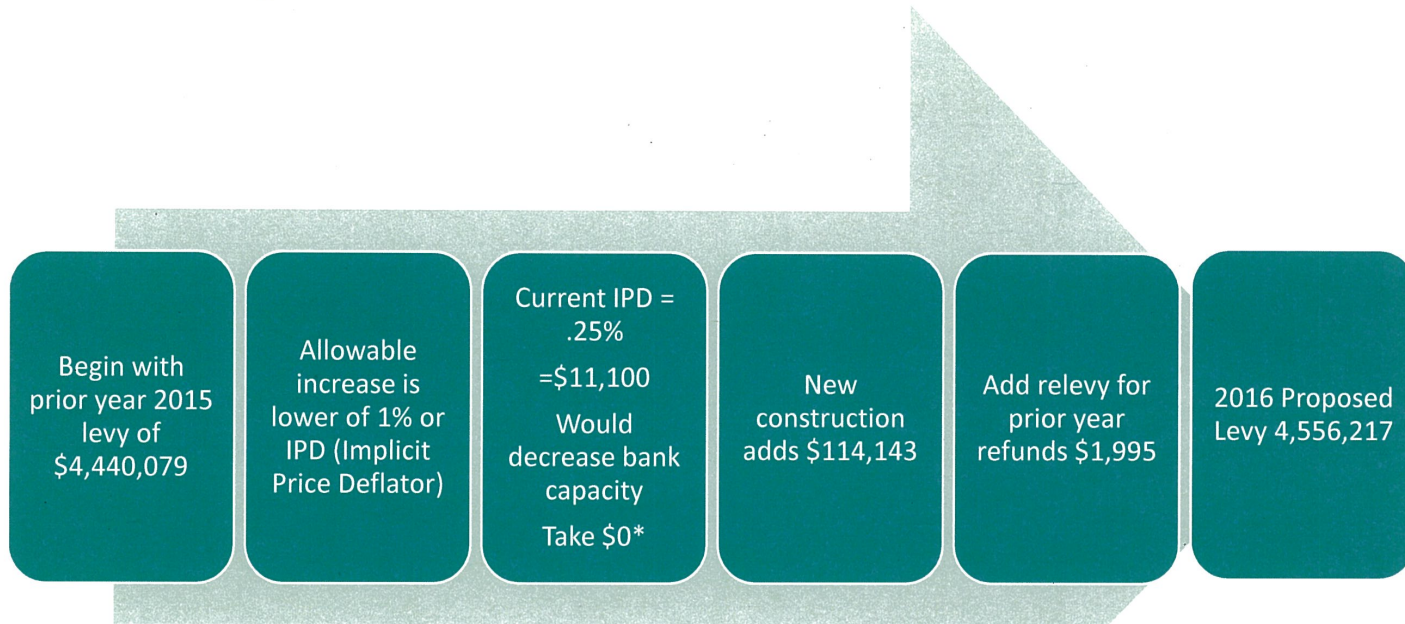
November 16,
2015

- Public Hearing on 2016 Tax Levy

November 23,
2015

- Adopt 2016 Tax Levy
- Adopt 2015-2020 CIP Amendments
- Adopt 2015-2016 Mid Biennial Budget Amendment

Annually the City Council must set the Tax Levy

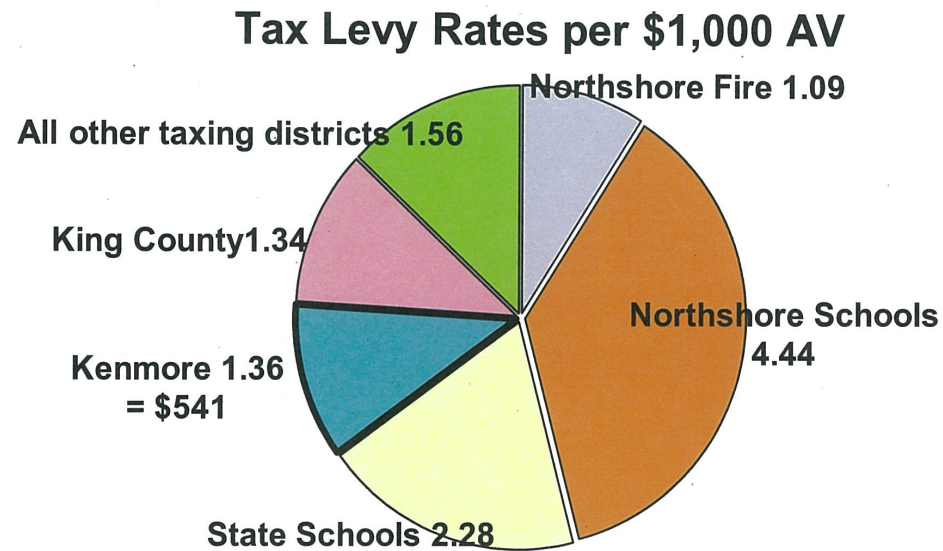


- **Take 0% increase this year and bank 1% for future need; bank is currently \$590,089**

Property taxes and assessed valuation

- **Proposed 2016 tax levy = \$4,556,217**
- 0% increase over last year
 - \$114,143 new construction
 - \$83,642,306 AV (preliminary)
 - Greatest value since since 2009
 - Re-levy prior refunds = \$1,995
- **Budgeted 2016 tax levy = \$4,521,519**
 - 1% increase + \$50K new construction
 - Proposed > budget by **\$34,698**
- Total 2016 **Assessed Valuation (AV)**:
 - \$3,619,618,281 includes new construction
 - 10.5% **increase in AV** from 2015
 - tax rate projected at **1.26/\$1,000 AV**
 - decrease from 1.36 in 2015

