



City of Kenmore - 18120 68th Avenue NE - Kenmore, WA 98028
Phone: 425-398-8900 - E-mail: cityhall@kenmorewa.gov

**City of Kenmore
City Council Regular Meeting Agenda
7:00 p.m., Monday, June 22, 2020 via Zoom**

Log-in Information for the Council Meeting:

Please click the link below to join the webinar or copy and put this link in your address bar in your web browser:

<https://us02web.zoom.us/j/88632571321>

Or iPhone one-tap :

US: +12532158782,,88632571321# or +16699009128,,88632571321#

Or Telephone:

Dial(for higher quality, dial a number based on your current location):

*US: +1 253 215 8782 or +1 669 900 9128 or +1 346 248 7799 or +1 646 558 8656 or
+1 301 715 8592 or +1 312 626 6799*

Webinar ID: 886 3257 1321

International numbers available: <https://us02web.zoom.us/j/88632571321>

If you have any questions or to confirm agenda items prior to the meeting, or if you require special accommodations, please email the City Clerk at kchelin@kenmorewa.gov.

I. CALL MEETING TO ORDER

II. ROLL CALL

III. FLAG SALUTE

IV. AGENDA APPROVAL

V. PRESENTATION

- A. Recognition of Fire Marshall Jeff LaFlam's Years of Service to the City - Brian Hampson, Development Services Director
- B. Forterra Riparian Restoration Program – Sammamish River - Richard Sawyer, Environmental Services Manager
[Agenda Item](#)
[Presentation](#)

VI. CITIZEN COMMENTS

- A. This is an opportunity to express your views on issues that are important to you

and to the community. Please email comments to the City Clerk at kchelin@kenmorewa.gov by 5:00 p.m. on Monday, June 8, 2020. The Mayor will read the comments into the record during the meeting. You can also use the "raise hand" feature in Zoom during the Citizen Comment portion of the meeting. The 3-minute limit still applies.

VII. CONSENT AGENDA

- A. Total Checks #44965 through 45034 in the amount of \$1,002,239.39.
Total Payroll/Taxes/Retirement/Flexible Spending/Health Savings Electronic Deposits dated 5/22/20 in the amount of \$160,413.74.
[Checks](#)
- B. City Council Meeting Minutes of May 11, 2020 and May 26, 2020
[5-26-20 Minutes](#)
[5-11-20 Minutes](#)
- C. Authorize the City Manager to Execute a Contract with the Responsible Low Bid Contractor for the 2020 Pavement Sealing Project for an amount up to \$700,000
[Agenda Item](#)
[Memorandum](#)
- D. Receive and File the April, 2020 Financial Report for the City of Kenmore
[Agenda Item](#)
- E. Adopt Resolution 20-341 Adopting the King County Regional Hazard Mitigation Plan and Kenmore Plan Annex
[Agenda Item](#)
- F. Adopt Ordinance 20-0508 Federal Emergency Management Agency (FEMA) Flood Hazard Area Zoning Code Amendments
[Agenda Item](#)
- G. Authorize the City Manager to Execute an Agreement with Transpo Group in an amount not to exceed \$70,000 (includes 10% contingency) for design and construction management services of the Local Road Safety Plan (LRSP) Signing and Lighting projects
[Agenda Item](#)
- H. Authorize City Manager to Purchase Two Environmental Services Division Vehicles up to the Approved Budget Amount of \$60,000
[Agenda Item](#)

VIII. BUSINESS AGENDA

- A. Environmental Sustainability Initiatives - Rob Karlinsey, City Manager and Adam Nebenzahl, Management Intern
[Environmental Sustainability Initiatives Agenda Bill Presentation](#)

[Plan for the Climate Action Plan](#)
[Local Governments for Sustainability \(ICLEI\)](#)
[Forterra Green City Partnership](#)
[Green City Presentation](#)
[Tree City USA](#)
[Salmon-Safe Certification](#)

- B. Ad-Hoc Public Art Committee's Recommendation to Accept Jennifer Dixon's Final Artwork Designs for Three Walkways and Waterways Projects at: Log Boom, Squire's Landing and Rhododendron Parks; and Authorization for the City Manager to Enter into a Fabrication and Installation Contract (Contract 20-C2159) with the Artist (Jennifer Dixon) - Maureen Colaizzi, Parks Project Manager
[Agenda Item](#)
[Presentation](#)
- C. King County-Cities Climate Collaboration (K4C) Letter of Joint Commitment - Richard Sawyer, Environmental Services Manager
[Agenda Item](#)

IX. STAFF REPORT

- A. Pandemic Update - Rob Karlinsey, City Manager
- B. Coronavirus Relief Funds (CRF) and Eligible Reimbursement Costs - Debbie Bent, Community Development Director
[Memorandum](#)
- C. Parks Project Status Update - Debbie Bent, Community Development Director
[Memorandum](#)
- D. Transportation Capital Improvement Plan Update - John Vicente, City Engineer
[Memorandum](#)

X. COUNCILMEMBER REPORTS, COMMENTS & INITIATIVES

XI. ADJOURNMENT

Subject/Topic: Forterra Riparian Restoration Program – Sammamish River.	For Council Meeting Agenda of: June 22, 2020 Department: Public Works, Env Services Division Prepared by: Richard Sawyer, Env Services Manager <u>Initial & Date</u> Approved by Department Head: RS Approved by City Attorney: _____ Approved by Finance Director: _____ Approved by City Manager: RK 6/12/20
Proposed Council Action/Motion: No Council action is needed – presentation is for information only.	Exhibits/Attachments: NA

INFORMATION/BACKGROUND:

Forterra's Riparian Restoration Program has been working to restore riparian zones throughout the Puget Sound region since 2010. Building on the early success of knotweed control and revegetation on the banks of the Cedar River, the program is continuing to expand to new watersheds. As of spring 2020, Forterra is working to restore riparian areas of Bear Creek, the Green-Duwamish Basin, Thornton Creek and the Skykomish Basin.

The objectives of the Riparian Restoration Program are to:

- Improve and increase the resiliency of riparian functions, including:
 - surface water storage and filtration
 - soil stabilization
 - riparian and instream fish and wildlife habitat provision
- Foster a stewardship ethic among private landowners, to be the long-term stewards and champions of the river

To achieve these objectives, the program follows a model originally developed for restoration of the Cedar River, and now replicated across numerous watersheds. The program model:

- Approaches riparian restoration at the landscape scale
- Aims to convene, mobilize and coordinate all relevant partners - state and federal landowners, tribes, cities, counties, private landowners, community groups and restoration practitioners active on the river - recognizing a diverse partnership group has more opportunity to generate and sustain interest and funding for future management challenges
- Allows Forterra to fill programmatic gaps in watershed management, typically through engagement of private landowners

With the financial assistance of a grant awarded by King County's WaterWorks grant program, Forterra is now working to bring this model of restoration to the Sammamish River. Before Forterra can begin replicating the program model successful in other basins, they are leading a process to better understand the needs of the Sammamish River community, and will be working to streamline the permitting process for conducting restoration work along the Sammamish along with partners, including the City of Kenmore, other local municipalities, state, county and federal agencies.

FISCAL CONSIDERATION:

The City does not have a financial commitment at this stage of the process other than staff time assisting Forterra with their efforts. Once Forterra completes their study staff will return to Council with an update on a plan moving forward.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

Council's 2020-2021 Priority #3 "Develop a Kenmore Climate and Environment Action Plan including water, air, forest, and habitat restoration

FORT&RRA



**WE SECURE PLACES—
URBAN, RURAL & WILD—
THAT ARE KEYSTONES OF A
SUSTAINABLE FUTURE FOR ALL.**

FORTERRA

SAMMAMISH RIVER RIPARIAN RESTORATION

ELI TOME
DIRECTOR OF RIPARIAN RESTORATION

FORT&ERRA

CEDAR RIVER MODEL

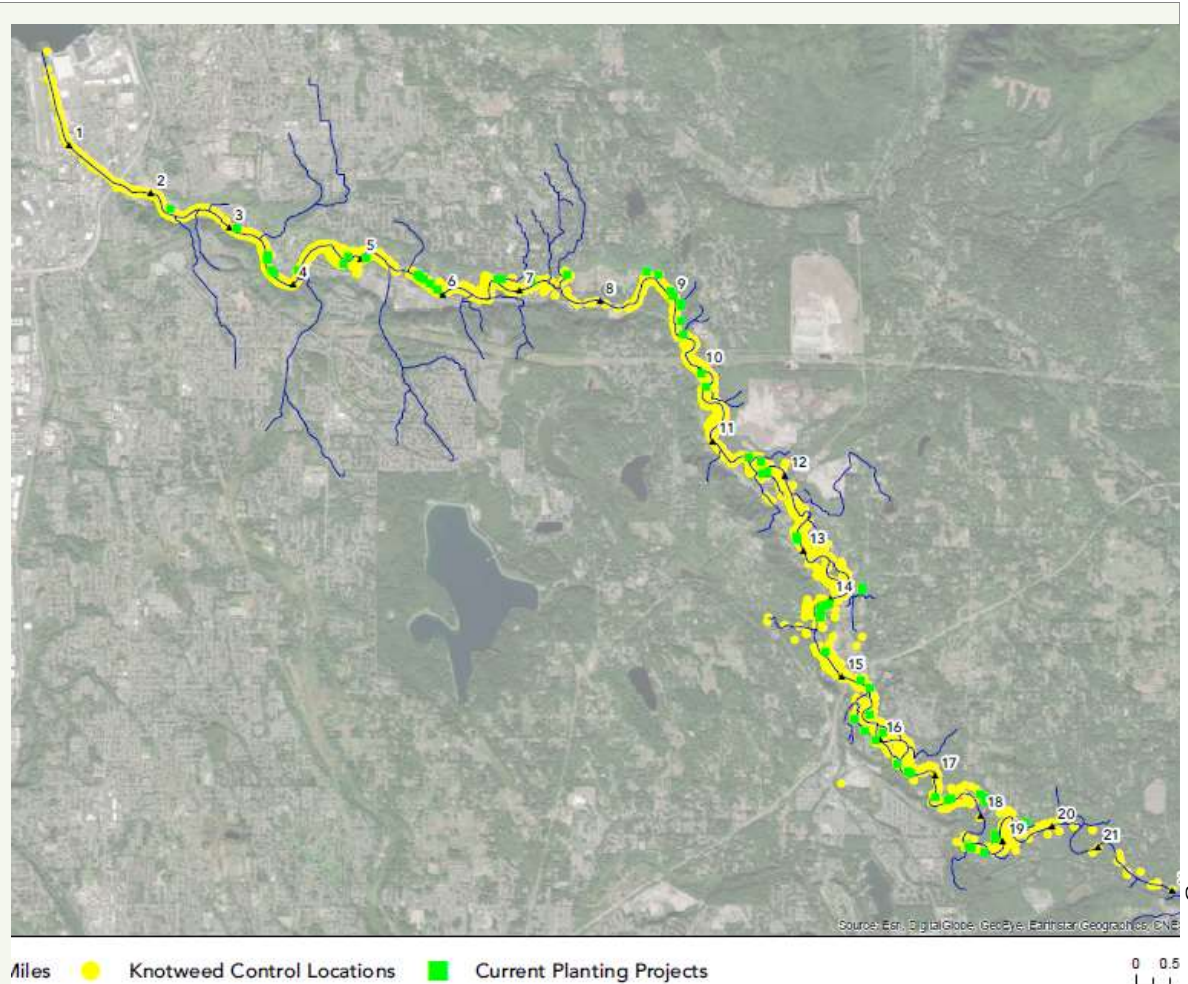
22 miles of control

Over 350 landowners

Community Engagement
through volunteer
opportunities

Nearly 95% controlled after 10
years of investment

Focus pivoting to revegetation
of native plants



SAMMAMISH

Aquatic invasive weeds

Reed Canary Grass

Blackberry

Knotweed

Temperature, need for shade



Photos from wikipedia

CHALLENGES

Permitting

Cross jurisdictional
coordination

Strategic approach to invasive
weed management



SAMMAMISH RESTORATION PROJECT

King County Waterworks
Council Allocation

Convene stakeholders along
the river

Identify permitting barriers and
work with ACOE and other
partners to streamline
permitting process

Draft a strategic action plan to
restore native plant
community through an
integrated weed management
approach



TIMELINE

Summer 2020:

- Outreach to stakeholders

Late Summer/Fall 2020:

- Identify main restoration project implementers
- Work with partners to streamline permitting process

Fall 2020 through Spring 2021

- Develop strategic plan
- Formalize partnership and create memorandum of understanding



THANK YOU!



Voucher Certification and Approval

City of Kenmore

DATE RANGE:

05/16/2020-05/29/2020

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, that any advance payment is due and payable pursuant to a contract or is available as an option for full or partial fulfillment of a contractual obligation, and the the claim is a just, due and unpaid obligation against the City of Kenmore and that I am authorized to authenticate and certify to said claim. The following checks and electronic payments are

Total Check #s 44965 through 45034: \$1,002,239.39

Total Payroll/Taxes/Flexible Spending/Retirement/Health Savings Electronic Deposits Dated: 5/22/2020: \$160,413.74

R. J. Kees 6/2/20
City Manager / Date

Joanne M. Gregory 5/29/20
Finance Director / Date

Vendor Name	Check #	Date	Description	Amount
AFLAC	44965	05/22/2020	Employee Medical/Disability Plans	359.99
AMERICAN GENERAL LIFE GPO/4005	44966	05/22/2020	Life Insurance	279.92
AWC EMPLOYEE BENEFIT TRUST	44967	05/22/2020	Employee Health Insurance	62,628.02
AWC EMPLOYEE BENEFIT TRUST	44968	05/22/2020	Void	-
DEPARTMENT OF LABOR AND INDUSTRIES	44969	05/22/2020	City of Kenmore	3,598.18
DEPARTMENT OF LABOR AND INDUSTRIES	44970	05/22/2020	Void	-
EMPLOYMENT SECURITY DEPARTMENT	44971	05/22/2020	Paid Family & Medical Leave	1,282.75
ICMA RETIREMENT C/O ALLFIRST BANK/109964	44972	05/22/2020	City of Kenmore 401a	17,850.91
ICMA RETIREMENT TRUST 457 / 304745	44973	05/22/2020	ICMA 457 Deferred Comp	5,742.94
LINCOLN NATIONAL LIFE INSURANCE	44974	05/22/2020	Life Ins/ADD & LTD	1,346.57
NATIONAL LIFE OF VERMONT	44975	05/22/2020	Life Insurance	123.17
STATE OF FLORIDA DISBURSEMENT UNIT	44976	05/22/2020	Employee Deduction	275.00
UNITED WAY OF KING COUNTY	44977	05/22/2020	Employee Charitable Contribution	53.00
A+ CONFERENCING	44978	05/29/2020	Conference Calls	55.83
AM TEST, INC	44979	05/29/2020	Swamp Creek Water Sample Testing	225.00
BANNER BANK BAKER	44980	05/29/2020	Zoom/Jurassicparliament/EB Leading Well	159.60
BUILDERS EXCHANGE OF WASHINGTON INC	44981	05/29/2020	W Samm/Juanita Ped/Bike Proj Publishing	600.80
CANON FINANCIAL SERVICES, INC.	44982	05/29/2020	May 2nd Floor Copier Lease	265.84
CECCANTI, INC.	44983	05/29/2020	19-C1977 Apr. W. Samm. Bridge Construction	529,479.44
CENTER FOR HUMAN SERVICES	44984	05/29/2020	Human Svcs Emergency Funds for PPE	2,500.00

CITY OF BELLEVUE	44985	05/29/2020	ARCH Housing 2020 Contributions	40,000.00
CITY OF BELLEVUE	44986	05/29/2020	2020 Aerial Map Project	2,314.27
CITY OF SHORELINE	44987	05/29/2020	2019 SET Charges for NAR C19040858	2,196.00
COLUMBIA RIDGE LANDFILL	44988	05/29/2020	April Sweeper Dump Fees	2,272.10
COMCAST	44989	05/29/2020	April City Hall Phones	369.98
COMCAST	44990	05/29/2020	April City Hall, KBI & Hangar Internet	2,188.78
COMCAST BUSINESS	44991	05/29/2020	5/14-6/13 City Hall Cable/Internet	162.22
COMCAST BUSINESS	44992	05/29/2020	5/10-6/9 Squire's Landing Internet	79.95
DEPARTMENT OF COMMERCE	44993	05/29/2020	61st/190th Culvert PWTF Loan Payment	6,561.97
GOVERNMENT FINANCE RESEARCH GROUP	44994	05/29/2020	Municast Forecasting Annual Maint./Updates	1,995.00
GREGORY, JOANNE	44995	05/29/2020	Reimbursement for Online Training Classes	267.00
HERRERA ENVIRONMENTAL CONSULTANTS	44996	05/29/2020	20-C2153 3/2-3/27 Aquatic Weeds Prof. Svcs	1,250.90
HONEY BUCKET	44997	05/29/2020	5/4-5/31/20 PW Yard Rental	150.15
HORIZON DISTRIBUTORS INC	44998	05/29/2020	Irrigation Supplies	11.23
INTERSECTION MEDIA, LLC	44999	05/29/2020	Outreach Materials-Puget Sound Starts Here	194.22
JACOBS ENGINEERING GROUP	45000	05/29/2020	2/13-4/24 W. Samm Bridge Engineering/Proj Mgmt	67,856.69
JAYMARC AV	45001	05/29/2020	Hangar Software/Projector/Power/Audio Repairs	866.25
JET CITY CLEANING	45002	05/29/2020	SWM Facilities Asphalt Cleaning	5,632.00
KBA INC.	45003	05/29/2020	18-C1846 April W. Samm. Bridge Project Mgmt.	99,499.07
KENMORE COMMERCIAL LLC	45004	05/29/2020	June Incubator Bldg. Lease Payment	3,367.04
KING COUNTY FINANCE	45005	05/29/2020	April Road Svcs/Signs	1,167.21
KING COUNTY FINANCE	45006	05/29/2020	April Road Svcs/Sign & Signal Maintenance	2,735.26
KING COUNTY RECORDER'S OFFICE	45007	05/29/2020	Filing Fee Title Notice Extingulshment - Violation	104.50
MOTT MACDONALD GROUP, INC.	45008	05/29/2020	Apr. Squire's Landing Design/Permitting Svcs	28,997.09
NORTHSHORE FIRE DEPT	45009	05/29/2020	March/April Fire Marshal Plan Review	920.00
NORTHSHORE UTILITY DIST	45010	05/29/2020	3/15-5/15 CH/Hangar/Parks/Irrigation	1,479.14
OLSON BROTHERS PRO VAC	45011	05/29/2020	19-C1978 15322 61st Pl CCTV//Hydro Excavating	3,360.00
OLSON BROTHERS PRO VAC	45012	05/29/2020	19-C1978 Vactor Truck/Jetting Svcs	1,400.00
OLSON BROTHERS PRO VAC	45013	05/29/2020	19-C1978 Vactor Services	1,400.00
OLSON BROTHERS PRO VAC	45014	05/29/2020	19-C1978 Vactor/CCTV Svcs	1,885.00
OLSON BROTHERS PRO VAC	45015	05/29/2020	19-C1978 Vactor Truck/Jetting Svcs	1,400.00
PACE ENGINEERS, INC.	45016	05/29/2020	April Development Svcs Engineering Consultant	501.50
PUGET SOUND ENERGY	45017	05/29/2020	Apr. St. Lights/CH, Hangar & Incubator Gas/Electric	10,123.47
QUALITY BUSINESS SYSTEMS / WELLS FARGO	45018	05/29/2020	5/5-6/4/20 1st Floor Copier Lease	675.53
RED BARN ENGINEERING, INC.	45019	05/29/2020	20-C2128 5/11-5/22 Engineering/Inspection Svcs	3,827.00
RED BARN ENGINEERING, INC.	45020	05/29/2020	20-C2128 3/27-5/8 Engineering/Inspection Svcs	11,479.25

RED BARN ENGINEERING, INC.	45021	05/29/2020	20-C2128 2/3-2/24 Engineering/Inspection Svcs	4,313.25
REPUBLIC SERVICES	45022	05/29/2020	April Hangar Bldg. Solid Waste Svcs	597.89
SCORE	45023	05/29/2020	April Inmate Housing/Medical	14,960.00
SCORE	45024	05/29/2020	March Outside Health Services @ SCORE	454.24
SHANNON & WILSON, INC.	45025	05/29/2020	19-C2122 4/2-5/2 Prof. Geotech Consulting Svcs	2,422.50
SMS CLEANING, INC.	45026	05/29/2020	City Hall/Hangar/PW Monthly Janitorial Svcs	6,495.00
STEWART MACNICHOLS HARMELL, INC.	45027	05/29/2020	April Public Defense Services	5,000.00
T MOBILE USA, INC.	45028	05/29/2020	Staff Cell Phones/Data Plans	989.52
TOTAL LANDSCAPE CORP	45029	05/29/2020	City Hall & Parks' Monthly Landscaping Svcs	5,025.45
TOWN CENTER HARDWARE	45030	05/29/2020	Irrigation Parts & Supplies	172.92
UTILITIES UNDERGROUND LOCATION CTR	45031	05/29/2020	April Utility Locates	199.95
WA STATE DEPT OF TRANSPORTATION	45032	05/29/2020	Apr. 68th/175th & 68th/181st Signal Maint.	263.50
WILLIAMS, KASTNER & GIBBS PLLC	45033	05/29/2020	Apr. Special Counsel Kenmore v. El-Sharawy	3,297.50
COLUMBIA FORD	45034	05/29/2020	2020 Ford EcoSport - Development Services	22,530.94
DRS 457	DFT0000692	05/22/2020	DRS 457 Deferred Comp	1,908.91
AVIDIA HEALTH	DFT0000693	05/22/2020	Employee Health Savings Contribution	100.00
DEPARTMENT OF RETIREMENT SYSTEMS	DFT0000694-99	05/22/2020	Public Employees Retirement	31,891.60
NAVIA	DFT0000700	05/22/2020	Employee Flexible Spending Account	416.15
BANK OF AMERICA 941	DFT0000701	05/22/2020	Federal Taxes	17,957.79
PAYROLL	Electronic Deposit	5/22/2020 Direct Deposit		108,139.29
				<u><u>\$ 1,162,653.13</u></u>

VII. A. Total Checks #44965 through 45034 in the amount of \$1,002,239.39...



City of Kenmore

Vendor Purchasing Report

For Date Range 01/01/2020 - 05/29/2020

Vendor Set: Vendor Set 01

Vendor	Name	Volume
0002	ACTION ENTERTAINMENT	550.00
0014	AMERICAN PLANNING ASSOCIATION	1,336.00
0022	ASSOCIATION OF WA CITIES	90.00
0024	BAKER, DAVID	4,051.53
0037	BASTYR UNIVERSITY	351.45
0054	BULGER SAFE & LOCK, INC.	173.41
0064	CASCADE PEST CONTROL	572.00
0067	CENTER FOR HUMAN SERVICES	2,500.00
0076	CITY OF BELLEVUE	101,518.12
0083	CITY OF LAKE FOREST PARK	48,111.00
0086	CITY OF SHORELINE	2,196.00
0092	CODE PUBLISHING COMPANY	922.30
0099	CONSOLIDATED PRESS	4,349.92
0106	CROWN PRODUCTS LLC	991.20
0109	DAILY JOURNAL OF COMMERCE	1,482.60
0111	DEPARTMENT OF ECOLOGY	18,077.85
0121	REPUBLIC SERVICES	6,440.80
0130	EMPLOYMENT SECURITY DEPARTMENT	6,899.90
0137	FERGUSON ENTERPRISES INC #3011	1,322.83
0145	FRUHLING SAND & TOPSOIL	1,296.67
0151	CALPORTLAND COMPANY	783.49
0152	GOVERNMENT FINANCE OFFICERS ASSOC	190.00
0169	HERRERA ENVIRONMENTAL CONSULTANTS	1,250.90
0173	HOME DEPOT CREDIT SERVICES	1,014.10
0174	HOPELINK	10,000.00
0184	INSLEE, BEST, DOEZIE & RYDER, P.S.	80,769.21
0197	JET CITY PRINTING	820.60
0201	KCDA PURCHASING COOP	4,010.70
0205	KENMORE HERITAGE SOCIETY	100.00
0213	KING COUNTY ANIMAL SVCS	1,435.00
0216	KING COUNTY FINANCE	500.00
0218	KING COUNTY FINANCE	1,552.81
0219	KING COUNTY FINANCE	50,468.10
0224	SOUND PUBLISHING, INC.	395.00
0230	KING COUNTY RADIO COMM SERVICES	300.30
0233	KING COUNTY SHERIFF	35,125.32
0235	KING COUNTY TREASURY	39,839.98
0246	LAKE CITY PICTURE FRAMING	310.21
0251	LIGHTHOUSE CONSULTING INC	44,767.35
0261	PENDLETON CONSULTING LLC	4,200.70
0285	NORTHSHORE FIRE DEPT	2,240.00
0286	NORTHSHORE SCHOOL DISTRICT	116,303.00
0287	NORTHSHORE SENIOR CENTER	16,800.00
0288	NORTHSHORE UTILITY DIST	30,477.19
0290	NORTHSHORE YOUTH & FAMILY SERVICES	4,000.00
0292	HONEY BUCKET	7,373.75
0299	EBIX, INC.	118.27
0300	OFFICE DEPOT	2,940.69
0304	OLYMPIC ENVIRONMENTAL RESOURCES INC	1,540.00
0310	PACIFIC TOPSOILS	3,372.95
0314	PETTY CASH CUSTODIAN	400.31
0327	PUGET SOUND CLEAN AIR AGENCY	18,889.00

Vendor Purchasing Report

For Date Range 01/01/2020 - 05/29/2020

Vendor Set: Vendor Set 01

Vendor	Name	Volume
0328	PUGET SOUND ENERGY	75,976.17
0329	PUGET SOUND FINANCE OFFICERS ASSOC	130.00
0345	SEATTLE TIMES	2,457.55
0355	STAPLES ADVANTAGE	7,085.50
0357	STEWART MACNICHOLS HARMELL, INC.	25,000.00
0359	SOUND CITIES ASSOC	15,539.29
0365	TOTAL LANDSCAPE CORP	37,084.25
0371	UNITED STATES POSTMASTER	1,817.64
0375	US POSTAL SERVICE (HASLER)	4,422.83
0385	WA ASSOC OF BUILDING OFFICIALS	70.00
0387	WA CITIES INSURANCE AUTHORITY	329,569.00
0401	WA STATE DEPT OF TRANSPORTATION	3,617.76
0405	WASHINGTON STATE OFFICE CASH MGMT	880.00
0412	COLUMBIA RIDGE LANDFILL	13,077.91
0424	ICMA RETIREMENT TRUST 457 / 304745	63,306.40
0425	DRS 457	20,992.73
0426	AFLAC	1,799.96
0428	BANK OF AMERICA 941	199,256.26
0429	AWC EMPLOYEE BENEFIT TRUST	311,053.80
0431	DEPARTMENT OF RETIREMENT SYSTEMS	348,320.86
0432	DEPARTMENT OF LABOR AND INDUSTRIES	18,376.24
0434	UNITED WAY OF KING COUNTY	583.00
0436	NATIONAL LIFE OF VERMONT	615.85
0448	UPS STORE KENMORE	414.24
0450	AURORA RENTS	2,356.89
0473	ARTS OF KENMORE	3,400.00
0515	NATIONAL LEAGUE OF CITIES	1,563.00
0550	KING COUNTY RECORDER'S OFFICE	216.00
0586	QUADIENT LEASING USA, INC.	709.50
0588	ENVIRONMENTAL SYSTEMS RESEARCH INST	5,720.00
0641	TELESYSTEMS WEST	137.51
0685	PACE ENGINEERS, INC.	27,083.95
0690	BUILDERS EXCHANGE OF WASHINGTON INC	1,011.55
0692	HDR ENGINEERING, INC	177,813.53
0696	AMERICAN GENERAL LIFE GPO/400S	1,399.60
0699	BANNER BANK DB	1,114.51
0743	BANNER BANK NO	4,321.45
0764	OUSLEY, NANCY	86.08
0781	QUALITY BUSINESS SYSTEMS INC.	2,997.09
0791	NORTHSHORE ROTARY CLUB	367.00
0807	CASCADE RECREATION, INC	551.25
0817	GRAINGER	2,402.46
0828	PUGET SOUND BUSINESS JOURNAL	125.00
0831	NORTHSHORE PARK & REC SERVICE AREA	2,567.00
0851	EVER MARK, LLC	310.20
0852	GREGORY, JOANNE	267.00
0858	A+ CONFERENCING	1,438.38
0864	COLUMBIA FORD	22,530.94
0868	JAYMARC AV	5,814.62
0869	BANNER BANK JGORDON	181.99
0892	JACOBS ENGINEERING GROUP	94,936.78
0899	SHRED IT USA LLC	252.89
0912	ALCALDE & FAY	20,368.86
0913	KENMORE ELEMENTARY	2,500.00
0981	COMCAST BUSINESS	1,709.80
0994	GORDON THOMAS HONEYWELL	15,800.25
1003	IWORQ SYSTEMS	2,800.00
1010	TOWN CENTER HARDWARE	662.00

Vendor Purchasing Report

For Date Range 01/01/2020 - 05/29/2020

Vendor Set: Vendor Set 01

Vendor	Name	Volume
1045	HORIZON DISTRIBUTORS INC	2,826.35
1047	SARAH ROBERTS	46,841.59
1052	FIRE PROTECTION, INC	3,246.40
1068	WA STATE DEPT OF LABOR & INDUSTRIES	147.20
1114	PHSI PURE HEALTH SOLUTIONS INC.	404.36
1116	FRONTIER	4,922.99
1123	AM TEST, INC	900.00
1140	PAWS	975.00
1148	AGORA REFRESHMENTS	112.64
1177	WELLS FARGO FINANCIAL	81.67
1197	MILLER STEPHENS, MARY	6,250.00
1215	STATE OF FLORIDA DISBURSEMENT UNIT	3,025.00
1222	OLSON BROTHERS PRO VAC	26,469.73
1259	PERTEET INC.	352.36
1267	AUTOMATED CONTROLS	1,551.00
1269	KAMINS CONSTRUCTION INC.	7,047.24
1293	THE WATERSHED COMPANY	9,287.50
1297	GOVERNMENT FINANCE RESEARCH GROUP	1,995.00
1299	VERIZON WIRELESS	1,814.82
1309	BANNER BANK BAKER	6,831.54
1311	WASHINGTON STATE PATROL	1,039.49
1313	BOTHELL KENMORE CHAMBER OF COMMERCE	3,000.00
1322	AABCO BARRICADE COMPANY INC.	1,485.00
1331	KBA INC.	290,529.47
1339	STATE OF WA DEPARTMENT OF LICENSING	0.44
1345	SHERWIN WILLIAMS CO. #8099	57.96
1356	KARLINSEY, ROB	150.08
1357	KENMORE COMMERCIAL LLC	20,202.24
1358	ALPHAGRAPHS	649.40
1372	AAA PRINTING	922.14
1385	CITYWORKS/ AZTECA SYSTEMS INC.	37,100.00
1390	UTILITIES UNDERGROUND LOCATION CTR	851.40
1403	OSBORN CONSULTING INC.	122,917.34
1431	BRIEN, GAYLYNN	200.00
1452	CITY OF KENT	500.00
1456	HESTON VISUAL ARTS	214.70
1457	LANGUAGE LINE SERVICES, INC.	35.37
1459	FLEMINGS HOLIDAY LIGHTING LLC	5,174.70
1485	WA ASSOC OF PUBLIC RECORDS OFFICERS	25.00
1504	SCORE	131,648.89
1555	LINCOLN NATIONAL LIFE INSURANCE	6,755.13
1581	STARDOM SERVICES, INC.	2,847.66
1606	GALLATIN PUBLIC AFFAIRS	18,564.25
1629	WESTERN DISPLAY FIREWORKS, LTD.	4,750.00
1657	STEWART TITLE COMPANY	258,326.30
1673	KPFF CONSULTING ENGINEERS	89,393.34
1689	MOTT MACDONALD GROUP, INC.	330,993.68
1704	BANNER BANK RK	9,291.20
1711	SOFTWAREONE, INC.	11,360.34
1712	SITEIMPROVE, INC.	3,353.90
1718	RESOURCE EXPLORATION, LLC	20,000.00
1731	NORTHWEST ARBORICULTURE LLC	6,571.40
1738	MUNIMANAGE, LLC	5,280.00
1754	RFI ENTERPRISES INC.	365.20
1762	BAKER, BRIDGIT	905.54
1763	REID, JAMES FALCONER	7,717.50
1774	OWEN EQUIPMENT COMPANY	1,112.43
1814	YSI INCORPORATED, A XYLEM BRAND	1,789.98

Vendor Purchasing Report

For Date Range 01/01/2020 - 05/29/2020

Vendor Set: Vendor Set 01

Vendor	Name	Volume
1816	NAVIA	11,077.65
1828	QUALITY BUSINESS SYSTEMS / WELLS FARGO	3,377.65
1829	SHI INTERNATIONAL CORP.	882.79
1838	AVIDIA HEALTH	1,100.00
1884	CADMAN MATERIALS, INC.	47.50
1885	NATIONAL BARRICADE CO., LLC	1,958.00
1889	WILLIAMS, KASTNER & GIBBS PLLC	37,559.70
1892	HEARTH MUSIC	2,050.00
1901	NORTH COAST ELECTRIC COMPANY	1,837.55
1908	VAUGHAN, KENT	400.00
1914	MCNAMARA SIGNS	1,420.29
1927	GAMETIME	981.73
1930	T MOBILE USA, INC.	4,345.03
1932	U.S. BANK N.A. / CUSTODY	188.00
1945	GLASS MASTERS LLC	3,445.00
1948	MULTICARE CENTERS OF OCCUPATIONAL MEDICINE	100.00
1960	WALTER E. NELSON CO.	408.87
1964	EARTHWORKS	25,511.41
1970	CROSSROAD SIGN	385.00
1980	HRA VEBA TRUST	18,182.55
1985	CONTRACT LAND STAFF LLC	19,785.24
1991	WASHINGTON STATE TREASURER	6,290.28
1993	HYAS GROUP, LLC	3,750.00
1999	KING COUNTY POLICE CHIEFS ASSOCIATION	50.00
2004	RED BARN ENGINEERING, INC.	37,801.00
2009	O'CONNOR CONSULTING GROUP, LLC	21,000.00
2010	JUDHA OF LION LANDSCAPING AND SERVICES LLC	1,932.80
2017	DARRELL THOMSON	1,667.58
2024	DFR LAW GROUP, LLC	600.00
2048	SMS CLEANING, INC.	32,475.00
2054	BLUE FLAME HEATING, AIR & ELECTRIC	264.60
2081	SHANNON & WILSON, INC.	19,539.00
2113	WA ASSOC. OF SHERIFFS & POLICE CHIEFS	180.00
2119	PIONEER TOWING COMPANY	138,000.00
2120	LAKEPOINTE, INC.	24,000.00
2135	AMERICAN SOLUTIONS FOR BUSINESS	637.76
2142	ICMA RETIREMENT C/O ALLFIRST BANK / 109964	193,309.57
2143	ERIK D PLUMBER LLC	165.00
2147	SOD SPOT LLC	5,400.00
2156	ASSOCIATED PETROLEUM PRODUCTS INC.	1,536.49
2157	SOUND SAFETY PRODUCTS CO.	586.27
2161	BENNETT GOLD, TOBIN	4,035.47
2167	APWA/WA CHAPTER	1,500.00
2175	ELECTRONIC BUSINESS MACHINES	757.71
2176	CANON FINANCIAL SERVICES, INC.	1,329.20
2183	SISKUN POWER EQUIPMENT	363.56
2206	CHECK RIDE	3,450.00
2209	MORUP SIGNS, INC.	456.51
2211	PRECISION FUEL SOLUTIONS	1,237.50
2214	CAROLYN LAW	6,487.50
2215	INTERSECTION MEDIA, LLC	194.22
2221	O'REILLY/FIRST CALL	58.27
2222	GRADE, INC.	14,044.24
2236	COMCAST	12,826.50
2237	CREATIVE HOUSE BRANDING	942.93
2242	MARY'S PLACE	17,834.00
2247	EMERALD PAVING, INC	4,941.00
2249	KING COUNTY BAR ASSOCIATION	500.00

Vendor Purchasing Report

For Date Range 01/01/2020 - 05/29/2020

Vendor Set: Vendor Set 01

Vendor	Name	Volume
2252	TRUGREEN	302.50
2253	CHANCERY CIVIC LLC	11,208.60
2254	U.S. BANK PURCHASE CARDS	38,162.56
2259	MINUTEMAN PRESS	9,941.08
2264	SWOFFORD EXCAVATING	25,353.90
2268	IRIS WINDOW COVERINGS	8,635.00
2270	LAKESIDE INDUSTRIES	914.10
2283	VSS INTERNATIONAL INC.	72,923.00
2285	QUALITY WATER FINANCIAL	659.50
2295	ALL THINGS HR, LLC	175.00
2300	MICROSOFT CORPORATION	7,288.51
2311	BEST BEST & KRIEGER LLP ATTORNEYS AT LAW	11,232.00
2312	GOOD, MICHAEL J.	250.00
2313	MANAGEMENT PARTNERS	26,930.00
2318	PIXEYES GRAPHICS & DESIGN	780.00
2327	PACIFIC AIR CONTROL, INC.	3,634.68
2333	NORTHEND TRUCK EQUIPMENT CO., LLC	1,062.33
2334	NORTHSHORE YOUTH SOCCER ASSOC.	44.00
2335	DEBO, ALEXANDER	150.00
2336	CHRISTEN ESTATES, LLC	15,000.00
2337	HUANG, ANGELINA	7,500.00
2338	58 STARS TRAVEL	940.30
2339	EE-NA ENTERPRISES, LLC	1,147.75
2340	MOJO STRATEGIES	15,750.00
2341	ALLIANCEONE RECEIVABLES MGMT INC	350.93
2342	RAINBOW TOWING	302.50
2344	DZHENKOV, PETAR	275.00
2345	DEOL, GUR RAJ	275.00
2346	DILLON, MARGARET	550.00
2347	HOUSING AUTHORITY OF KING COUNTY WA	3,525.00
2348	ARROWHEAD PARK VISTA CONDOMINIUM ASSOCIATIC	2,150.00
2349	SSI & MHA CORPORATION	9,755.00
2351	ENGINEER SUPPLY	709.00
2352	EARTHCAM	15,715.73
2353	NORTHSHORE SCHOOLS FOUNDATION	4,000.00
2354	ALLAN WEBB NISSAN	62,542.46
2355	BUREAU VERITAS	9,900.00
2356	KEIM, JEANNIE	150.00
2357	4IMPRINT	432.07
2359	PRECISION PLUMBING AND HEATING	165.90
2360	O'CAIN, MELANIE	965.22
2361	BFI 4 LLC	26,351.99
2362	CHASEWEST VENTURES, INC.	25,406.25
2363	IDAHO ASSOC. OF BUILDING OFFICIALS, INC.	25.00
2364	JASON'S CREATIONS	350.00
2365	ADAM TIEGS	350.00
2366	CCI SOLUTIONS	858.00
2367	MARGARET FLYNN	650.00
2368	JEFF LUKE PHOTOGRAPHY LLC	4,525.11
2369	MARIA SZABLYA RIVAS	150.00
2370	PYRAMID CATERING & EVENTS	925.00
2371	RACHEL RISING	150.00
2372	ANDERSON ROOFING INC.	218.60
2373	BRAD OR KELLI CARSON	150.00
2374	DEPARTMENT OF NATURAL RESOURCES	1,261.17
2375	FONG, DAPHNE	150.00
2376	LISA TROUT	100.00
2377	NORTH URBAN HUMAN SVCS ALLIANCE	1,000.00

Vendor Purchasing Report**For Date Range 01/01/2020 - 05/29/2020****Vendor Set: Vendor Set 01**

Vendor	Name	Volume
2378	NXLVLUP, LLC	5,732.00
2379	JENNIFER DIXON	8,500.00
2380	JOHN BROWN	56.75
2381	NORTHLAKE LITTLE LEAGUE	250.00
2382	FOCUS TOOLS & ENGINEERING, INC.	25,050.00
2383	NORTH LAKE LITTLE LEAGUE	3,080.00
2384	NORTHWEST ENERGY EFFICIENCY COUNCIL	75.00
2385	TACOMA SCREW PRODUCTS, INC.	82.81
2386	CECCANTI, INC.	923,085.48
2387	HUI, IVANA	150.00
2388	3CMA CITY-COUNTY COMMUNICATIONS & MARKETIN	400.00
2389	JET CITY CLEANING	5,632.00
2392	DEPARTMENT OF COMMERCE	6,561.97
Vendor Set Vendor Set 01 Total:		6,201,864.36

**City of Kenmore
City Council Regular Meeting
Minutes
May 26, 2020**

CALL TO ORDER - Mayor David Baker called the meeting to order at 7:00 p.m. via zoom.