Illustration of the 2015 Property Tax Distribution for a \$398,000 Home*

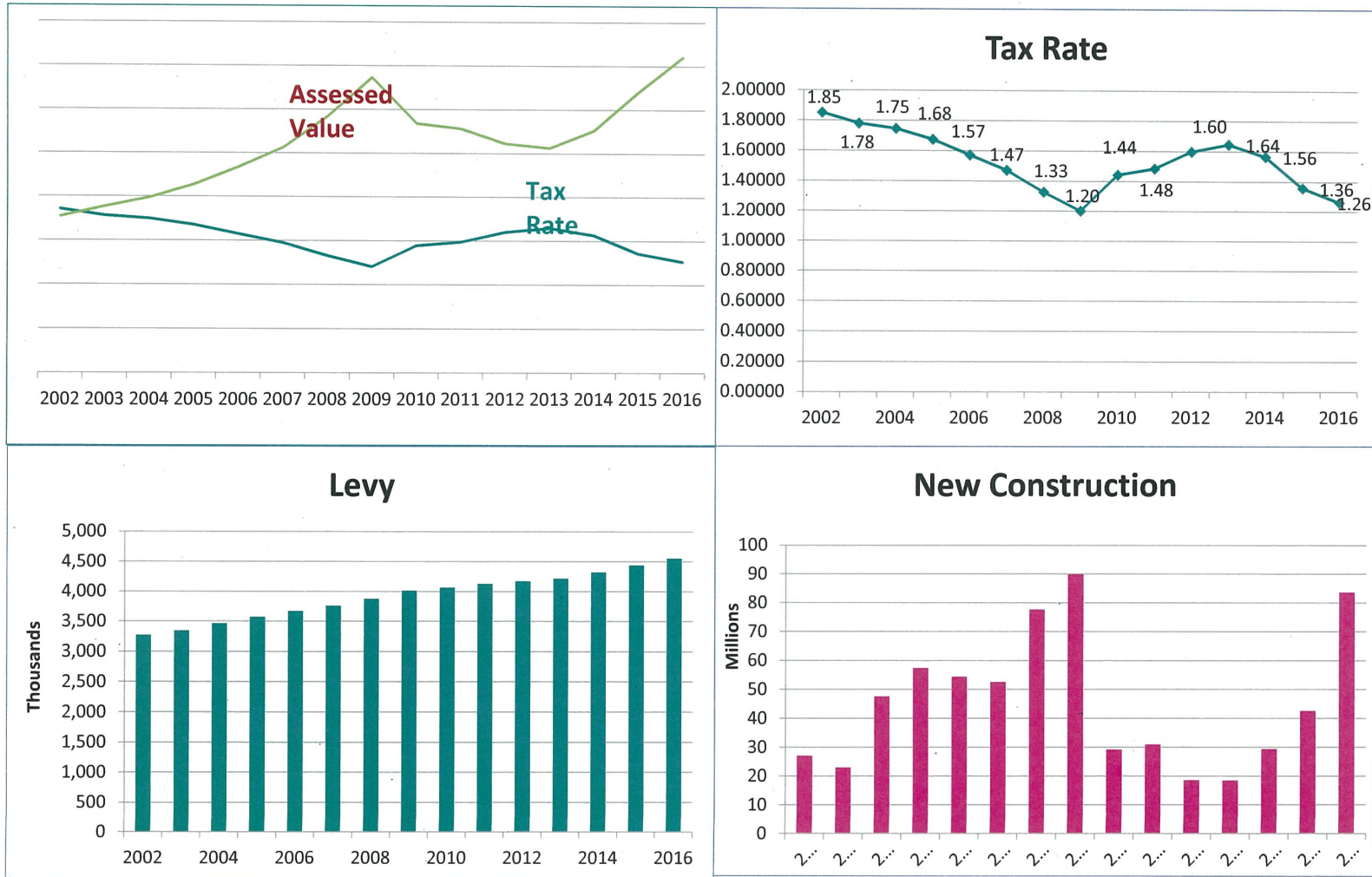


* 2015 Kenmore Median Residence Value

Estimated total tax bill of \$4,804

Percentages of total tax bill are based on tax rates for the various jurisdictions (total \$12.07)

Property Tax Rates, AV, & New Construction



11/18/2015

City of Kenmore, Washington

6

THANK YOU!

The presentation portion
of the Public Hearing on
setting the 2016 Property
Tax Levy is concluded

The next actions will be:

- November 23: Ordinance to set the 2016 Property Tax Levy and possibly Resolution of Substantial Need