ROLL CALL

Mayor David Baker
Deputy Mayor Nigel Herbig
Councilmember Joe Marshall
Councilmember Milton Curtis
Councilmember Debra Srebnik
Councilmember Corina Pfeil
Councilmember Melanie O’Cain

FLAG SALUTE

AGENDA APPROVAL

The agenda was approved as submitted.

PROCLAMATION

Pride Month - June, 2020

National Gun Violence Awareness Day - June 2, 2020

CITIZEN COMMENTS

Derek Wycoff

Mayor Baker read a letter into the record from Derek Wycoff about a request to make gold the official color of the City.

Vicki Grayland

Ms. Grayland spoke about the concerns with pesticides in Sammamish River and she would like to be involved in the Climate Action Plan that the City is putting together.

City of Kenmore - City Council Meeting Minutes
May 26, 2020

Steve Yoder

Inglewood Shores Condos

Mr. Yoder spoke about his concerns with the elimination of the southbound right turn pocket into Inglewood.

CONSENT AGENDA

MOTION: Councilmember Curtis made a motion to approve the consent agenda, Mayor Baker seconded the motion. The motion passed unanimously.

The consent agenda included the following:

Total Check #s 44822 through 44899 in the amount of \$843,820.25.

Total Payroll/Taxes/Flexible Spending/Retirement/Health Savings Electronic Deposits Dated 4/24/20 in the amount of \$163,269.33.

Total Check #s 44900 through 44964 in the amount of 224,155.87.

Total Payroll/Taxes/Flexible Spending/Retirement/Health Savings Electronic Deposits Dated 5/9/20 in the amount of \$167,588.65.

Authorize City Manager to Execute Contract No. 20-C2134 with Earthworks Landscape Services, Inc. for Right-of-Way Landscape Maintenance

City Council Meeting Minutes of April 13, 2020 and April 27, 2020

Ratify the Proclamation & Issuance of Emergency Rule 20-07 Face Covering Directive - Rob Karlinsey, City Manager

BUSINESS AGENDA

Receive and File the March, 2020 Financial Report for the City of Kenmore - Joanne Gregory, Finance and Administration Director

Director Gregory presented the March 2020 Financial Report to the Council.

MOTION: Councilmember Pfeil made a motion to receive and file the March 2020 Financial Report for the City of Kenmore, Mayor Baker seconded the motion. The motion passed unanimously.

City of Kenmore - City Council Meeting Minutes
May 26, 2020

Continuation of Employee Benefits while on Washington State Paid Family and Medical Leave - Joanne Gregory, Finance and Administrative Director

Director Gregory explained in 2020 the State of Washington's Paid Family and Medical Leave Act (PFMLA) became effective which enables an employee to apply to the Employment Security Department for partial salary payments related to birth or adoption of a child or serious health conditions. This Act is administered by the State and the State directly pays the employee a portion of their salary, and an employee is considered to be in "unpaid leave status" with the City while on PFMLA (unless the employee otherwise uses paid leave benefits in connection with such leave).

Continued health care coverage is not required to be provided by the employer under the PFMLA unless required under the Family Medical Leave Act (FMLA). The City is a covered employer under the FMLA; however, its employees are not covered under the FMLA unless the City employs 50 or more employees. The City of Kenmore has historically not met the threshold of employing 50 or more employees under the FMLA. However, the City's employee numbers are currently such that it is near the 50-employee threshold and may meet this threshold, even if temporarily, with the hire of additional permanent and/or seasonal employees. The 50-employee threshold is determined as of the date an employee provides notice of the need for a FMLA-qualifying leave. The practical effect of this is that some City employees may be covered under the FMLA while others may not, depending upon the timing of their leave request.

The Parental Paid Leave program offered by the City implicates an FMLA-qualifying leave reason (i.e., the birth or placement of a child). Given the current status of the City's employee count, the City anticipates a scenario in which some parents would be entitled to up to 12 weeks of FMLA (running concurrently with the six weeks of Parental Paid Leave) and continued health care coverage during this time, while others will not be FMLA eligible, and therefore ineligible for continued health care benefits if they go into unpaid leave status (such as by taking PFMLA) following Parental Paid Leave.

Staff recommends that the City's leave policies be amended to account for this potential discrepancy. Staff proposes to amend the Parental Paid Leave policy to clarify that, if an employee on Parental Paid Leave is not otherwise FMLA-eligible, the employee will nonetheless be eligible to receive up to an additional six weeks of continued health care benefits, during any unpaid leave of absence (including leave under the PFMLA) associated with reasons covered by the Parental Paid Leave program. Health care benefits under the Paid Parental Leave program would not be continued beyond a total of 12 weeks unless the affected employee is in paid status with the City (back to work or using accrued leave). The additional six weeks of benefits will be awarded only to the extent not available under the FMLA/PMFLA.

MOTION: Deputy Mayor Herbig made a motion to approve the Continuation of Employee Benefits while on Washington State Paid Family and Medical

City of Kenmore - City Council Meeting Minutes
May 26, 2020

Leave as presented, Councilmember O’Cain seconded the motion. The motion passed unanimously.

Curbside Lunch Giveaway- Councilmember Pfeil and Councilmember Srebnik

Councilmember Pfeil and Councilmember Srebnik explained that United Way is willing to sponsor curbside lunches for the community. United Way would pay for all lunches. There is no eligibility requirement and the first priority areas will be the low census count areas.

MOTION: Councilmember Pfeil made a motion to support United Way’s efforts to provide curbside meals to the community for 5 days with city and staff time but no monetary cost to the City, Councilmember Marshall seconded the motion. The motion passed unanimously.

City Manager Karlinsey asked the Council if John Hendrickson, a citizen, can speak to the Council given that he was unable to raise his hand to speak during citizen comments via zoom.

MOTION: Councilmember Curtis made a motion to suspend the Council rules to allow Mr. Hendrickson to speak, Councilmember Srebnik seconded the motion. The motion passed unanimously.

CITIZEN COMMENTS

John Hendrickson

Mr. Hendrickson spoke about the investigation of Mayor Baker by Councilmember Pfeil.

STAFF REPORT

Pandemic Update - Rob Karlinsey, City Manager

COUNCILMEMBER REPORTS, COMMENTS & INITIATIVES

The meeting was adjourned at approximately 8:36 p.m.

David Baker, Mayor

ATTEST:

Kelly M. Chelin, City Clerk

**City of Kenmore
City Council Regular Meeting
Minutes
May 11, 2020**

CALL TO ORDER - Mayor David Baker called the meeting to order at 6:00 p.m. via zoom.

RECESS TO EXECUTIVE SESSION

The meeting was recessed to executive session at 6:03 p.m. to receive and evaluate complaints or charges brought against a public officer or employee per RCW 42.30.110 (1)(f).

RECONVENE BACK TO REGULAR SESSION

The meeting reconvened back to regular session at 7:00 p.m.

POSSIBLE ACTION RELATING TO EXECUTIVE SESSION

Attorney Mike Bolasina explained that the Seabold Group was retained to investigate allegations of gender discrimination asserted by Councilmember Corina Pfeil against Mayor David Baker. The investigation is concluded, and the report has been submitted.

MOTION: Councilmember Curtis made a motion to accept the report from the Seabold Group, file it and publish it for the public to see it, Councilmember Srebnik seconded the motion. The motion passed unanimously.

Clerk notes: The [investigation report](#) is attached to this set of minutes for reference.

ROLL CALL

Mayor David Baker
Deputy Mayor Nigel Herbig
Councilmember Joe Marshall
Councilmember Milton Curtis
Councilmember Debra Srebnik
Councilmember Corina Pfeil
Councilmember Melanie O’Cain

City of Kenmore - City Council Meeting Minutes
May 11, 2020

FLAG SALUTE

AGENDA APPROVAL

The agenda was approved as submitted.

PRESENTATION

Introduce Adam Nebenzahl, Part-Time Management Intern - Rob Karlinsey, City Manager

CITIZEN COMMENTS

Nadia Silver via zoom

Ms. Silver asked about social distancing and upcoming summer events in the City.

CONSENT AGENDA

MOTION: Deputy Mayor Herbig made a motion to approve the consent agenda, Councilmember Pfeil seconded the motion. The motion passed unanimously.

The consent agenda included the following:

Total Check #s 44751 through 44821 in the amount of \$237,111.41.

Total Payroll/Taxes/Flexible Spending/Retirement/Health Savings Electronic Deposits Dated 4/10/20 in the amount of \$162,850.48.

Authorize the City Manager to execute an agreement with WSDOT to accept Highway Safety Improvement Program (HSIP) grant funds in the amount of \$346,000 (Signing) and 34,000 (Lighting) for design and construction of the Local Road Safety Plan (LRSP) Signing and Lighting Projects

Authorize the City Manager to execute Contract 20-C2144 with Thomco Construction in the amount of \$10,994,869.07 to construct the Juanita Drive NE Pedestrian and Bicycle Safety Improvements (T-41) project, plus a 10% construction contingency for total contract authorization of \$12,100,000.

Receive and File Proclamation for Safe Boating and Paddling Week - May 16-22, 2020

STAFF REPORT

Pandemic Update - Rob Karlinsey, City Manager

City of Kenmore - City Council Meeting Minutes
May 11, 2020

ADJOURNMENT

The meeting was adjourned at approximately 7:58 p.m.

David Baker, Mayor

ATTEST:

Kelly M. Chelin, City Clerk



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

Subject/Topic: Authorization to Award 2020 Pavement Sealing Project Contract

For Council Meeting Agenda of: June 22, 2020

Department: Public Works / Engineering

Prepared by: Tobin Bennett-Gold

Proposed Council Action/Motion:

Authorize the City Manager to execute a contract with the Responsible Low Bid Contractor for the 2020 Pavement Sealing Project for an amount up to \$700,000.

Approved by Department Head:

Approved by City Attorney:

Approved by Finance Director:

Approved by City Manager:

Initial & Date

JFV 06/09/20

n/a

n/a

RK 6/11/20

Exhibits/Attachments:

Attachment A: Vicinity Map

INFORMATION/BACKGROUND:

As part of the City's 2019/2020 pavement preservation plan, the City has identified roads to provide pavement sealing on approximately 240,000 square yards of pavement. 120,000 square yards of pavement sealing were completed in 2019 and an additional 120,000 square yards of pavement are planned to be sealed this year. This year's pavement sealing will include slurry seal similar to what was used last year, but also where possible, microsurfacing will be used. Microsurfacing is a type of slurry seal process which hardens faster and requires shorter road closures. Prior to sealing the roads, pavement patching will be performed in areas on project roads where roots are damaging the pavement.

The proposed work was separated into three project areas: Arrowhead neighborhood, Northeast Kenmore (north of 192nd St and between 75th Av and 80th Av), and Northwest Kenmore (Kenlake Pl north of 62nd Av, and several small road sections north of SR 522 and west of 68th Av). See Attachment A, Vicinity Map for more information on pavement seal locations.

This project will be scheduled for the mid-to-late summer when temperatures are high and precipitation is low. Completion is expected to occur before the end of August to avoid potential conflict with school bus routes and weather conditions.

Traffic Impacts:

Slurry sealing work will require full road closure of project roads on days when work is performed. Preparation for slurry seal work will begin at 7am and be completed before 1pm and will require 4 hours for the slurry seal to cure allowing roads to reopen at 5pm. Roads which are suitable for microsurfacing will follow the same schedule, but will require a shorter cure period and could be open as early as 2pm. All roads impacted are residential streets; commercial areas will not be impacted by road closures. Every attempt will be made to reduce impacts to local residents and roads which are suitable for microsurfacing may afford additional scheduling flexibility if needed.

Public Outreach:

Residents in neighborhoods receiving pavement sealing will be notified by mailers identifying the location and describing the work. Once a contractor has been selected and the schedule approved, an additional notice will be sent to residents of the work schedule. Residents living on project streets or on streets with access affected by road closures will receive door-hanger notification in addition to other notification. General information regarding project schedule and road closures will be posted on social media. All project information will be available on the City website. In the event that road closure schedules are changed (due to weather delays, for example), information on the City website will be updated immediately and residents on affected streets will be notified with door hangers as quickly as possible.

Recommendation: Staff recommends that City Council authorize the City Manager to execute a contract with the Responsible Low Bid Contractor for the 2020 Pavement Sealing Project in an amount up to \$700,000.

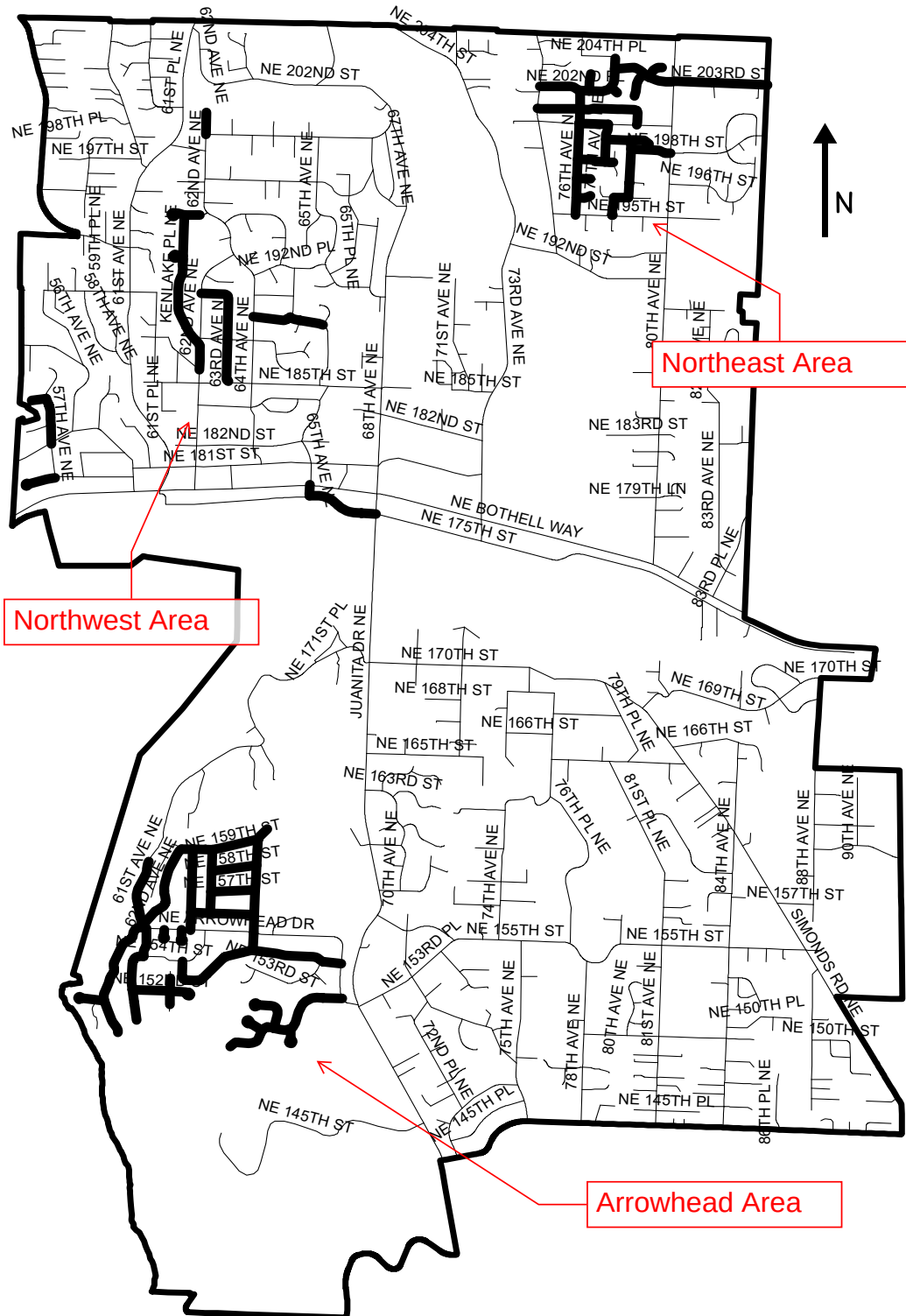
FISCAL CONSIDERATION:

Funds for this project are budgeted in the Street Fund.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

1. Focus and emphasize multimodal transportation safety in the City of Kenmore with a specific focus on pedestrian, bicycle, and other means of travel.

ATTACHMENT A





City of Kenmore, Washington

Memorandum

Date: June 18, 2020

To: City Council

From: Tobin Bennett-Gold, PE
Traffic Engineer

Re: 2020 Pavement Sealing Project Bid Award Supplement (consent Agenda 6/22/2020)

The bid opening for the 2020 Pavement Sealing Project was held on June 18, 2020, at 2:00PM. Because it was anticipated that the project bids may exceed the available project budget, the project was structured for bid according to three schedules, with Schedule A consisting of Arrowhead Neighborhood, Schedule B Northeast Kenmore, and Schedule C Northwest Kenmore. The highest priority for award included all three schedules, second priority was schedules A and B, and third priority was listed as schedule A alone. Two bids were received for this project; a summary of the bids received is as follows:

	Engineer's Estimate	Intermountain Slurry Seal Inc.	VSS, Inc.
Total Schedule A thru C	\$624,447.01	\$526,526.00	\$551,993.99
Total Schedule A thru B	\$456,060.56	\$401,974.50	\$426,211.83
Total Schedule A	\$320,097.09	\$295,740.10	\$316,945.65

The apparent low bidder was Intermountain Slurry Seal Inc. with a bid of \$526,526.00 for schedule A thru C, which is approximately \$98,000 less than the engineer's estimate for the full scope of this project and approximately \$123,000 less than the available project budget.

The Council Agenda Bill for this project is recommending Council award the contract to the responsible low bid contractor for an amount up to \$700,000. Staff is recommending award of the 2020 Pavement Sealing Project to Intermountain Slurry Seal Inc. for Schedules A thru C.

18120 68th Ave NE, Kenmore, WA 98028

Office: (425) 398-8900 · Fax: (425) 481-3236 · cityhall@kenmorewa.gov · www.kenmorewa.gov

Subject/Topic
April 2020 Financial Report

Prepared by: Joanne Gregory, Director of Finance
and Administration

Approved by City Manager: jmg for RK

Exhibits/Attachments:
April 2020 Financial Report for the City of Kenmore,
Washington.

The April 2020 monthly financial report is presented for Council review. This provides the opportunity for the City Council and the community to receive information on the City of Kenmore's biennium to date revenues and expenditures in comparison to the City's 2019-2020 adopted biennial budget. The budget was adopted on November 19, 2018 and a mid-biennium review was conducted in November 2019. Due to expected negative economic impacts of the COVID19 pandemic, the expenditure budget was reduced by \$1.1M and the budget reductions are incorporated into this report.

April is the 16th month of the 2019-2020, 24-month biennium and is the first month that was fully affected by the Governor's Stay Home Stay Healthy order in March. As of April, revenues exceeded expenditures in the General Fund by \$507,129, even with \$2,051,000 of planned one-time transfers from the General Fund to the Street Fund (\$1,427,000) and Strategic Opportunities Fund (\$624,000).

In April, General Fund revenues were \$2,443,256 which included the first half of 2020 receipts of property taxes and expenditures were \$589,710. Sales tax has a two-month lag therefore revenues received in April were from sales in February. The Dow Jones index rose to 24,374 on April 30 from 21,917 at the end of March. Unemployment spiked dramatically to 14.7%,

Kenmore Budget Policy 9a: A revenue/expenditure report will be produced monthly so that it can be directly compared to the actual results of the fiscal year to date. Kenmore Budget Policy 9b: All budget amendments, both revenues and expenditures, will be noted in the monthly report.

Priority Based Budgeting Result: Governance: Supports decision-making with timely and accurate short-term and long-range analysis that enhances vision and planning.



18120 68TH AVE. NE
KENMORE, WASHINGTON 98028

MEMORANDUM

TO: Rob Karlinsey, City Manager
FROM: Joanne Gregory, Finance Director
DATE: June 10, 2020
RE: April 2020 Financial Reports for the City of Kenmore, Washington

April 2020 financial information is presented for your review and delivery to the City Council. Attached you will find the following reports:

- General Fund Summary
- General Fund Revenue Graphs
- General Fund Expenditure Graphs
- Street Fund Summary
- Cash and Investment Report
- Investment Schedule
- Sales Tax Receipts by Business Type
- Retail Sales and Use Tax Distribution
- Real Estate Excise Tax Report
- Report for Transportation Benefit District

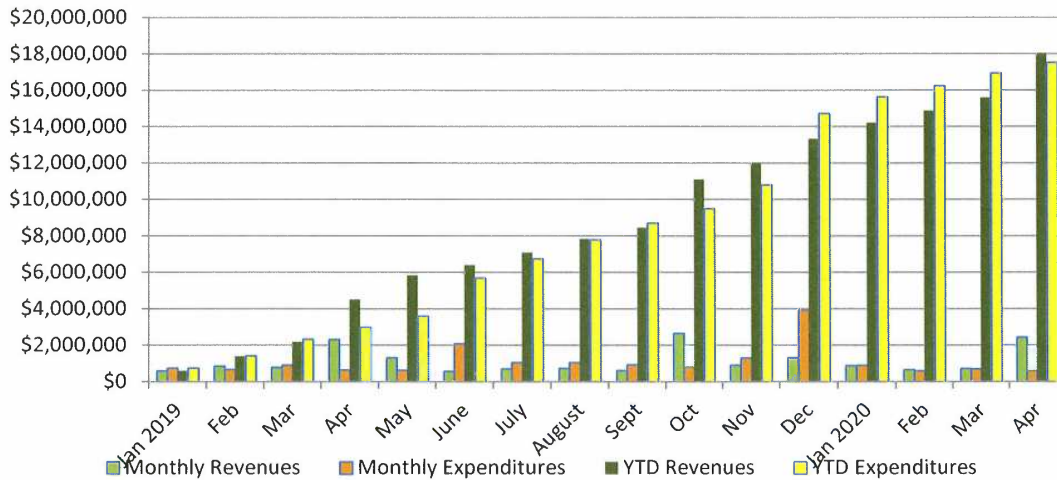
If you would like additional information or have any questions regarding the financial reports, please feel free to contact me.

GENERAL FUND

The first section of the monthly financial report is a review of the General Fund. This fund accounts for operational activities and includes all financial resources except those required or elected to be accounted for in another fund. Revenues include various taxes, per capita distributions from the State, fines and forfeitures, permits and licenses, and fees for service. In the context of the biennial budget, April is the sixteenth month (66%) of the 2019-2020 biennial budget period. For the month of April, revenues exceeded expenditures in the General Fund by \$1,853,545. Biennium to date, revenues exceed expenditures by \$507,129.

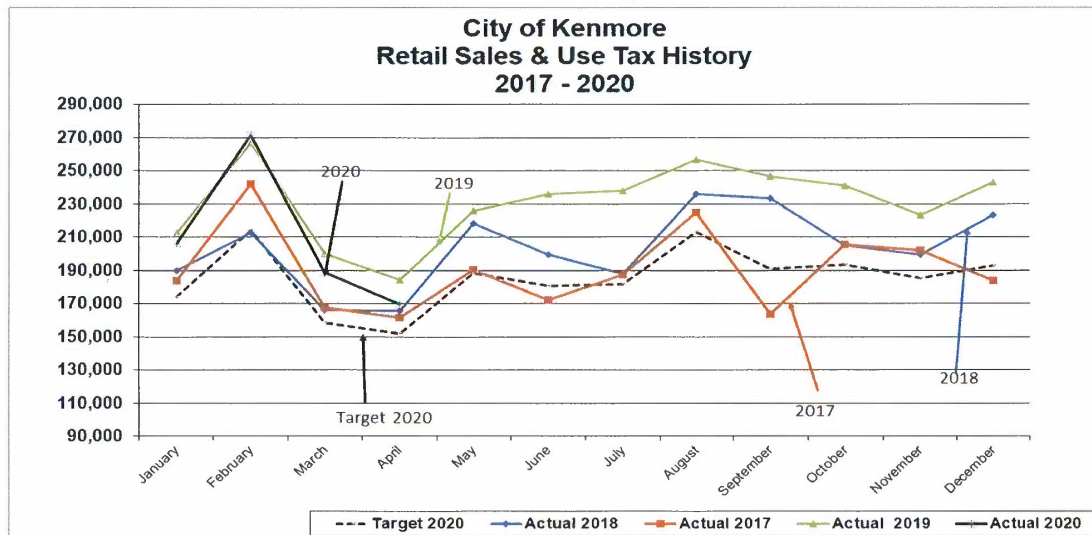
The following chart illustrates the monthly revenue and expenditure activity in the General Fund through April 2020.

City of Kenmore, Washington
Monthly Financial Report
April 2020



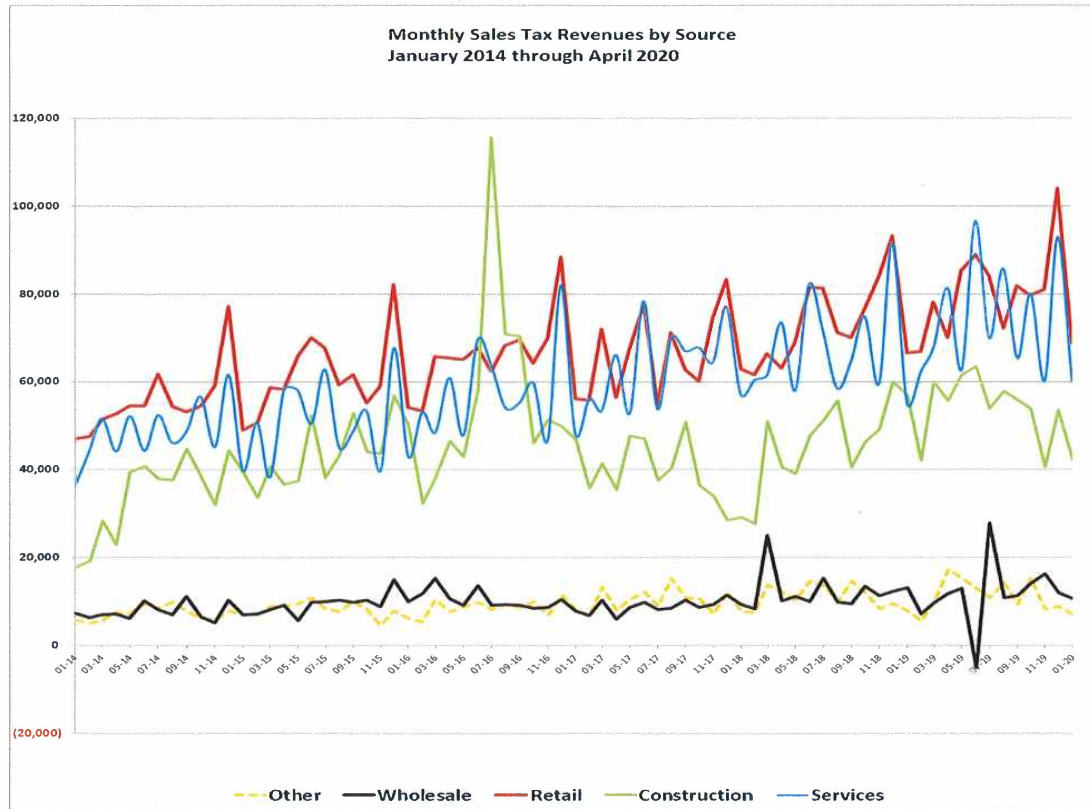
Total **revenues** for the month were **\$2,443,255**. Biennium to date revenues are \$18,039,262 which is 68% of the amended budgeted revenues of \$26,477,872. Primary sources of revenue for the month included property taxes in the amount of \$1,851,488, development fees & permits in the amount of \$56,546, retail sales and use taxes in the amount of \$169,696, franchise fees in the amount of \$186,009, and utility taxes in the amount of \$19,697. The utility tax amount is low due to the PSE electric/gas utility tax payment not received until May.

A summary of sales tax revenues received in April is attached. These receipts are based on **February** sales activity. The chart below gives a historical perspective of monthly sales tax receipts over the last several years. The black dotted Target 2020 line is a monthly average of actual receipts during 2017, 2018, and 2019. The purple line represents 2020 actual receipts, which are \$27,271 below 2019 and ahead of the 2020 target by \$137,528.



City of Kenmore, Washington
Monthly Financial Report
April 2020

The following chart illustrates the historical trends of sales tax receipts from the major segments: construction, retail, wholesale, other (agriculture, services, manufacturing, transportation and utilities) from January 2014 through April 2020.



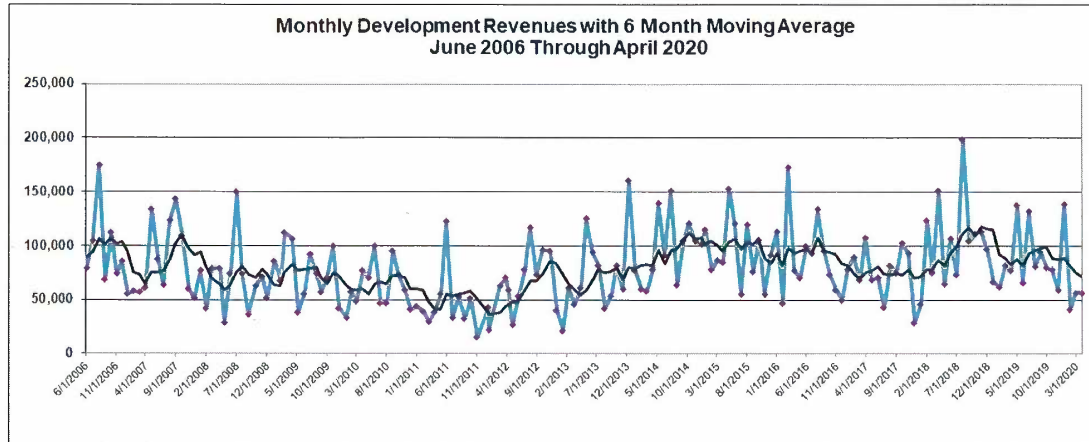
In April, the top 255 sales tax remitters, accounting for 83% or \$140,242 of total remittances, were reviewed for internet sales activity.

Of the \$169,696 of sale tax remitted by these companies in April, \$33,886 (20% of the total) was generated from internet based companies. Below is a chart that illustrates the amount of internet based sale tax in the major segments:

	Total Sales Tax Remitted in April	Internet Based Companies	% of Total Internet Sales Tax Collected
Retail Trade	\$53,792	\$21,698	41%
Information	6,838	1,660	25%
Services	28,281	9,538	34%
Wholesale	5,828	990	17%
		\$33,886	

City of Kenmore, Washington
Monthly Financial Report
April 2020

The following chart illustrates the development revenue activity over the last 14 years.



April 2020 expenditures were **\$589,710**. Biennium to date expenditures are \$17,532,133, which is 63% of the amended biennial budget expenditures of \$27,857,781.

Total City cash (\$22,772,205) and long-term investments (\$7,508,827), at the end of April, totaled \$30,281,032. Proposition 1 levy funds are included in this cash balance. The Other Funds Monthly Activity graphs compare biennium to date revenues and expenditures to the 2019-2020 biennial budget.

Total non-General Fund revenues were \$1,247,800 and total non-General Fund expenditures were \$452,587.

In the **Street Fund** revenue from gas tax distributions were \$35,269. This revenue is from gas sales in March and is 14% lower than February. \$37,325 was expended for maintenance and operations during the month.

In the **Transportation Capital Fund**, there were expenditures in the amount of \$110,447 on pedestrian safety projects.

The **Park Impact Fee** fund received no revenues during the month.

There were no revenues for the **Transportation Impact Fee** fund during the month.

The **Real Estate Excise Tax** Fund received \$125,508 of real estate excise taxes (REET) in April from sales activity that occurred in March. 37 transactions were reported during the month. The 2020 year to date revenue is higher than the 2019 revenue by \$169,233 and \$70,227 than the 2020 target.

The **Park Capital** fund had \$141,904 in Park improvement expenditures during the current month.

City of Kenmore, Washington
Monthly Financial Report
April 2020

The **Walkways & Waterways Debt Service** Fund collected \$185,734 in property taxes related to the Prop 1 Bond for a biennium to date total revenue of \$1,473,813.

The **Transportation Benefit District** Fund received \$30,591 in vehicle license fees during the month.

SUMMARY

This concludes the financial report for the City of Kenmore as of **April 30, 2020**. I appreciate your feedback and encourage you to contact me if you have any questions prior to the City Council meeting.