Open for Questions and
Public Comment



**City Council Business Agenda Item
City of Kenmore, WA**

Subject/Topic: Adopt Resolution 15-269 of the City of Kenmore, Washington, Making a Declaration of Substantial Need Proposed Council Action/Motion: Adopt Resolution 15-269 of the City Council of Kenmore, Washington, Making a Declaration of Substantial Need for Purposes of Setting the Limit Factor for the Property Tax Levy for 2016	For Council Meeting Agenda of: November 23, 2015 Department: Finance and Administration Prepared by: Joanne Gregory Approved by Department Head: <u>Janis 11/18/15</u> Approved by City Attorney: Approved by Finance Director: <u>Janis 11/18/15</u> Approved by City Manager: <u>AK</u> Exhibits/Attachments: Resolution 15-269	
Expenditure Required None	Amount Budgeted 2016 Property Tax Levy: \$4,521,519	Appropriation Required N/A
<u>INFORMATION/BACKGROUND:</u> A presentation and public hearing was held November 16, 2015 regarding the proposed tax levy for 2016.		
<u>FISCAL CONSIDERATION:</u> The 2015 property tax levy was \$4,440,079 (the adopted budget was \$4,427,247). The budgeted levy for 2016 is \$4,521,519. Each year the City is allowed to increase its levy by the <u>lesser</u> of one (1) percent or the percentage increase in the July IPD (Implicit Price Deflator). The IPD this year is .25% (which is less than 1%). In this unusual year where the IPD is less than 1%, the City may pass a Resolution of Substantial Need in order for the 101% levy limit factor to be applied. The City may choose to take the 1% increase or bank it for future need. The City is currently experiencing good revenue growth in other areas and with new construction will receive more property tax revenue than budgeted. Therefore it seems prudent to bank the 1% for future needs and that is the Staff recommendation. Based on preliminary levy information from the King County Assessor, the proposed property tax levy for 2016 would be \$4,556,217 if there is NO increase over 2015. This includes new construction, which adds about \$114,143 (or 2.6%) to the tax rolls, and \$1,995 of refunds to be re-levied. A re-levy of refunds is how the City is allowed to recoup any refunds that occurred in the prior year due to appeals, errors, etc. This levy will exceed our budgeted levy by \$34,690. Also, the City will increase rather than decrease its banked capacity which is currently \$590,089. With the increase in assessed valuation for the entire City, the levy rate will decline from \$1.36 to \$1.26 for each \$1,000 of assessed value.		

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To pass a Resolution of Substantial Need, a majority of the Council, plus one, must approve the Resolution.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

RCW. 84.55.120 The legislative body must hold a public hearing for the coming year's budget including consideration of possible increases in property tax revenues, before taking action on the property tax levy.

CITY OF KENMORE
WASHINGTON
RESOLUTION NO 15-269

**A RESOLUTION OF THE CITY COUNCIL OF KENMORE,
WASHINGTON, MAKING A DECLARATION OF SUBSTANTIAL
NEED FOR PURPOSES OF SETTING THE LIMIT FACTOR FOR
THE PROPERTY TAX LEVY FOR 2016**

WHEREAS, RCW 84.55.010 provides that a taxing jurisdiction may levy taxes in an amount no more than the limit factor multiplied by the highest levy of the most recent three years plus additional amounts resulting from new construction and improvements to property, newly constructed wind turbines, and any increase in the value of state-assessed utility property;

WHEREAS, under RCW 84.55.005(2) (c), the limit factor for a taxing jurisdiction with a population of 10,000 or over is the lesser of 101 percent or 100 percent plus inflation;

WHEREAS, RCW 84.55.005(1) defines "inflation" as the percentage change in the implicit price deflator for personal consumption expenditures for the United States as published for the most recent 12-month period by the Bureau of Economic Analysis of the federal Department of Commerce in September of the year before the taxes are payable;

WHEREAS, "inflation" for 2016 is 0.251 percent and the limit factor is 100.251 percent;

WHEREAS, RCW 84.55.0101 provides for use of a limit factor of 101.00 percent or less with a finding of substantial need by a majority plus one Councilmembers;

WHEREAS, due to current and future increases in general operation, maintenance, and contract service expenditures as well as the need for capital improvements for parks, recreation, transportation, and safety;

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF KENMORE, WASHINGTON, DOES RESOLVE AS FOLLOWS:

Section 1. A finding is made of substantial need under RCW 84.55.0101, which authorizes the use of a limit factor of 101.00 percent for the property tax levy for 2016.

PASSED BY THE CITY COUNCIL OF THE CITY OF KENMORE, WASHINGTON, AT A REGULAR MEETING THEREOF THIS 23th DAY OF NOVEMBER, 2015.

CITY OF KENMORE

David Baker, Mayor

ATTEST/AUTHENTICATED:

Patty Safrin, City Clerk

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**City Council Business Agenda Item
City of Kenmore, WA**

Subject/Topic: Resolution No. 15-270, Establishing a Joint Emergency Management Organization with the City of Lake Forest Park; and Interlocal Agreement Forming the Northshore Emergency Management Coalition (NEMC) with the City of Lake Forest Park, Northshore Utility District and Northshore Fire District Proposed Council Action/Motion: Motion to Approve Resolution No. 15-270; A Resolution of the City Council of the City of Kenmore, Washington, Establishing a Joint Emergency Management Organization with the City of Lake Forest Park, Authorizing the City Manager to Execute an Interlocal Agreement with the City of Lake Forest Park for Emergency Management Services and Authorizing the City Manager to Execute an Interlocal Agreement with the City of Lake Forest Park, Northshore Utility District and Northshore Fire District for Regional Emergency Management, Substantial to the Contracts Attached.	For Council Meeting Agenda of: <u>November 23, 2015</u> Department: <u>Development Services</u> Prepared by: <u>Bryan Hampson</u> <table border="0"> <tr> <td></td> <td align="right"><u>Initial & Date</u></td> </tr> <tr> <td>Approved by Department Head:</td> <td align="right"><u>EB 6/24/15</u></td> </tr> <tr> <td>Approved by City Attorney:</td> <td align="right"><u>✓ RK</u></td> </tr> <tr> <td>Approved by Finance Director:</td> <td align="right"><u>June 11/20/15</u></td> </tr> <tr> <td>Approved by City Manager:</td> <td align="right"><u>[Signature]</u></td> </tr> </table> Exhibits/Attachments: #1: Resolution No. 15-270, Joint Local Emergency Management Organization #2: Contract No. 15-C1492, Interlocal Agreement for Emergency Management #3: Contract No. 15-C1488, Interlocal Agreement for Regional Emergency Management (NEMC) #4: Prepare Northwest Scope of Work #5: King County Office of Emergency Management Correspondence		<u>Initial & Date</u>	Approved by Department Head:	<u>EB 6/24/15</u>	Approved by City Attorney:	<u>✓ RK</u>	Approved by Finance Director:	<u>June 11/20/15</u>	Approved by City Manager:	<u>[Signature]</u>
	<u>Initial & Date</u>										
Approved by Department Head:	<u>EB 6/24/15</u>										
Approved by City Attorney:	<u>✓ RK</u>										
Approved by Finance Director:	<u>June 11/20/15</u>										
Approved by City Manager:	<u>[Signature]</u>										
Expenditure Required \$25,000 Amount Budgeted \$98,440 Appropriation Required: NA											
<u>INFORMATION/BACKGROUND:</u> Emergency Services Coordinating Agency (ESCA) was established in 1984 through an Interlocal Agreement first between seven member agencies and then updated in 1994 and again in 1999 to include ten member agencies. Kenmore joined in 1999. The ten member agencies that currently make up ESCA's client base are: the cities of Brier, Edmonds, Lynnwood, Mill Creek, Mountlake Terrace, Muklito and the Town of Woodway in Snohomish County, and the cities of Kenmore, Lake Forest Park and Woodinville in King County. The purpose of ESCA is to provide joint emergency management planning and preparedness assistance activities for member agencies. In 2014, ESCA lost two senior staff members, including the Director, leaving two coordinators and one part-time person to serve the client cities. An interim director was hired to oversee the agency while conducting an agency review and evaluation report. That report along with a strategic planning document was presented to the ESCA Board of Directors for their consideration. After weighing the options, on March 26th, 2015 the ESCA Board voted to approve Resolution No. 2015-2 recommending the dissolution of ESCA effective December 31, 2015. On May 18, 2015, Kenmore City Council passed Resolution No. 15-261, authorizing the City's designated representative to the Board of Directors of ESCA to vote to dissolve the agency and terminate the ESCA Interlocal											

Agreement, effective December 31, 2015.

With the dissolution of ESCA, the City of Kenmore needed to find a solution to managing emergency services. City staff met with the King County, Office of Emergency Management, Northshore Utility District, Northshore Fire District, City of Lake Forest Park, City of Bothell, and the City of Woodinville to identify potential solutions. Through these discussions and meetings it became clear the best solution for both the City of Kenmore and the City of Lake Forest Park was to form a joint local organization for emergency management that meets the State Military Department's requirements. The formation of a joint local organization for emergency management allows both cities to receive emergency management performance grant (EMPG) funds. Kenmore's current EMPG amount is roughly \$14,000.

In addition the Cities of Kenmore and Lake Forest Park are joining with the Northshore Utility District and Northshore Fire District to form a Northshore Emergency Management Coalition (NEMC) to efficiently coordinate emergency management services. NEMC will contract with Prepared Northwest to provide services such as; updating emergency plans; emergency volunteer coordination; joint emergency operations center; staff training; combined emergency exercises; resource management; and coordinated communications.

The cities will also rely on King County, Office of Emergency Management (OEM), to be a key resource and provider of emergency services. OEM has told the cities that we have access to all of their regional services, regardless of whether or not we form a joint local organization or a local coalition. We will be coordinating our planning, emergency volunteers, training and exercises, EOC support, response, mitigation, and recovery efforts with OEM.

FISCAL CONSIDERATION:

As outlined in the NEMC ILA the City of Kenmore will contribute an annual fee of \$25,000. Current budget for emergency management is \$98,440 (2015-2016), which includes \$51,059 paid to ESCA in 2015. Receiving the EMPG funds would reduce the City's financial commitment even further.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

To provide a safe and secure community

RESOLUTION NO. 15-270

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF KENMORE, WASHINGTON, ESTABLISHING A JOINT EMERGENCY MANAGEMENT ORGANIZATION WITH THE CITY OF LAKE FOREST PARK, AND AUTHORIZING THE CITY MANAGER TO EXECUTE AN INTERLOCAL AGREEMENT WITH LAKE FOREST PARK FOR EMERGENCY MANAGEMENT SERVICES

WHEREAS, pursuant to Chapter 39.34 RCW, local governments may exercise jointly their powers, privileges and authorities through interlocal agreements, in order to use efficiently their powers and to cooperate with other localities on a basis of mutual advantage, thereby providing services and facilities in a manner that will accord best with geographical, economic, population, or other factors of their respective communities; and

WHEREAS, pursuant to RCW 38.52.070, political subdivisions must either establish their own local organizations for emergency management or provide for membership in a joint local organization for emergency management; and

WHEREAS, the City of Kenmore and the City of Lake Forest Park ("Cities") desire to provide for membership in a joint emergency management organization; and

WHEREAS, under RCW 38.52.070, the Director of the Washington State Military Department may authorize membership of the Cities in a joint emergency management organization, after reviewing an interlocal agreement for such membership and the approving resolutions for such membership; and

WHEREAS, the Cities have agreed upon the terms and conditions of an interlocal agreement for membership in a joint emergency management organization;

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Kenmore as follows:

Section 1. Joint Emergency Management Organization Established. The City of Kenmore hereby authorizes the establishment of a joint emergency management organization with the City of Lake Forest Park, under the terms and conditions stated in the interlocal agreement authorized in Section 2 of this Resolution. The method of sharing the costs of supporting the organization are stated in such interlocal agreement. The organization shall be headed by a director of emergency management who shall be appointed by and be directly responsible to the City Manager of Kenmore and the Mayor of Lake Forest Park, and who shall be responsible for the organization,

administration and operation of the organization.