City of Kenmore, Washington
General Fund Summary Report
April 30, 2020



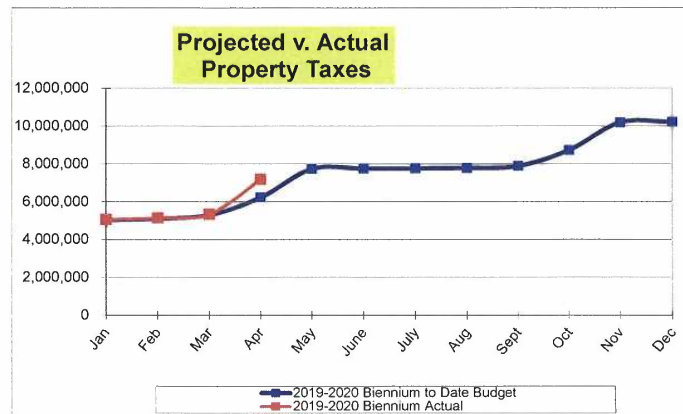
	CURRENT PERIOD 2019-2020				PREVIOUS PERIOD 2017-2018			
	MONTH April 2020	BIENNIUM TO DATE 2019-2020	% of BUDGET	BIENNIUM BUDGET 2019-2020	MONTH April 2018	BIENNIUM TO DATE 2017-2018	% of BUDGET	BIENNIUM BUDGET 2017-2018
REVENUES								
Beginning Fund Balance		4,934,368		4,934,368		3,138,914		3,131,687
Property Taxes	1,851,488	7,185,633	70.3%	10,224,205	1,809,829	6,698,458	70.6%	9,491,704
Sales and Use Taxes	215,671	4,562,020	73.4%	6,212,000	211,815	3,849,131	65.2%	5,906,291
Utility Taxes	19,697	1,380,122	56.0%	2,466,355	120,433	1,731,071	63.7%	2,717,485
Other Taxes	1,736	166,262	91.4%	181,868	14,855	110,817	50.8%	218,113
Development Fees & Permits	56,546	1,307,950	70.5%	1,854,042	151,502	1,303,338	63.6%	2,050,518
Franchise Fees	186,009	1,300,350	71.0%	1,831,835	71,952	1,187,700	68.1%	1,743,476
Intergovernmental and Grants	56,531	801,143	75.7%	1,057,677	49,749	629,627	74.8%	841,615
Investment Interest	47,133	143,326	150.4%	95,300	8,203	131,765	253.4%	52,000
Fines and Forfeitures	0	4,173	n/a	0	0	14,440	0.0%	0
Transfers and Other Revenues	8,445	1,188,284	46.5%	2,554,590	2,941	616,268	38.5%	1,600,972
Total Revenues	2,443,255	18,039,262	68.1%	26,477,872	2,441,280	16,272,617	66.1%	24,622,174
Total Revenues & Beginning Fund Balance		22,973,630		31,412,240		19,411,531		27,753,861

	CURRENT PERIOD 2019-2020				PREVIOUS PERIOD 2017-2018			
	MONTH April 2020	BIENNIUM TO DATE 2019-2020	% of BUDGET	BIENNIUM BUDGET 2019-2020	MONTH April	BIENNIUM TO DATE 2017-2018	% of BUDGET	BIENNIUM BUDGET 2017-2018
EXPENDITURES								
Cost Center								
City Council	13,910	250,761	74.6%	336,208	14,422	247,095	75.0%	329,426
City Manager	122,354	2,213,470	69.8%	3,170,520	140,064	2,064,887	62.0%	3,328,297
City Clerk	21,267	471,421	51.3%	919,466	26,154	361,534	85.0%	425,368
Finance	52,832	1,387,869	72.1%	1,925,756	37,398	1,329,828	79.5%	1,672,775
Legal	28,150	415,988	63.5%	654,782	17,415	324,964	65.0%	500,000
Interfund Transfers	0	2,606,529	80.8%	3,226,484	0	650,220	46.3%	1,403,228
Public Safety	37,403	4,485,997	50.0%	8,967,044	65,504	4,217,160	47.9%	8,806,304
Engineering & Environmental Services	43,470	867,066	55.7%	1,555,790	60,160	825,992	58.4%	1,415,011
Community Development	53,688	1,041,906	65.9%	1,580,826	56,288	837,168	48.8%	1,715,510
Developmental Services	92,139	1,663,786	73.2%	2,273,299	134,272	1,592,825	74.7%	2,131,288
Parks & Facility Maintenance	124,498	2,127,339	65.5%	3,247,606	84,328	1,303,719	45.7%	2,854,489
Total Expenditures	589,710	17,532,133	62.9%	27,857,781	636,004	13,755,393	56.0%	24,581,696
Ending Fund Balance	1,853,545	5,441,496	0	3,554,459		5,656,138		3,172,165
Total Expenditures and Ending Fund Balance		22,973,630		31,412,240		19,411,531		27,753,861

*Non-Departmental expenditures have been moved to other General Fund Cost Centers

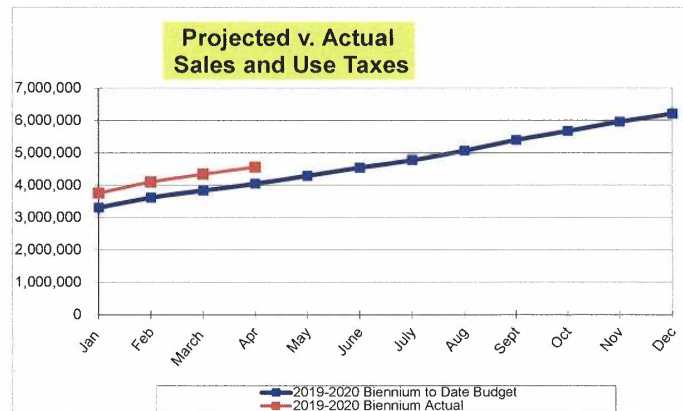
**City of Kenmore, Washington
General Fund Revenue Graphs
April 30, 2020
PROPERTY TAXES**

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	5,024,414	5,050,864
Jan	5,041,120	5,061,216
Feb	5,105,461	5,142,142
Mar	5,296,524	5,334,145
Apr	6,228,071	7,185,633
May	7,737,751	
June	7,752,286	
July	7,766,698	
Aug	7,782,013	
Sept	7,886,618	
Oct	8,730,684	
Nov	10,194,653	
Dec	10,224,205	
2019-20	10,224,205	
Year To Date		
Actual v. Projected		115%



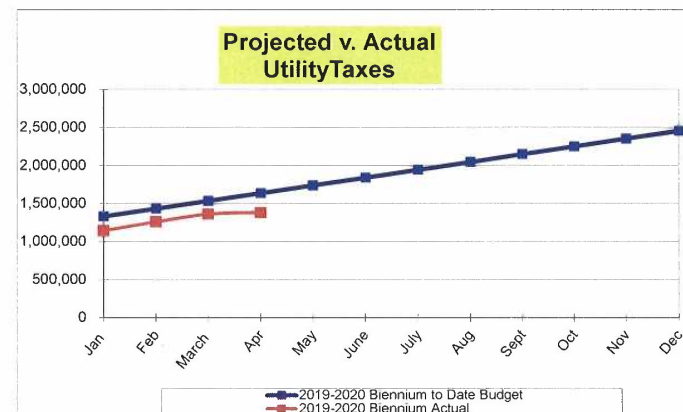
SALES, USE, CRIM JUSTICE TAXES

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	3,102,000	3,493,551
Jan	3,314,653	3,759,238
Feb	3,620,942	4,101,432
March	3,838,937	4,346,349
Apr	4,049,383	4,562,020
May	4,291,368	
June	4,543,454	
July	4,778,211	
Aug	5,068,877	
Sept	5,397,027	
Oct	5,677,075	
Nov	5,960,380	
Dec	6,212,000	
2019-20	6,212,000	
Year To Date		
Actual v. Projected		113%



UTILITY TAXES

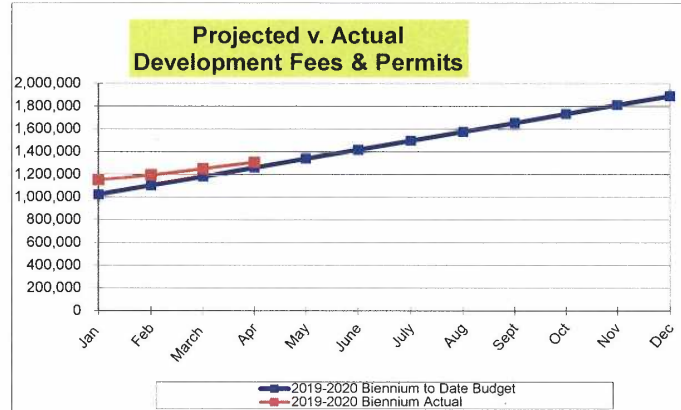
	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	1,227,000	1,029,975
Jan	1,329,250	1,143,328
Feb	1,431,500	1,257,030
March	1,533,750	1,360,425
Apr	1,636,000	1,380,122
May	1,738,250	
June	1,840,500	
July	1,942,750	
Aug	2,045,000	
Sept	2,147,250	
Oct	2,249,500	
Nov	2,351,750	
Dec	2,454,000	
2019-20	2,466,355	
Year To Date		
Actual v. Projected		84%



City of Kenmore, Washington
General Fund Revenue Graphs
April 30, 2020

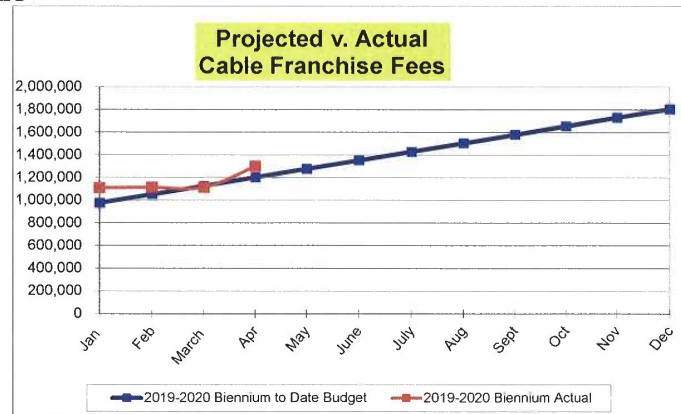
DEVELOPMENT FEES & PERMITS

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	945,576	1,014,896
Jan	1,024,374	1,153,770
Feb	1,103,172	1,195,109
March	1,181,970	1,251,405
Apr	1,260,768	1,307,950
May	1,339,566	
June	1,418,364	
July	1,497,162	
Aug	1,575,960	
Sept	1,654,758	
Oct	1,733,556	
Nov	1,812,354	
Dec	1,891,152	
2019-20	1,854,042	
Year To Date		
Actual v. Projected		104%



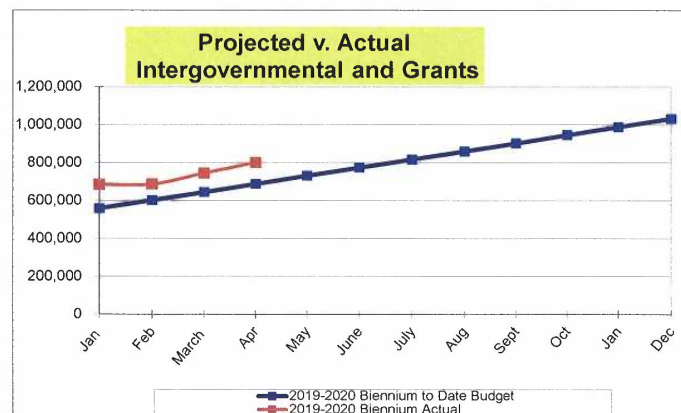
CABLE/WATER/SEWER FRANCHISE FEES

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	902,382	874,872
Jan	977,581	1,110,153
Feb	1,052,779	1,114,341
March	1,127,978	1,114,341
Apr	1,203,176	1,300,350
May	1,278,375	
June	1,353,573	
July	1,428,772	
Aug	1,503,970	
Sept	1,579,169	
Oct	1,654,367	
Nov	1,729,566	
Dec	1,804,764	
2019-20	1,831,835	
Year To Date		
Actual v. Projected		108%



INTERGOVERNMENTAL & GRANTS

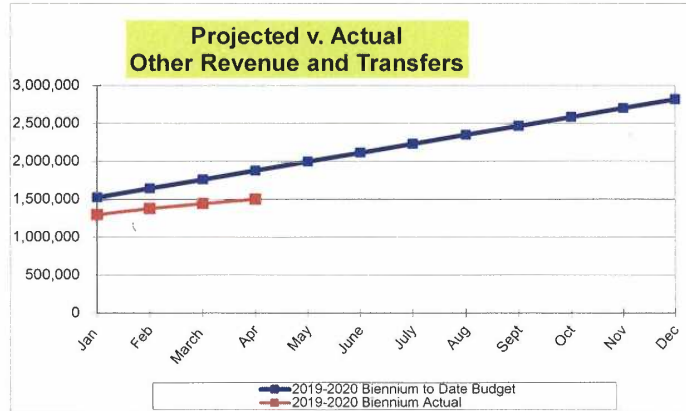
	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	515,651	627,769
Jan	558,622	684,503
Feb	601,593	686,213
March	644,564	744,611
Apr	687,535	801,143
May	730,506	
June	773,477	
July	816,447	
Aug	859,418	
Sept	902,389	
Oct	945,360	
Jan	988,331	
Dec	1,031,302	
2019-20	1,057,677	
Year To Date		
Actual v. Projected		117%



**City of Kenmore, Washington
General Fund Revenue Graphs
April 30, 2020**

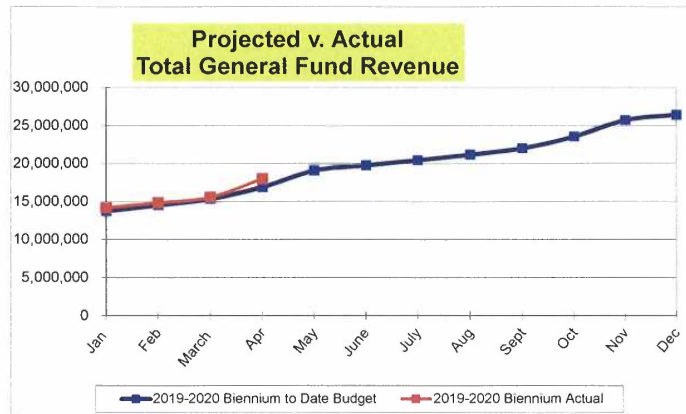
OTHER REVENUES AND TRANSFERS

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	1,410,444	1,234,739
Jan	1,527,981	1,297,287
Feb	1,645,518	1,378,460
March	1,763,055	1,444,730
Apr	1,880,592	1,502,044
May	1,998,129	
June	2,115,666	
July	2,233,203	
Aug	2,350,740	
Sept	2,468,277	
Oct	2,585,814	
Nov	2,703,351	
Dec	2,820,888	
2019-20	2,831,758	
Year To Date		
Actual v. Projected		80%



TOTAL GENERAL FUND REVENUE

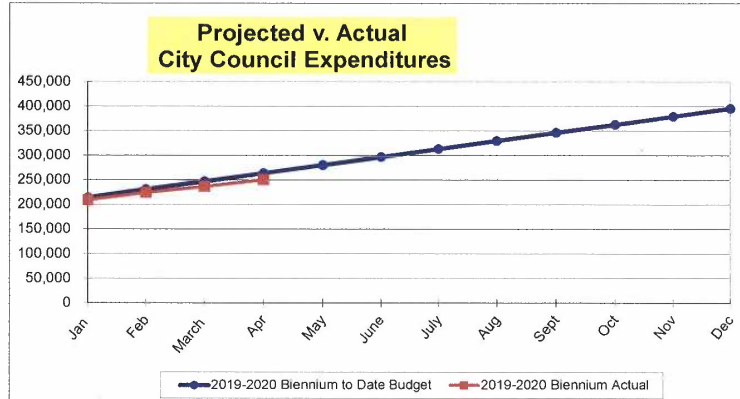
	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
Jan	13,773,581	14,209,494
Feb	14,560,965	14,874,728
March	15,386,777	15,596,006
Apr	16,945,525	18,039,262
May	19,113,945	
June	19,797,319	
July	20,463,243	
Aug	21,185,979	
Sept	22,035,488	
Oct	23,576,356	
Nov	25,740,386	
Dec	26,438,311	
2019-20	26,477,872	
Year To Date		
Actual v. Projected		106%



**City of Kenmore, Washington
General Fund Expenditure Graphs
April 30, 2020**

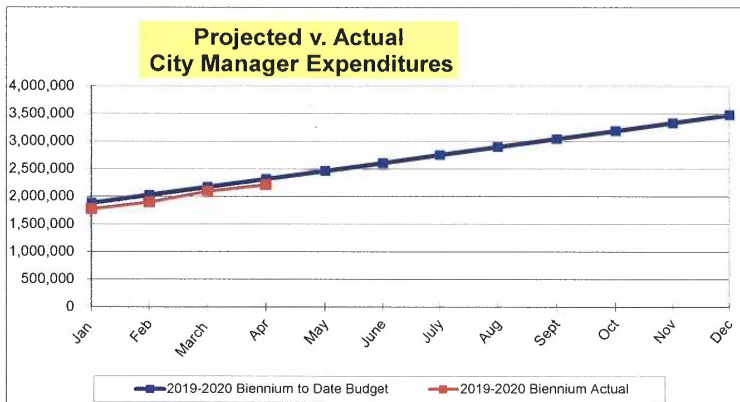
CITY COUNCIL

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	197,953	166,557
Jan	214,449	209,570
Feb	230,945	224,551
March	247,441	236,851
Apr	263,937	250,761
May	280,433	
June	296,930	
July	313,426	
Aug	329,922	
Sept	346,418	
Oct	362,914	
Nov	379,410	
Dec	395,906	
2019-20	400,337	
Year To Date		
Actual v. Projected		95%



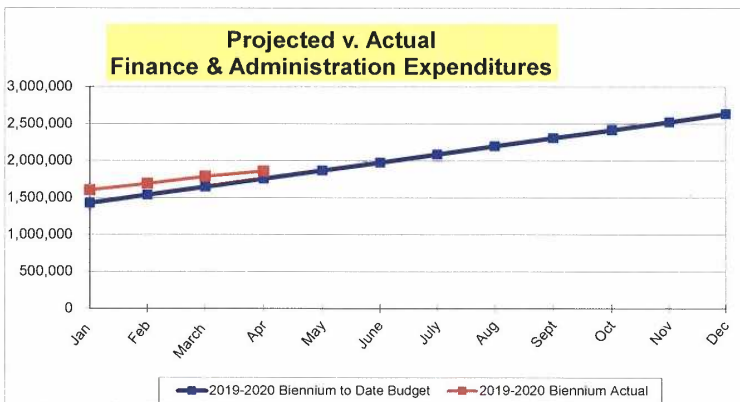
CITY MANAGER

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	1,738,841	1,651,429
Jan	1,883,744	1,773,645
Feb	2,028,648	1,897,149
March	2,173,551	2,091,116
Apr	2,318,455	2,213,470
May	2,463,358	
June	2,608,262	
July	2,753,165	
Aug	2,898,068	
Sept	3,042,972	
Oct	3,187,875	
Nov	3,332,779	
Dec	3,477,682	
2019-20	3,471,467	
Year To Date		
Actual v. Projected		95%



FINANCE & ADMINISTRATION

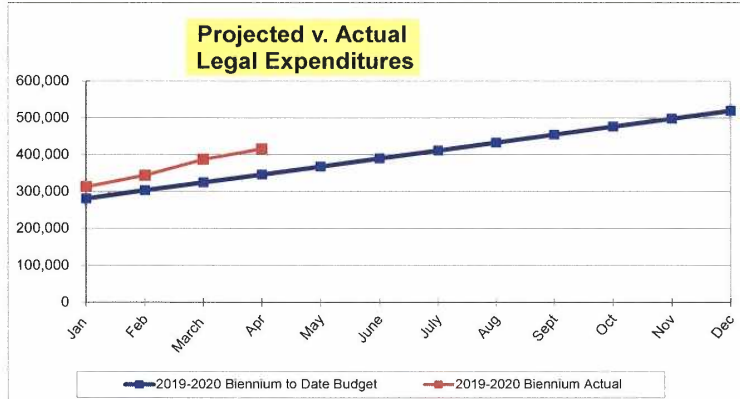
	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	1,316,827	1,248,548
Jan	1,426,563	1,603,856
Feb	1,536,298	1,691,479
March	1,646,034	1,785,191
Apr	1,755,769	1,859,291
May	1,865,505	
June	1,975,241	
July	2,084,976	
Aug	2,194,712	
Sept	2,304,447	
Oct	2,414,183	
Nov	2,523,918	
Dec	2,633,654	
2019-20	2,708,853	
Year To Date		
Actual v. Projected		106%



**City of Kenmore, Washington
General Fund Expenditure Graphs
April 30, 2020**

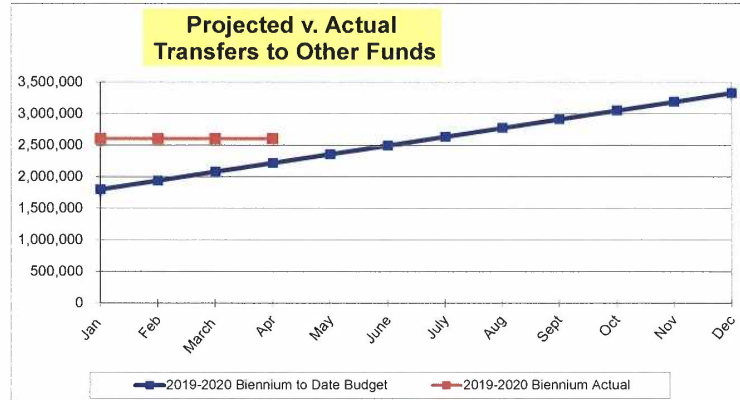
LEGAL

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	260,000	312,722
Jan	281,667	313,184
Feb	303,333	344,327
March	325,000	387,838
Apr	346,667	415,988
May	368,333	
June	390,000	
July	411,667	
Aug	433,333	
Sept	455,000	
Oct	476,667	
Nov	498,333	
Dec	520,000	
2019-20	530,000	
Year To Date		
Actual v. Projected		120%



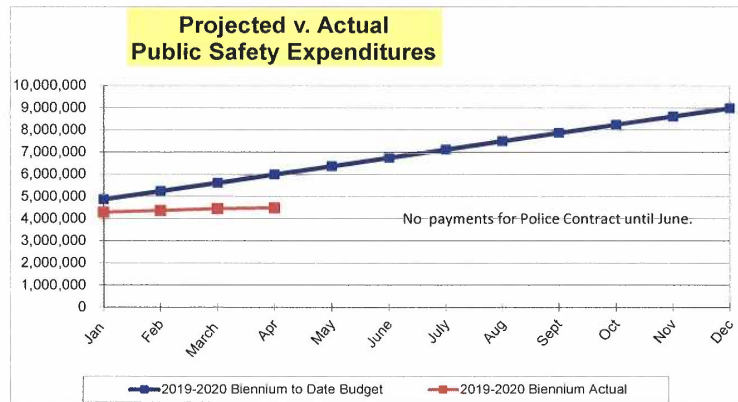
TRANSFERS TO OTHER FUNDS

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	1,663,897	2,606,529
Jan	1,802,555	2,606,529
Feb	1,941,213	2,606,529
March	2,079,871	2,606,529
Apr	2,218,529	2,606,529
May	2,357,187	
June	2,495,846	
July	2,634,504	
Aug	2,773,162	
Sept	2,911,820	
Oct	3,050,478	
Nov	3,189,136	
Dec	3,327,794	
2019-20	3,226,484	
Year To Date		
Actual v. Projected		117%



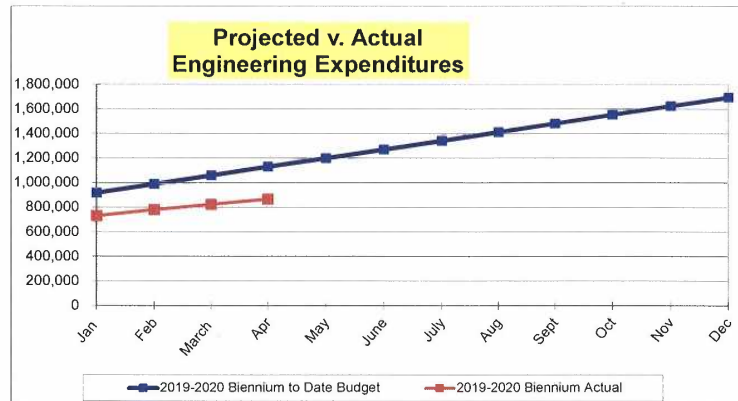
PUBLIC SAFETY

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	4,492,575	4,282,065
Jan	4,866,956	4,291,016
Feb	5,241,338	4,362,349
March	5,615,719	4,448,594
Apr	5,990,100	4,485,997
May	6,364,481	
June	6,738,863	
July	7,113,244	
Aug	7,487,625	
Sept	7,862,006	
Oct	8,236,388	
Nov	8,610,769	
Dec	8,985,150	
2019-20	9,133,991	
Year To Date		
Actual v. Projected		75%



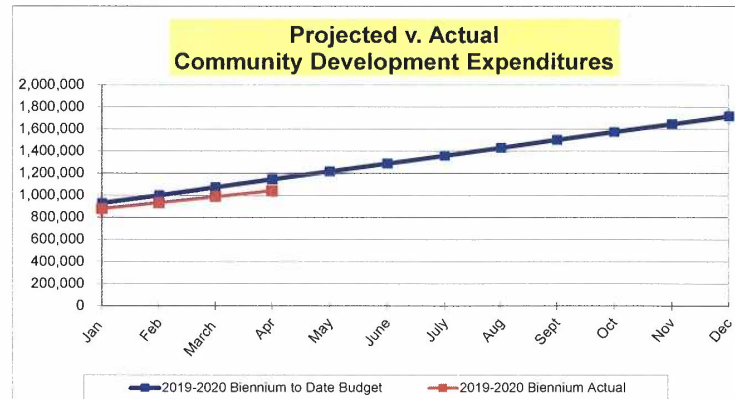
City of Kenmore, Washington
General Fund Expenditure Graphs
April 30, 2020
ENGINEERING

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	847,685	674,259
Jan	918,325	731,841
Feb	988,966	780,295
March	1,059,606	823,596
Apr	1,130,247	867,066
May	1,200,887	
June	1,271,528	
July	1,342,168	
Aug	1,412,808	
Sept	1,483,449	
Oct	1,554,089	
Nov	1,624,730	
Dec	1,695,370	
2019-20	1,658,620	
Year To Date		
Actual v. Projected		77%



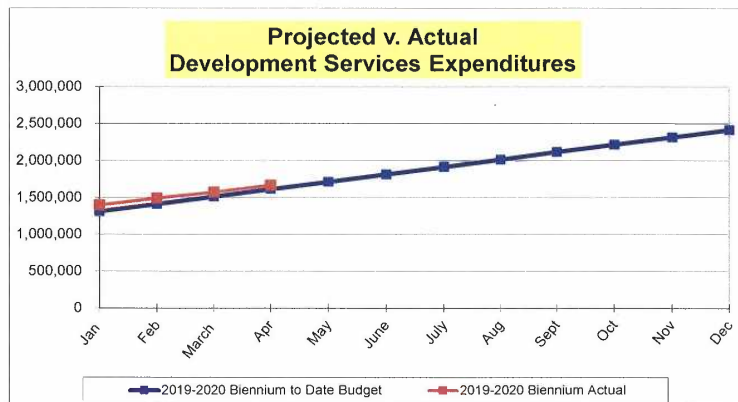
COMMUNITY DEVELOPMENT

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	858,610	798,613
Jan	930,161	878,279
Feb	1,001,712	933,626
March	1,073,263	988,218
Apr	1,144,813	1,041,906
May	1,216,364	
June	1,287,915	
July	1,359,466	
Aug	1,431,017	
Sept	1,502,568	
Oct	1,574,118	
Nov	1,645,669	
Dec	1,717,220	
2019-20	1,698,893	
Year To Date		
Actual v. Projected		91%



DEVELOPMENT SERVICES

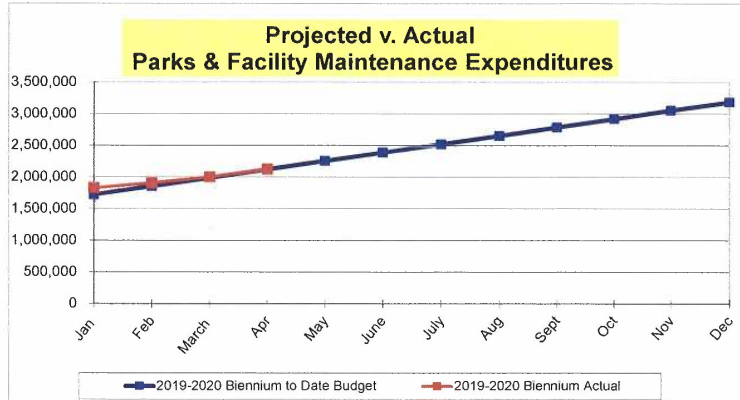
	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	1,208,200	1,227,207
Jan	1,308,883	1,396,571
Feb	1,409,567	1,491,445
March	1,510,250	1,571,648
Apr	1,610,933	1,663,786
May	1,711,617	
June	1,812,300	
July	1,912,983	
Aug	2,013,667	
Sept	2,114,350	
Oct	2,215,033	
Nov	2,315,717	
Dec	2,416,400	
2019-20	2,461,502	
Year To Date		
Actual v. Projected		103%



**City of Kenmore, Washington
General Fund Expenditure Graphs
April 30, 2020**

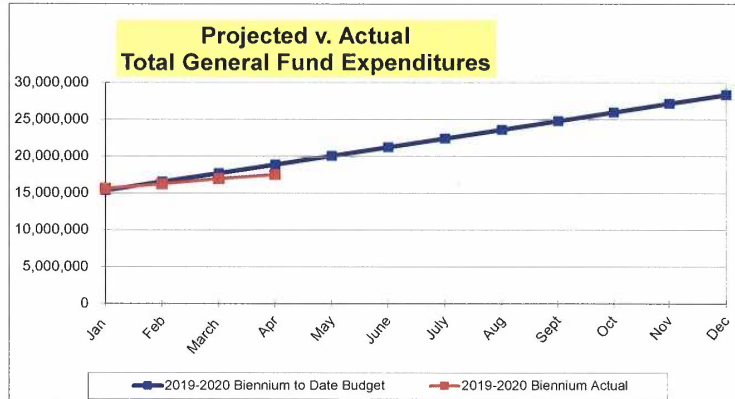
PARKS & FACILITY MAINTENANCE

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
2019	1,592,380	1,760,364
Jan	1,725,078	1,828,695
Feb	1,857,777	1,905,398
March	1,990,475	2,002,841
Apr	2,123,173	2,127,339
May	2,255,872	
June	2,388,570	
July	2,521,268	
Aug	2,653,967	
Sept	2,786,665	
Oct	2,919,363	
Nov	3,052,062	
Dec	3,184,760	
2019-20	3,236,725	
Year To Date		
Actual v. Projected		100%



TOTAL GENERAL FUND EXPENDITURES

	2019-2020 Biennium to Date Budget	2019-2020 Biennium Actual
Jan	15,358,382	15,633,185
Feb	16,539,796	16,237,147
March	17,721,210	16,942,423
Apr	18,902,624	17,532,133
May	20,084,038	
June	21,265,452	
July	22,446,866	
Aug	23,628,280	
Sept	24,809,694	
Oct	25,991,108	
Nov	27,172,522	
Dec	28,353,936	
2019-20	28,526,872	
Year To Date		
Actual v. Projected		93%



**City of Kenmore, Washington
Street Fund Summary Report
April 30, 2020**



	MONTH	BIENNIUM TO DATE	% of	BUDGET
	<u>April 2020</u>	<u>2019-2020</u>	<u>BUDGET</u>	<u>2019-2020</u>
<u>REVENUES</u>				
Beginning Fund Balance		926,962		926,962
Fuel Tax	35,269	633,944	63.0%	1,006,385
Investment Interest	468	18,500	370.0%	5,000
Miscellaneous	0	10,579	528.9%	2,000
ROW Permit Fees/Inspections	8,965	200,655	83.6%	240,000
Multimodal Transportation	0	39,678	63.1%	62,910
Transfer from General Fund	0	1,982,529	76.2%	2,602,484
Transfer from TBD	0	358,000	50.0%	716,000
Total Revenues	44,702	3,243,885	70.0%	4,634,779
Total Revenues & Beginning Fund Balance		4,170,847		5,561,741
		BIENNIUM TO DATE	% of	BUDGET
		<u>2019-2020</u>	<u>BUDGET</u>	<u>2019-2020</u>
<u>EXPENDITURES</u>				
Salary and Benefits	53,443	885,174	67.0%	1,320,880
Maintenance & Operations	37,325	1,480,474	52.2%	2,838,406
Capital	490	155,286	341.6%	45,463
Total Expenditures	91,258	2,520,934	60.0%	4,204,749
Ending Fund Balance		1,649,913		1,356,992
Total Expenditures and Ending Fund Balance		4,170,847		5,561,741

City of Kenmore, Washington
Cash and Investment Report
April 30, 2020



<u>Fund</u>	<u>Beg. Cash & Inv.</u> <u>from Prev. Mo.</u>	<u>Monthly</u> <u>Revenues</u>	<u>Monthly</u> <u>Expenditures</u>	<u>End. Cash & Inv.</u> <u>Current Month</u>
General	\$3,587,951	\$2,443,255	\$589,710	5,441,496
Street	1,695,467	44,702	91,258	1,648,912
Transportation Capital	-119,246	0	110,447	(229,693)
Public Art	70,988	20	0	71,008
Park Impact Fee	321,409	91	0	321,500
Transportation Impact Fee	3,295,665	936	0	3,296,601
Swamp Creek Basin	1,085,880	308	0	1,086,188
Transportation Benefit District	207,759	30,659	0	238,417
Sammamish Bridge Replacement	1,765,999	9,209	10,044	1,765,163
Walkways & Waterways Debt Service	218,489	185,734	0	404,223
Real Estate Excise Tax	1,827,634	126,063	0	1,953,696
Kenmore Village	3	0	0	3
Park Capital	-38,085	0	141,904	(179,989)
Walkways & Waterways Bond	6,414,461	5,555	0	6,420,015
Surface Water Management	1,698,036	808,318	93,142	2,413,213
Surface Water Capital	-98,002	34,764	0	(63,238)
Public Works Shop Fund	-16,253	0	-16,253	0
Strategic Reserve	1,337,535	380	0	1,337,915
Strategic Opportunities	3,044,196	864	0	3,045,060
Equipment Replacement	513,515	146	176	513,485
Trust & Agency	818,996	52	21,868	797,180
Totals	\$27,632,396	\$3,691,055	\$1,042,297	\$30,281,154

<u>Fund</u>	<u>Cash, Savings,</u> <u>Local Govt Investment Pool</u>	<u>(> One Year)</u> <u>Fixed</u> <u>Investments</u>	<u>Total</u>
General	\$3,579,099	\$1,862,772	5,441,871
Street	798,913	850,000	1,648,913
Transportation Capital	-229,693	0	(229,693)
Public Art	56,008	15,000	71,008
Park Impact Fee	-608,498	930,000	321,502
Transportation Impact Fee	3,266,604	30,000	3,296,604
Swamp Creek Basin	-313,811	1,400,000	1,086,189
Transportation Benefit District	238,417	0	238,417
Sammamish Bridge Replacement	1,765,163	0	1,765,163
Walkways & Waterways Debt Service	404,222	0	404,222
Real Estate Excise Tax	1,953,694	0	1,953,694
Kenmore Village	0	0	0
Park Capital	-179,989	0	(179,989)
Walkways & Waterways Bond	6,420,015	0	6,420,015
Surface Water Management	1,903,214	510,000	2,413,214
Surface Water Capital	-63,239	0	(63,239)
Public Works Shop Fund	0	0	0
Strategic Reserve	487,915	850,000	1,337,915
Strategic Opportunities	3,045,061	0	3,045,061
Equipment Replacement	63,484	450,000	513,484
Trust & Agency	697,175	100,000	797,175
Totals	\$23,283,754	\$6,997,772	\$30,281,527

note: negative balances are due to pending transfers from other funds, not yet recorded.

City of Kenmore, Washington
Investment Schedule
April 30, 2020



Average Yield to Maturity-Securities							Overall Average Yield		0.87%
Report by Security	Investment #	Type	Maturity Date	Purchase Date	Rate	Yield	Principal or Balance	Yield Equivalents	
Morgan Stanley									
	3134G9GR2	FHLMC	8/18/2020	8/7/2017	1.60%	1.62%	999,500.00	16,191.90	
	3130ACTL8	FHLB	11/25/2020	12/22/2017	1.95%	1.95%	997,650.00	19,454.18	
	3130AB3N4	FHLB	10/29/2019	4/28/2017	1.55%	1.55%	1,000,750.00	15,511.63	
Total Morgan Stanley Purchases							2,997,900.00	51,157.70	
Time Value Investments									
	3130AHV83	FHLB	1/22/2024	1/22/2020	1.78%	1.78%	1,001,154.00	17,820.54	
	XXXXXLAU8						1,510,054.50	-	
	76116FAG2	RFCSP	1/15/2021	5/31/2018	2.50%	2.50%	999,718.18	24,992.95	
Total TVI Purchases							3,510,926.68	42,813.50	
Opus Bank CD's									
	11495975	CD	8/10/2020	8/10/2019	2.50%	2.50%	1,000,000.00	24,970.00	
Total Cascade Bank CD's							1,000,000.00	24,970.00	
TOTAL ALL SECURITIES							\$ 7,508,826.68	\$ 118,941.20	
Banner Checking and Savings						0.04% Banner	6,379,577.84	2,551.83	
Opus Savings						1.05% Opus	3,147,442.42	33,048.15	
LGIP - Primary Account						0.81% LGIP	4,934,861.78	40,159.91	
LGIP - Bond Proceeds Account						0.81% LGIP	8,310,322.82	67,629.41	
Total Accounts							\$ 30,281,031.54	262,330.48	

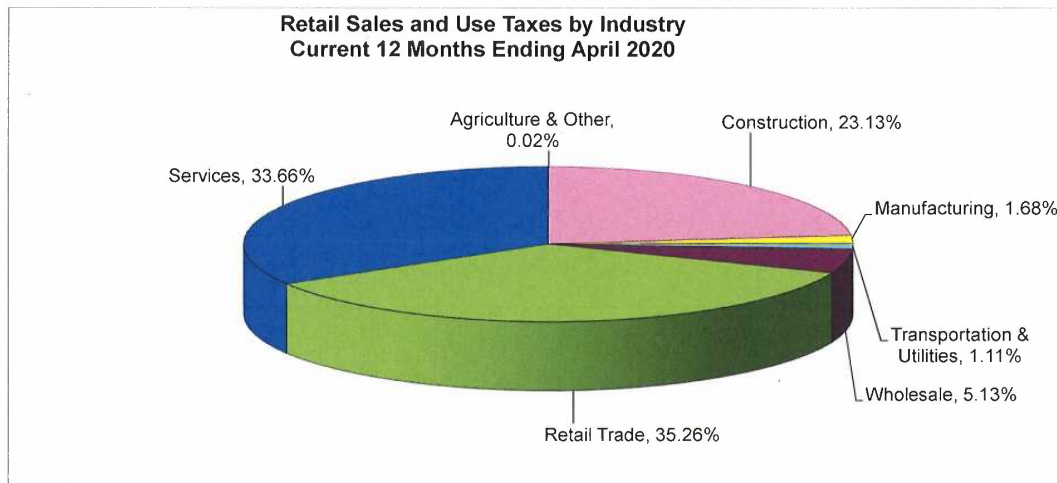
City of Kenmore, Washington
SALES TAX RECEIPTS BY BUSINESS TYPE
 April 2020

	SALES TAX	USE TAX	TOTAL	PERCENT
AGRICULTURE & OTHER	26.60	0.00	26.60	0.0%
CONSTRUCTION	35,974.60	589.13	36,563.73	21.5%
MANUFACTURING	2,962.29	4.54	2,966.83	1.7%
TRANSPORTATION & UTILITIES	255.56	57.52	313.08	0.2%
WHOLESALE	8,755.96	82.03	8,837.99	5.2%
RETAIL TRADE	74,023.29	113.17	74,136.46	43.7%
SERVICES	34,886.50	244.67	35,131.17	20.7%
INFORMATION	8,035.59	54.19	8,089.77	4.8%
PUBLIC SERVICES	7.91	3,622.61	3,630.52	2.1%
	<u>164,928.30</u>	<u>4,767.86</u>	<u>169,696.16</u>	<u>100.0%</u>

City of Kenmore, Washington
Retail Sales and Use Tax Distribution
April 30, 2020

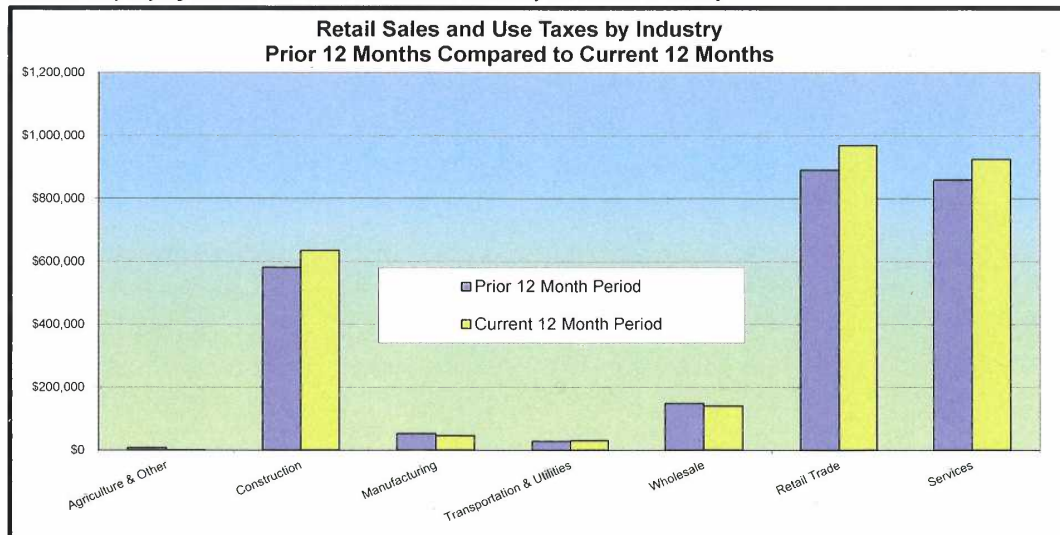


Industry	Prior 12 Months ending April 2019	Current 12 Months ending April 2020	% Increase/ (Decrease)	% of Total
Agriculture & Other (Landscaping, Animal Hospitals)	\$6,891	\$603	-91.25%	0.02%
Construction	580,792	635,335	9.39%	23.13%
Manufacturing (Printing, Publishing, Other Manuf.)	52,086	46,159	-11.38%	1.68%
Transp/Comm/Utilities (Telecomm., Air Transport.)	28,370	30,577	7.78%	1.11%
Wholesale (Lumber, Other Wholesale)	148,531	140,922	-5.12%	5.13%
Retail Trade (Eating, Merchandise, Food Stores)	890,220	968,576	8.80%	35.26%
Services (Auction, Recreation, Auto Repair, Financial)	859,337	924,650	7.60%	33.66%
Totals	\$2,566,227	\$2,746,821	7.04%	100%
Increase/(Decrease)		\$180,594	7.04%	



NOTE: Due to the City's Confidentiality Agreement with the Department of Revenue, specific business information cannot be disclosed.