Section 2. ILA Authorized. The City Manager of Kenmore is authorized to execute the interlocal agreement for emergency management with the City of Lake Forest Park attached hereto and incorporated herein.

Section 3. Submittal of Resolution and ILA. The City Manager of Kenmore, or designee, is directed to submit a copy of this Resolution and the interlocal agreement for emergency management to the Director of the Washington State Military Department, and to request the Director to authorize and approve the joint emergency management organization.

Section 4. Corrections. The City Clerk is authorized to make necessary corrections to this resolution including, but not limited to, the correction of scrivener's/clerical errors, references, resolution numbering, section/subsection numbers and any references thereto.

PASSED BY THE CITY COUNCIL OF THE CITY OF KENMORE, WASHINGTON,
AT A REGULAR MEETING THEREOF THIS ____ DAY OF _____, 2015.

CITY OF KENMORE

Mayor David Baker

ATTEST/AUTHENTICATED:

Patty Safrin, City Clerk

APPROVED AS TO FORM:

Rod Kaseguma, City Attorney

FILED WITH THE CITY CLERK:
PASSED BY THE CITY COUNCIL:
RESOLUTION NO.: 15-270

Interlocal Agreement for Regional Emergency Management

City of Kenmore Contract No. 15-C1488

This interlocal agreement for regional emergency management ("Agreement") is made pursuant to the Interlocal Cooperation Act, Chapter 39.34 RCW, by and between the following parties:

- The city of Lake Forest Park, a Washington State municipal corporation, ("LFP")
- The city of Kenmore, a Washington State municipal corporation, ("Kenmore")
- King County Fire District No. 16, a Washington State special purpose district and municipal corporation, ("KCFD16")
- Northshore Utility District, a Washington State special purpose district and municipal corporation, ("NUD")

LFP, Kenmore, KCFD16 and NUD are also referred to collectively as "Parties" and individually as "Party."

RECITALS

- (1) LFP and Kenmore are adjacent cities located along the north shores of Lake Washington. KCFD16 and NUD are local municipal service providers to LFP and Kenmore (See Exhibit "A" for boundaries of the Parties).
- (2) Each Party has responsibilities and obligations to prepare for emergencies. Pursuant to RCW 38.52.070, LFP and Kenmore are required to establish local organizations for emergency management. LFP and Kenmore have established a joint local organization for emergency management, as authorized by RCW 38.52.070 (also known as a joint emergency management organization). The same requirement does not apply to KCFD 16 or NUD.
- (3) The Parties agree that it is in the best interest of their local communities to administer and coordinate their emergency management plans and programs.

AGREEMENT

To that end, the Parties agree as follows:

- (4) Purpose. The purpose and intent of this Agreement is to provide an economical mechanism for the efficient administration and coordination of emergency management plans and programs, generally to protect the public peace, health and safety, to preserve the lives and property of the people served by the Parties and to ensure the continuation of municipal services.
- (5) Effective Date and Duration. This Agreement shall take effect upon execution by all representatives of the Parties. This Agreement shall remain in effect for a period of 12 months.

- (6) Successor Agreement. No less than 120 days prior to the expiration of this Agreement, the Parties shall meet to discuss a successor agreement. If a successor agreement is negotiated, it shall be executed prior to the expiration of this Agreement.
- (7) No Separate Entity. This Agreement establishes a joint operation of the Parties, and does not create a separate legal or administrative entity. The joint operation shall be called the "Northshore Emergency Management Coalition" or "NEMC."
- (8) No Joint Venture. Nothing contained in this Agreement shall be construed as creating any type or manner of partnership, joint venture or other enterprise between the Parties.
- (9) Administration. Subject to the policies and directives of the "NEMC Committee" established in Section (11) below, LFP shall serve as the Lead Agency for the Parties (hereafter, the "Lead Agency") and the NEMC. As Lead Agency, LFP shall appoint an employee to administer and coordinate the joint operation, to oversee and supervise all agreements of the Lead Agency or any Party on behalf of the NEMC, and to serve as the point of contact for the Parties. The Lead Agency shall contract in its own name for the services of Prepare Northwest, on behalf of the NEMC, and shall bill each Party quarterly for its share of the charges of Prepare Northwest as described in the "Cost-sharing" section below. The Lead Agency shall share all reports, documents and written work products with all Parties.
- (10) Ownership of Property. Except as agreed otherwise by the Parties in writing, title to property owned by a Party and used by the NEMC shall not be transferred to NEMC or any other Party. All Parties must agree in advance to the acquisition or lease of new property used by the NEMC, and such property shall be jointly owned by all Parties unless agreed otherwise by the Parties in writing.
- (11) Administering Body. A decision making body, called the "NEMC Committee," shall govern and administer this Agreement and LFP's actions as Lead Agency, consistent with the terms and conditions of this Agreement, and consistent with the Comprehensive Emergency Management Plans and Emergency Management Program Papers of LFP and Kenmore, pursuant to Chapter 38.52 RCW. The Mayor of LFP and the chief executive officer of each Party shall appoint a representative to the NEMC Committee. The NEMC Committee shall meet at least annually and at such other times as is determined by the Committee. At the request of one Party, the NEMC Committee shall meet within a reasonable time after the request. The NEMC Committee shall strive to make decisions by consensus.
- (12) Cost-sharing. Each Party shall be responsible for its own internal costs of participating in the NEMC, such as costs for staff time and facilities used for pre-emergency planning. All costs incurred by the Lead Agency for the services of Prepare Northwest for or on behalf of the NEMC, which are provided in 2015 or after the effective date of this Agreement, shall be shared as follow:

Party	Total	Kenmore	LFP	KCFD 16	NUD
Percentage Share	100%	38.50%	38.50%	11.50%	11.50%

Any other costs incurred by the Lead Agency for or on behalf of the NEMC, and any costs incurred by a Party for or on behalf of NEMC, which are provided after the effective date of this Agreement, shall be shared in accordance with an agreement approved by all Parties in writing.

The Lead Agency shall send an invoice quarterly for the services described above on the first business day of the quarter. The invoice shall include the Lead Agency's billing fee, which shall be the Lead Agency's general billing fee under the Lead Agency's Code. The invoice shall be due 30 days after the invoice date. Within 30 days of the end of a calendar year, the Lead Agency shall prepare and deliver to the Parties a reconciliation of expenditures and fees collected for the previous calendar year, and any surplus resulting from the reconciliation shall be shared by the Parties proportionally, based on the cost-sharing percentages above or as agreed to by the Parties, as applicable, and shall be credited against the second quarter cost assessments of the Parties in the year of the reconciliation.

- (13) Financial Commitment: No counting amounts paid for the services of Prepare Northwest that are provided and paid for prior to the effective date of this Agreement, the maximum financial commitment of the Parties, for the one-year duration of this Agreement, shall be as follows:

	Total	Kenmore	LFP	KCFD 16	NUD
Budget	\$65,000	\$25,000	\$25,000	\$7,500	\$7,500

There shall be no additional cost assessment without the agreement of all Parties.

- (14) Regular Operations: Each Party shall continue to fulfill its respective municipal functions and duties without reimbursement from any other Party to this Agreement. Although the Parties are administering and coordinating their emergency management plans and programs under this Agreement, each Party shall retain sole discretion and full control over its own emergency plans and programs and resources.
- (15) Mutual-aid: During an emergency, the individuals listed under the "Notices" section, or their successors as set forth in a notice to the other Parties, are authorized to request assistance from any other Party for services outside of the regular roles and municipal duties of that Party. The requested Party is not obligated to fulfill any request. If assistance is rendered, the requesting Party shall pay for the assistance at the rates published on the responding Party's website.
- (16) Early Termination: Any Party may withdraw from this Agreement with a 120-day written notice to the other Parties. Costs paid and resources contributed by the withdrawing Party shall not be refundable. The financial commitments of the remaining Parties, as set forth in Section 13 above, shall not be modified as a result of such withdrawal, unless such financial commitments are insufficient to pay for the expenses incurred by the Lead Agency or any Party on behalf of the NEMC prior to the withdrawal.
- (17) Notices: All NEMC email notices shall be sent to the Parties at the following addresses:

NEMC Interlocal Agreement

LFP	Pete Rose	prose@ci.lake-forest-park.wa.us
LFP	Steve Sutton	ssutton@ci.lake-forest-park.wa.us
LFP	Frank Zenk	fzenk@ci.lake-forest-park.wa.us
Kenmore	Rob Karlinsey	rkalinsey@kenmorewa.gov
Kenmore	Bryan Hampson	bhampson@kenmorewa.gov
Kenmore	Jennifer Gordon	jgordon@kenmorewa.gov
KCFD16	Jim Torpin	jtorgin@northshorefire.com
KCFD16	Doug Knight	dknight@northshorefire.com
NUD	Fanny Yee	fyee@nud.net
NUD	Al Nelson	anelson@nud.net

Written notices shall be sent by mail or hand-delivered to:

Pete Rose, City Administrator
City of Lake Forest Park
 17425 Ballinger Way NE
 Lake Forest Park, WA 98155

Rob Karlinsey, City Manager
City of Kenmore
 18120 68th Ave NE
 Kenmore, WA 98028

Jim Torpin, Fire Chief
King County Fire District 16
 7220 NE 181st Street
 Kenmore, WA 98028

Fanny Yee, General Manager
Northshore Utility District
 6830 NE 185th Street
 Kenmore, WA 98028

- (18) Indemnification: Except in those situations where the Parties have statutory or common law immunity for their actions and/or inactions and to the extent permitted by state law, and for the limited purposes set forth in this Agreement, each Party shall protect, defend, hold harmless and indemnify each other Party, its officers, elected officials, agents and employees, while acting within the scope of their employment as such, from and against any and all claims (including demands, suits, penalties, liabilities, damages, costs, expenses, or losses of any kind or nature whatsoever including attorney's fees) arising out of or in any way resulting from such Party's own negligent acts, errors, or omissions or willful misconduct related to such Party's participation and obligations under this Agreement. Each Party agrees that its obligations under this section extend to any claim, demand, and/or cause of action brought by or on behalf of any of its employees or agents. For this purpose, each Party, by mutual negotiation, hereby waives, with respect to the other Parties only, any immunity that would otherwise be available against such claims under the industrial insurance act provisions of Title 51 RCW.
- (19) No Third Party Beneficiaries: This Agreement is for the sole benefit of the Parties. No other persons shall be deemed to have any rights in, under, or to this Agreement.

Signatures on the next page.