There is a sixty-day lag between sales taxes collected and when they are remitted to the City



City of Kenmore, Washington
Real Estate Excise Tax Report
April 30, 2020



Real Estate Excise Taxes (REET)
2017 - 2020 Monthly Receipts

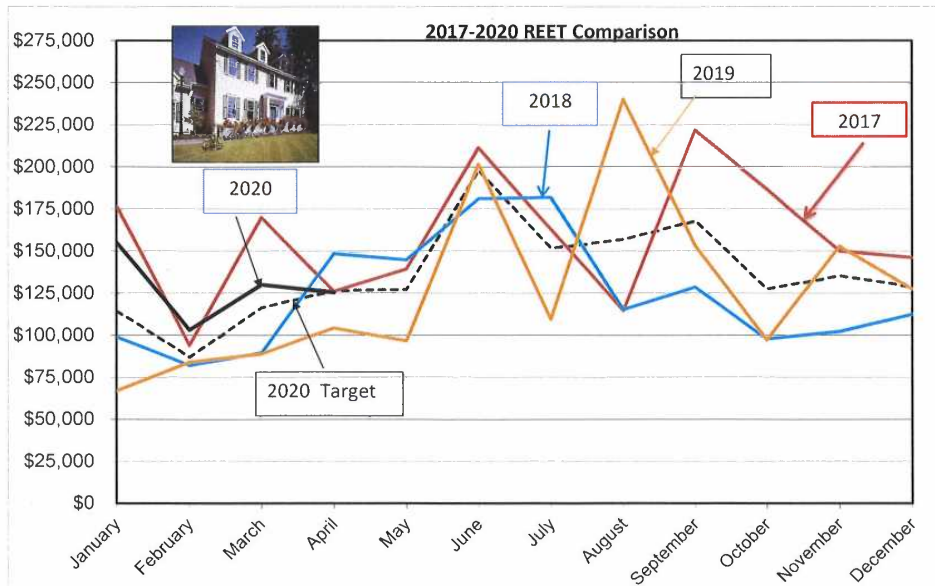
	Actual 2017	Actual 2018	Actual 2019	Actual 2020	Target 2020
January	176,657	99,205	67,141	155,141	114,335
February	94,134	82,263	84,215	103,270	86,871
March	170,086	89,698	89,106	130,207	116,297
April	126,245	148,514	104,430	125,508	126,396
May	139,422	144,906	96,756		127,028
June	211,430	181,182	201,666		198,093
July	163,138	181,974	109,538		151,550
August	114,754	115,421	240,124		156,766
September	221,719	128,704	153,174		167,866
October	186,805	97,998	97,291		127,365
November	150,187	102,373	152,965		135,175
December	146,159	112,490	127,473		128,707
	\$1,900,736	\$1,484,728	\$1,523,880	\$514,126	\$1,636,448

For 2020, REET is \$169,233 more than the same period last year and more than the 2020 target by \$70,227

* NOTE THE 2020 target is computed on a 3 year average (2017-2019) of actual receipts

Real Estate Excise Taxes (REET)
2017 - 2019 Property Sales > \$500,000
 (30 Day Lag)

	2017	2018	2019	2020	2017	2018	2019
January	27,548,430	17,379,581	12,424,500	26,365,900	136,365	86,029	61,501
February	19,017,050	15,277,640	14,286,900	17,193,650	94,134	75,624	70,720
March	29,692,641	13,818,387	15,106,888	23,534,795	146,979	68,401	74,779
April	19,953,544	23,896,450	19,671,000	24,286,927	98,770	118,287	97,371
May	24,277,456	25,710,632	16,722,738		120,173	127,268	82,778
June	36,414,050	31,816,871	36,281,428		180,250	157,494	179,593
July	28,779,145	32,800,185	20,426,900		142,457	162,361	101,113
August	18,859,991	19,693,600	44,530,295		93,357	97,483	220,425
September	38,431,272	22,172,221	23,545,383		190,235	109,752	116,550
October	31,278,148	14,697,849	15,876,738		154,827	72,754	78,590
November	16,347,581		28,040,050		0	80,921	138,798
December	25,603,889	19,908,284	20,693,490		126,739	98,546	102,433
	\$299,855,616	\$253,519,281	\$267,606,310	\$91,381,272	\$1,484,286	\$1,254,920	\$1,324,651

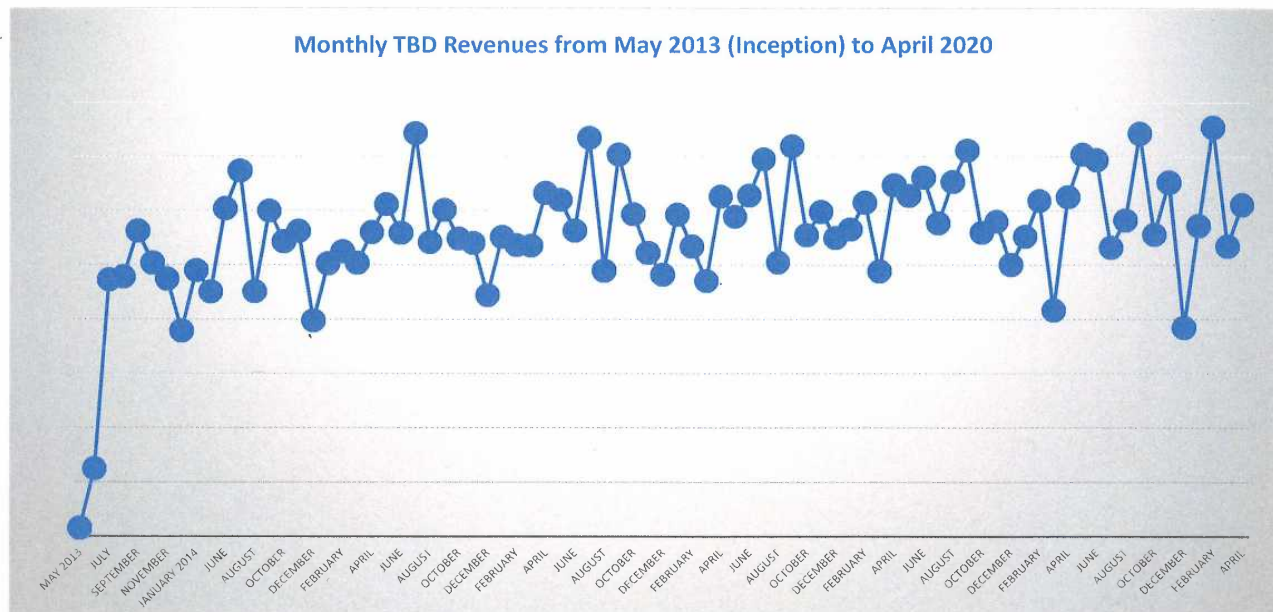


I:\Admin & Finance\Monthly Reports\2020\April 2020REET

Kenmore Transportation Benefit District
Monthly Report
April 30, 2020



Revenues	April 2020	Biennium-to-Date	Percent of Budget	Biennium Budget
Vehicle Fees	30,591	477,124	67.20%	710,000
Investment Interest	68	4,933	61.66%	8,000
Total Revenues	\$30,659	\$482,057	67.14%	\$718,000
Expenditures				
Reimbursement to Street Fund	0	358,000	50.00%	716,000
Total Expenditures	0	358,000	50.00%	716,000
Net Income (Loss)	\$30,659	\$124,057		\$2,000



Subject/Topic: Approval of Resolution 20-341 Adopting the King County Regional Hazard Mitigation Plan and Kenmore Plan Annex Proposed Council Action/Motion: Approve Resolution 20-341 adopting the King County Regional Hazard Mitigation Plan and Kenmore Plan Annex.	For Council Meeting Agenda of: June 22, 2020 Department: Development Services Prepared by: Bryan Hampson, Development Services Director Lauri Anderson, Principal Planner Approved by Department Head: Approved by City Attorney: Approved by Finance Director: Approved by City Manager: <u>Initial & Date</u> DB/BH RK Exhibits/Attachments: 1. King County Regional Hazard Mitigation Plan 2. Kenmore Plan Annex 3. Resolution 20-341
<u>INFORMATION/BACKGROUND:</u> As discussed at the April 27 City Council meeting, the King County Regional Hazard Mitigation Plan (KCRHMP) is currently undergoing its five-year update. The update reassesses risks and vulnerabilities to natural and human-caused hazards, and develops strategies to reduce risk to those hazards. Each of nearly 60 planning partners in the County has developed an “annex” to the plan, including the risk-reduction strategies that are a key output of the plan. The plan is also a requirement for receiving federal Hazard Mitigation Assistance grants. FEMA has now approved the 2020-2025 KCRHMP (see Attachment 1), including the City of Kenmore Plan Annex with minor changes (see Attachment 2). The FEMA-requested changes are to clearly describe: a) The process to integrate mitigation plan goals, data, actions into other planning mechanisms; and b) How the mitigation plan has been integrated into other planning mechanisms since the last update, if it has. A new section entitled, “Mitigation Plan Integration,” on page 13 of Attachment 2 addresses FEMA’s request. The County Plan has been revised to incorporate more details on pandemic response in light of recent events. The next step in the update process is for the City Council to approve a resolution (see Attachment 3) adopting the KCRHMP as well as the Kenmore Plan Annex. The King County Council will then take final action to approve the overall plan and forward it to FEMA. <u>Background</u> A staff working group representing emergency operations, public works, environmental services, development services, and planning, developed Kenmore’s Annex and submitted it to the County for review on October 14, 2019. The County then forwarded the entire Regional Hazard Mitigation Plan to the State. The State approved	

the draft on February 4, 2020 and forwarded it to FEMA for their consideration. A City Council briefing occurred on April 27, 2020. FEMA has now given their approval, requesting some minor changes.

Hazard mitigation is another word for disaster risk reduction. It is focused on actions with long-term benefits and can include projects that reduce risk or development codes that prevent it. Hazard mitigation plans are developed periodically by states, counties, and cities to assess risks and identify actions to address those risks.

Kenmore's annex is focused on hazard mitigation actions related to:

- Sammamish River Bridge detour routes,
- Inclement weather (snow and ice) procedures,
- Flood reduction and resiliency,
- Severe weather event debris disposal,
- Stabilization of hazardous slopes in City right-of-way, and
- Landslide hazard area education and outreach.

Kenmore's current Hazard Mitigation Plan was adopted in 2015 by Resolution 15-266. The new plan, once adopted, will be in place for the coming 5 years.

FISCAL CONSIDERATION:

None. Staff time was spent to work on this project.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

Comprehensive Plan 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."

Comprehensive Plan Policy PS-3.3.2: "Participate in regional emergency management programs."

2020-2025

King County Regional Hazard Mitigation Plan





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Executive Summary

The King County Hazard Regional Hazard Mitigation Plan promotes programs and projects that partner with communities to build a foundation of resilience before, during, and after disasters. Hazard mitigation is the mission area of emergency management that argues *life safety is not good enough*. Disasters are not foregone conclusions. Incidents will always occur, but their impact is within our ability to change if we target investments in areas that will reinforce those areas most critical to our community, thereby making us all more resilient.

For the 2020 Plan, we identify investments and opportunities to strengthen 14 determinants¹ of equity and social justice, areas the whole community has identified as necessary to *make King County a welcoming community where every person can thrive*.

1. Access to Affordable, Healthy Food
2. Access to Health and Human Services
3. Access to Parks and Natural Resources
4. Access to Safe and Efficient Transportation
5. Affordable, Safe, Quality Housing
6. Community and Public Safety
7. Early Childhood Development
8. Economic Development
9. Equitable Law and Justice System
10. Equity in Government Practices
11. Family Wage Jobs and Job Training
12. Healthy Built and Natural Environments
13. Quality Education
14. Strong, Vibrant Neighborhoods

We can strengthen and support each of these areas through investments in better land use practices, stronger infrastructure, healthy habitats and systems, improved accessibility, and individual and family resilience. The hazard mitigation strategies contained in this plan will each be reported on biannually to help provide updates on areas where investments would be most critical.

In addition to hazard mitigation strategies, this plan includes risk profiles designed to provide an overview of the key priorities, vulnerabilities, and potential impacts of natural and human-caused hazards. We examine risk in terms of property, the economy, natural systems, infrastructure systems, government operations, and populations, with a focus on populations more likely to suffer losses or long recovery times from a disaster.

¹ King County Office of Equity and Social Justice. 2016. Equity and Social Justice Strategic Plan. Accessed online on 11/13/19 from <https://kingcounty.gov/elected/executive/equity-social-justice/strategic-plan.aspx>.



Finally, this plan lays out a process to identify and prioritize hazard mitigation projects over the long term and to increase investment in communities that are more vulnerable to disasters. We do this by taking a holistic approach to prioritization.

This plan was developed through the partnership of many county staff and local jurisdictions. The work is a result of their commitment and input throughout the planning process.



Introduction

The King County Regional Hazard Mitigation Plan promotes programs and projects that partner with communities to build a foundation of resilience before, during, and after disasters. This plan update reassesses risks and vulnerabilities to eight natural and seven human-caused hazards and develops strategies to reduce risk from those hazards. In addition to a base plan covering King County as a whole, each participating jurisdiction developed an annex that independently meets most FEMA planning requirements. Each annex, plus this base plan, meets the planning requirements outlined in *44 CFR 201.6*. In addition to King County, over 60 cities and special purpose districts developed plan annexes.

Mitigation Plan Priorities:

King County Regional Hazard Mitigation Plan Steering Committee (Steering Committee) set the following priorities for the 2018 plan update process.

Break down planning silos and establish new partnerships	Collaborate with jurisdictions to build integrated hazard mitigation strategies, including around risk management, floodplain management, comprehensive planning, equity and social justice, and climate change.
Provide more education and training to partners to prepare for FEMA DRRRA grants in 2020	In preparation for a tripling of federal grants for natural hazard mitigation through the Disaster Recovery Reform Act, beginning in 2020, work with planning partners and county agencies to identify projects and project champions. Build capacity among planning partners to identify vulnerability, craft a mitigation strategy, communicate project benefits, and successfully pursue hazard mitigation grant funding.
Conduct a robust public outreach process involving all planning partners.	Implement a proactive outreach strategy focused hazard mitigation success stories and hands-on demonstrations of effective mitigation projects, working with the media to follow-up on stories highlighting Washington's need for more hazard preparedness and resilience.
Develop quality hazard mitigation strategies and a method to prioritize and track them.	Work with planning partners to craft comprehensive hazard mitigation strategies that are measurable, actionable, trackable, and identify specific funding sources. Prioritize strategies in accordance with opportunity to reduce risk and further county priorities.
Integrate equity and social justice into our understanding of risk and vulnerability.	Work with King County departments to identify an appropriate way to address population vulnerability. Include this information in the plan in a way that is operationally meaningful and can support mitigation strategies that will reduce risk to these populations.



Integrate mitigation planning and climate preparedness

Fully integrate with the update process for the Strategic Climate Action Plan. Integration includes participation in workgroups and shared strategies that increase climate and hazard resilience.

Timeline

February-May 2019:
Begin planning process

Meet with each of the 60+ jurisdictions participating in this plan update. Convene the steering committee. Draft plan format and begin GIS analysis. Begin outreach strategy. Develop first drafts of the risk assessment.

June-September: Conduct public outreach

Work with partners on community outreach; conduct media outreach; conduct mitigation strategy development workshops with planning partners.

October-December

Review the plan and submit to FEMA.

January-April, 2020

Complete revisions and adopt the plan prior to expiration on April 30, 2020.

Revisions from 2015 Edition

The 2020 plan was fully rewritten and reformatted to reflect updated priorities and a greater emphasis on hazard mitigation strategies. The most substantive change is to those strategies, which are formatted in an action-plan style, consistent with the Washington State Enhanced Hazard Mitigation Plan. With the change to mitigation strategies, the method of reporting has also been updated.

The risk assessments in this edition have been shortened and refocused to better support the intended audience - emergency managers who are called upon to plan for and respond to these hazards. The information is largely taken from the 2016 Hazard Inventory and Risk Assessment and the 2018 FEMA RiskMAP Risk Report.

The capabilities assessment in this edition has been modified to focus on the relationship between programs, plans, and policies that could support mitigation and the hazard mitigation plan and program. This change will help the plan better reflect how each capability supports mitigation instead of just listing potential capabilities. A similar process was used to document potential sources of funding.

This plan is written to meet or exceed the relevant elements of the Emergency Management Standard (ANSI standard) by the Emergency Management Accreditation Program (EMAP).

The number of participating jurisdictions increased from the 2015 update. In 2015, 53 jurisdictions participated in the plan. For this update, over 60 jurisdictions participated in the planning process and at least 50 are expected to submit complete annexes for FEMA approval.

Regional Hazard Mitigation Plan Chapters

The base plan satisfies all requirements for King County plus many of the planning requirements for local planning partners. The plan is organized as follows.



Planning Process: The planning process section corresponds roughly to Element A in the FEMA Mitigation Plan Review Guide and includes information on the planning process, including public outreach, meetings, and the planning timeline.

Capabilities Assessment and King County Hazard Mitigation Program: The capabilities chapter meets requirements associated with coordinating the hazard mitigation program with other entities as well as information on available funding.

Risk Assessment: The risk assessment chapters include profiles of each profiled natural and human-caused hazard. These profiles are brief and are designed to provide an overview to emergency managers and other users of this plan. This section meets the requirements of Element B in the FEMA Mitigation Plan Review Guide.

Hazard Mitigation Strategies: Hazard mitigation strategies are the key deliverable of this plan and include information on how strategies are identified, developed, and prioritized. This section meets most of the requirements in Element C of the FEMA Mitigation Plan Review Guide.



Hazard Mitigation Planning Process

King County's 2019 Regional Hazard Mitigation Plan (RHMP) was developed with input of a multi-agency, multi-jurisdictional steering committee. The Steering Committee supervised the writing of the plan and was consulted for final decisions made by the King County Emergency Management Planning Team. The process was led by King County Emergency Management, which facilitated both the internal county process and supported individual city planning efforts. Individual departments developed their own strategies internally and then socialized the strategies with the other county participants.

Steering Committee Members

Name	Email	Organization	Focus Area
Lara Whitely-Binder	lwbinders@kingcounty.gov	King County Department of Natural Resources and Parks	Climate Preparedness Specialist
Mitch Paine	mpaine@kingcounty.gov	King County Department of Natural Resources and Parks	Floodplain Management Program Manager
Cecelia Hayes	Cecelia.Hayes@kingcounty.gov	King County Department of Executive Services	Equity and Social Justice Program Manager
Karen Wolf	karen.wolf@kingcounty.gov	King County Executive Office	Comprehensive/Land Use Planning Policy Analyst
Cynthia Hernandez	cynthia.hernandez@kingcounty.gov	King County Department of Natural Resources and Parks	Emergency Management Program Manager
Sean Catanese	sean.catanese@kingcounty.gov	King County Risk Management	Risk Management
Andrew Stevens	astevens@sammamish.us	City of Sammamish	Emergency Manager
Ellen Montanana	emontanana@bellevuewa.gov	City of Bellevue	Emergency Manager
Jennifer Franklin	jennifer.franklin@mercergov.org	City of Mercer Island	Emergency Manager



Janet Sailer	janet.sailer@spwsd.org	Sammamish Plateau Water District	Emergency Manager
Steve Moye	smoye@ccud.org	Coal Creek Utility District	Manager
Janice Rahman	janice.rahman@kingcounty.gov	King County Emergency Management	Recovery Program Manager
Mike Ryan	mryan@bellevuewa.gov	King County Emergency Management	N/E Zone Coordinator
Sarah Miller	sarah.miller@kingcounty.gov	King County Emergency Management	S Zone Coordinator
Jeffrey Linn	jlinn@kingcounty.gov	King County GIS	GIS
Derrick Hiebert	dhiebert@kingcounty.gov	King County Emergency Management	Planning Process Facilitator, Plan Author

The team met monthly to review progress and make key decisions about the direction of the planning effort. These meetings were hosted by King County Emergency Management.

Steering Committee Meeting Topics

Month	Topic
February 2019	Outline proposed planning process and timeline and approve plan and plan annex templates.
March	Identify public outreach sites and strategy
April	Integrating equity and social justice into the mitigation plan.
May	Integrating equity and social justice into the mitigation plan.
June	Establish plan goals, priorities, and strategy prioritization method
July	Workshop 2 – hazard mitigation strategies.
August	Review capabilities assessment
September	Review risk assessment



October	Long-term mitigation plan monitoring and implementation strategy
November	Review draft base plan and King County hazard mitigation strategies
January 2020	Submit plan to FEMA
March 2020	Incorporate FEMA revisions
April 2020	Receive notice of Approval, Pending Adoption from FEMA
June 2020	Plan adoption and final approval

In addition to the multi-jurisdictional steering committee, the King County Emergency Management Coordinating Committee (EMCC) contributed to the plan update as the steering committee for the King County-specific hazard mitigation strategies. This committee consists of every King County department as well as representatives from the King County Executive's Office and the King County Council. A list of all EMCC members is available in the Capabilities chapter. The EMCC meets monthly.

Individual jurisdiction annexes were developed in partnership with King County, but with separate internal steering committees. The members of each jurisdiction's steering committee are documented in each annex.

Mitigation Planning Partner Engagement

The King County portion of this plan focuses on unincorporated areas of the county. These areas border, or are served by, cities, tribes, and special purpose districts, all of whom were invited to participate in this plan update. For the purpose of interjurisdictional coordination, King County defined 'neighboring jurisdictions' as these partners since they are the entities most critical to effective implementation of multi-jurisdictional mitigation projects and since many city residents receive county services and visa-versa. In addition to coordination with these jurisdictions, King County maintains a high level of engagement with neighboring counties, especially Pierce and Snohomish. The planning team invited counterparts in Pierce and Snohomish to attend each of the planning workshops described below. There are also multiple other concurrent planning efforts involving these counties, including the Close Coordinated Terrorist Attack (CCTA) program and the Regional Catastrophic Planning (RCPG) effort.

The planning process kicked off in November 2018 with a meeting and workshop to which all planning partners were invited. At this workshop, participants learned about the process, expectations, and were asked to provide commitment letters with billing rates to meet federal grant match requirements.

To support the more-than-60 planning partners, the planning team met individually or in small groups with each jurisdiction to discuss the planning process and go over the planning requirements. These meetings took place between February and May.

To supplement these meetings, King County hosted a webinar and two in-person planning workshops in June 2019 (June 3, 10, and 27). During these workshops, the planning team presented updated information on public outreach, plan integration, risk assessments, and strategy prioritization.



In addition to planning assistance workshops, King County partnered with FEMA RiskMAP and Washington State to offer three workshops on the identification of threats and hazards, the development of mitigation strategies, and the process to successfully fund those strategies. The workshops were held on December 13, 2018, July 25, 2019, and August 22, 2019. Approximately 70 attendees were recorded at each. Invitees included representatives from all King County departments, all cities, most special purpose districts, and other agencies and organizations such as the Port of Seattle and the Northwest Healthcare Response Network.

Following the submission of the base plan in December 2019, King County will begin a second stage of outreach targeting those jurisdictions who missed the original submission deadline and those who were not previously involved. Among the second group, school districts will be proactively engaged and offered assistance in developing annexes to the hazard mitigation plan.

Sign-in sheets for all outreach events are available upon request.

Jurisdiction Plan Annex Process

Jurisdictions may join the regional hazard mitigation plan at any time by submitting a letter of intent to King County Emergency Management and completing the planning process and plan template. Each plan can be unique, and jurisdictions may do more than what is required in the template; however, this template is designed to help walk communities through the planning process in an accessible way. Further details on how to conduct the process are available in the King County Regional Hazard Mitigation Plan. King County staff will provide technical assistance to planning partners, whenever possible.

Review and Incorporation of Reports and Studies

In addition to the data sources outlined in the Risk Assessment section of this plan, the planning team leveraged a number of existing and ongoing planning processes and other documents. More information can be found in the Program Capabilities chapter of this plan.

- The Strategic Climate Action Plan (SCAP) is a plan designed to assess the impacts of climate change on King County and develop strategies to both reduce risk from climate impacts and reduce King County's contribution to climate change. The planning team for the RHMP included the lead for the SCAP and participated in the SCAP.
- The State Enhanced Hazard Mitigation Plan was used for data on hazards and for identifying capabilities. Another contribution from that plan is the hazard mitigation strategy format, which was copied and modified for use in the King County plan.
- The Equity and Social Justice Strategic Plan was integral to establishing the hazard mitigation plan goals and the process by which mitigation projects are prioritized.
- Puget Sound Regional Council's Vision 2050 lays out planning policies and guidelines for the King-Pierce-Kitsap-Snohomish county area and is undergoing an update in 2019 and 2020. The mitigation planning team reviewed and contributed to the planning process for Vision 2050.
- The King County Floodplain Management Plan is being updated and data from that planning effort is included in sections of this plan referring to the NFIP, flood risk, and flood mitigation strategies.



- The Washington, DC Hazard Mitigation Plan (draft) was a source for inspiration for the method of prioritizing mitigation strategies and conducting the risk assessment for vulnerable populations.
- The 2018-2019 FEMA RiskMAP Risk Report for King County was reviewed for data and mapping purposes as well as for information on historic disasters and potential mitigation strategies.
- The 2019 King County Dam Inventory from the Washington State Department of Ecology and guidance from the King County Dam Safety Program.
- The Clean Water and Health Habitat Initiative, uniting departments involved in health and environmental resilience, was convened by the King County Executive and includes the hazard mitigation program.
- The draft Regional Resiliency Assessment Program report for transportation for Western Washington.

King County Plan Update Timeline

The following is a timeline of significant events and milestones for King County in the Regional Hazard Mitigation Plan Update.

Plan Update Timeline

PLANNING ACTIVITY	DATE	SUMMARY	ATTENDEES
Plan Kickoff	11/28/18	Conducted a kickoff meeting for the planning process, including discussions of expectations and the project timeline.	Designated county, city, and special district staff who are leading local plan updates
Risk Assessment Workshop	12/13/18	First workshop with FEMA RiskMAP staff to socialize hazard data and develop problem statements.	Approximately 80 attendees including GIS staff, county departments, city emergency managers, and other program managers with interest in mitigation
Steering Committee Meeting Kickoff	2/19/19	Outline proposed planning process and timeline and approve plan and plan annex templates.	Steering committee
Outreach Strategy Meeting	2/22/19	Meet with staff to identify outreach strategy	OEM Director, Outreach Team, Coordination Team
Steering Committee Meeting	3/12/19	Identify public outreach sites and strategy	Steering committee



Steering Committee Meeting	4/30/19	Integrating equity and social justice into the mitigation plan.	Steering committee
EMCC Meeting	5/1/19	Discuss planning process, DRRRA funding, and mitigation strategies	County departments
Steering Committee Meeting	5/14/19	Integrating equity and social justice into the mitigation plan.	Steering committee
Mitigation Technical Webinar	6/3/19	Reviewed planning process and helped local partners on mitigation planning questions	local jurisdiction partners
EMCC Meeting	6/5/19	Mitigation strategy meeting discussions and identify points of contact in each agency	County departments
Mitigation Technical Workshop	6/10/19	Reviewed planning process and helped local partners on mitigation planning questions	local jurisdiction partners
Steering Committee Meeting	6/11/19	Establish plan goals, priorities, and strategy prioritization method	Steering committee
CSA Town Hall Outreach Event	6/18/19	Comments received included concerns about mitigation of solid waste facilities, whether or not earthquake insurance makes sense, and need for snow mitigation following February snowstorm.	Residents from central King County and the Issaquah/Hobart/Maple Valley areas. Approximately 100 attendees.
CSA Town Hall Outreach Event	6/25/19	Discussed concerns about impacts to Enumclaw area from a lahar/Mt. Rainier	Residents from southeast King County, predominately from Enumclaw and nearby unincorporated areas. Approximately 100 attendees.
Mitigation Technical Workshop	6/27/19	Reviewed planning process and helped local partners on mitigation planning questions	local jurisdiction partners
Mitigation Strategy Meetings	7/9/19	Met with internal planning partners (county departments) to develop mitigation strategies.	DES, FMD and KC International Airport



Mitigation Strategy Meetings	7/11/19	Met with internal planning partners (county departments) to develop mitigation strategies.	DNRP
Mitigation Strategy Meetings	7/11/19	Met with internal planning partners (county departments) to develop mitigation strategies.	Local Services (Roads)
Mitigation Strategy Meetings	7/15/19	Met with internal planning partners (county departments) to develop mitigation strategies.	Local Services (Permitting)
Hazard Mitigation Workshop	7/25/19	Worked through the entire strategy development process from risk identification to mitigation projects.	County and local partners, approximately 75 attendees
Steering Committee Meeting	8/20/19	Review mitigation capabilities	Steering committee
Mitigation Funding Workshop	8/22/19	Worked through process of developing a successful hazard mitigation grant application	County and local partners. Approximately 60 attendees.
Clean Water Healthy Habitat Initiative Workshop	9/4/19	Participated in a process to coordinate mitigation planning efforts with other environmental quality, climate change, and hazard reduction programs in the county.	60-100 attendees from multiple county departments, especially DNRP.
Steering Committee Meeting	9/16/19	Review risk and vulnerability assessments	Steering committee
CSA Town Hall Outreach Event	9/10/19	Residents looked at the hazard information and discussed strategies for protecting their community from an earthquake. A major concern is the likelihood that the area will be isolated by an earthquake due to liquefaction.	Dozens of residents from the areas of White Center, Highline, Skyway, and Burien.
Critical Transportation Workgroup	9/17/19	Discussed the establishment and mitigation of lifeline transportation routes for a post-Cascadia scenario.	County departments, local jurisdictions, and state agencies participated in the workshop.
Steering Committee Meeting	10/8/19	Review base plan and King County mitigation strategies	Steering committee



CSA Town Hall Outreach Event	10/17/19	Discussed flooding in the Snoqualmie-Carnation-Duvall areas.	Residents from the northeastern portion of the county, especially in Snoqualmie, Carnation, and Duvall
County Departments Strategy Coordination	11/14/19	Meet with King County departments to go over all the mitigation strategies, eliminate gaps, and ensure consistent priorities.	County departments, including OEM, FMD, DNRP, PHSKC, KCIT, DES.
Steering Committee Meeting	11/12/19	Review draft base plan	Steering committee
Submit to WA EMD and FEMA	12/15/19	Submit full mitigation plan to FEMA for review	Planning Team

Support for Community Rating System (CRS) Communities

The hazard mitigation plan update process was also closely linked to the update for King County's Flood Hazard Management Plan. To receive credit, participating jurisdictions must follow the CRS process outlined in the current version of the CRS Coordinators Manual, element 510. At a minimum, jurisdictions wanting to receive CRS planning credit must have at least two participants in one of the planning teams.

As such, a separate, parallel process was led by the King County River and Floodplain Management Section. This process was integrated into the planning effort for the overall hazard mitigation plan. Three meetings were held in addition to the regular mitigation planning meetings. The flood portion steering committee consisted of the following members:

Committee Member	Organization	Key Role
Gwyn Berry	City of Snoqualmie	Floodplain Manager/Planner
Bob Freitag	UW Institute for Hazard Mitigation Planning & Research	Director
Elissa Ostergaard	Snoqualmie Watershed Forum	Salmon Recovery Manager
Scott Smith	King County Permitting Division	Senior Engineer
Monica Walker	King County River & Floodplain Management Section	Program Manager, White-Cedar-Sammamish Basin
Ken Zweig	King County River & Floodplain Management Section	Program Manager, Countywide Policy and Planning Unit



PLANNING ACTIVITY	DATE	SUMMARY	ATTENDEES
Planning Meeting 1	10/10/19	Discussed the flood hazard assessment.	Representatives from cities, county departments, academia, and the public.
Planning Meeting 2	10/30/19	Developed flood hazard mitigation strategies.	Representatives from cities, county departments, academia, and the public.
Planning Meeting 3	11/6/19	Prioritize hazard mitigation strategies and review draft risk assessment.	Representatives from cities, county departments, academia, and the public.

Public Outreach Process

Public outreach during the plan update process is considered to be a critical part of hazard mitigation planning. For this update, participating jurisdictions are asked to conduct two outreach events. One of these events should be a meeting-style event and the other could be any event desired by the jurisdiction, including workshops, fairs, neighborhood meetings, etc. Jurisdictions were encouraged to make the meetings valuable to the community. Holding a separate, stand-alone meeting for the sole purpose of this plan update *was NOT required*, especially if using an existing event, like a commissioner's meeting, could help expand public engagement and engage elected officials simultaneously. Jurisdictions were also encouraged to partner with neighbors or special purpose districts serving their area for more effective public outreach events.

To count as outreach for the hazard mitigation plan, meetings had to meet the following requirements.

1. Be advertised to the general public. You do NOT have to publish an ad in the paper. You can use your newsletters, social media, press releases, and other mechanisms to conduct outreach.
2. Promote two-way communication between the public and the planning team.
3. Focus on hazard mitigation, resilience, risk-reduction, etc., for some significant part of the event. The focus does not have to be solely on mitigation, and you do not have to refer to the event as related to "mitigation planning;" however, the concepts of resilience, risk-reduction, etc., should be discussed.
4. Be documented. This is very important. Please summarize both who attends and what they contribute and make sure to include it in the plan.

County public outreach partnered with the Department of Local Services and other local jurisdictions to ensure that events occurred throughout unincorporated areas as well as in incorporated areas served by some county services. The unincorporated area events were part of Community Service Area (CSA) Town Halls. These events are well-attended and well-advertised, with 60-100 attendees per meeting. This outreach model, partnering with existing meetings and services, is designed to help put emergency management and hazard mitigation in context. The work done in hazard mitigation is almost exclusively



carried out by non-emergency management entities. By partnering with other departments and using outreach mechanisms where they would all be present, it may be possible to help demonstrate the role of emergency management in the community and the partnerships that good hazard mitigation requires. The following is an excerpt from the King County Department of Local Services newsletter that goes out to nearly 8000 residents.

King County holds first four 2019 town halls

King County Councilmember Reagan Dunn and the King County Department of Local Services co-hosted the county's first four 2019 Community Service Areas Program Town Hall events in June.

The evening events—in the Greater Maple Valley/Cedar River, Four Creeks/Tiger Mountain, Southeast King County, and Fairwood areas—gave participants an opportunity to meet county officials, learn about services, and talk about issues that affect them and their communities.

Each meeting was attended by 60-100 people. Residents heard from Dunn, their elected representative (*shown at right*), as well as leaders of the Department of Local Services, which aims to serve as a "virtual city hall" for residents of unincorporated King County. These included Local Services Director John Taylor, Road Services Division Director Rick Brater, and Permitting Division Director Jim Chan.



Staff members Ty Peterson and Kim Layman from the King County Permitting Division greet community members at the Southeast King County town hall in Enumclaw.

Other county departments that serve the unincorporated areas were also represented, including the Sheriff's Office (Major Troy Olmsted), Natural Resources and Parks (Director Christie True), Water and Land Resources (Division Director Josh Baldi), and Elections (Director Julie Wise).

Each event started with an open house where participants connected with both county and non-county service providers, including the Assessor's Office, Public Health – Seattle and King County, Metro Transit, Elections, Emergency Management, and Animal Services.

Local Services will host another round of town halls for the remaining Community Service Areas in the fall. Learn more on [King County's Community Service Areas website](#).



King County Public Meetings

Date	Location	Summary	Attendees
6/18/19	Greater Maple Valley CSA	Comments received included concerns about mitigation of solid waste facilities, whether or not earthquake insurance makes sense, and need for snow mitigation following February snowstorm.	Residents from central King County and the Issaquah/Hobart/Maple Valley areas. Approximately 100 attendees.
6/25/19	Enumclaw/Southeast King County CSA	Discussed concerns about impacts to Enumclaw area from a lahar/Mt. Rainier	Residents from southeast King County, predominately from Enumclaw and nearby unincorporated areas. Approximately 100 attendees.
9/12/19	White Center CSA	Residents looked at the hazard information and discussed strategies for protecting their community from an earthquake. A major concern is the likelihood that the area will be isolated by an earthquake due to liquefaction.	Dozens of residents from the areas of White Center, Highline, Skyway, and Burien.
10/17/19	Snoqualmie/Carnation/Duvall CSA	Discussed flooding in the Snoqualmie-Carnation-Duvall areas.	Residents from the northeastern portion of the county, especially in Snoqualmie, Carnation, and Duvall



The Des Moines Farmers Market public outreach event hosted by the City of Des Moines and including King County Emergency Management and Valley regional Fire Authority.



Help Identify Good Risk-Reduction Projects

The key deliverable of a successful planning process is a prioritized list of risk reduction strategies. These strategies are identified by each participating jurisdiction through an asset-based process. We would love to hear from you! Please consider these questions and either fill out the form below or email me at dliebert@kingcounty.gov.

1. What makes your community great? What are the assets, features, and value, that you cannot live without? These can be both physical assets like fire stations, community assets like the business district, and intangible assets like the peace and tranquility of the community.
2. What hazards potentially threaten those assets and values?
3. How susceptible or vulnerable are those assets to hazards?
4. What happens if you lose those assets? What is the impact on your community? What is the impact from the asset's failure or loss?
5. Are these assets redundant? Can I afford to live without it? Does another asset serve a similar purpose?
6. What can I do to reduce or eliminate the risk to this asset from hazards?

The following is a questionnaire handed out at these events. Major topics of discussion, and any comments or feedback on the plan and planning process, are included in the summary table for the public meetings.

King County Emergency Management also joined several locally-led events. For this, the planning team developed a table-sized 3D-printed topographic map of the county with an aerial image printed on it. The interactive, 3D physical map was used to talk about the county's history of hazards, flooding, climate change, landslides, lahar zones, liquefaction areas, and more.

The model was available for use by local jurisdictions both with and without county staff so that it

could be used to support a wider range of outreach activities.

Finally, in addition to in-person outreach, King County Emergency Management developed a website, <https://www.kingcounty.gov/hazardplan>. The website explains the purpose of mitigation and provides an overview of key hazards and examples of effective hazard mitigation. This website will be kept up for at least the duration of the plan review.

Joint Public Meetings

Date	Location	Summary	Attendees
7/16/19	City of Medina	Presented to the City of Medina Emergency Management Committee and other local residents and led a discussion afterward. The primary interest was on how residents could contribute to mitigation and resilience goals for their city. Residents in Medina will serve as the steering committee for the mitigation plan update and will help identify and prioritize mitigation strategies based on at-risk, high-priority community assets.	Community members, elected officials, and members of Medina EMC. Approximately 20 people attended.
7/24/19	City of North Bend	World Café workshop at the North Bend Public Library	No attendees were recorded at this event.



8/21/19	City of Kenmore	Presentation and hazard mitigation booth with 3D map at a Kenmore Town Square movie night. Spoke with approximately 25 people. The main focus of questions were around which areas of the community were at higher risk. Also collected feedback from community members on their ranking of Kenmore's mitigation strategies.	Lots of children plus community members attended. Over 100 attendees estimated.
8/27/19	Cities of Tukwila, Kent, Covington and SeaTac	Presented on county hazard mitigation efforts and discussed countywide risks at a joint public meeting at Fire Station 74 in Kent. Major comments included questions about how cities and the county are prioritizing mitigation investments, comments on the risk of fire from homes built very close together, and questions about the restoration of water in areas with unstable soils.	10-12 attendees, mostly from Kent, spoke with staff from their cities and King County Emergency Management
	City of Des Moines	Hosted a booth at Des Moines Farmers Market. Discussed the possibility of Des Moines becoming an island after a major earthquake. Discussed the vulnerability of the waterfront relative to the lower-vulnerability of the rest of the city. The City of Des Moines and Valley Regional Fire Authority were also present and completed surveys for their mitigation plan annexes.	The booth was occupied continuously by residents from 10AM until 2PM.
9/28/19	Cities of Maple Valley, Covington, and Black Diamond	Annual preparedness fair 3D map booth and presentation. Spoke with dozens of residents and several elected officials and shared information on hazard risk and ways to address hazard risk. Major comments were related to length of time needed to reach residents in far-flung areas following an earthquake, especially given the response times during the February 2019 winter storms.	Hundreds of residents from the area and cities around Maple Valley. Dozens stopped by the booth.



Residents examining the 3D hazard map at a North City Water public outreach event (Source: Diane Pottinger, North City Water)

Continued Public Participation

King County and its partner cities already maintains substantial public outreach capabilities, focusing on personal preparedness and education. Information on ongoing progress in implementing the hazard mitigation plan will be integrated into public outreach efforts. The Community Service Area Town Hall events led by the Department of Local Services are scheduled annually and provide a unique opportunity to highlight mitigation successes. This will provide King County residents, already engaged in personal preparedness efforts, with context and the opportunity to provide feedback on the county's progress and priorities in large-scale mitigation. In the vertical integration of risk-reduction activities from personal to local to state and federal, it is important that the public understand how its activities support, and are supported by, larger-scale efforts.

The outreach and mitigation teams will also continue to work with media and other agency partners to publicize mitigation success stories and help explain how vulnerabilities are being fixed. When possible, public tours of successfully-completed mitigation projects will be organized to allow community members to see successful mitigation in action.



King County Regional Hazard Mitigation Program Capabilities

King County includes 39 cities, over 129 special purpose districts, and large unincorporated areas. While each city and special purpose district is responsible for its own hazard mitigation efforts, King County supports these jurisdictions through region-wide services and planning coordination, including efforts associated with land use, emergency management, and floodplain management. County departments involved in hazard mitigation efforts include Executive Services (facilities management, emergency management), local services (permitting, roads), Natural Resources and Parks (wastewater, landslides, floodplain management, climate change), and the Office of the Executive (planning).

As the lead agency for hazard mitigation, King County Emergency Management (KC EM) engages partners to promote and/or support mitigation activities. KC EM also publicizes Hazard Mitigation Assistance grant opportunities and provides technical support to develop applications and administer awards. KC EM also serves on interagency workgroups such as comprehensive planning, climate adaptation, and transportation as a way of promoting consistency in risk assessment and reduction priorities.

The focus of King County Emergency Management's hazard mitigation program is integration, including plan integration, program integration, and departmental/jurisdictional integration. Plan integration helps ensure partners use the best available data and that plan outcomes are supportive of a resilient future. Program integration helps partners find fund sources and support outside of their departments or programs. Department and jurisdiction integration builds on the role the county EOC serves for response, engaging resources to promote and implement the most effective, highest-priority hazard mitigation opportunities. In a large county with dozens of partners, a jurisdiction-by-jurisdiction approach is less effective at building resilience. KC EM's approach is to unify partners behind the vision of resilience laid out in this plan.

Plan Integration

When plans and planning processes are more integrated, it is possible to achieve greater impact through clearer definition, smarter investment, partnerships, and innovation. Successful integration requires

Hazard Mitigation Program

Hazard mitigation is most effective when implemented through a systematic program that establishes priorities and understands that resilience requires system-wide investments in mitigation.

Cohesive, comprehensive strategies and the establishment of partnerships are the core elements of a program. Individual projects matter, but are made more effective by systematic, strategic implementation.

In order to support this program, King County Emergency Management convenes multi-agency committees, offers technical assistance on federal mitigation grants, supports partners in planning and mitigation projects, and maintains and updates the King County Regional Hazard Mitigation Plan.



coordination between planning efforts and, especially, cross-participation in planning processes. The goals of plan integration are to:

- Ensure consistency with jurisdiction priorities across all planning processes
- Leverage opportunities to further multi-benefit initiatives that are supported by multiple planning processes
- Achieve common measures of success for outcomes

The hazard mitigation plan can benefit from integration with planning processes that:

- Prioritize and invest in infrastructure
- Regulate development
- Set strategic direction for programs

To other planning processes, the hazard mitigation plan brings risk and vulnerability information to help prioritize projects and set development standards or regulations. The mitigation plan also comes with potential funding for investments in cost-effective risk-reduction projects. On the other hand, the mitigation plan depends on other plans and processes to implement many strategies. Since the mitigation plan is not itself a regulatory or budgetary document, strategies identified in the mitigation plan are often best implemented through those processes or programs.

There are many plans and planning processes within King County that impact hazard risk. These include strategic plans, long-range plans, resource plans, and capital plans.

TITLE	DESCRIPTION	LEAD	INTEGRATION STRATEGY
Capital Facilities Plans	Capital facilities plans identify and prioritize large-scale projects. Entities involved in this include the King County Facilities Management Division and the King County Flood Control District.	Various	• Integrate mitigation strategies from capital plans • Encourage the use of hazard information to prioritize capital improvements • Support county departments with funding gaps in accessing Hazard Mitigation Assistance to complete or expand projects that are identified as important but are unfunded or partially funded.



Clean Water and Health Habitat Strategic Plan	The CWHH Strategic Plan seeks to establish a strategic alignment across all plans that impact clean water and healthy habitat in order to achieve “greater impact through clearer definition, smarter investment, partnerships, and innovation.” This process is just starting, and it includes over 20 separate plans and programs.	Department of Natural Resources and Parks	• Participate in plan development. • Align outcome measures and program prioritization methods • Work through this process to help align mitigation planning with other planning in the natural resource sector, such as forest health, solid waste, and salmon recovery.
Comprehensive Plan	The King County Comprehensive Plan is the long-range guiding policy document for all land use and development regulations in unincorporated King County, and for regional services throughout the County including transit, sewers, parks, trails and open space.	Executive’s Office	• Encourage updates to the critical areas ordinance • Provide feedback and comments on the plan
Comprehensive Emergency Management Plan (CEMP)	The CEMP is for use by elected and appointed County officials, and King County government department directors, managers and staff in mitigating, preparing for, responding to, and recovering from disasters. This plan is a product of coordinated planning efforts between King County Emergency Management, County departments, emergency management representatives from various political jurisdictions, and selected private and nonprofit sector interests. It meets the requirements of WAC 118-30 and the Federal Emergency Management Agency's (FEMA) planning guidance for the National Response Framework and	Emergency Management	• The Hazard Mitigation Plan provides the risk profiles that support the development of the CEMP. • The Hazard Mitigation Plan is also a component (the mitigation component) of the CEMP.



	the National Incident Management System (NIMS) compliance.		
Equity and Social Justice Strategic Plan	The Equity and Social Justice Strategic Plan is a blueprint for action and change that will guide the county's pro-equity policy direction, decision-making, planning, operations and services, and workplace practices in order to advance equity and social justice within County government and in partnership with communities.	Executive's Office	- Follow guidance in the ESJ plan for the prioritization of strategies - Develop information on populations vulnerable to hazards and share with ESJ planning teams
Flood Hazard Management Plan	The current (2013) King County Flood Hazard Management Plan is a functional annex of the comprehensive plan. It outlines the County's approach to comprehensive floodplain management including land use planning, flood mitigation efforts, and flood protection facilities management.	Department of Natural Resources and Parks	- Work with department responsible for floodplain management to write the flood risk assessment. - Work with local CRS coordinators to ensure the mitigation plan is worth the maximum number of points.
Strategic Climate Action Plan	King County's Strategic Climate Action Plan (SCAP) is a five-year blueprint for County action to confront climate change, integrating climate change into all areas of County operations and its work in the community. The SCAP is King County's blueprint for climate action and provides a "one-stop-shop" for county decision-makers, employees, and the general public to learn about the County's climate change goals, priorities and commitments.	Department of Natural Resources and Parks	- Inter-workgroup participation - Integrated mitigation strategies - Consistent risk assessments
Strategic Plan for Road Services	The Road Services Strategic Plan lays out system needs and anticipated service levels and an asset management approach to road maintenance and improvement.	Department of Local Services	Integrate mitigation strategies



Program and Policy Capabilities

With over 15,000 employees and dozens of departments and offices, King County has a tremendous capability to implement mitigation projects. Mitigation efforts are underway throughout the county, including such organizations as the Rivers and Floodplain Management Section of DNRP and the Wastewater Treatment Division of DNRP.

The hazard mitigation planning process has engaged participants from across these program and policy areas in order to establish a common assessment of hazards, identify potential mitigation strategies, partnerships for future projects, and to assess county capabilities to implement mitigation projects. The list below identifies King County policies and programs that support and implement hazard mitigation and assesses the effectiveness of each. For state-level policies and programs that support hazard mitigation, such as the Growth Management Act, please see the Washington State Enhanced Hazard Mitigation Plan.²

The following table identifies the programs and organizations contributing regularly to hazard mitigation.

PROGRAM/POLICY	MITIGATION ACTIVITIES	LEAD
Building and Development Codes	Building and development codes are adopted and modified from the 2015 IBC by Washington State Building Code Council and King County. These codes help ensure that new construction and substantial improvements meet international standards, accounting for our hazard risk.	Department of Local Services, Permitting
Building and Development Code Enforcement	The Department of Local Services, Permitting Division is the agency that provides land use, building and fire regulatory and operating permits, code enforcement and a limited number of business licenses for unincorporated areas of King County. Other local jurisdictions provide similar services within incorporated areas. The Code Enforcement Section investigates complaints regarding violations of King County Codes (KCC) related to zoning, building, property maintenance, shorelines and critical areas in unincorporated King County.	Department of Local Services, Permitting
Community Rating System	The CRS program rewards communities that have established exceptional floodplain management programs and undertaken certain activities to reduce flood risk. King County is one of the highest rated communities in the country. The program provides NFIP policyholders in floodplains with a discount of up to 40% on their insurance.	DNRP DLS KCEM

² Washington State Enhanced Hazard Mitigation Plan. 2018. "Potential Sources of Funding and Mitigation Capability." Accessed online on 7/12/19 from <https://mil.wa.gov/enhanced-hazard-mitigation-plan>.



Critical Areas Ordinance	The critical areas ordinance requires the identification of geologically-hazardous and frequently-flooded areas. These areas must either be protected from development or any development in these areas must be designed to account for hazard risk.	Department of Local Services
Equity and Social Justice	King County has deep and persistent inequities – especially by race and place—that in many cases are getting worse and threaten our collective prosperity. Launched by King County Executive Ron Sims in 2008 and formalized by Executive Dow Constantine and the Metropolitan King County Council via ordinance in 2010, Equity and Social Justice (ESJ) is an integrated part of the County’s work and is supported by the Office of Equity and Social Justice since it was established in early 2015.	King County Executive’s Office, Office of Equity and Social Justice
Facilities Management Division	The Facilities Management Division (FMD) oversees and maintains King County's real estate assets. The Major Projects and Capital Planning section is tasked with efficiently and effectively delivering large-scale projects in alignment with the policy directives of King County government, the facility needs of employees and the public, and for overall service to the community. Part of this includes the development of hazard-resilient facilities.	Department of Executive Services, FMD
GIS	King County GIS provides analysis support, mapping, and other data to all King County departments. This data is valuable for hazard mitigation planning activities.	KCIT
Hazard Mitigation	The hazard mitigation program works with partners across county departments and local jurisdictions to coordinate and promote hazard mitigation projects. The program also coordinates applications to federal Hazard Mitigation Assistance grant programs and conducts hazard mitigation planning for the county in partnership with local jurisdictions and special-purpose districts.	KC Emergency Management
King County Conservation District	The King County Conservation District is an independent special purpose district with separately-elected commissioners. It promotes water, land, soil, and forest conservation and preservation and conducts wildfire risk reduction activities.	King County Conservation District
King County IT	KCIT leads the county’s response to, and preparedness for, cyber incidents. KCIT has helped local cities recover from ransomware and other attacks.	King County Information Technology (KCIT)



King County Flood Control District	In 2007, the King County Flood Control District was established to provide a proactive, regional approach to flooding as well as funding to improve the county's nearly 500 aging and inadequate flood protection facilities. Funding for the Flood Control District comes from a county-wide property levy of 12.9 cents per \$1,000 assessed value. This amounts to \$54 per year on a \$416,000 home. The levy raises roughly \$54.5 million a year. This funding dramatically increases the number of projects that can be completed each year. The additional local funding also enhances the District's ability to receive federal and state matching funds. The King County Flood Control District is a separate special purpose district.	King County Flood Control District
Landslide Hazards	The Landslide Hazards program conducts mapping and outreach associated with landslide risk.	DNRP Water and Land Resources Division
Land Use Planning and Zoning	Land use planning and zoning establishes growth and land use patterns that are consistent with long-range plans and supported by infrastructure.	King County Executive's Office
National Flood Insurance Program	Communities that participate in the National Flood Insurance Program adopt a floodplain management code in exchange for FEMA making flood insurance available to residents and businesses.	DNRP, DLS – Permitting Division
Office of Risk Management Services	Risk Management investigates and resolves claims against King County in a fair and expeditious manner, and also provides internal services to King County agencies, including: • Insurance: King County administers a self-insurance program and purchases a variety of other insurance policies and related services consistent with good risk management practices and the needs of the County. • Contracts: Risk Management advises King County agencies on insurance requirements, indemnification, release, and hold harmless provisions in all types of contracts. Risk Management actively negotiates these provisions and, together with the Prosecuting Attorney's Office, assists agencies in pursuing and tendering claims arising out of contractual relations. • Recovery Services: The recovery section of Risk Management is charged with seeking compensation for	Department of Executive Services



	damages caused to King County property or injury to King County employees by negligent third parties. • Loss Control Program: The Loss Control Manager works with King County agencies to identify areas of potential loss and recommend strategies to reduce exposure to liability. The Loss Control Program also administers continuing workplace training and education for King County employees. Part of this work includes the development and maintenance of a risk register of events and information on how those events can impact King County.	
Public Health	Public Health — Seattle & King County (Public Health) works to protect and improve the health and well-being of all people in King County as measured by increasing the number of healthy years that people live and eliminating health disparities. Public Health is the one of the largest metropolitan health departments in the United States with 1,400 employees, 40 sites, and a biennial budget of \$686 million. The department serves a resident population of nearly 2.2 million people in an environment of great complexity and scale, with 19 acute care hospitals and over 7,000 medical professionals. Over 100 languages are spoken here, and King County is an international destination welcoming nearly 40 million visitors annually. Public Health protects the public from threats to their health, promotes better health, and helps to assure that people are provided with accessible, quality health care. Health protection functions include disease control, such as tuberculosis, HIV, communicable disease epidemiology and immunizations, and ensuring that the air is safe to breathe, and water and food are safe to consume. Health promotion functions include preventing behaviors that lead to disease, averting injuries and managing chronic health conditions. Health provision functions include convening and leading system-wide efforts to improve access and quality, advocating for access to quality health care for all, forming partnerships with service providers and directly providing individual health services when there is a public health need.	Public Health Seattle-King County



Road Services Division	Road services builds and maintains over 2000 miles of road and 200 bridges. They are responsible for many mitigation activities, including those related to culvert replacement, pavement preservation, and bridge retrofits.	Department of Local Services
Shoreline Master Program	King County has nearly 2,000 miles of shoreline along major lakes and rivers and Vashon-Maury Island. These shorelines provide habitat for fish and wildlife, places for public enjoyment and space for wide-ranging waterfront land uses. The Shoreline Master Program helps preserve these spaces and uses, thereby reducing risk to hazards including sea-level rise.	DLS – Permitting Division
Wastewater Treatment Division	Invest in upgrades to pipe and water treatment facilities to make them more resilient to earthquakes, severe weather, flooding, and climate-change.	DNRP

Integration with Departments and other Jurisdictions

Beyond departmental integration, King County works with local jurisdictions, special purpose districts, and tribes to support effective risk reduction. King County coordinates activities related to emergency management and hazard mitigation through two bodies, the Emergency Management Coordinating Committee (EMCC) and the Emergency Management Advisory Committee (EMAC), which are each described in greater detail in the table below.

King County Stakeholder Integration Capabilities

ORGANIZATION	DESCRIPTION	MEMBERSHIP
Clean Water / Healthy Habitat Initiative	An initiative convened by the county executive to help streamline projects, increase collaboration, and improve results for the work accomplished through the spending of \$6 Billion over the next decade on clean water and habitat protection in King County.	All county agencies
King County Community Rating System Users Group	King County and the cities who are part of CRS meet to coordinate efforts and provide technical assistance to each other on maintaining and improving CRS ratings.	• Auburn • Bellevue • Issaquah • Kent • North Bend • Renton • Snoqualmie • Carnation



		• Redmond • King County
Emergency Management Coordinating Committee (EMCC)	EMCC is charged by the King County Council with coordinating interdepartmental emergency preparedness matters. EMCC works to support departments in developing continuity of operations plans, preparedness plans, and hazard mitigation plans. It also contributes to after action reports. EMCC has played an important role in the mitigation plan update process for the county by identifying and dedicating key staff to participate in planning and by reviewing and providing feedback on planning team activities.	All county departments are included in the EMCC. The following are those who attend meetings more regularly. • King County Emergency Management • Department of Human Resources • Metro Transit Department • Department of Local Services • Public Health - Seattle and King County • Department of Natural Resources and Parks (DNRP) • Department of Community and Human Services • Department of Adult and Juvenile Detention • Facilities Management Division of the Department of Executive Services • Director's Office of the Department of Executive Services • King County Information Technology • Office of Labor Relations • King County Sheriff's Office • Office of the King County Executive • Department of Assessments • King County District Court • King County Elections • DNRP Solid Waste Division • DNRP Waste Treatment Division
Emergency Management Advisory Committee (EMAC)	EMAC advises, assists, reviews, and comments on emergency management and homeland security issues, regional planning, and policies. They measure and prioritize core capabilities and recommend homeland security allocations and work products to sustain and enhance preparedness and operational levels. Members, as set forth in code, provide regional and multi-disciplinary perspective, and represent cities, fire service, law enforcement,	The membership for EMAC is established by the King County Council and includes the following entities/interests: • Central region EMS and Trauma Care Council • City of Bellevue • City of Kent • City of Renton • City of Seattle • 1 Utility • 1 Faith-Based Organization • 1 Financial Community Organization • American Red Cross • KC DNRP



	hospitals, the Port of Seattle, government, special purpose districts, tribes, utilities, non-profit agencies, and the private sector.	• KC Metro • KC Roads • KC Executive Office • King County Fire Chiefs Association • King County Fire Commissioner's Association • King County Police Chiefs Association • King County Sheriff's Office • KC Local Emergency Management Planning Committee • Muckleshoot Tribal Nation • Northwest Healthcare Response Network • Port of Seattle • 1 Private Industry Representative • Public Health Seattle and King County • Puget Sound Educational Services District • Snoqualmie Tribal Nation • Sound Cities Association • Washington Association of Building Officials • 1 Water and Sewer District Representative
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Potential Sources of Hazard Mitigation Funding

Hazard mitigation projects are most often completed with funding from capital budgets as part of the normal building and maintenance processes that occur in any jurisdiction. There is also source and use-specific funding, such as that provided by the King County Flood Control District that is part of regular program funding and is highlighted in the program section above. Beyond regular capital funding, there are dedicated mitigation programs operated by state, county, and federal agencies.

Potential Sources of Hazard Mitigation Funding

PROGRAM	LEAD AGENCY	DESCRIPTION	PROJECT TYPES
BUILD Grants	US Department of Transportation (USDOT)	Grants support investments in surface transportation infrastructure and are to be awarded on a competitive basis for projects that will have a significant local/regional impact.	Transportation and related infrastructure retrofits, including stormwater projects
Building Blocks for Sustainable Communities	U.S. Environmental	This EPA program provides targeted, technical assistance to communities to	Planning and feasibility studies



	Protection Agency (EPA)	develop resilience plans, development plans, sustainability strategies, etc.	
Building Resilient Infrastructure in Communities (BRIC)	Federal Emergency Management Agency (FEMA)	New annual mitigation grant program that is expected to replace PDM. Will focus more on large-scale infrastructure projects that reduce risk to natural hazards.	Most long-term risk-reduction projects that protect against fire, flood, earthquake, and other natural hazards.
Community Development Block Grants	U.S. Department of Housing and Urban Development (HUD)	CDBG funds comprehensive plans, limited infrastructure planning/construction, feasibility studies, community action plans. Income and population restrictions apply.	Housing and infrastructure retrofits, feasibility studies, planning
Community Economic Revitalization Board	WA Department of Commerce	CERB provides loan funding to local jurisdictions for public infrastructure to support private business growth and expansion.	Infrastructure retrofits, public-private partnerships
Combined Water Quality Funding Program	WA Department of Ecology	Fund sources for projects associated with publicly-owned wastewater and stormwater facilities. The integrated program also funds nonpoint source pollution control activities.	Drinking-water system improvements, feasibility studies, source-water protection, infrastructure retrofits
Cooperating Technical Partnership Program	FEMA	The program creates partnerships between FEMA and qualified local and state partners to create, maintain, and publicize up-to-date flood and other hazard maps and data.	Planning, outreach, feasibility studies
Drinking Water State Revolving Fund	WA Department of Health	The Drinking Water State Revolving Fund (DWSRF) provides loans to drinking water systems to pay for infrastructure improvements. In some cases, partial loan forgiveness is offered.	Infrastructure retrofits, source-water protection, planning, drinking-water system improvements
Emergency Watershed Protection Program	Natural Resource Conservation Service (NRCS)	Emergency recovery measures for runoff retardation and erosion prevention to relieve imminent hazards created by a natural disaster.	Infrastructure retrofits, slope stabilization, source-water protection, flood risk reduction, erosion prevention
Estuary and Salmon	Department of Fish and	ESRP provides funding restoration and protection efforts in Puget Sound,	Acquisitions, slope stabilization, flood risk



Restoration Program	Wildlife (DFW)	including projects such as flood storage, erosion control, and climate resilience measures.	reduction projects, ecosystem restoration
FireWise Fuel Mitigation Grant Program	WA Department of Natural Resources	The Fuel Mitigation Grant provides a cost share for communities engaged in defensible space and fuels reduction projects.	Wildfire fuels reduction, defensible space
Floodplains by Design	WA Department of Ecology	Floodplains by Design is the primary grant program for projects that reduce flood hazards while restoring the natural functions that Washington rivers and floodplains provide.	Slope stabilization, ecosystem recovery, flood-risk recovery
Flood Mitigation Assistance Grant Program	FEMA	FMA provides funding to local jurisdictions and states for projects and planning that reduces or eliminates long-term risk of flood damage to structures insured under the NFIP.	Flood risk reduction projects that benefit the NFIP, including acquisitions, elevations, and some structural mitigation such as local risk reduction structures and dry floodproofing.
Hazard Mitigation Grant Program	FEMA	HMGP is authorized statewide after a disaster declaration and is the most flexible of FEMA's three mitigation programs. Jurisdictions must have an approved hazard mitigation plan and projects must be cost effective.	Most long-term risk-reduction projects that protect against fire, flood, earthquake, and other natural hazards.
King County Flood Control District Flood Reduction Grants	King County Flood Control District	The Flood Reduction Grants target medium and small local flood reduction projects including projects where the control of stormwater will have a direct benefit in reducing flooding. Eligible applicants include homeowners, special districts, tribes, cities, and county agencies.	Projects can address either existing or potential flooding and proposals should show that the flooding has current or potential economic impacts.
King County Budget	King County	The two-year King County budget for 2019-2020 was approximately \$11.6 billion dollars. Approximately 15% of this money makes up the general fund. Major Expenditures are: Metro Transit (21%), Wastewater (14%), Health & Human Services (13%), and Law, Safety, & Justice (12%). There are ~15,000 full-time-equivalent (FTE)	Various



		county employees with most employed in Transit (35%), Criminal Justice (25%), and Public Health (9%).	
King County Loss Control Fund	Office of Risk Management	The Loss Control Fund is for internal county projects and is limited to emergent risks where advance planning and budgeting were unavailable. \$2M has been appropriated for the 2019-2020 biennium.	Emergent risks, to include likely infrastructure failure
King County Parks Levy	King County	Revenue generated by the parks levy goes to fund open space protection, new parks, trails, and other assets. This funding could theoretically be used for the acquisition of threatened properties for preservation as open space.	Acquisition of high-hazard properties for preservation as open space
Post-Fire Hazard Mitigation Grant Program	U.S. EPA	Program authorized following a Fire Management Assistance Grant (FMAG) declaration. Program focuses on wildfire risk and post-fire risk mitigation, including fuels reduction and post-fire flood control projects. Program prioritizes the county receiving the FMAG declaration.	Fire-related mitigation, including defensible space, generators, and post-fire flood risk reduction, planning, feasibility studies
Pre-Disaster Mitigation Grant Program	FEMA	Annual program for cost-effective mitigation projects and plans. Jurisdiction must have a current mitigation plan to be eligible. Following the 2019 grant round, this program will be replaced by BRIC.	Most long-term risk-reduction projects that protect against fire, flood, earthquake, and other natural hazards.
Public Works Board	WA Department of Commerce	Low-interest loans for pre-construction or new construction for replacement/repair of infrastructure for stormwater, solid waste, road, or bridge projects. Emergency loans are available for public projects made necessary by a disaster or imminent threat to public health and safety.	Utility and infrastructure retrofits
Rural Community Assistance Corporation	Rural Community Assistance Corporation	Water, wastewater, stormwater, and solid waste planning; environmental work; to assist in developing an application for infrastructure	Planning, feasibility studies



		improvements for small, rural communities.	
Rural Water Revolving Loan Fund	National Rural Water Association	The RWLRF provides low-cost loans for short-term repair costs, small capital projects, or pre-development costs associated with larger projects to small, rural communities.	Source-water protection, drinking water system improvements, other retrofits
Source Water Protection Grant Program	WA Department of Health	Projects and studies to identify solutions to source water protection problems, implement protection plans, or update data that directly benefits source water protection.	Source-water protection, drinking water system improvements, other retrofits, feasibility studies
Washington Transportation Improvement Board	Transportation Improvement Board	TIB makes and manages street construction and maintenance grants to 320 cities and urban counties.	Infrastructure retrofits, flood risk reduction
Urban and Community Forest Program	U.S. Department of Agriculture	Program provides technical, financial, research and educational services to local jurisdictions and organizations for the preservation, protection, and restoration of forestlands.	Natural resource protection, public information, planning

King County Hazard Mitigation Grant Assistance Program

A major initiative launching as part of this plan update is the King County Hazard Mitigation Grant Assistance Program. Led by KC EM, this program seeks to lower the barriers to applying for FEMA grants, especially given the new opportunities associated with the Disaster Recovery Reform Act of 2018.

King County will support jurisdictions by ensuring the mitigation projects are identified in the regional plan, offering technical assistance in developing applications, and, when requested, by administering grants on behalf of communities that lack internal grant management capabilities. This program reflects KC EM's focus on end-to-end emergency management, supporting partners across all mission areas from mitigation to recovery.

Participation in the 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.



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.

Participants in the NFIP must, at a minimum, regulate development in floodplain areas in accordance with NFIP criteria. 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.

Additionally, in the Puget Sound watershed, communities are required to regulate development in floodplains in a way that doesn't cause habitat loss or negative impacts to Chinook, coho, and steelhead salmon species. This is part of the FEMA/NOAA Biological Opinion related to communities' participation in the National Flood Insurance Program.

New Flood Insurance Rate Maps (FIRMs) are currently in a preliminary stage and are scheduled to be published in mid-2020.

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.

Participation in CRS

The Community Rating System is a voluntary program within the NFIP that encourages floodplain management activities that exceed the minimum NFIP requirements and rewards discounts to ratepayers in participating communities. King County is a Class 2 community. 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

As of this writing, there are 10 CRS-rated communities in King County.

Community Name	Class	% Discount in SFHA	% Discount in non-SFHA
Auburn	5	25	10
Bellevue	5	25	10
Issaquah	5	25	10
Kent	5	25	10
North Bend	5	25	10
Renton	5	25	10
Snoqualmie	5	25	10
Carnation	7	15	5
Redmond	5	25	10
King County	2	40	10

Regional Risk and Probability Summaries

While most of the risk and probability of future occurrence for hazards is similar for all jurisdictions in King County, some are at greater risk due to specific geographic features including proximity to floodplain (increases flood probability and risk from earthquakes due to liquefaction). For natural hazards, the relative probability of occurrence within 25-50 years (**High**, **Medium**, or **Low**) and relative risk as described in each jurisdiction's annex are identified in the table below.

The table below does not include Avalanche risk (high annual probability of occurrence, but only in unincorporated areas) nor tsunami (low probability of occurrence for all areas, exposure is currently only mapped for the cities of Des Moines and Seattle. Acronyms: WSD = Water and Sewer District, WD = Water District, SD = School District, RFA = Regional Fire Authority, UD = Utility District.

Community Name	Earthquake		Flood		Landslide		Weather		Volcano		Wildfire	
	Prob	Risk	Prob	Risk	Prob	Risk	Prob	Risk	Prob	Risk	Prob	Risk
Auburn												
Beaux Arts Village												
Bellevue												
Bothell												
Burien												
Clyde Hill												
Covington												
Des Moines												
Duvall												
Hunts Point												
Issaquah												



Community Name	Earthquake	Flood	Landslide	Weather	Volcano	Wildfire
Kenmore						
Kent						
Kirkland						
Lake Forest Park						
Maple Valley						
Mercer Island						
Medina						
Newcastle						
North Bend						
Redmond						
Renton						
Sammamish						
SeaTac						
Shoreline						
Snoqualmie						
Tukwila						
Woodinville						
Cedar River WSD						
Covington WD						
Coal Creek UD						
Highline WD						
King County WD 20						
King County WD 90						
King County WD 125						
Lake Meridian WD						
North City WD						
NE Sammamish WSD						
Northshore UD						
Renton SD						
Sammamish Plateau WSD						
Skyway WSD						
Soos Creek WSD						
South King Fire						
Valley RFA						
Valley View Sewer						
Vashon Island Fire						
Woodinville WD						
Muckleshoot Indian Tribe						



Risk Assessment Overview

The King County Regional Hazard Mitigation Plan Risk Assessment covers 8 natural and 6 human-caused hazards.

- Avalanche
- Earthquake
- Tsunami
- Volcano
- Landslide
- Wildfire
- Flood
- Severe Weather
- Hazardous Materials
- Health Incident
- Terrorism
- Civil Disturbance
- Cyber Incident
- Dam Failure

These assessments were developed using the best available data from sources including:

- Washington State Fusion Center (Terrorism, Civil Disturbance)
- King County Dam Safety Program (Dam Failure)
- King County IT (Cyber Incident)
- Public Health Seattle-King County (Health Incident)
- Washington State Emergency Management LEPC Program (Hazardous Materials)
- King County Flood Control District (Flood)
- Washington State Emergency Management Geologic Hazards Program (Tsunami, Earthquake, Volcano)
- King County Strategic Climate Action Plan (Wildfire, Severe Weather)
- Washington State Department of Transportation (Avalanche)
- King County Department of Natural Resources and Parks (Landslide)
- King County Department of Permitting (Structure Fire)
- Washington State Enhanced Hazard Mitigation Plan
- Washington State Department of Natural Resources (Landslide, Earthquake, Tsunami, Volcano, Wildfire)
- King County Facilities Management Division
- King County Hazard Inventory and Risk Assessment, 2016
- FEMA RiskMAP Program, King County Risk Report (Earthquake, Landslide, Volcano, Flood)



Data sources are cited with footnotes throughout the plan. In addition to using data and report information from the above sources, many also contributed time and expertise to the review and development of the individual risk assessment chapters.

Methodology

This risk assessment is intended to provide a robust overview containing key details, vulnerabilities, and considerations to enable emergency managers to plan for disasters. The profiles are designed to be brief, and yet also comprehensive enough, to be useful during a disaster response to help provide information on potential impacts and priority vulnerabilities.

This assessment focuses on examining impacts (consequences) from hazards on 10 different topic areas. These areas reflect best practices as identified by the Emergency Management Accreditation Program (EMAP) plus priority areas identified by King County.

- King County residents – all residents in King County
- Vulnerable populations – populations more likely to experience losses and recover more slowly from an incident. Different vulnerable populations may be highlighted depending on the incident type. For example, wildfire in King County is overwhelmingly a problem of smoke and smoke impact people with respiratory vulnerabilities most severely.
- Property – private property
- The economy – economic functions and assets
- The environment – natural resources, wildfire, fish, plants, and natural systems
- Health systems – hospitals, pharmacies, and the ability for people to find and receive care
- Government operations (continuity of operations) – King County government operations
- Responders – fire, police, EMS, and related services
- Lifeline infrastructure – power, water/wastewater, transportation, communications
- Public confidence in jurisdiction’s governance and capabilities

Each profile also looks at priority vulnerabilities in order to identify those areas requiring immediate focus before, during, and after an incident.

Data

GIS data was taken from a variety of King County, Washington State, and federal sources. The data was sourced via King County GIS, including layers owned by both GIS and by other entities. Some of the GIS data analyzed in completing this risk assessment include:

TITLE	DESCRIPTION	SOURCE
Active Faults	Known active faults in the Puget Sound region	WA State Department of Natural Resources (DNR)



Wastewater Systems	King County wastewater treatment and conveyance systems	King County Department of Natural Resources and Parks Water Treatment Division (DNRP)
Water Supply Facilities	Seattle water supply facilities and conveyance systems. These are used to supply Seattle as well as many cities.	City of Seattle Public Utilities
Bridges	King County-maintained bridges	King County Roads
Rail Routes	All rail routes, including BNSF and Sound Transit	King County GIS
Transit Routes	Metro transit routes	King County Metro
Arterials	Arterial streets	King County Roads
Levees and Revetments	County-maintained flood protection structures.	DNRP, King County Flood Control District
BPA Transmission Lines	Bonneville Power Administration power transmission systems	Bonneville Power Administration
Historic Buildings	Designated historic buildings	King County GIS
Schools	School facilities	King County GIS
Government Buildings	King County government buildings	King County GIS, Facilities Management Division
Hospitals and Medic Units	Hospitals and medic unit locations	King County GIS
Pharmacies	Pharmacy locations	King County GIS
First Responder Facilities	Locations of fire, police, and EMS	King County GIS
City Boundaries	City jurisdictional boundaries	King County GIS
Rivers and Lakes	Waterbodies	King County GIS
Building Address Points	Building address points and age	King County Assessor
Building Age	Building address points and age	King County Assessor



Volcanic Hazard Areas	Lahar, lava flow, and lahar sediment areas	WA DNR, U.S. Geological Survey
Landslide Hazard Areas	Historic, deep landslide risk areas	WA DNR
Preliminary 100-year Floodplain	1% annual chance, special flood hazard area as mapped by FEMA. Will take effect as the regulatory floodplain in 2020.	FEMA, King County Flood Control District
Floodways	The regulatory areas including the channel and adjacent land areas that must be preserved in order to discharge the base flood without increasing the water surface elevation by more than a designated height.	FEMA, King County Flood Control District
Liquefaction Potential	Areas of NEHRP soil classes D, E, and F.	WA DNR
Landslide Buffer Areas	Buffers of 50 feet around known landslide areas.	King County GIS
Statewide Roads	State and federal highways	King County GIS
Health Insurance Coverage	Individuals with health insurance, by Census Tract	US Census, American Community Survey (ACS)
Travel Time to Work	Travel time to work on average by Census Tract	US Census, ACS
Means of Transportation to Work	Means of transportation to work, by percent, by Census Tract	US Census, ACS
Race	Self-identified race	US Census, ACS
Ethnicity	Self-identified ethnicity	US Census, ACS
Income	Income (range)	US Census, ACS
Languages	Languages other than English spoken at home	US Census, ACS
Disability Status	Counts of disabled persons	King County GIS
Education	Educational attainment by years, by Census Tract	US Census, ACS



Tenure	Housing tenure (ownership) status	King County GIS
HAZUS for earthquake (Seattle Fault, Cascadia Subduction Zone)	HAZUS runs for Seattle Fault 7.1 and Cascadia Subduction Zone 9.0 scenarios	FEMA RiskMAP

This and any additional data can be viewed on the ArcGIS online hazard map. This map will be available at least during the plan review and adoption phase and may be made available permanently:

<http://kingcounty.maps.arcgis.com/apps/View/index.html?appid=41abdeae1bf44907a9c14b98a2e5fb92>.

Vulnerable Populations and Population-Based Vulnerability

Population vulnerability (or social vulnerability) measures factors that theoretically increase the likelihood of a population to suffer more losses during disasters or recover more slowly after being impacted. There is a growing body of work on this kind of vulnerability; however, how the data is reported can obscure the root causes of vulnerability when converted into an index or score. Knowing the root causes of vulnerability and how those vulnerabilities contribute to losses during disasters is critical for hazard mitigation professionals since each cause may require a unique strategy to address. For example, if the vulnerability results from language differences, then this can be addressed with robust translation and outreach services.

Communities that consider population-based vulnerability and social justice, often do it as an overlay – examining the impacts of a proposed project on vulnerable populations, for example, after the project has already been prioritized or mapping the location of vulnerable populations in accordance with some composite score and institutionally-defined definition of vulnerability. It is unclear if mapping alone, if awareness alone, has had much impact on where the bulk of resources are directed.

For this analysis, we examine the best available data of factors that have been found to lead to increased losses or recovery times following hazard events. This is to establish areas with different kinds of heightened vulnerability. We then overlay data on race, ethnicity, and income. This is to establish where equity may be a concern, where causes of vulnerability overlap with historically underrepresented minority populations.

Determinants of Population Vulnerability

Good data at the appropriate scale was not available for all the below factors. However, these are factors that were identified through research and by the planning team as critical determinants of vulnerability. Maps of a selection of these factors, along with priority hazard areas, follow the list of variables.

Population factors (population-based measures)

1. Home Ownership Status (Renter)
2. Age (old or young)



3. Unemployment
4. Income
5. Wealth
6. Access and Functional Needs/Disability
7. Dependence on public transportation
8. Language other than English spoken at home
9. No health insurance
10. Hazard insurance coverage
11. Minimum wage employment/service sector employment
12. Families with dependents
13. Living in poverty
14. Crime rate
15. Years of schooling completed (HS, BA, MA, etc.)