NEMC Interlocal Agreement

The Parties have executed this Agreement on the dates written below:

LFP:

Kenmore:

By Mary Jane Goss, its Mayor
City of Lake Forest Park
Date Signed: _____

By Rob Karlinsey, its City Manager
City of Kenmore
Date Signed: _____

KCFD16:

NUD:

By Jim Torpin, its Fire Chief
King County Fire District 16
Date Signed: _____

By Fanny Yee, its General Manager
Northshore Utility District
Date Signed: _____

OVERLAPPING BOUNDARIES OF THE PARTIES



Attachment #4

To: Northshore Emergency Management Coalition
Re: Scope of Work Proposal
From: Carl Lunak, Prepare Northwest
Date: August 21, 2015
Updated: October 23, 2015

This initial scope of work has been developed based on a series of meetings I had with representatives of the City of Lake Forest Park, the City of Kenmore, King County Office of Emergency Management, Northshore Fire District and Northshore Utility District. The proposed scope of work may be changed based on feedback from Northshore Emergency Management Coalition (NEMC) members.

Background and Assumptions

The Emergency Services Coordinating Agency (ESCA) is officially closing its operation as of December 31, 2015 and will no longer provide services after October 31, 2015. This situation created an opportunity for the formation of the NEMC. The Coalition has been formed to efficiently coordinate emergency management for the City of Lake Forest Park, the City of Kenmore, Northshore Fire District and Northshore Utility District. Each member is unique and as such has many different emergency management needs and goals. Included in this scope of work are the tasks identified by each member that are mutually beneficial to all the Coalition members. (See Appendix B for more on stated goals.)

Project Tasks (See Appendix A)

1, 2. Updating Plans

With the dissolution of ESCA and formation of NEMC, existing emergency response plans and/or other related documents will need to be updated. The Comprehensive Emergency Management Plans (CEMP) for both cities require significant updating to reflect the new regional structure. It appears that there are some plans, or elements of plans that may not exist and will need to be developed. These include a Continuity of Operations Plan (COOP), Continuity of Government (COG) plan and a Sheltering plan. As we proceed there may be other plans that will also need to be developed.

King County Office of Emergency Management (KCOEM) will take an active role in writing the CEMPs for both Cities. Rewriting CEMPs will require staff from both Cities to be directly involved, including key decision-makers. A free flow of information between the Cities and KCOEM is critical for the success of this task. The Emergency Coordinator will function as a liaison between the NEMC members and KCOEM. The Coordinator will work to keep the process in line with the agreed upon target goals and dates. To bring the CEMPs to completion, a number of supporting tasks must be completed along the critical path while the plans are being developed. Upon completion of the CEMP's and acceptance by

the Washington Military Department's Emergency Management Division, the Coalition member staff will be trained on the new revised plans.

3. Emergency Volunteer Coordination

Both the Cities of Kenmore and Lake Forest Park utilize volunteers to fulfill various functions within each city and both cities have existing systems in place to organize those volunteers. Neither system are, however, ready to manage Community Emergency Response Team (CERT) trained volunteers nor Radio Amateur Civil Emergency Service (RACES) volunteers due to their specialized training, recordkeeping requirements, and qualifications. In addition, both cities desire to create a joint process to manage spontaneous and affiliated volunteers. A shared centrally located system will need to be developed to track affiliated emergency volunteers.

The Emergency Coordinator will assure that the system meets the requirements for emergency volunteers and will help to design procedures, forms and other required documents. The Coordinator will serve in a facilitation role in helping the NEMC jurisdictions recruit, train, and utilize their emergency volunteers. The Coordinator will assist with the implementation of a joint Volunteer Reception Center VRC. Northshore Fire District will continue to recruit and train CERT volunteers, provide meeting space for CERT programs and make staff available to train volunteers. All of the NEMC members and the Coordinator will need to look for opportunities to keep the volunteers active, by suggesting volunteering opportunities and continuing education. KCOEM can provide assistance with emergency volunteer training and activities. The completed functional shared system will be dependent on the software products available, and the Cities staffs' expertise.

4. Joint Emergency Operations Center (EOC)

None of the Coalition members have adequate staff to fill every role in a full EOC activation. In regional scenarios, setting up multiple EOC's independently may be a wasteful duplication of effort. A joint EOC will allow Coalition members to share responsibilities and be more efficient with limited staff.

The development of a joint EOC will also benefit the Coalition with a single situational awareness perspective. A tiered activation structure similar to KCOEM will allow for improved communication between the Coalition members and further efficiency. The decision for a primary and secondary location will need to be agreed upon and supported by all Coalition members. The Coordinator will facilitate the development and implementation of an EOC Plan with support and assistance from NEMC staff and KCOEM. Members will need to make staff available for initial training on EOC set up as well as routinely thereafter.

5. Staff Training

Each coalition member has some system in place to track required staff training and upcoming training opportunities. With the formation of the NEMC, there will be new required training for many staff members such as EOC activation as well as a focus on joint training opportunities.

A multi-year training schedule will be developed by the Emergency Coordinator to include new required training and also existing National Incident Management System (NIMS) classes that could benefit the Coalition. The Coordinator will set up and schedule some training depending on the needs of the members. It will be up to each member agency to continue to track employee training independently and authorize employees to attend. The actual classes will be performed by FEMA, Washington State Emergency Management, KCOEM, or other subject matter experts.

6. Combined Emergency Exercise

Based on hazards identified by each of the members, the Emergency Coordinator will propose a schedule of emergency exercises of varying degree and type. The schedule will span multiple years. Future exercises and drills will be developed in conjunction with KCOEM to meet the needs of the Coalition. With the multi-state functional exercise Cascadia Rising already scheduled for June 7, 2016, it is the recommendation of the Emergency Coordinator to participation in that exercise as the first combined exercise. The Coordinator will work with KCOEM and NEMC jurisdictions to schedule and coordinate exercises. At least one joint NEMC table top or field exercise will be held per year.