Accessibility and capital factors (access/infrastructure measures/social capital)

- Access to services (schools, libraries, community centers, county/city facilities)
- Quality of public facilities (public facility effective age)
- Quality of schools
- Access to hospitals or health clinics
- Quality of hospitals/health clinics
- Access to phone and internet
- Average age of housing
- Average commute time/distance to work
- Per capita government spending
- Neighborhood engagement (civic engagement, neighborhood association, something else?)

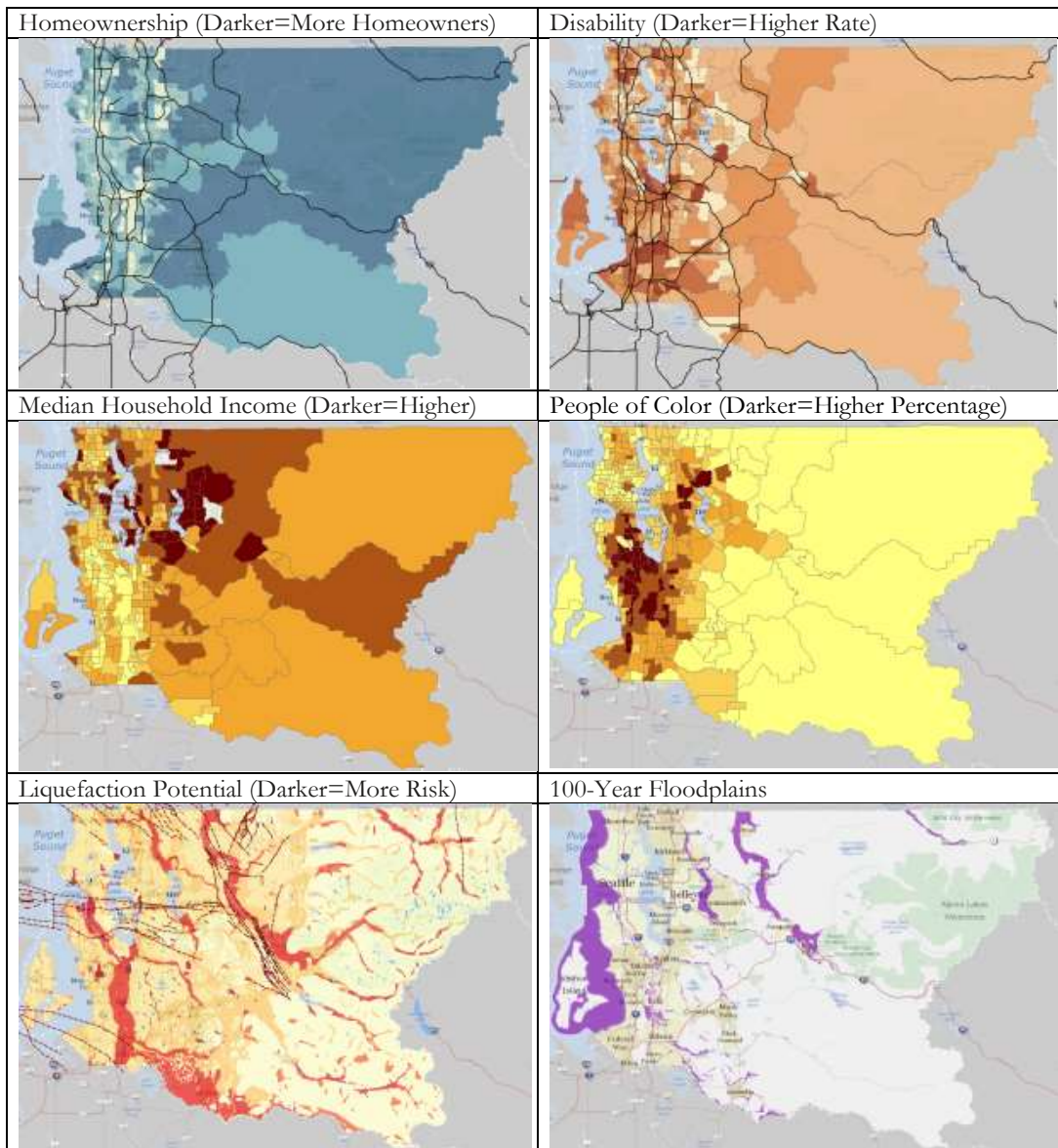
Meta-factors (determinants of equity)

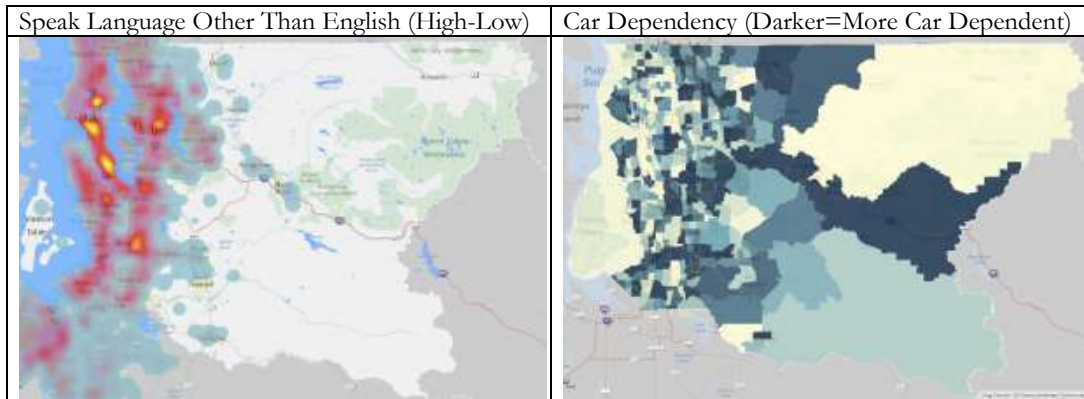
- Race/ethnicity
- Age
- Income
- Immigrant/refugee status

The results from this analysis will be used to promote more effective, equitable disaster mitigation, response, and recovery by identifying key vulnerabilities and areas that may require additional investment. Also, this analysis will help identify areas where public infrastructure is older or less resilient, or where hazard risk is greater, so that additional investments can be targeted in those areas.



The following maps illustrate several of the above variables associated with greater hazard risk along with high hazard areas and non-white populations. This is just a selection of potential variables and illustrates how high-hazard areas, factors associated with hazard risk, and communities of color or with higher rates of disability may overlap. The highest population-risk areas in King County tend to be areas south of Seattle in the Green River Valley. These areas also are areas with the highest hazard risk. Investments that target critical public infrastructure and support structures in these communities would likely have the best cost-benefit ratio. Investments in these areas would have the added benefit of also promoting more equitable access to high-quality infrastructure and services for populations historically underserved by public investment.





Jurisdiction-Specific Risk Assessments

In addition to this countywide risk assessment, each planning partner completed a risk assessment focusing on the priority hazards, vulnerabilities, and consequences. These assessments are contained in each planning partner annex. These assessments will have much more detail about individual jurisdiction risks and should supplement the wider lens of the risk profiles contained in the core plan.

To complete their assessments, jurisdictions were provided with GIS data and an ArcGIS online map containing relevant data on hazards and impacts. The data is the same as that used in the base plan risk assessments, but jurisdictions were asked to focus on impacts specific to their assets and boundaries. Jurisdictions assessed risk in two ways.

First, jurisdictions looked at hazards that could impact them, how susceptible/vulnerable they are to those hazards, and the consequences/impacts of a hazard event. The task was to develop “risk elevator pitches” that summarize the key elements of hazard risk in a way accessible to elected officials and the public.

Second, jurisdictions were asked to consider an asset-based approach, looking at their priority assets, the hazards that threaten those assets, and the consequences of losing the asset. All jurisdictions were encouraged to complete this process, but only special purpose districts were required to complete it. The goal of this approach was to identify assets that needed mitigation.

In addition to these risk summaries, a map showing the spatially discrete hazards (flood, liquefaction potential, steep slopes) was developed for cities.

In developing their risk assessments, jurisdictions held internal meetings to select the list of hazards that would be included and to assess the relative risk of each hazard. Most used a high-medium-low approach for impact, where high impact is a debilitating event and moderate impacts are serious events that disrupt operations for multiple days. For those that also considered probability separately from the base plan, a high probability event is likely to occur on an annual basis. These jurisdiction-specific risk assessments are not designed to be exhaustive but should give a much clearer picture of risk and vulnerability than is normally available from countywide assessments.



King County Development Trends and Risk Trajectory

From 2010 to 2018 King County has grown at a rate of 13.4% per year.³ This population growth has coincided with a near doubling of total assessed property values in the county from \$340 billion in 2014 to \$606 billion in 2019.⁴ Over \$44 billion worth of new construction was assessed from 2014-2018. Property values stabilized in most of the county in 2018, although many unincorporated areas, especially in the northeast of the county around Carnation and Duvall, continued to grow at double-digit rates.

The huge growth in property values and development of new lands has also coincided with a growth in diversity. In 2018, the total population identifying as white declined by nearly 5000 persons while the non-white population grew dramatically. While this is a small change, it indicates that the future of King County will be more diverse and more populous.

Also, since 2015 the available science on risk has improved markedly. King County has new landslide hazard data from Washington State Department of Natural Resources (WA DNR). There is also updated tsunami data indicating far greater risk than previously recognized in the coastal areas. New climate change data is available in the Puget Sound State of Knowledge Report.⁵ Finally, WA DNR is expected to publish a draft wildland-urban interface fire risk map by the end of 2019, helping to show the extent of fire risk, much of it spurred by the growth indicated above.

As development has occurred, jurisdictions have invested in risk reduction measures such as the installation of ductile iron pipe to replace cast iron pipe in water systems. While this work is critical, in most jurisdictions it is unlikely to be complete for 20-30 years. Other work has included bridge retrofits, wastewater system improvements, flood risk reduction projects, and risk assessments and planning. Nevertheless, there are dozens to hundreds of bridges in need of upgrades to keep the transportation system functioning in the event of a major earthquake.

New science showing more risk and a dramatic increase in population, especially in areas not previously developed, indicates that the county trajectory is toward more exposure and vulnerability. While there is ongoing work to reduce risk, it is not keeping up with existing needs, much less the needs of a larger, more diverse population living across a larger area.

ESTIMATED CHANGES IN RISK 2015-2020		
SECTOR	RISK CHANGE (Increased -, Decreased +, No Change =)	EXPLANATION

³ King County Office of the Executive. 2018. 2018 King County Quick Facts. Accessed online on 8/28/19 from <https://kingcounty.gov/depts/executive/performance-strategy-budget/regional-planning/Demographics.aspx>.

⁴ King County Office of Economic and Financial Analysis. July 19, 2019. July 2019 King County Economic and Revenue Forecast. Accessed online on 8/28/19 from https://www.kingcounty.gov/~media/business/Forecasting/documents/July2019_Forecast.ashx?la=en.

⁵ Climate Impacts Group. 2015. Puget Sound State of Knowledge Report. Accessed online on 8/28/19 from http://cse.washington.edu/picea/mauger/ps-sok/ps-sok_cover_and_execsumm_2015.pdf.

King County Residents		With a larger population that is likely no more prepared, risk to King County residents is estimated to have increased.
Vulnerable Populations		While there has been a large increase in median income, there is more income inequality and housing insecurity due to housing costs and other issues. There are also many new immigrants who may not be reached by disaster messaging or be familiar with the region's hazards. Overall risk to vulnerable populations has increased as these populations have grown.
Property		While the construction boom is reducing risk in some areas, some construction patterns, such as building homes close together, is increasing risk from fire. Also, the new development, some of it in marginal areas is increasing risk. This is especially acute in areas in the wildland-urban interface, near floodplains, or on unstable soils.
The Economy		The economy has grown but is also susceptible to a shock caused by a disaster that could permanently displace the major companies that make this region so competitive. Many of these companies are highly mobile and a disaster that destroys the region's infrastructure could devastate the economy.
The Environment		With heightened climate change and more development, the environment is more threatened by hazards including wildfire and flooding.
Health Systems		Health systems have seen modest improvement in overall risk as hospitals are upgraded to higher seismic standards.

Government Operations		No increase or decrease in risk to government operations is identified. While there continues to be some modest investment in the resilience of public facilities, there is still significant risk of disruption of services during a major incident, as demonstrated during the 2019 snow event. A seismic event would still threaten the ability of King County government to provide services and many buildings may not be useable.
Responders		No change in the risk to responders is identified.
Infrastructure Systems		Although not sufficient to meet the need, investments in infrastructure have modestly reduced risk.
Public Confidence	Mixed	Public confidence in the jurisdictions' capabilities is estimated to be mixed. On one hand, emergency management and county government are delivering services on a huge scale and received relatively positive feedback from the February 2019 storms. On the other, there has been little movement to systematically improve earthquake resilience, something frequently reported by the media.

Regional Risk Profile: Avalanche

Hazard Description

Avalanche hazards in the Northwest are associated with winter storms in the Cascade and Olympic Mountain ranges. Avalanches occur when a snow pack loses its grip on a slope and slides downhill. Typically, slopes of between 20 to 30 degrees and snow packs of 34 inches or more may produce avalanches. Most natural avalanches occur in back country little used by humans during such weather conditions. This tends to minimize exposure to avalanche impacts. Most vulnerable are travelers and



Stevens Pass WSDOT avalanche control areas

winter recreation enthusiasts using Stevens Pass in northeastern King County, Snoqualmie Pass in central-eastern King County, and Crystal Mountain Ski Area near Chinook and Cayuse passes in just outside of southeastern King County.⁶

Regionally, severe winter weather in the form of snowfall in the Cascade Mountains results in a snowpack that – when conditions are right – can lead to a natural or man-made/induced avalanche.

Avalanches can result in impacts to transportation

through mountain passes and injuries or death to people using the mountain backcountry recreationally. Avalanche danger in King County is highest during severe winter weather from October through March annually. When moist air from the Pacific rises to climb the Cascade Mountains and meets the colder air of the U.S. interior, precipitation often falls as snow from late October through March or April each year.

The most frequent impact from avalanche is from pass closures, especially along Snoqualmie Pass on I-90. In particularly severe events, both Snoqualmie and Stevens pass may close for days at a time, effectively cutting the state in half. The other routes that cross the cascades, US 12, US 20, SR 410, and SR 14, are not suitable for large traffic volumes and large trucks and are often closed when I-90 and US 2 are closed. This occurred most recently during the February 2019 snowstorm. In that event, all the east-west highways were closed, limiting King County's road salt supply from the east side of the state. The snowfall totals at the pass exceeded normal, with 118 total inches in February alone (average accumulation in February is 73.9 inches). February 12, 2019 broke the 24-hour snowfall record, with 31.5 inches recorded



Snoqualmie Pass WSDOT avalanche control areas.

⁶ Washington State Department of Transportation, Prediction of Snow and Avalanches in Maritime Climates: Final Report, WA-RD 203.1, December 1989, p.3.



by Washington State Department of Transportation (WSDOT) crews recorded at the summit. During this event, I-90 was closed beginning Monday afternoon, February 11, reopening on Thursday morning due to avalanche danger.

Avalanche impact areas are mapped for Snoqualmie and Stevens passes, which are maintained throughout the winter by WSDOT crews. Chinook and Cayuse passes are closed during the winter due to avalanche danger and difficulty of maintaining a clear roadway.

In addition to the roadway risk, two of the state's three cross-state railways pass through the Cascades. These railroads travel along a route similar to the major highways and are similarly susceptible to avalanche. Major snowfall and avalanche danger can disrupt rail freight traffic across the state, with significant economic impacts.

Vulnerability Characteristics and Previous Occurrences

Recreational areas that support snowshoeing, alpine and cross-country skiing, snowmobile areas, and winter hikers and campers are most at risk from avalanche incidents. Typically, injuries to recreational hikers, skiers, snow boarders, and climbers occur outside managed areas. Several stretches of Interstate 90 and Highway 2 in King County are vulnerable to avalanches between October and April each year, depending on snow packs and weather conditions. Both Snoqualmie and Stevens Pass are significant commercial routes. Cargos are carried between the Ports of Tacoma and Seattle, and eastern Washington. When Stevens and Snoqualmie Passes are closed, I-84 in Oregon or air travel are the only practical ways to travel between Spokane and Seattle.

The popular backcountry skiing areas around Stevens and Snoqualmie passes are high-hazard zones where avalanche fatalities are relatively common. WSDOT posts signs, though these warnings are frequently ignored. People engaged in snow sports in these areas are often among the most experienced enthusiasts; however, even with safety equipment, they may trigger or fall victim to avalanches. There are, on average, one to three fatalities in avalanches statewide each year. Hundreds of avalanches are thought to occur around the Cascades each winter, though most without any human cause or impact.

There are twelve common factors that contribute to avalanche danger, including old snow depth, old snow surface, new snow depth, new snow type, snow density, snow fall intensity, precipitation intensity, settlement, wind direction and wind speed, temperature, subsurface snow crystal structure, and tidal effect.⁷ Research done at Snoqualmie Pass indicates that most natural avalanches occur within one hour after the onset of rain over a weakened snow pack.⁸ Large amounts of new snow accumulation also increases avalanche risk, especially when coupled with wide temperature swings.

⁷ Kruse, Scott M. "Avalanche Evaluation Check List," *Avalanche Review* vol. 8, No 4, February 1990

⁸ Washington State Department of Transportation, Washington State Department of Transportation – Avalanche Control <http://www.wsdot.wa.gov/maintenance/avalanche4>



Significant Historic Avalanches 2001-2019 – Stevens and Snoqualmie Passes⁹

YEAR	PASS	FATALITIES AND INJURIES
1910 (Historic Maximum)	Stevens Pass (railway)	96 Fatalities
2001	Stevens Pass, Snoqualmie Pass	1 Fatality, 2 Injuries
2002	Stevens Pass, Snoqualmie Pass	10 Injuries
2003	Snoqualmie Pass	1 Fatality, 1 Injury
2004	None	None
2005	Snoqualmie Pass	1 Injury, 1 Fatality
2006	None	None
2007	Snoqualmie Pass	1 Injury, 2 Fatalities
2008	None	None
2009	None	None
2010	Snoqualmie Pass	3 Injuries
2011	Stevens Pass, Snoqualmie Pass	6 Injuries, 2 Fatalities
2012	Stevens Pass, Snoqualmie Pass	12+ Injuries, 6 Fatalities
2013	Stevens Pass, Snoqualmie Pass	4+ Injuries, 2 Fatalities
2014	Stevens Pass, Snoqualmie Pass	7+ Injuries, 1 Fatality
2015	Stevens Pass, Snoqualmie Pass	2 Injuries, 2 Fatalities
2016	None	None
2017	Stevens Pass, Snoqualmie Pass	2 Injuries, 1 Fatality
2018	Stevens Pass, Snoqualmie Pass	1 Injury, 3 Fatalities
2019	None	None

⁹ Northwest Avalanche Center, Accident Reports. Accessed online on 5/13/19 from <https://www.nvac.us/accidents/accident-reports/>



Scenario Drivers

There are two kinds of avalanches, loose and slab. Loose avalanches occur when light-grained snow exceeds its “angle of repose”, collapses a snow drift or bank and fans out as it slides downhill. A slab avalanche occurs when heavy or melting snow resting on top of looser snow breaks away from the slope and moves in a mass. The latter often occurs when rains soak the top layer of snow on moderately sloped terrain.

Priority Vulnerabilities

Back-country recreationists	Snowmobilers, hikers, and skiers in back-country and off-trail environments are at the highest risk from avalanche.
Transportation networks	I-90 and US-2 are the most vulnerable routes to avalanche. Disruptions to both are common during the winter, though most are for a short duration. A long-duration disruption could have significant economic consequences.
Public safety officers and volunteers	Search and Rescue regularly travel on search missions for missing recreationists, putting them at risk from avalanche as well.

Priority Impact Areas

King County residents	Avalanche conditions can cause closure of ski areas like: Alpental, Hyak (Summit East), Ski Acres (Summit Central), Stevens Pass, and/or Crystal Mountain. The recreational skiers and the people who are seasonally employed can be impacted when these conditions close ski areas. People who ski “out of bounds” take exceptional risks in locations where avalanche control does not maintain safe conditions and search and rescue operations may be hampered. Pass closures may inconvenience people by causing them to either take commercial flights between eastern and western Washington or cause them to take wide routes around the mountain area through the Columbia Gorge between Washington and Oregon. There are no major populations in King County that are exposed to avalanche terrain. The King County community closest to avalanche country is Skykomish. It has not experienced an avalanche in recent memory.
Vulnerable populations	No specific impacts are expected to vulnerable populations for this hazard.
Property	Property exposed to avalanches include ski area lifts and equipment, small clusters of seasonal vacation homes and utilities supporting ski areas, ski lodges, ski area support operations, and those vacation properties.



The economy	Closure of ski areas from avalanche danger usually lasts only a short time. While revenue to one or more ski areas may be reduced, no long-term economic impacts can be expected from avalanche issues. Heavy snows and avalanche danger may close Stevens and/or Snoqualmie Pass for extended periods. These pass closures can impede transportation of goods between eastern/western Washington, impact the Port of Seattle and port/countries around the/Pacific Rim. Avalanche closure of King County passes may cause motorists and truckers to reroute through Interstate 84 in Portland. The most significant avalanche event in Washington State, and the deadliest in US history, occurred in 1910 near Stevens Pass. Two trains carrying passengers were hit by an avalanche killing 96 people. Economic impacts are also substantial. A WSDOT study claimed that a four-day closure at Snoqualmie Pass in the winter of 2007/2008 cost the state \$27.9M in economic output, 170 jobs, and \$1.42M in state revenue (2008 dollars).¹⁰
The environment	Avalanches are natural events; however, they kill wildlife and trees and can reshape the landscape.
Health systems	There are no known healthcare facilities or systems exposed to avalanches.
Government operations (continuity of operations)	Avalanche areas are remote to most King County operations. Where avalanches may occur, King County Sheriff's Office Search and Rescue, Ski patrols, and volunteers may be involved. This may include BARK, a group that provides K-9 search capability for avalanche victims. Support may also be required from the aviation unit of the King County Sheriff's Office and from Emergency Medical Service units. Support personnel for avalanche control are provided by Washington State Department of Transportation.
Responders	When avalanches bury or injury skiers and backcountry hikers, the King County Sheriff's Office Search and Rescue team(s) may be deployed along with trained volunteers and specially trained volunteer K-9 units like BARK (Backcountry Avalanche Rescue K-9). Most search missions occur in or around the off-trail perimeter of ski areas like Snoqualmie Acres, Hyak,

¹⁰ Ripley, Richard, "Four-day Snoqualmie Pass closure cost \$27.9 million," Spokane Journal, 11/20/2008. Accessed online: <https://www.spokanejournal.com/local-news/four-day-snoqualmie-pass-closure-cost-279-million/>



	Alpental, Crystal Mountain, and Steven's Pass. Buried skiers are often severely injured or may be killed from their injuries or suffocation under large amounts of snow in areas difficult to reach.
Infrastructure systems	There are no critical facilities located in areas of the county subject to avalanches. Critical infrastructure that may be impacted includes the BNSF railway (also used by Amtrak) and the east west highways, US 2 (Stevens Pass) and I-90 (Snoqualmie Pass). Chinook Pass usually closes from October through May.
Public confidence in jurisdiction's governance and capabilities	The public at risk has a good understanding of the risks from avalanche. Warnings are regularly posted and announced to skiers and back country hikers during the winter months.



Regional Risk Profile: Civil Disorder

Hazard Description

Civil Disorder and civil disturbances can range from minor to significant events that can disrupt the functioning of a community for a few days, weeks or months. A worst case-scenario for a King County civil disorder would be an incident that takes place in a large urban environment and lasts for an extended period of time. An example of a worst-case scenario was the 1999 Seattle World Trade Organization rioting which significantly impacted the City and led to numerous injuries and arrests. The rioting raised Seattle's cost of handling the conference to \$9 million from an earlier estimated city cost of \$6 million surpassing worst-case projections¹¹. In addition, downtown Seattle businesses lost an estimated \$20 million in property damage and lost sales during the WTO conference.

Title 18 of the United States Code defines civil disorder and lists the crimes associated with civil disorder. In Section 231 of Chapter 12, defines civil disorder as: “any public disturbance involving acts of violence by assemblages of three or more persons, which causes an immediate danger of or results in damage or injury to the property or person of any other individual... (a)(1)...use, application or making of any firearm, or explosive or incendiary device, or technique capable of causing injury or death to persons...or... (a)(2)...transports or manufactures for transportation in commerce any firearm, or explosive or incendiary device, knowing or having reason to know or intending that the same will be used unlawfully in furtherance of a civil disorder...or... (a)(3)...commit any act to obstruct, impede, or interfere with any fireman or law enforcement officer lawfully engaged in the lawful performance of official duties incident to and during the commission of a civil disorder...”,¹²

The term civil disobedience in contrast is a non-violent form of protest or resistance to obeying certain laws, demands and commands of a government or of an occupying power. Civil disobedience has been promoted by nationalist movements in Africa and India, the civil rights movement of the U.S., and labor and anti-war movements in many countries. Civil disobedience is sometimes equated with protests or non-violent resistance. Acts of civil disobedience can start peacefully but can lead to violence. In this context, civil disorder arising from civil disobedience in which participants turn violent and antagonistic toward public safety and civil authority is illegal. Washington state law defines civil disorder as “any public disturbance involving acts of violence that is intended to cause an immediate danger of, or to result in, significant injury to property or the person of any other individual.” Under Revised Code of Washington 9A.48.120, civil disorder training “as (1)...a person is guilty of civil disorder training if he or she teaches or demonstrates to any other person the use, application, or making of any device or technique capable of causing significant bodily injury or death to persons, knowing, or having reason to

¹¹ CBC News. January 6, 2000. WTO protests hit Seattle in the pocketbook. Accessed online on 8/26/19 from <https://www.cbc.ca/news/world/wto-protests-hit-seattle-in-the-pocketbook-1.245428>.

¹² Office of the Law Revision Council. 18 USC Ch. 12: Civil Disorders. Accessed online on 8/26/19 from <https://uscode.house.gov/view.xhtml?path=/prelim@title18/part1/chapter12&edition=prelim>.



know or intending that same will be unlawfully employed for use in, or in furtherance of, a civil disorder”...and (2) classifies it as a “class B felony.”

Vulnerability Characteristics and Previous Occurrences

Civil disorder may result from many situations and encompass a broad spectrum of civil action that ranges from peaceful events to other forms of disturbance caused by a group of people. The severity of such disturbances often reflects the degree of public displeasure or expression of discontent. Examples of civil disorder include, but are not necessarily limited to: violent demonstrations and other forms of obstructions, riots, sabotage, and other forms of crime. Civil disorder can be a dangerous condition that can become increasingly chaotic and volatile.

Laws have evolved that govern civil disorder and peacefully resolve conflict. In the United States, gathering in a crowd is constitutionally protected under “the right of the people to peacefully assemble.” However, assemblies that are not peaceable are generally not protected. The laws that deal with disruptive conduct are generally grouped into offenses that disturb the public peace. They range from misdemeanors, such as blocking sidewalks or challenging another to fight, to felonies, such as looting and rioting.¹³

The circumstances surrounding civil disorder may be spontaneous or may result from escalating tensions as was demonstrated during 1999 Seattle World Trade Organization protests. Civil disorder can erupt anywhere but the most likely locations are those areas with large population groupings or gatherings.¹⁴ Sites that are attractive for political rallies should be viewed as potential locations for the epicenter of civil disorder events. Disruption of critical infrastructure may occur during very severe civil disorder events. Public services such as water, power, communication, and transportation may be temporarily unavailable.

Civil disorder can also occur in proximity to locations where a ‘trigger event’ occurred as was the case in January 2017 at University of Washington when demonstrators and counter-demonstrators gathered as a politically conservative commentator was scheduled to speak. Violent protests took place on campus and a person was shot.

The Seattle Mardi Gras riot occurred on February 27, 2001, when disturbances broke out in the Pioneer Square neighborhood during Mardi Gras celebrations. There were numerous random attacks on revelers over a period of about three and a half hours. There were reports of widespread brawling, vandalism, and weapons being brandished. Damage to local businesses exceeded \$100,000. About 70 people were

¹³ Revised Code of Washington Title 9A.

¹⁴ Mid-America Regional Council. 2015. Regional Multi-Hazard Mitigation Plan. Accessed online on 8/26/19 from https://www.marc.org/Emergency-Services-9-1-1/pdf/2015HMPdocs/HMP2015_Sec4-HAZ-CivilDisorder.aspx.



reported injured. Several women were sexually assaulted. One man, Kris Kime, died of injuries sustained during an attempt to assist a woman being brutalized.¹⁵

Civil disorder can also occur as a collective outburst from a causal factor or driver. For example, past May Day protests in Seattle have routinely exhibited violence or vandalism. A 2013 May Day protest in downtown Seattle turned violent with police responding to demonstrators throwing rocks, bottles, metal pipes, fireworks -- and even a skateboard. The clashes left eight officers with injuries, and police reporting the arrests of 17 people on various offenses including property destruction and assault. During the clashes, police deployed flash-bang grenades and tackled unruly protesters to the ground.¹⁶ In 2016 May Day protest in Seattle a peaceful march turned violent when protesters lit fireworks and threw rocks and Molotov cocktails at police. Nine people were arrested and five officers were injured in the clashes.

While May Day is not recognized as an official holiday, many treat it as a nationwide day of strike with thousands turning out for peaceable protests and marches in Seattle.¹⁷ Other groups, such as anti-capitalists, anti-fascists, radical environmentalists and anarchists plan May Day events too with chaos and violence often resulting in arrests, infrastructure damage and interruption to transportation services. These aren't the only groups to demonstrate on May Day. In the 1970s, anti-war protesters took to the streets of Seattle. Anti-police brutality activists joined anarchists in 2015.¹⁸

The ultimate severity of any civil disorder event will depend on the magnitude of the event and its location. The more widespread an event is, the greater the likelihood of excessive injury, loss of life and property damage. Additional factors, such as the ability of law enforcement to contain the event, are also critical in minimizing damages.

Against this backdrop and historical precedence, King County will continue to experience civil disorder stemming from civil disturbance in which participants turn violent and antagonistic toward civil authority in Seattle and other communities. However, based on King County's experience with such disturbances, the probability that such incidents will develop into mass violence of civil disorder remains low.

¹⁵ Burton, Lynsi. February 16, 2015. Looking back: Mardi Gras riots of 2001. *The Seattle Times*. Accessed online on 8/26/19 from <https://www.seattlepi.com/seattlenews/article/Looking-back-Mardi-Gras-riots-of-2001-6084162.php>.

¹⁶ Watts, Amanda and Lindy Royce-Bartlett. May 2, 2013. 17 arrested as Seattle May Day protests turn violent. *CNN*. Accessed online on 8/26/19 from <https://www.cnn.com/2013/05/01/us/seattle-may-day-protests/index.html>.

¹⁷ Mirfendereski, Taylor. April 30, 2017. What is May Day? *King 5 News*. Accessed online on 8/26/19 from <https://www.king5.com/article/news/local/what-is-may-day/281-435393398>.

¹⁸ Guevara, Natalie. May 1, 2019. May Day: A primer on the labor, immigrant rights rally and its history in Seattle. *The Seattle Post-Intelligencer*. Accessed online on 8/26/19 from <https://www.seattlepi.com/seattlenews/article/May-Day-Seattle-protest-immigration-labor-anarchy-13808200.php>.



Scenario Drivers

Civil Disorder can arise from many situations and be triggered by a specific issue or by combination of causes. Instances of police violence have often been a scenario trigger for civil disorder (e.g. 2009 Oakland police shooting of Oscar Grant).¹⁹ In King County, the 2008 video of a King County deputy assaulting a teen girl in a holding cell was referenced in a Seattle 2010 'March Against Police Brutality' flyer.²⁰ During the Capital Hill demonstration Seattle police arrested five individuals for investigation of crimes ranging from trespassing to inciting a riot.

While demonstrations and protests can occur throughout King County, these civil actions often involve free speech rights in public places and do not evolve into chaos and violence. Civil disorder within King County remains centered in the Seattle area. For planning purposes, civil disorder occurs in areas of government buildings, military bases, schools/universities, city council meetings, state/city parks and within a downtown core.

The lines between civil disorder, civil disobedience, civil unrest and protest/demonstrations are often times blurred and encompass a wide range of actions from peaceful to violent, from legal to illegal and from spontaneous to highly planned. Further, while a group of people may organize and bring attention to a specific cause through peaceful protest/demonstrations, a smaller, separate group may engage in illegal tactics. This group of anarchists are seen as purveyors of violence and destruction.²¹ Typically, criminal anarchists employ a common mode of dress which is part of a tactic frequently called "Black Bloc." In the "Black Bloc" stratagem, throngs of criminal anarchists all dress in black clothing in an effort to appear as a unified assemblage, giving the appearance of solidarity for the particular cause at hand. This tactic is particularly troubling for law enforcement security forces, as no anarchist rioter can be distinguished from another, allowing virtual anonymity while conducting criminal acts as a group.

Black Bloc gained attention in the United States in 1999 after violent protests at a meeting of the World Trade Organization in Seattle, according to a 2001 history of the tactic on the anarchist news website, A-Infos. Hundreds of people were arrested in the Seattle riots, which involved anarchists vandalizing businesses.²²

Not every public protest or demonstration will attract an element of criminal anarchists. The types of demonstrations unlawful anarchists most commonly attend include those against environmentally harmful practices, those against gentrification, and anti-police rallies.

¹⁹ Associated Press. June 13, 2011. Ex-BART Officer Johannes Mehserle Released From Jail. *KPIX CBS SF Bay Area*. Accessed online on 8/26/19 from <https://sanfrancisco.cbslocal.com/2011/06/13/ex-bart-officer-johannes-mehserle-released-from-prison/>.

²⁰ JSeattle. April 9, 2010. Protest against police brutality starts at Seattle Central. *Capitol Hill Seattle Blog*. Accessed online on 8/26/19 from <https://www.capitolhillseattle.com/2010/04/protest-against-police-brutality-starts-at-seattle-central/>.

²¹ Flowers, Kory. January 30, 2015. Understanding the Black Block. *Police: The Law Enforcement Magazine*. Accessed online on 8/26/19 from <https://www.policemag.com/341767/understanding-the-black-bloc>.

²² Rossman, Sean. February 2, 2017. G-20 summit protests: What is a Black Bloc? *USA Today*. Accessed online on 8/26/19 from <https://www.usatoday.com/story/news/nation-now/2017/02/02/what-black-bloc/97393870/>.



Priority Vulnerabilities

Government facilities	Civil disorder incidents often target government organizations or visible images of the government such as police vehicles, city halls, or court facilities.
Businesses	Businesses such as banks, businesses in downtown areas or along transportation routes, and other commercial establishments are often targeted during looting or may be targeted for political or racist reasons such as ownership by an immigrant group in the case of anti-immigration riots or because they are associated with an industry being targeted by the manifestation (banks, abortion clinics, oil company offices, etc.).
Minority and immigrant communities	There have been multiple incidents in recent years of white-supremacist organizations holding events that turn violent, including the Charlottesville, VA marches that resulted in the death of a woman at the hands of a white supremacist terrorist who drove his vehicle into a crowd.

Priority Impact Areas

King County residents	All King County residents can be impacted, though those who live or work in downtown areas tend to be more exposed and impacted by civil disorder incidents.
Vulnerable populations	Ethnic minority and immigrant communities are historically targeted by civil disorder events. While rare in our region, the United States has a long history of racially-motivated riots that burn and destroy minority-owned businesses and homes.
Property	Much of the impact from civil disorder is to property, secondary only to economic impacts. During the World Trade Organization protests in 2000, over \$20 million in damage was recorded by businesses and \$9 million in costs to the city.
The economy	Economic impacts caused by loss of business, destruction of businesses, and business interruption can exceed the property damage dollar figures by a factor of two or more. Lost sales and uninsured losses can permanently destroy many businesses. Areas can also become perceived as unsafe or unwelcoming for business, further hurting the economy.
The environment	Civil Disorder will have a minimum impact on the environment; unless, hazard material facilities such as petroleum, chemical, and recycling are targeted in arson fires or vandalism. The impact on the environment in such cases could be significant.
Health systems	Health systems can be overwhelmed by civil disorder incidents, such as when large numbers of demonstrators are brought to the hospital due to exposure to tear gas or due to clashes with counter-demonstrators or with police.



Government operations (continuity of operations)	Major incidents can bring government services to a standstill. In King County, with both City of Seattle and King County offices are in the same area, along with court facilities. A major incident in this area would prevent employees from getting to work or home. Furthermore, government buildings are often targeted and can be damaged or destroyed.
Responders	Responders are often on the front line of events. Responders can be targeted, causing injury to personnel, damage to facilities, and the loss of equipment. Responders are often injured during major incidents and, even when events are brought under control, may be seen as an enemy of the community causing long-term trust issues.
Infrastructure systems	• Energy: Pipelines carrying oil are a potential target for demonstrators. Oil trains have been targeted frequently in Washington; however, these protests do not tend to turn violent. • Water/Wastewater: Water systems are rarely the primary target of a demonstration and may only be peripherally impacted. • Transportation: One of the largest impacts from a major incident is disruption to transportation. Transit facilities and assets like busses may be destroyed. Roads can be closed for hours or days. • Communications: Communication systems are redundant and are unlikely to be severely impacted by a civil disorder incident.
Public confidence in jurisdiction's governance and capabilities	Major incidents can cause long-term damage to public confidence in the jurisdiction or, especially, public safety elements of jurisdiction governance. This can cause either alienation or, when response is proactive, help rebuild confidence and trust. To best preserve and grow confidence, a jurisdiction must respond quickly and effectively but without excessive force. The general public expects a quick restoration of order and protection of property while activists may demand accountability from officials and safety for peaceful demonstrators.



Regional Risk Profile: Cyber Incident

Hazard Description

Information technology has become embedded in the ways we conduct business, work and live. In a government context technology is fundamental to public services such as providing healthcare, public transportation, law enforcement, citizen engagement, public utilities, and supporting tax and rate payers.

A cyber-incident can have a severe impact on technology and therefore local government's capability to deliver services and conduct daily operations.

A cyber incident is defined by the Department of Homeland Security (DHS) in the 2016 National Cyber Incident Response Plan as "an event occurring on or conducted through a computer network that actually or imminently jeopardizes the confidentiality, integrity or availability of computers, information on communication systems or networks, physical or virtual infrastructure controlled by computers or information systems, or information resident thereon²³.

- Confidentiality refers to the ability to preserve authorized restrictions on information access and disclosure, including means for protecting personal privacy and proprietary information.
- Integrity speaks to guarding against improper information modification or destruction and ensuring information non-repudiation and authenticity.
 - Data Integrity – The property that data has not been altered in an unauthorized manner. Data integrity covers data in storage, during processing, and while in transit.
 - System Integrity – The quality that a system has when it performs its intended function in an unimpaired manner, free from unauthorized manipulation of the system, whether intentional or accidental.
- Availability refers to the ability to ensure timely and reliable access to and use of information²⁴

The nature of a cyber-incident differs from other hazards such as a landslide or an earthquake because it often lacks physical presence or evidence. The Ponemon Institute estimates the average time to identify a data breach is 206 days. When the breach is discovered it has already occurred or is still ongoing.²⁵ The average time it takes to fully contain a breach, after it has been identified, is 73 days. Organizations have seen an increase in the identification and containment mean time over the last few years, which has been attributed to the increasing severity of criminal and malicious attacks.²⁶

Wherever information technologies exist and are used, cyber incidents can occur. As the County becomes more and more dependent on its IT infrastructure it also becomes more vulnerable to IT related disruptions. Most cyber incidents can be categorized as malicious attacks, human errors or as

²³ National Cyber Incident Response Plan, Department of Homeland Security, December 2016 p. 8

²⁴ <https://nvlpubs.nist.gov/nistpubs/SpecialPublications/NIST.SP.800-12r1.pdf> 10/14/19

²⁵ IBM 2019 Cost of a Data Breach Report: Global Overview. p 50

²⁶ IBM 2019 Cost of a Data Breach Report: Global Overview. p 50



system glitches. More than 50% of the incidents are estimated to be caused by malicious or criminal attackers.²⁷

Cyber incidents based on actors with malicious intent can be driven by criminal motives for profit, extortion, and theft or to damage, destroy or interfere with infrastructure systems. Organizations worldwide experience malicious attacks on a daily basis. Most of the attacks are unstructured with little to no organization behind them such as a phishing attack or malware hidden in a downloaded file. Attacks are carried out with tools aiming to take advantage of well-known flaws and are often detected by security tools such as antivirus programs before they cause harm. However, an undetected attack can cause significant harm to an organization before it's detected and fully contained. More sophisticated attacks with a specific target are less common, harder to detect and take longer to contain. These attacks are more likely to have a catastrophic impact on an organization causing disruptions over some or all of the network. Over the last few years attackers have been targeting organizations using sophisticated ransomware, which encrypts the organizations' data and demands a ransom to decrypt it. Other attacks include cyber terrorism, aiming to cause sufficient destruction or disruption, to generate fear or undermine entities such as an organization, a region, a sector or a country.

Cyber incidents due to human errors or system glitches can occur because of negligence, lack of implemented policies and/or process, unclear roles and responsibilities, insufficient training, misconfigurations etc. Such incidents are often identified and contained faster than disruptions caused by malicious actors²⁸. Human errors and system glitches can expose confidential data, decrease availability and put data integrity at risk.

Data centers, physical IT infrastructure and hardware are vulnerable to other hazards such as long lasting power outages, flooding, earthquakes and fires. In the event of such hazards it is likely that the disruption to information technology will slow down the recovery time of critical communication systems, essential services and hardware.

Unshielded electronic and electrical equipment is sensitive to electromagnetic pulses (EMP). An EMP is an intense burst of electromagnetic energy resulting from natural (e.g. solar storms or space weather) or man-made (e.g. nuclear or pulse-power device). An EMP can temporarily affect or permanently damage electronic equipment. Solar storms which affects electronic equipment are rare but have occurred in the past impacting GPS satellite systems and signals sent to ground-based receivers²⁹.

The impact of a cyber-incident ranges from minimal to catastrophic depending on factors such as; magnitude of internal and external impact, affected systems, length of the incident, the nature of the data and so on. A small earthquake, a misconfiguration which was discovered early without any implications or a stolen encrypted laptop without sensitive data could have a minimal impact on the County. Whereas a ransomware attack which encrypts all or most of the County's data could have a

²⁷ IBM 2018 Cost of a Data Breach Report: Global Overview. p 6

²⁸ IBM 2018 Cost of a Data Breach Report: Global Overview. p 9

²⁹ NASA Solar Flares, https://www.nasa.gov/mission_pages/sunearth/news/X-class-flares.html 2019-10-14



catastrophic impact on the organization leading to loss of County operational capability, economic and reputational loss as well as life, health and safety risks and financial loss for individuals who live, work or visit the region.

Vulnerability Characteristics and Previous Occurrences

Regardless of the nature of the cyber incident, any area where an IT system supports the County services can be vulnerable. In order to reduce the risk of cyber incidents it is important to manage threats and vulnerabilities, have established backup systems, incident response plans and exercises, disaster recovery and continuity of operations. The magnitude of a cyber-incident varies greatly based on the extent and duration of the impact. The extent varies based on which specific system or data is affected, possible warning time, the ability to preempt the incident and activate a well-known and effective incident response plan.

Minor cyber incidents which are identified early and are recoverable may have some impact on daily operations before fully contained but won't have any significant effect on the County. A significant incident can have a major impact not only to the County but the region. Such incidents may result in safety and health risks, financial losses for the County and the region, reputational damage and inability to comply with regulatory requirements including penalties and fines. It may also affect the County's ability to achieve critical strategic objectives and fulfill Executive priorities.

The County's business essential services are critical to support life, health and safety in the region. Cyber incidents affecting those systems and services can have catastrophic impact on people who live, work or visit the region if they're not available within 0-72 hours after the initial disruption. The business essential services also include functions with legal requirements.

The County manages public, sensitive and confidential data on behalf of people who live, work and visit the region. Some of the data is regulated by federal law, Revised Code of Washington and national or global compliance regulations. Unauthorized, unanticipated, or unintentional disclosure of confidential data could result in loss of reputational damage, or legal action against the County and can, amongst other things result in identity theft or financial loss for impacted individuals. Personal Health Information (PHI) is more valuable on the black market than regular Personally Identifiable Information (PII). Therefore, there is a higher incentive for malicious attackers to target PHI than sensitive data such as PII. Loss of critical system or data availability, functionality and operational effectiveness, for example, may result in loss of productivity, thus impeding the end users' performance of their functions in supporting the County's operations. If hardware, computer systems, networks, servers and backups are damaged due to other hazards or accidental or deliberate damage, it can cause additional delays. System and data integrity is lost if unauthorized changes are made to the data or IT system by either intentional or accidental acts. If the loss of system or data integrity is not corrected, continued use of the contaminated system or corrupted data could result in inaccuracy, fraud, or erroneous decisions.

King County has services relying on SCADA (Supervisory Control And Data Acquisition) systems. SCADA systems are industry control systems which are used to control infrastructure and facility based



processes such as wastewater treatment and airports. Cyber incidents affecting those type of services can have severe impact on areas such as the environment, health, safety and financial consequences for the region.

Not all IT systems utilized by the County are owned or managed by the County. The County relies on numerous third party vendors and partners who are also exposed to cyber incidents and can therefore be vulnerable to cyber disruptions in other organizations.

Cyber incidents occur daily across the globe. The quantity of information being stolen by malicious attackers, destroyed or exposed as a result of a human error or made unavailable due to a system glitch is growing each year. King County is the recipient of a constant variety of attacks ranging from scans for weaknesses in our defenses, malware, phishing, and internet based attacks, as well as insider threats. The timeline below comprises state, national and international events and exemplifies consequences of a cyber-incidents.

Year	Location	Description
2006	United States	Geomagnetic storms and solar flares disabled the Global Positioning System (GPS) signal acquisition over the United States.
2007	Estonia	Dispute regarding movement of a Russian statue led to a cyber-attack that crippled websites for government services, banks, media outlets etc.
2008	Turkey	Hackers disabled communications, alarms, and caused a crude oil refinery the Turkish pipeline to explode, destroying operations and facilities.
2013	United States	Hackers stole credit card information from over 40 million Target customers.
2014	Washington State	Washington State experienced a six hour long 911 system outage due to human error.
2014	United States	280 000 AT&T accounts were breached by insiders who accessed user information with malicious intent.
2015	United States	The Office of Personnel Management experienced a malicious attack resulting in over 20 million compromised personnel records.
2016	Global	Over 1 billion Yahoo user accounts were compromised in 2013 and were discovered and communicated in 2016.
2017	Global	Geomagnetic storm affected power grids and radios.
2017	Sweden	Due to human error the National Transport Agency exposed its entire database including military secrets and personal identifiable information on individuals in the witness protection program, military personnel, and police officers.



2017	Global	WannaCry, a ransomware virus affected over 200 000 computers across 150 countries.
2017	Washington State	The University of Washington suffered a HIPAA data breach exposing information of nearly 1 million patients due to human error.
2018	United States	The City of Atlanta, Georgia and the Colorado Department of transportation suffered a ransomware attack named SamSam.
2018	United states	The City of Valdez in Alaska was targeted by a ransomware attack that remained dormant for weeks before doing any damage.
2019	Washington State	The City of Sammamish was targeted by a ransomware attack that shut down many city online services, requiring the city manager to declare an emergency and request support from law enforcement and King County IT and hire a tech company to help resolve the crisis.

Scenario Drivers

Cyber incidents can occur at any time, with or without previous warnings. Cyber incidents based on an actors malicious intent can be driven by criminal motives for profit, extortion, and theft or to damage, destroy or interfere with infrastructure systems. Cyber incidents due to human errors or system glitches can occur because of negligence, lack of policy and/or process, unclear roles and responsibilities, insufficient training, misconfigurations etc.	
Advanced Persistent Threat (APT)	An attack in which the attacker gains access to a network and remains undetected. APT attacks are designed to steal data instead of cause damage.
Adware	A form of software that displays advertising content in a manner that is potentially unexpected and unwanted by users, which may also include various user-tracking functions (similar to spyware).
Denial-of-Service Attack (DoS)	Attacks that focus on disrupting service to a network in which attackers send high volumes of data until the network becomes overloaded and can no longer function.
Drive-by Downloads	Malware is downloaded unknowingly by the victims when they visit an infected site.
Electro Magnetic Pulse (EMP)	Intense burst of electromagnetic energy resulting from natural (e.g. solar storms or space weather) or man-made (e.g. nuclear or pulse-power device) which can temporarily affect or permanently damage electronic equipment.

Hazards	Earthquakes, flooding and extreme weather can cause a verity of cyber incidents including loss of data and system availability and communications.
Malvertising	Malware downloaded when the victim clicks on an affected ad.
Malware	Software that can destroy data, affect computer performance, cause a crash, or even allow spammers to send email through an account.
Man-in-the-Middle	MITM attacks mirror victims and endpoints for online information exchange. In this type of attack, the MITM communicates with the victim who believes is interacting with the legitimate endpoint website. The MITM is also communicating with the actual endpoint website by impersonating the victim. As the process goes through, the MITM obtains entered and received information from both the victim and endpoint
Password Attacks	Third party attempts to crack a user's password and subsequently gain access to a system. Password attacks do not typically require malware, but rather stem from software applications on the attacker's system. These applications may use a variety of methods to gain access, including generating large numbers of generated guesses, or dictionary attacks, in which passwords are systematically tested against all of the words in a dictionary. Due to users reusing the same password for different systems a password attack targeting an unrelated system can give the attacker access to a more sought after system.
Pharming	Arranging for a web's site traffic to be redirected to a different, fraudulent site, either through a vulnerability in an agency's server software or through the use of malware on a user's computer system.
Phishing	Malicious email messages that ask users to click a link or download a program. Phishing attacks may appear as legitimate emails from trusted third parties.
Physical damage	Intentional or unintentional damage to physical infrastructure such as data center, hardware, power grids etc.
Ransomware	Malware that locks a person's keyboard or computer to prevent them from accessing data until you pay a ransom, usually in Bitcoin. A

	popular variation of this is ransom crypto ware, which corrupts files using a private key that only the attacker possesses
Social Engineering	In the context of cyber-security, this refers to an effort to psychologically manipulate a person, especially through misrepresentation or deception, to gain access to information. The manipulation often relies on the trusting nature of most individuals, or makes use of many persons' natural reluctance to offend others or appear too mistrustful. The ruse may involve creating impressions that make things appear more benevolent, trustworthy, and reliable than they actually are. Some schemes are very complex, and involve several stages of manipulation over a substantial period of time.
Social Engineered Trojans	Programs designed to mimic legitimate processes (e.g. updating software, running fake antivirus software) with the end goal of human-interaction caused infection. When the victim runs the fake process, the Trojan is installed on the system.
Spear Phishing	A form of phishing that targets a specific individual, company, or agency, usually relying on an accumulation of information to make subsequent ruses more effective when further probing the target, until a successful security breach finally becomes possible.
Spoofing	Attempting to gain access to a system by posing as an authorized user, synonymous with impersonating, masquerading, or mimicking. Attempting to fool a network user into believing that a particular site was reached, when actually the user has been led to access a false site that has been designed to appear authentic, usually for the purpose of gaining valuable information, tricking the user into downloading harmful software, or providing funds to the fraudsters.
Spyware	Software that allows others to gain private information about a user, without that person's knowledge or consent, such as passwords, credit card numbers, social security numbers, or account information.
Structured Query Language injection (SQLi)	Attackers use malicious SQL code for backend database manipulation to access information that was not intended to be displayed.
Virus	A program or code that attaches itself to a legitimate, executable program, and then reproduces itself when that program is run.



Worm	A self-contained program (or set of programs) that is able to spread copies of itself to other computer systems, usually through network connections of email attachments
Zero-day exploit	An attack which occurs the same day a vulnerability is discovered in the software. The vulnerability is exploited by the attacker before it can be fixed by a patch or a permanent solution.

Priority Vulnerabilities

Essential Services	The County has identified a number of essential services which are critical to support life, health, safety and legal requirements in the region.
Critical SCADA Systems	Industrial control systems which are used to control infrastructure and facility based processes such as wastewater treatment and airports.
Critical facilities	Facilities such as data centers and incident response facilities.
Critical devices	Smart devices paired to essential services such as medical devices.
Communication system	Although separate communication systems can be utilized in the event of a severe incident the County still relies on its communications systems for daily operations.

Priority Impact Areas

King County residents	Anyone who is present in King County during a cyber-incident can be impacted. Impact on residents may include: delayed services such as transportation, impaired or cancelled healthcare services, decreased or no availability of public services, information, and financial loss and exposed or lost information.
Vulnerable populations	Individuals who have a direct dependency on King County for health and safety reasons are vulnerable to cyber incidents impacting their needed services. Other vulnerable populations include individuals and organizations who depend on an income from the County if payments can't be processed, who are dependent on critical public services or County provided transportation.
Property	Cyber incidents can cause physical damage if property such as facilities, devices, infrastructure, or end consumers are affected by the disruption. An incident including utilities, life support devices, transportation or telecommunications may lead to extensive property damages.

The economy	The financial impact of a cyber-incident ranges from little or minimal to significant depending upon duration, scale, affected systems, devices and users. A significant, extended cyber incident affecting most or all of the County's operations would likely impact the local and possibly regional economy for some time. An incident of that magnitude would likely creates significant, potentially long-term or ongoing challenges to the County's ability to fund essential services and activities related to Executive priorities. Organizations who experiences cyber incidents which leads to data breaches of sensitive or confidential information can be subjects to legal fines and financial penalties if, for example, Personal Healthcare Information (PHI) is lost or exposed or personal identifiable information including social security numbers, credit card information or driver's license information is breached. Organizations who fail to meet regulatory and contractual obligations due to a cyber-incident may have significant cost for legal fees, settlements and fines.
The environment	The loss of control or availability of the County's SCADA systems could potentially impact the environment in the region if, for example, it causes the release of hazardous materials or improper disposal of waste water.
Health systems	Last years' cyber incidents including ransomware attacks, distributed denial of service attacks, system glitches and human error in healthcare systems all demonstrate that cyber incidents, are capable of triggering emergencies that impact patient care and public health. If an agency cannot access its own EHR, patient care could be delayed or hindered. Furthermore if other critical healthcare related systems and devices can't be accessed or data integrity guaranteed patient safety will be at risk.
Government operations (continuity of operations)	Minor cyber incidents which are identified early and are recoverable may have some impact on daily operations before fully contained but won't lead to significant loss of operations. A significant incident impacting one or more functions and businesses can severely affect the County's capability to perform critical operations. However, not all daily operations are critical. The County has defined its essential services, which need to become operational within 0-72 hours after disruption to ensure the organizations capability to maintain critical healthcare, safety and legal and regulatory needs.



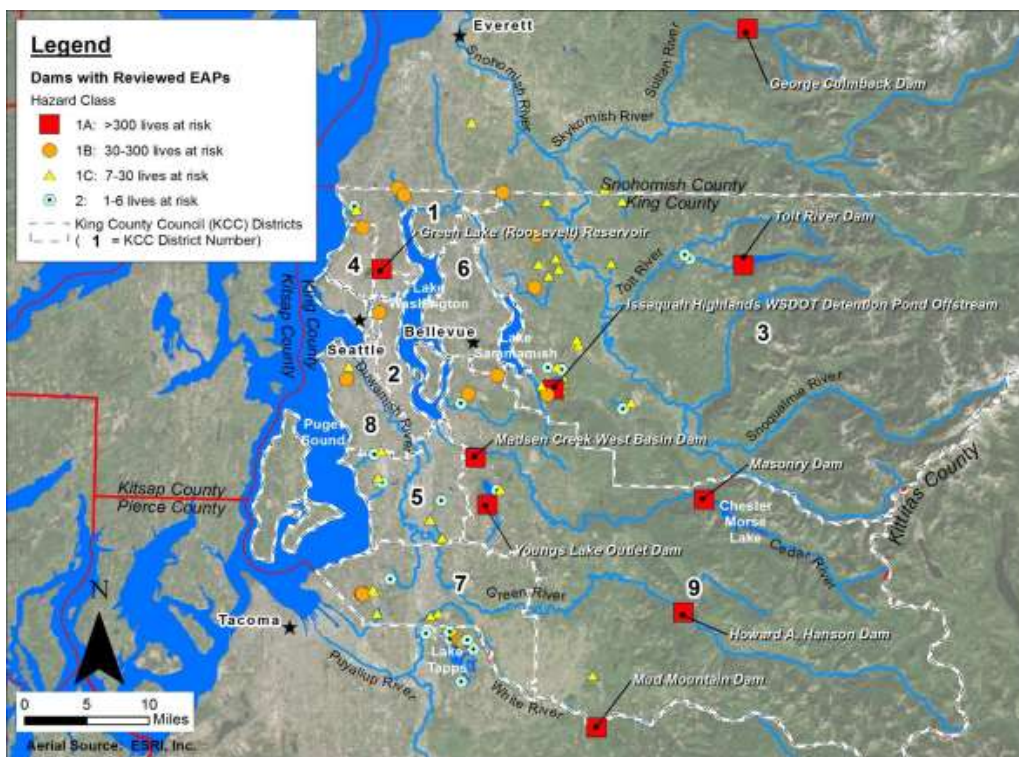
	In the event of a cyber-incident which render a non-critical service unavailable the County may lose revenue, experience loss of productivity and risks losing data over time.
Responders	Emergency responders may not be able to access their mission critical system, experience delays or performance issues. If data confidentiality is lost the public may lose their trust in organization and system. If data integrity is lost it may put patients and first responders at risk. King County may experience a prolonged incident response if the disruption is long lasting, complexed and exhausting internal resources.
Infrastructure systems	• Energy – Information technology has a direct dependency to energy. A hazard impacting the power system can therefore have a secondary effect on the County and lead to a cyber-incident due to loss of power to devices rendering systems and data unavailable, loss of power to cooling systems which can cause overheating and fires in server rooms and data centers. Critical infrastructure have backup generators. Ensuring fuel delivery during long lasting power outages for the generators is critical. A cyber incident impacting King County and no other organization should not have an effect on the energy system. • Water/Wastewater – Both water and wastewater facilities and infrastructure are vulnerable to cyber incidents on their SCADA systems, which can result in the release of hazardous material and malfunctioning systems. Such scenarios can result in environmental impact and create health and safety risks in the region. • Transportation – Transportation systems are vulnerable to attacks on their SCADA systems, which may result in trains and vehicles not operating as planned, airport functionality issues, delays, cancellations which can result in a secondary economic impact in the region due to loss of productive if people can't access public transportation to and from work. • Communications – The County relies on different types of technology based communications methods such as its website, VOIP and email to conduct its daily operations. A cyber incident impacting the VOIP or email system would quickly result in a loss of productivity, a negative consumer experience and could potentially halt or delay some of the County's operations.
Public confidence in jurisdiction's governance and capabilities	Recent cyber-incidents involving government agencies such as the ransomware attack on the City of Atlanta shows that such large scale disruption generate National media interest; third party actions; jeopardizes perceptions of effective operations, Executive priorities, and public confidence.

Regional Risk Profile: Dam Failure

Hazard Description

Dam failure is an uncontrolled, oftentimes, rapid release of water from an impoundment.³⁰ The impact of failure varies on factors such as impoundment size, steepness, land use downstream of the dam, and speed of failure. For larger dams, failure is characterized by a flood wave with high velocities. Smaller dams may only raise water levels slightly and slowly. The result of a dam failure can result in loss of life, property, infrastructure damage, public health impacts, safe drinking water, and environmental degradation within the inundation zone, but may have secondary effects on populations outside of the flooded area.

To better understand the threat locally of dam failure, the planning team worked with our own Dam Safety Officer who manages the King County Emergency Management's Dam Safety program. The program consists of creating response plans for high hazard dams in the community, educating at-risk populations of the threat of dam failure, and connecting poor condition dams to resources that are available for repair or removal of the dam. The King County Emergency Management Dam Safety



³⁰ Tetra Tech. 2017. King County Dam Safety Emergency Planning Gap Analysis Report. Page 10.



Officer works closely with Washington State Department of Ecology's Dam and Wells Manager to share information and create a regional effort to heighten dam safety in the County. The information on dams in the hazard profile are from the State Department of Ecology's Inventory of Dams.

The Washington State Department of Ecology Dam Safety Office is the regulating body over non-federal dams that impound at least 10-acre feet of water in the State of Washington. The DSO permits all new dam construction, inspects all high and significant hazard dams every 5 years, and requires that all deficiencies be remedied.

Dams serve the County in a variety of ways, agriculture, hydroelectric power generation, flood control, and recreation. King County has 127 dams located in the County. All but eleven of these dams are embankment-type dams. Contrary to the popular images of dams like Hoover, these dams are smaller and are typically made of a mixture of compacted materials such as soil, clay, and rock. A semi-pervious outer covering with a dense impervious core gives embankment dams their ability to resist seepage and water pressure. The other dams are made of concrete.

While there are 127 dams in King County, there are 21 other dams situated in neighboring counties that impact the County if they were to fail. Out of the 147 total dams, 94 threaten human life. A full list of dams that impact King County can be found at the end of this section.

Hazard Class	Number
1A = High – Greater than 300 lives at risk	10
1B = High – 31 to 300 lives at risk	18
1C = High – 7 to 30 lives at risk	42
2* = Significant – 1 to 6 lives at risk	17
2D = Significant – 1 to 6 lives at risk	7
2E = Significant – Environmental or economic impact	3
3 = Low – No lives at risk	50

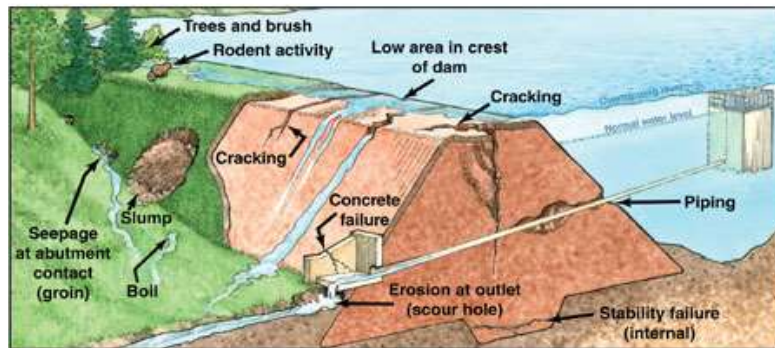
* Legacy classification, parsing all 2's into 2D's and 2E's ³¹

Dams fail for a variety of reasons, but the four most common are:³²

- Overtopping, 34% - caused by the reservoir reaching capacity and water spilling over the top of a dam
- Foundation defects, 30% - caused by settlement and slope instability
- Piping and seepage, 20% - when water travels through the dam and causes internal erosion
- Conduits and valves, 10% - Piping of embankment material into the conduit through joints or cracks

³¹ Washington State Department of Ecology - Water Resources Program - Dam Safety Office. 2019. Inventory of Dams Report.

³² Washington State Department of Ecology – Water Resource Program – Dam Safety Office. Accessed 8/28/2019. <https://ecology.wa.gov/Water-Shorelines/Water-supply/Dams/Emergency-planning-response/Incidents-failures>.



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Dam failure events are infrequent and may coincide with other events, such as earthquakes, landslides, excessive rainfall, wildfires, lahars and snowmelt. The average age of dams in King County is 47. As infrastructure ages, increased spending is needed to maintain its integrity.

Following are a selection of events that may cause a dam to fail.

Earthquake³⁴

Earthquakes can result in damage or failure of a dam. Earthquake effects on dams mainly depend on dam types. For example, the 2011 Tohoku Earthquake damaged 48 dams, causing one embankment type dam to fail³⁵. Safety concerns for embankment dams subjected to earthquakes involve either the loss of stability due to a loss of strength of the embankment and foundation materials or deformations such as slumping, settlement, cracking and planer or rotational slope failures. Dams are engineered to withstand the Maximum Considered Earthquake, but older dams may have been engineered before we fully understood the earthquake risk in the region.

Climate Change³⁶

While dam failure probabilities are low. The chance of flooding associated with changes of dam operation in response to weather patterns is higher. Dam designs and operations are developed in part from hydrographs and historical records. If weather patterns 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. Release rates and impound thresholds may have

³³ Washington State Department of Ecology – Water Resource Program – Dam Safety Office. 2018. Status of High and Significant Hazard Dams. Page 6.

³⁴ KUOW. Seattle's Faults: Maps that Highlight Our Shaky Ground. Accessed 8/29/19.

<http://archive.kuow.org/post/seattles-faults-maps-highlight-our-shaky-ground>

³⁵ International Commission on Large Dams. 2013. The 2011 Tohoku Earthquake and Dams. Page 9.

³⁶ Climate Impacts Group - University of Washington. 2018. New Projections of Changing Heavy Precipitation in King County. Page 40.

Landslides³⁷

to be changed. This would result in increased discharges downstream, thus increasing the probability and severity of flooding.

The integrity of a dam or reservoir can be affected by a landslide if they fail or move. Landslides can be triggered by heavy rainfall, snowmelt, reservoir drawdown, or earthquakes. Landslides can occur upstream in the reservoir, in a canyon downstream of a dam, or within the abutment of a dam. A landslide into the reservoir can generate a wave large enough to overtop a dam. Sloshing back and forth in the reservoir can result in multiple waves overtopping the dam. If the waves are large enough, there could be downstream consequences can just from a wave overtopping the dam even if it doesn't fail. If enough large waves overtop an embankment dam or a concrete dam with erodible abutments, a failure could potentially result³⁸. Some dams in the County have been built abutting a landslide. Often, these are ancient landslides that have stopped moving or are moving very slowly. However, if a landslide moves far enough, it can crack the core of an embankment dam, resulting in pathways for internal erosion to initiate, or disrupting the abutment support of a dam, resulting in failure.³⁹

Wildfires⁴⁰

Many of the County's highest hazard dams lie within wildfire-prone areas. Wildfires can damage dams, such as Eightmile dam near Leavenworth, directly by burning the surface of the dam or spillway and damaging other facilities at the dam. But the main threat from wildfires is how the surrounding watershed behaves. Heavy rains in a burned area can create:

- More and faster runoff from rainfall events, especially high-intensity storms.
- Large amounts of sediment, which may reduce storage capacity in a reservoir.
- Debris flows (mudslides) or downed timber, which may obstruct access to the dam.
- Debris flows from hill slopes near spillways, which may obstruct spillways.
- More floating debris (dead trees, branches, sticks) in a reservoir, which may obstruct spillways⁴¹

³⁷ Washington State Department of Natural Resources. Geological Portal Information. Accessed 8/28/2019. https://geologyportal.dnr.wa.gov/#natural_hazards

³⁸ U.S Department of the Interior: Bureau of Reclamation. 2015. Risk Management: H-2 Landslide Risks. Page 1.

³⁹ Quartz. 2015. The World's Biggest Hydro Power Project May Be Causing Giant Landslides in China.

<https://qz.com/436880/the-worlds-biggest-hydropower-project-may-be-causing-giant-landslides-in-china/>

⁴⁰ NW News Network. 2019. Eightmile Dam Near Leavenworth Has New Spillway, Is Being Monitored.

<https://www.nwnewsnetwork.org/post/eightmile-dam-near-leavenworth-has-new-spillway-being-monitored>

⁴¹ Washington State Department of Ecology - Water Resources Program - Dam Safety Office. 2015. Focus on Dams and Wildfires. Page 1.



Additionally, new development, outside of the 100 year flood plain, continues in dam inundation zones, meaning the population-at-risk from dam failure will continue to rise. Below shows development outside of the floodplain, but within a dam failure inundation area.

Vulnerability Characteristics and Previous Occurrences

King County has high hazard 1A dams that sit on the Green, White, Cedar, and Tolt Rivers. Additionally, Culmback dam in Snohomish County would flood parts of the Lower Snoqualmie Valley. The Green, White and Lower Snoqualmie Valleys are the areas of greatest concern for dam failure. Smaller privately owned and government dams are also a concern, as they may not have access to funding streams that other larger municipal governments do.

Four dam failure incidents have occurred in King County; they account for all lives lost due to dam failure in Washington State:⁴²

- 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.
- January 1997 - N. Boeing Creek Dam in Shoreline failed due to excessive seepage, poor hydraulics, and no emergency spillway during a large storm event; no lives were lost.

Other notable dam incidents in King County:

- In January 2009 two depressions were discovered in the right abutment of the United States Army Corps of Engineers' Howard Hanson Dam. While repairs were being conducted, there

⁴² Washington State Department of Ecology - Water Resources Program - Dam Safety Office. 2019. Washington State Notable Dam Failures and Incidents.



was a 1 in 3 chance of a 25,000 cfs release down the Green River which would have caused significant flooding. The USACE was able to fully fix the dam by 2011 before a substantial flood ensued. King County and local jurisdictions spent \$30 million on flood protection that wasn't reimbursed by FEMA.⁴³

- In January 2009, Mud Mountain Dam, owned and operated by the USACE, released a higher than usual flow down the White River during a heavy rain event. As a result, 100 homes were flooded. Since then, King County Flood Control District, Washington State, and Pierce County jointly funded a levee setback to reduce the risk of flooding and increase habitat restoration⁴⁴.

Scenario Drivers

Howard A Hanson	Howard Hanson, constructed in 1961, is a federally owned and operated dam by the United States Army Corps of Engineers. Its primary purpose is to provide flood control in the winter and fish enhancement in the summer. It dramatically reduced the amount of flooding that the Green River Valley experienced before its construction. The right abutment of the dam is the toe of a large landslide. Seepage problems can occur for dams built into landslides. As mentioned previously, landslide activity can pose a serious risk to dams. Many mitigation actions have been taken to reduce risk at the dam, such as a gravel blanket and additional vertical and horizontal drains in the drainage tunnel have all drastically improved the safety of the dam. If preventative actions are not taken, internal erosion could fail the dam.
South Fork Tolt Dam	The South Fork Tolt Dam is owned and operated by the City of Seattle. It is a hydroelectric dam that also provides drinking water for 30% of 1.3 million people across the greater Seattle area. South Fork Tolt Dam is a large embankment type dam, equipped with a morning glory spillway. The Tolt dam has known landslide hazards below the dam, and above the reservoir. If a slide were to occur below the dam, the slide may create a dam of its own. Engineers would need to evaluate what action should be taken. The Tolt Dam would have to lower the amount of flow downstream why the risk is being assessed. Additionally, if a slide were to occur in the reservoir, an overtopping wave may be generated that could cause the dam to fail or send a flood wave downstream.
Mud Mountain Dam	Mud Mountain Dam is a United States Army Corps of Engineer owned and operated dam on the White River. Its primary purpose is to provide flood control for nearly

⁴³ Seattle Times. 2011. FEMA won't pick up \$30 million tab to prepare for flooding.

<https://www.seattletimes.com/seattle-news/fema-wont-pick-up-30-million-tab-to-prepare-for-flooding/>

⁴⁴ King County Department of Natural Resources and Parks – Water and Land Resource Division. 2018. Lower White River Countyline Levee Setback Project. <https://www.kingcounty.gov/depts/dnrp/wlr/sections-programs/river-floodplain-section/capital-projects/lower-white-river-countyline-a-street.aspx>



	400,000 residents in King and Pierce Counties. Typically, there isn't a reservoir being impounded by the dam. During heavy rains or times of snowmelt, engineers will impound the water and slowly release it downstream to avoid flooding residents. The White River is a glacial river fed by Mt. Rainier. This leaves the possibility that a lahar, triggered by an earthquake, volcanic activity, or heavy rains could cause a debris flow that would block the intake structure on the dam. Such an event would decrease the storage capacity of the reservoir and cause flows to travel over the spillway. The loss in flood control capabilities on the White River would leave the Green, White, and Puyallup River Valleys susceptible to flooding. Situated in Snohomish County, but inundating a portion of the King County's Lower Snoqualmie Valley, the Culmback Dam is owned and operated by Snohomish Public Utility District One. Culmback offers hydroelectric power generation, flood control, drinking water, and recreational benefits to the region.
Culmback Dam	Culmback's morning glory spillway is designed to maintain adequate levels of freeboard in maximum probable flood events. Changes in hydrology affect the amount of water a dam would need to convey downstream to keep it from failing. Culmback Dam's watershed lies within a densely forested area that slows the speed in which water enters the reservoir, prevents sediment from entering the reservoir, and prevents debris flows. A wildfire around the dam would increase the hydrologic strain on the dam. An increased flow could be compensated with larger releases from the dam, but would result in flooding of the Town of Sultan. If not enough water could be discharged, an overtopping scenario at the dam would prove very dangerous.
Lake Tapps	Lake Tapps is a reservoir that sits in Pierce County made up of a system of dikes. If particular dikes were to fail, they would inundate Auburn and portions of the Green and White River Valley. Lake Tapps was built by Puget Sound Energy in 1911 and ran a hydroelectric program until 2004. Lake Tapps was purchased by Cascade Water Alliance in 2009 who currently owns and operates the reservoir. Its primary function is to provide drinking water to a group of contracting King County cities and water districts. In addition to providing drinking water, Lake Tapps is also a residential community, many of whom use the Lake for recreational purposes. While residents are instructed to stay off the dikes, there is no physical security to keep individuals from accessing the structure. Many dikes have publically accessible roads. Acts of terrorism or sabotage could provide a serious threat to the integrity of the levees.



Madsen Creek Flow and Water Control Pond	Madsen Creek Pond is a King County-owned dam. Constructed in 2008, its primary purpose is to provide flood control in extreme rainfall events. There is oftentimes no impoundment behind the dam in summer months when there isn't consistent rainfall. Madsen Creek Pond is designed to store runoff from a 100-year 24-hour storm and still maintain freeboard necessary to prevent flooding downstream. While the dam is comparatively very young as climate patterns become more unpredictable, Madsen Creek Pond and other dams may need to be retrofitted to accommodate the change in probable maximum precipitation. If actions were not taken to adjust to the new hydrology, chances of failure from an overtopping situation or an uncontrolled release would become higher.
Cedar Falls Project Masonry Dam	The Masonry Dam within the Cedar Falls Project is one of the oldest dams in the County. It was built in 1914 and currently is owned and operated by the City of Seattle. The dam serves two purposes, hydroelectric power generation and water supply. The dam is a concrete gravity dam with an emergency spillway, service spillway, power tunnel intake, and a low-level outlet. While there have been fewer failures of concrete dams than earthen dams in general⁴⁵, this doesn't mean that failure is unrealistic. The Masonry dam sits near the Rattlesnake Mountain Fault. While concrete dams have escaped failure in earthquake scenarios, minor damage has been observed. The Masonry Dam would need to be assessed for damage after an earthquake for cracking or other deficiencies in the structure or supporting structures. If deficiencies are noted, action must be taken to ensure that the dam doesn't fail. Earthquakes can also trigger landslides around the dam. Finally, large earthquakes can devastate communities, created a resource-scarce environment, potentially making it more difficult to find resources.

Priority Vulnerabilities

Small Local Government and Privately Owned Dams	These dams may not have access to funding, or have employees dedicated to dam safety. This means that there is a higher chance that maintenance and deficiencies go unmediated. Thus, leading to a higher chance of dam failure.
Lack of Public Knowledge	Most dams use a "For Official Use Only" designation on their inundation maps. This means that inundation maps only be shared on a need to know basis. A lack of public knowledge about dams, their presence in the community, and their failure potential creates an added challenge in creating a resilient community.

⁴⁵ Association of State Dam Safety Officials. 1989. Failure of Concrete Dams. Page 4.



Out of Date or Missing
Emergency Action Plans

High and significant dams are required to have Emergency Action Plans in Washington State. Missing EAPs and out of date EAPs pose a risk if owners are unequipped to deal with an emergency at their dam.

Poor and Unsatisfactory
Dams

Any dam that is designated as “poor” or “unsatisfactory” by the Washington State Dam Safety Office should be brought to a higher standard.

Priority Impact Areas

With all the dams in the county, only a small amount of information can be shared here due to “For Official Use Only Designation”. Another reason is that there is a lack of in-depth study done on dam failure impacts to King County. The best and most available estimates for dam failure damages/impacts are from the potential high release scenario at Howard Hanson Dam in 2009. Examples provided here relate to those studies.

King County residents	Dam Name	Estimated Impacted King County Population (Full Pool Failure)	Estimated Impacted King County Population (Sunny Day Failure)*
	Mud Mountain	24,480	2,031
	Howard Hanson	20,845	6,235
	South Fork Tolt	2,291	N/A
	Lake Youngs	2,744	2,139
	Culmback	145	N/A
	Other Dams Combined (Estimate)**	5,295	N/A

⁴⁶

*Sunny day failure assumes a regular pool

**Hazard class median reach of range

Populations are based on census data. Areas such as the Green River Valley experience drastic differences in day time/night time population being an economic hub. The

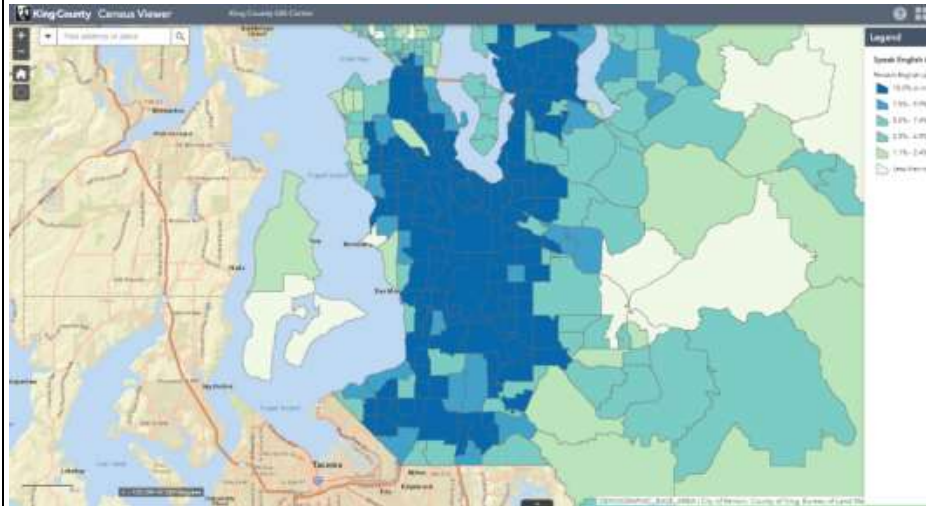
⁴⁶ Tetra Tech. 2017. King County Dam Safety Emergency Planning Gap Analysis Report. Page 27.



number of people that would need to be evacuated could drastically differ from the numbers identified in the hazard classification. An estimate in 2009 put a 25,000 cfs release from Howard Hanson triggering an evacuation on the scale of 200,000 to 300,000 people.⁴⁷

Vulnerable populations

Dam inundation areas consist of some of the highest Limited English Proficiency populations in the County. Spanish, Vietnamese, African Languages, and Mandarin are all spoken in high percentages in dam inundation areas.