7. Resource Management

Both of the Cities relied on ESCA to develop and manage resources that could be called upon in an emergency. Any standing agreements, memorandums of understanding or mutual aid arrangements will need to be evaluated and possibly renewed. Other resource lists and accompanying documents will require updating.

All the members will need to provide copies of any standing agreements, resource lists and support documentation. All member agencies should have, at some time, performed a vulnerability assessment to determine what resources are likely to be needed. The Emergency Coordinator will evaluate the standing agreements and the needs of each member agency to identify and report gaps in anticipated resource needs. The Coordinator will facilitate and support the merging of multiple resource lists into one. KCOEM will assist with regional resources. NSF and NUD have robust mutual aid agreements in place to meet their primary functions but should evaluate secondary resource needs.

8. Coordinated Communications

Each member agency has a unique way of communicating critical information to internal and external audiences. These systems can always be improved upon in both day-to-day situations and during emergencies. A shared system for emergency communication needs to be developed.

The member agencies will need to share their policies and procedures for disseminating information. Key decision-makers need to be identified at each agency along with preferred points of contact specifically for critical information. The Emergency Coordinator will assess existing strategies and recommend a system to share information. A regional communication system will require regular use by all the members to be effective during emergencies. KCOEM will assist with public outreach and notification.

Project Schedule

Completion dates for the specific deliverable listed in the chart are dependent on the start date and will be established once a start date has been determined. The Emergency Coordinator will provide monthly status reports to the members that includes progress on all deliverables. With the dissolution of ESCA proceeding rapidly some elements such as volunteer coordination would benefit from the earliest possible start date.

Project Cost

Based on the discussions among the members, my role has changed from what was initially described in Fanny Yee's email of June 25, 2015 (See Appendix C), as KCOEM will now be developing the plans and I will be fulfilling the other roles described above. As proposed in the Inter-Local Agreement, the City of Lake Forest Park will serve as the lead agency and as such will be billed monthly by Prepare Northwest for work performed at a rate of \$65 per hour with a maximum number of hours not to exceed 80 hours per month. I will provide a detailed description of work completed for the hours billed. Division of those costs amongst the Coalition members will be the responsibility of the City of Lake Forest Park as the lead agency. I will endeavor to keep all NEMC members informed about my progress. I will be willing to subject myself to a 30-day, no cause termination notice in my service agreement.

ATTACHMENT #5



King County

Office of Emergency Management

Department of Executive Services
3511 Northeast Second Street
Renton, WA 98056
206.296.3830 TTY Relay: 711
www.kingcounty.gov

RECEIVED
OCT 26 2015

CITY OF KENMORE

October 20, 2015

Rob Karlinsey, City Manager
City of Kenmore
PO Box 82607
Kenmore, WA 98028

Dear Mr. Karlinsey:

With the dissolution of ESCA coming at the end of October, 2015, I wanted to welcome you to King County's regional emergency management program. As part of that program, you have access to regional services, some of which are outlined below and some which are outlined in the accompanying services catalog. Please know that neither document is meant to be all inclusive. The King County Office of Emergency Management (KCOEM) is pleased to assist with activities in the mission areas of mitigation, preparedness, response and recovery as follows:

Preparedness

Planning. With the dissolution of ESCA, existing emergency response plans and/or other related documents will need to be updated. KCOEM will take an active role in convening stakeholders to collect information, writing and updating relevant plans and assisting with any applicable approval processes. KCOEM will also work with the emergency management point of contact to integrate the City into any regional planning efforts.

Emergency Volunteer Coordination. KCOEM will facilitate emergency worker registration for volunteers to include, but is not limited to, CERT and RACES. KCOEM can also provide assistance with training and activities, as well as access to regional opportunities.

Training/Exercise. KCOEM will assist with training needs for city staff and senior elected officials, and will integrate the city into regional training efforts. Classes could be conducted by KCOEM, Washington State Emergency Management, FEMA, or other subject matter experts. KCOEM will also work with city staff to develop and conduct exercises. Similar to training efforts, there will also be an opportunity for city staff to participate in regional drills and exercises.

Response Coordination

Duty Officer/EOC Support. KCOEM will provide 24 hour access to a duty officer for emergency management issues. The phone number is 206-423-6119. In addition, KCOEM will activate the King County ECC to support the city. The level of the activation will depend of the situation, but the priority will be to make King County emergency resources available. When requested and practical, KCOEM will deploy a liaison to the jurisdiction to assist with incident management leadership, technical and other support.

Alert and Warning. KCOEM will use multiple means of communication to notify, warn and provide information and instruction to the general public regarding impending or occurring disasters. Not only is the city included in the County mass notification system, but also have access to numerous public information officers who can support the City on site or through virtual means. KCOEM will continue to support the city's use of the notification system to communicate with and mobilize city staff and volunteers.

Resource Management. KCOEM will assist with regional resource management, providing all necessary forms, training and technology access to ensure the cities requests for resources are addressed in a timely, coordinated manner.

Mitigation

King County OEM will provide assistance with mitigation planning and identifying mitigation measures that would enhance the city's resilience. Staff will assist the city in seeking grant funds to implement those measures.

Recovery

KCOEM acts as the county's applicant agent for disaster recovery, meaning all requests for assistance will be coordinated and supported through this office. In addition, the City will be included in all disaster recovery planning efforts as well as the resilient King County initiative.

Again, this is not meant to be an all-inclusive list of services. On behalf of our entire staff, I welcome Kenmore to our regional program and look forward to our partnership in making King County the best prepared county in the State.

Sincerely,



Walt Hubbard, Director
King County Office of Emergency Management

Cc: Bryan Hampson, City of Kenmore