Auburn, Kent, and Riverview School District, as well as private schools, have locations that are vulnerable to dam failure. Riverview school district practices an evacuation of Carnation Elementary School and Tolt Middle School every September in the City of Carnation. Both of these schools would need to be evacuated if the South Fork Tolt Dam failed.

Preliminary studies indicate that there are at least 15 assisted living facilities within dam inundation areas.⁴⁸ Evacuation will take longer for this population than most.

A 2019 report indicates that there 11,199 individuals experiencing homelessness in the County.⁴⁹ Alert and warning can be especially challenging for this population as they may not be tied to a geo-coded database.

⁴⁷ Seattlepi. 2019. 300,000 might have to evacuate if Green River Floods.

<https://www.seattlepi.com/seattlenews/article/300-000-might-have-to-evacuate-if-Green-River-889468.php>

⁴⁸ FEMA Region X. 2009. HAZUS Analysis for the Green River Valley. Page 168.

⁴⁹ All Home. 2019. Seattle/King County Point-In-Time County of Persons Experiencing Homelessness.



Property	Dam Name	Residential Buildings Impacted in King County (Full Pool Failure)	Estimated Impacted in King County (Sunny Day Failure)*	
	Mud Mountain	9,992	829	
	Howard Hanson	8,508	2,545	
	South Fork Tolt	935	N/A	
	Lake Youngs	1,120	873	
	Culmbach	59	N/A	
	Other Dams Combined (Estimate)	N/A	N/A	
50				
*Sunny day failure assumes a regular pool				
2009 modelling of a high release from Howard Hanson.				
	Structures impacted	Lower Green	In 17,000 cfs impact area	In 25,000 cfs impact area
	Residential	3,486	1,743	1,937
	Commercial	16,798	12,245	13,667
	Industrial	7,839	6,549	6,644
51				
The economy	The Green River Valley is an economic powerhouse in the region. Flood damage prevented in the valley by Howard Hanson Dam since the January 2009 flood is			

⁵⁰ Tetra Tech. 2017. King County Dam Safety Emergency Planning Gap Analysis Report. Page 168.

⁵¹ FEMA Region X. 2009. HAZUS Analysis for the Green River Valley. Page 166.



	estimated at \$6 billion alone⁵². The economic impact of a failure would devastate the region. With large employers, such as Boeing, and economic centers like the South Center Mall, in the Valley, a dam failure would leave the local economy crippled. Commutes, roadways, and rail lines would all be impacted by a high release from Howard Hanson. Unemployment may follow after areas that experience a dam failure. 2009 Hazus modeling for a high release from the Howard Hanson Dam show impacts:⁵³ • At 17,600 cfs flows from a dam failure: - \$1.34 billion in economic losses • At 19,000 cfs flows from dam failure: - \$1.97 billion in economic losses • At 25,000 cfs flows from dam failure: - \$3.75 billion in economic losses An economic analysis is needed to quantify how much impact a complete failure would have on the local economy.
The environment	The primary environmental impact from dam failure is natural and manmade debris from the inundation. Silt, wood, rocks and gravel, hazardous materials, construction debris, vehicles, dead animals may be carried by inundation waters to locations that may be spawning areas for local fish, wetlands for birds and reptiles, or inhabited areas that the County has invested in heavily. While recovery and impact will vary with each inundation area. • At 17,600 cfs – 84,000 tons of debris • At 19,000 cfs – 208,000 tons of debris • At 25,000 cfs – 280,000 tons of debris ⁵⁴ Isolating the potential environmental impact of dam failure is obscured by the likelihood that another hazard, like an earthquake, may have triggered the dam failure.
Health systems	MultiCare Auburn Medical Center lies within a dam failure inundation area, but further study is needed to fully understand the impacts on health systems from dam failure.
Government operations (continuity of operations)	Auburn, Kent, Tukwila, Carnation, Pacific, and Algona all have city halls within inundation areas. Courts, the County Elections office, King County Regional Justice Center in Kent where Superior Courts, Adult Detention, and other county agencies are located within dam failure inundation areas as well.
Responders	Kent, Pacific, Seattle, Renton Regional Fire Authority, Valley Regional Fire Authority, and Eastside Fire and Rescue all have fires stations within dam inundation areas.

⁵² USACE. Howard A. Hanson Dam. Accessed 8/28/2019. <https://www.nws.usace.army.mil/Missions/Civil-Works/Locks-and-Dams/Howard-Hanson-Dam/>

⁵³ FEMA Region X. 2009. HAZUS Analysis for the Green River Valley. Page 166.

⁵⁴ FEMA Region X. 2009. HAZUS Analysis for the Green River Valley. Page 169.



	Auburn, Algona, Pacific, Kent, Seattle, State Patrol Crime Lab, and King County Sherriff all have stations in dam failure inundations.
Infrastructure systems	Infrastructure impacts vary dramatically based on the individual dam and type of failure. • Energy- While there are dams that generate power in the County, they provide a relatively small amount of power. The Cedar, Snoqualmie, Twin Falls and, Tolt projects account for only 126 max MW output⁵⁵. Power outages may be long term in areas where there has been a failure. • Water/Wastewater – Drinking water availability would be drastically impacted by a failure of the Masonry, Lake Tapps, Lake Youngs, and Howard Hanson Dams. A failure of one of the many of the reservoirs around the County would also challenge water systems. The King County South Treatment Plant also lies within a dam failure inundation area. • Transportation- Rail lines (commercial and commuter), LINK Light Rail, bus routes, numerous state highways, and numerous bridges can be impacted by dam failure.
Public confidence in jurisdiction governance and capabilities	A dam failure may cause the public to lose confidence in dam owners to manage local dams. Depending on the success of the response, the public may also lose confidence in first responders.

Full List of Dams That Impact King County

<u>Dam Name</u>	<u>NIDID</u>	<u>Max Storage (acre- feet)</u>	<u>Age (Years)</u>	<u>Hazar d Classif ication</u>	<u>Lat,Long</u>	<u>County</u>
ISSAQUAH HIGHLANDS WSDOT DETENTION POND	WA007 07	53	11	1A	47.541919,- 122.013939	King
MADSEN CREEK WEST BASIN DAM	WA018 62	27	11	1A	47.45887,- 122.146561	King
GREEN LAKE RESERVOIR	WA002 12	25	109	1A	47.681486,- 122.314571	King

⁵⁵ Bonneville Power Administration. 2018 Transmission Plan. 2018. Page 77.



HOWARD A HANSON DAM	WA002 98	136700	57	1A	47.27797,- 121.78603	King
MASONRY DAM	WA002 55	175000	105	1A	47.41221,- 121.75259	King
YOUNGS LAKE OUTLET DAM	WA002 54	18908	98	1A	47.402843,- 122.124665	King
MUD MOUNTAIN DAM	WA003 00	156000	71	1A	47.139329,- 121.931859	King
TOLT RIVER - SOUTH FORK	WA001 77	67200	57	1A	47.693158,- 121.689555	King
TAPPS LAKE DIKE NO. 1	WA004 18	22000	108	1A	47.241348,- 122.184894	Pierce
CULMBACK DAM	WA002 08	200000	36	1A	47.974825,- 121.687897	Snohomish
PANTHER LAKE BALLFIELD DAM	WA017 37	102	25	1B	47.293417,- 122.337225	King
LAKEMONT STORMWATER POND	WA016 51	30	27	1B	47.557275,- 122.111876	King
ISSAQUAH HIGHLANDS REID POND DAM	WA006 80	69	17	1B	47.537831,- 122.027253	King
PANTHER LAKE DETENTION DAM	WA017 33	339	25	1B	47.295169,- 122.338302	King
PANTHER LK. FIRST AVE. DETENTION POND	WA017 47	18	19	1B	47.293334,- 122.336049	King
VOLUNTEER PARK RESERVOIR	WA002 10	69	118	1B	47.629988,- 122.316676	King
HIGH POINT REDEVELOPMENT STORMWATER DAM	WA018 69	22	13	1B	47.549375,- 122.371263	King
LAKE FOREST PARK RESERVOIR	WA002 17	208	57	1B	47.770339,- 122.278611	King
HIRAM M. CHITTENDEN LOCKS & DAM	WA003 01	458000	103	1B	47.667639,- 122.39853	King



BITTER LAKE RESERVOIR	WA002 13	31	61	1B	47.7311,- 122.348669	King
RADAR LAKE (OBRIAN) DAM	WA001 86	68	46	1B	47.730511,- 122.024173	King
JOHNSON POND DAM	WA019 99	25	7	1B	47.66287,- 122.050033	King
CRYSTAL LAKE DAM	WA001 95	6	88	1B	47.775751,- 122.107419	King
TAPPS LAKE DIKE NO. 6	WA004 23	43000	108	1B	47.238839,- 122.163482	Pierce
TAPPS LAKE DIKE NO. 5	WA004 22	40000	108	1B	47.240926,- 122.167596	Pierce
TAPPS LAKE DIKE NO. 4	WA002 96	58340	108	1B	47.240789,- 122.170259	Pierce
NEWCASTLE VISTA DEVELOPMENT POND 3	WA019 08	13	13	1B	47.5347,- 122.161437	King
CEDAR WAY STORMWATER DETENTION DAM	WA014 04		34	1B	47.778205,- 122.289697	Snohomish
REDMOND RIDGE EAST POND SRN 2 NO.1	WA018 92	52	11	1C	47.697463,- 122.013921	King
ISSAQUAH HIGHLANDS SOUTH POND DAM	WA006 88	67	16	1C	47.541353,- 122.000025	King
SPRINGWOOD STORMWATER DETENTION DAM	WA016 68	50	27	1C	47.361671,- 122.170302	King
TALUS P5 STORMWATER DETENTION DAM	WA018 44	12	17	1C	47.534487,- 122.06288	King
SNOQ. RIDGE DOUGLAS AVE. POND D1 DAM	WA018 04	18	21	1C	47.527247,- 121.880358	King
SOUTH 336TH STREET STORMWATER DAM NO. 1	WA017 54	46	23	1C	47.295591,- 122.317872	King
PETERSON STORMWATER DETENTION DAM	WA013 37	90	31	1C	47.665661,- 122.021473	King



REBA LAKE STORMWATER DETENTION DAM	WA006 18	105	27	1C	47.467583,- 122.317944	King
MILL POND STORMWATER DETENTION DAM	WA017 16	16	25	1C	47.268797,- 122.219347	King
YELLOW LAKE OUTLET DIKE	WA005 59	220	33	1C	47.568281,- 122.009515	King
SOUTH RIDGE STORMWATER DETENTION DAM	WA018 20	25	17	1C	47.545498,- 122.035664	King
TROSSACHS DETENTION POND PC-3	WA017 87	18	20	1C	47.601051,- 121.975774	King
TROSSACHS DETENTION POND PC-2	WA018 33	55	17	1C	47.594216,- 121.972376	King
GARRISON CREEK - 98TH AVENUE DETENTION DAM	WA006 50	8	23	1C	47.394045,- 122.209814	King
MILL CREEK CANYON STORMWATER DETENTION DAM	WA014 43	18	37	1C	47.383155,- 122.222898	King
UPPER MILL CREEK STORMWATER DETENTION DAM	WA005 82	100	29	1C	47.362116,- 122.201882	King
SOUTH 336TH STREET STORMWATER DAM NO. 2	WA017 67	49	23	1C	47.29782,- 122.316762	King
WEYERHAUSER- ENUMCLAW FLOOD CONTROL DAM	WA006 36	140	26	1C	47.188673,- 121.929254	King
ISSAQUAH HIGHLANDS NPE POND	WA018 67	36	16	1C	47.555811,- 121.998433	King
REDMOND RIDGE CEDAR DAM	WA018 02	62	21	1C	47.690857,- 122.04408	King
REDMOND RIDGE DRIVE EC 4N ROADWAY DAM	WA018 37	148	16	1C	47.67683,- 122.026237	King
PORT OF SEATTLE - LAGOON #3 EXPANSION	WA006 71	256	18	1C	47.432537,- 122.31332	King



ISSAQUAH HIGHLANDS NP2 POND DAM	WA018 58	28	17	1C	47.548397,- 122.000606	King
ICON MATERIALS AUBURN SEDIMENT POND	WA006 83	200	22	1C	47.271936,- 122.206424	King
BOEING CREEK STORMWATER DETENTION DAM	WA004 83	41	36	1C	47.752036,- 122.360075	King
SNOQUALMIE MILL POND DAM	WA003 07	396	102	1C	47.529342,- 121.819312	King
WELCOME LAKE DAM	WA001 94	260	60	1C	47.724532,- 122.048251	King
TUCK LAKE DAM	WA001 80	290	53	1C	47.764918,- 122.03081	King
YOUNGS LAKE NEW INLET DAM	WA004 15	16836	93	1C	47.420921,- 122.102904	King
MARCEL LAKE DAM	WA002 00	350	55	1C	47.692486,- 121.918558	King
LOREENE LAKE DAM	WA001 93	86	56	1C	47.31269,- 122.385452	King
MARGARET LAKE DAM	WA002 36	1200	86	1C	47.766978,- 121.901433	King
DES MOINES CREEK REGULATORY DETENTION FACILITY WEST BERM	WA006 92	160	11	1C	47.428554,- 122.312781	King
DES MOINES CREEK REGULATORY DETENTION FACILITY EAST BERM	WA006 93	53	11	1C	47.427034,- 122.311192	King
ICON MATERIALS SEDIMENT POND 6	WA007 41	1200	4	1C	47.268341,- 122.193221	King
SOUTHWEST GENESEE STREET DETENTION DAM	WA003 80	52	45	1C	47.564882,- 122.36751	King
TAPPS LAKE DIKE NO. 11	WA004 27	38000	108	1C	47.238152,- 122.147596	Pierce



TAPPS LAKE DIKE NO. 3	WA004 21	28000	108	1C	47.249352,- 122.177817	Pierce
KAYAK LAKE DAM	WA001 99	230	54	1C	47.782211,- 121.931649	Snohomish
REDMOND RIDGE EAST POND SRS 1 No. 1	WA019 22	39	6	1C	47.685272,- 122.008553	King
SEATAC AIRPORT POND M	WA020 38	27	8	1C	47.464811,- 122.309788	King
SILVER FIRS DETENTION POND NO. 3	WA017 92	36	21	1C	47.858218,- 122.163964	Snohomish
DES MOINES CREEK STORMWATER DETENTION	WA016 49	23	31	2	47.426777,- 122.305916	King
204TH STREET STORMWATER DETENTION BASIN	WA018 19	17	18	2	47.419722,- 122.30375	King
NEWCASTLE RAILROAD EMBANKMENT DAM	WA006 48	200	119	2	47.522983,- 122.173869	King
QUADRANT EAST CAMPUS PARCEL 1 DAM	WA018 15	13	19	2	47.311672,- 122.289382	King
SNOQUALMIE FALLS DIVERSION DAM	WA002 95	818	121	2	47.54149,- 121.837891	King
TOLT RIVER REGULATED BASIN WEST DAM	WA002 37	35	57	2	47.70383,- 121.791131	King
YOUNGS LAKE CASCADES DAM	WA002 09	12320	69	2	47.419569,- 122.10876	King
LAKE KITTYPRINCE DAM	WA002 01	96	52	2	47.519114,- 121.894508	King
TOLT RIVER REGULATING BASIN SOUTH DAM	WA002 38	1100	57	2	47.699823,- 121.782893	King
TAPPS LAKE DIKE NO. 8	WA004 24	34000	108	2	47.239469,- 122.160082	Pierce
TAPPS LAKE DIKE NO. 9	WA004 25	26000	108	2	47.239893,- 122.157987	Pierce



TAPPS LAKE DIKE NO. 2B	WA004 20	28000	108	2	47.250305,- 122.186157	Pierce
TAPPS LAKE DIKE NO.10	WA004 26	32000	108	2	47.240913,- 122.155031	Pierce
TAPPS LAKE DIKE NO. 2A	WA004 19	20000	108	2	47.249683,- 122.187505	Pierce
TAPPS LAKE DIKE NO.13	WA004 29	10000	108	2	47.190787,- 122.164775	Pierce
TAPPS LAKE DIKE NO. 12	WA004 28	25000	108	2	47.229823,- 122.14456	Pierce
LAKELAND SOUTH POND NO.1	WA018 45	12	16	2	47.247554,- 122.226014	Pierce
BOEING CREEK M1 DETENTION DAM	WA017 82	14	21	2D	47.755515,- 122.363653	King
MUTH STORMWATER POND	WA018 83	37	12	2D	47.411031,- 122.277469	King
KLAHANIE STORMWATER DETENTION DAM NO. 2	WA014 85	14	35	2D	47.564342,- 122.019611	King
KLAHANIE STORMWATER DETENTION DAM NO. 13	WA006 02	56	29	2D	47.565061,- 122.001408	King
KLAHANIE STORMWATER DETENTION DAM NO. 1	WA014 84	28	35	2D	47.567181,- 122.024633	King
GARRISON CREEK STORMWATER DETENTION DAM	WA005 77	45	28	2D	47.406392,- 122.203895	King
CONNER JARVIS EAST POND	WA020 62	14	1	2D	47.573849,- 122.024296	King
SEATAC AIRPORT POND G	WA019 72	27	10	2E	47.459923,- 122.321072	King
SEATAC AIRPORT SE POND	WA019 01	14	12	2E	47.433611,- 122.300306	King
CEDAR HILLS LANDFILL CSW POND	WA020 61	53	3	2E	47.457243,- 122.05295	King



ECHO LAKE DAM	WA012 64	900	84	3	47.50649,- 121.871224	King
FOSTER WATERSKI POND	WA005 99	80	29	3	47.635375,- 121.929033	King
FRAATT DAM	WA017 00	30	63	3	47.688042,- 122.061542	King
BEAR CREEK FAIRWAY ESTAE DETENTION POND 1	WA014 35	43	18	3	47.724374,- 122.07023	King
BELLEVUE DETENTION POND (133)	WA004 77	90	36	3	47.61931,- 122.14265	King
BELLEVUE DETENTION POND (149)	WA004 76	92	36	3	47.581056,- 122.167666	King
BELLEVUE DETENTION POND (104)	WA014 40	25	36	3	47.581056,- 122.167666	King
I-405 COAL CREEK STORMWATER DETENTION DAM	WA016 47	40	32	3	47.566555,- 122.180361	King
LINDSLEY DAM	WA017 49	13	69	3	47.58387,- 121.980395	King
STAR LAKE CONTROL WORKS	WA011 76	70	69	3	47.352621,- 122.286532	King
LANDSBURG DIVERSION DAM	WA015 43	15	84	3	47.375929,- 121.961535	King
TAYLOR DAM	WA014 74	10	69	3	47.45545,- 122.025472	King
HIGH WOODLANDS STORMWATER DETENTION DAM	WA006 13	29	28	3	47.730592,- 122.194303	King
PRESTON MILL POND	WA012 97	10	72	3	47.521821,- 121.92759	King
QUADRANT LAKE NO. 1	WA017 40	113	25	3	47.298433,- 122.315121	King



SAWYER LAKE OUTLET STRUCTURE	WA011 77	1116	67	3	47.335379,- 122.045013	King
REDMOND RESERVOIR DAM	WA006 18	33	92	3	47.713047,- 122.056138	King
SOUTH 120TH STREET RESERVOIR	WA013 45	15	43	3	47.494916,- 122.315985	King
SNOQUALMIE RIDGE GOLF COURSE POND M1	WA006 56	70	22	3	47.538501,- 121.863171	King
TROSSACHS STORMWATER DETENTION POND	WA017 53	14	24	3	47.584739,- 121.971619	King
BOEING AUBURN DRAINAGE DITCH DETENTION DAM	WA016 75	7	25	3	47.291489,- 122.251231	King
QUEENS BOG DAM	WA016 33	132	32	3	47.579896,- 122.017182	King
WETZEL FAMILY LLC	WA020 15	19	39	3	47.213244,- 122.041401	King
VERDANA POND C	WA019 07	11	12	3	47.335,- 122.180556	King
BELLEVUE DETENTION POND (179 NORTH)	WA013 98	26	42	3	47.62593,- 122.146391	King
WILDWOOD POND	WA011 64	29	67	3	47.400369,- 122.492826	King
REDMOND RIDGE DETENTION POND BC-2, NO.2	WA018 43	12	17	3	47.6959,- 122.031538	King
REDMOND RIDGE DETENTION POND ECC-1B-1	WA018 26	13	15	3	47.682759,- 122.028926	King
REDMOND RIDGE DETENTION POND ECW 1B1	WA018 32	18	17	3	47.682345,- 122.041503	King
TUKWILA SOUTH PROJECT SOUTH POND	WA007 27	164	8	3	47.420628,- 122.269055	King



ALDARRA POND DF-R1	WA018 18	53	18	3	47.587773,- 121.954399	King
CEDAR HILLS REGIONAL LANDFILL STORMWATER POND	WA020 60	40	3	3	47.456374,- 122.052682	King
CARNATION WASTE POND NO. 2	WA013 41	25	38	3	47.667648,- 121.948802	King
WEST CAMPUS DAM NO. 6	WA014 18	18	45	3	47.290947,- 122.325197	King
WEEKS FALLS HYDRO PROJECT	WA015 84	10	33	3	47.432483,- 121.645884	King
BELLEVUE DETENTION POND (197)	WA004 78	11	36	3	47.63173,- 122.152261	King
MORSE LAKE DAM	WA002 56	75000	115	3	47.409604,- 121.725455	King
GREEN RIVER DIVERSION DAM	WA015 83	10	69	3	47.300919,- 121.840592	King
BELLEVUE DETENTION POND (165)	WA004 79	12	36	3	47.624358,- 122.171261	King
MARTINDALE LAKE DAM	WA010 89	10	59	3	47.378439,- 122.311706	King
RAVENSDALE PIT	WA003 39	165	47	3	47.347285,- 121.996183	King
JEAN LAKE DAM	WA001 92	12	56	3	47.311983,- 122.380264	King
BLACK DIAMOND AERATED LAGOON	WA015 61	15	38	3	47.303243,- 122.010413	King
LOUTSIS DAM	WA001 87	97	49	3	47.721992,- 121.979478	King
WEYERHAEUSER DAM	WA001 91	80	49	3	47.297176,- 122.29882	King
KEEVIES LAKE DAM	WA004 98	500	59	3	47.314814,- 122.050117	King



DEJONG DAIRY WASTE POND NO 1	WA018 66	16	20	3	47.211114,- 122.096129	King
NORTH CLEAR ZONE DETENTION DAM	WA013 21	33	46	3	47.468754,- 122.314808	King
TAPPS LAKE DIKE NO. 14	WA004 30	400	108	3	47.196489,- 122.132892	Pierce
TAPPS LAKE DIKE NO. 15	WA004 31	400	108	3	47.194076,- 122.13531	Pierce

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⁵⁶ Washington State Department of Ecology Dam Safety Office. 2019. Inventory of Dams Report.



Regional Risk Profile: Earthquake

Hazard Description

Puget Sound has a high risk of experiencing damaging earthquakes. The most common damaging quake is deep M6+ event, six of which occurred over the past ~100 years. In comparison, the Seattle Fault has been active three-four times in the past 3000 years and a subduction zone quake occurs approximately every 200-600 years, with a 10-20% chance it will rupture in the next 50 years, according to the Pacific Northwest Seismic Network (PNSN). With many potentially active faults in the area, Earthquake impacts can occur anywhere in King County, with earthquake risk focused near faults and in areas with less stable soils. Washington has the second-highest earthquake risk in the United States, after California. According to the USGS, there is a 5% chance of a Seattle Fault and a 10-15% chance of a Cascadia Subduction Zone earthquake striking the region by 2055. This equates to an up to 20% chance of a major earthquake striking King County with potentially catastrophic damages in the next 35 years.⁵⁷

Earthquakes can last from a few seconds to over five minutes. Earthquakes may also be accompanied by a series of foreshocks, or aftershocks in the weeks to months leading up to and following the earthquake, which can cause additional damage and injury. 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 as the shaking damages or demolishes buildings and other structures. Disruption of communications, electrical power supplies and gas, sewer and water lines, and transportation routes should be expected. Earthquakes may cause, or lead to fires, dam failures, landslides, tsunamis, or releases of hazardous materials, compounding their disastrous effects. An earthquake on the Cascadia Subduction represents the largest potential risk to the entire Pacific Northwest. However, local sources such as faults immediately beneath King County may have a much more intense shaking over a shorter period of time leading to focused damage on the area. The earthquake hazard presents the greatest regional potential for damages, casualties, economic, and social impacts.

Vulnerability Characteristics and Previous Occurrences

The impact of an earthquake on structures and infrastructure is largely a function of ground shaking and secondary impacts. Ground shaking, or earthquake intensity, measured by the modified Mercalli scale, depends on distance from the source of the quake, and the soil type. A shallow earthquake that is relatively small, but nearer to populated areas with a hypocenter closer to the surface, is potentially more damaging than a much larger earthquake that is farther away. Even when an earthquake is distant, unconsolidated soils, such as sands, clays, or gravels, found in many floodplains or river valleys, amplify shaking, leading to more potential damage.

Secondary impacts of earthquake shaking include things like soil liquefaction and landslides. Liquefaction is a secondary effect of an earthquake in which soils lose their shear strength and flow or

⁵⁷ LaForge, Gordon. 2019. Critical but Not Urgent: Seattle Prepares for the Big One. Innovations for Successful Societies, Princeton University.



behave as liquid, thereby damaging structures that derive their support from the soil. Liquefaction generally occurs in soft sedimentary soils. Landslides, or ground failures, are also a common hazard that can occur with ground shaking, ranging from singular rocks falling down a hill, to mass movements of land large enough to dam rivers. Landslides falling into bodies of water, can potentially generate tsunamis, as occurred in the Tacoma Narrows during the 1949 Puget Sound Earthquake.

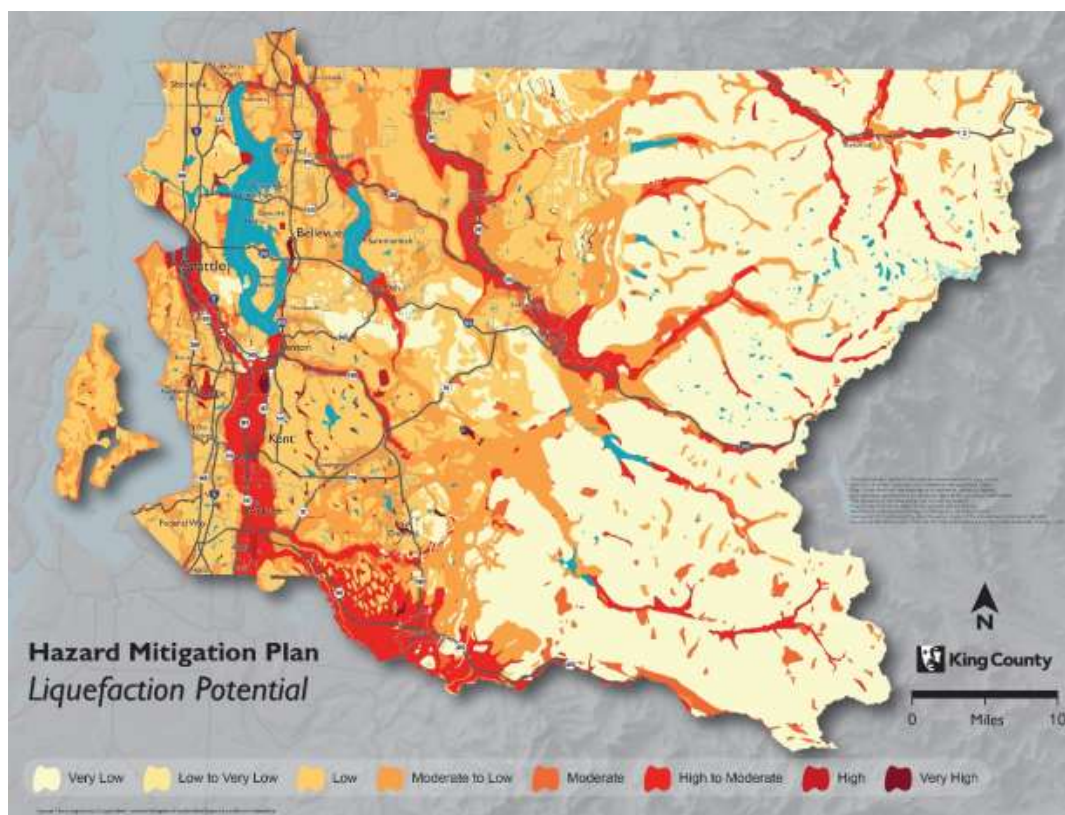
Earthquakes on the Cascadia Subduction Zone, and on the Seattle Fault are also capable of producing Tsunamis. Tsunamis are a destructive movement of the ocean involving at least one 'wave', and strong currents. Even a relatively 'small' tsunami could be devastating to port and maritime infrastructure within Puget Sound.⁵⁸ There is evidence that an earthquake on the Seattle Fault that occurred around 900 AD produced a 16-foot tsunami. The National Oceanic and Atmospheric Administration (NOAA) recreated this tsunami using a model.

Soil type impacts ground Shaking. The National Earthquake Hazard Reduction Program (NEHRP) creates maps based on soil characteristics to help identify locations subject to amplification and liquefaction during earthquakes. . Areas with NEHRP soils classes D, E and F are prone to shaking amplification, and structures in these areas experience greater damage during earthquake shaking. These also tend to be more susceptible to liquefaction.

NEHRP Soil Classification System

NEHRP SOIL TYPE	DESCRIPTION	MEAN SHEAR VELOCITY IN METERS PER SECOND
A	Hard Rock	1500
B	Firm to Hard Rock	760-1500
C	Dense Soil / Soft Rock	360-760
D	Stiff Soil	180-360
E	Soft Clay	<180
F	Special Study Soils (liquefiable soils, sensitive clays, organic soils, soft clays > 36 meters thick)	

⁵⁸ Seattle Office of Emergency Management. Tsunamis and Seiches. Accessed online on 11/12/19 from <https://www.seattle.gov/emergency-management/hazards/tsunamis-and-seiches>.



King County has a long history of documented earthquake activity. The most recent significant activity was the [Nisqually Earthquake – February 28, 2001](#). This earthquake, with an epicenter 10 miles northeast of Olympia in Thurston County (over 40 miles from Seattle), resulted in statewide losses exceeding \$2 billion and injured 700 people, many in King County.⁵⁹ A slide in King County generated from the 2001 Nisqually Earthquake partially blocked the Cedar River – flooding several homes.

The 6.8 magnitude Nisqually earthquake was centered under Anderson Island in south Puget Sound. The most extensive damage occurred along the Interstate-5 corridor, where river sediments led to shaking amplification and liquefaction impacts. Some damage was experienced in 300,000 households, many from settling foundations. Buildings built prior to 1950 located in the south downtown area and Pioneer Square in Seattle were the most impacted; structural damage to chimneys, walls, foundations and nonstructural elements accounted for two-thirds of all damage reported.⁶⁰ Insured losses were

⁵⁹ EQE International – Seattle Nisqually Washington Earthquake Feb 28, 2001;
<http://www.propertyrisk.com/refcentr/seattleeq.pdf>

⁶⁰ Hazard Mitigation Survey Team Report, Nisqually Earthquake, February 28, 2001, DR-1361-WA, Federal Emergency Management Agency and Washington Military Department, Emergency Management Division.



recorded as \$305M with \$2B in losses overall. Of those impacted, 21% had earthquake insurance but did not meet the deductible. 75% of retail businesses in Seattle that were impacted closed for some period for cleanup or repairs. The average closure was 4.8 days in Pioneer Square. Of those businesses impacted, 50% were financially threatened with closure. Harbor Island saw 69 businesses impacted for an average of \$30,900.

The Nisqually Earthquake led to a new emphasis in Washington, and King County especially, on the importance of retrofitting historic, unreinforced masonry buildings that were the most serious casualties of the event. The loss of historic buildings is not only costly in financial terms but can alter the social fabric of a community and fundamentally change its feel and sense of place.

Seattle-Tacoma Earthquake – April 1965⁶¹ At magnitude 6.5, the earthquake killed seven people and caused \$12.5 Million in damage (1965 dollars). Severe shaking was felt in Seattle and as far as Issaquah and beyond. Most damage was in the Pioneer Square area and waterfront. Older masonry buildings were most impacted. Damage patterns experienced in 1949 were repeated. Eight schools were closed for inspections and repairs; two were severely damaged. Areas along the Duwamish River experienced severe settling. Three water mains failed in Seattle.

Olympia Earthquake – April 1949⁶² The 7.1 magnitude earthquake was centered along the southern edge of Puget Sound. Eight people were killed and property damage in Olympia-Tacoma-Seattle amounted to about \$25 Million in 1949 dollars. In Seattle, a sixty-inch water main ruptured, a radio tower collapsed, power lines and gas lines were broken in over 100 places. Three damaged schools needed to be demolished and one rebuilt.

Scenario Drivers⁶³

The Juan de Fuca plate is moving northeastward with respect to the North American plate at a rate of 3 to 4 centimeters per year.⁶⁴ The boundary where these two plates converge, the Cascadia Subduction Zone, lies approximately 50 miles offshore and extends nearly 700 miles from Northern Vancouver Island in British Columbia to northern California. The collision of these two tectonic plates produces three types of earthquakes: Subduction Zone Earthquakes, Deep/Benioff Zone Earthquakes, and Shallow Crustal Earthquakes.⁶⁵

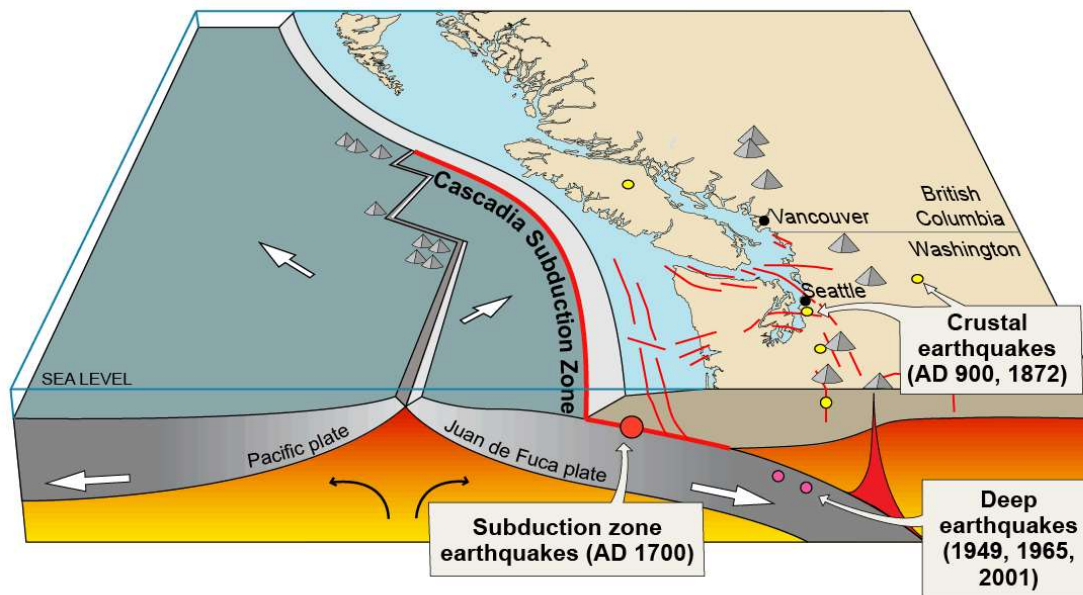
⁶¹ Seattle Earthquake History; <http://seattle.about.com/od/localgovernment/a/Seattle-Earthquakes.htm>

⁶² Earthquake History of Washington. 5 Aug. 2003. U.S. Department of the Interior, U.S. Geological Survey. 5 Oct. 2003 <http://earthquake.usgs.gov/earthquakes/states/washington/history.php>

⁶³ Earthquake Hazards in Washington and Oregon – Three Source Zones. U.S. Department of the Interior, U.S. Geological Survey. 2 Oct. 2003 <http://www.ess.washington.edu/SEIS/PNSN/CascadiaEQs.pdf>

⁶⁴ Understanding plate motions, USGS; <http://pubs.usgs.gov/gip/dynamic/understanding.html>.

⁶⁵ Earthquake Hazards in Washington and Oregon – Three Source Zones. U.S. Department of the Interior, U.S. Geological Survey. 2 Oct. 2003 <http://www.ess.washington.edu/SEIS/PNSN/CascadiaEQs.pdf>.



Source	Max. Size	Recurrence
● Subduction zone	M 9+	200–600 years
● Deep Juan de Fuca plate	M 7+	30–50 years
● Crustal faults	M 7+	Hundreds of years?

-  Volcano
 Active crustal fault
 Active plate boundary

*figure modified from USGS Cascadia earthquake graphics at <http://geomaps.wr.usgs.gov/pacnw/pacnweq/index.html>

Cascadia Subduction Zone Earthquakes	A subduction zone earthquake would originate from the Cascadia Subduction zone off the coast of Washington and Oregon. Such earthquakes typically have minutes 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 Magnitude 9 or greater on the Richter scale. This 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 locally from the earthquake and distant from the generated tsunami.
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Benioff Zone (Deep) Earthquakes (e.g. Nisqually Earthquake)	Deep, or Benioff Zone earthquakes are the most frequent damaging earthquakes occurring within the Puget Sound area. They occur within the Juan De Fuca plate as it sinks into the mantle. These earthquakes occur, 16 to 60 miles 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 compression results in a decrease in the size of the plate, and stresses build up that pull the plate apart. 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 (e.g. Seattle Fault Earthquake)	Shallow crustal earthquakes occur within the North America plate at depths of 18 miles or fewer. Shallow earthquakes within the North America plate account for most of the earthquakes in the Puget Sound region, though most are small and not felt. 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, the timelines and recurrence intervals of 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. FEMA estimates using HAZUS show that events on these faults have the potential to cause greater loss of life and property in King County than any other disaster likely to affect the area. 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.

Priority Vulnerabilities

Unreinforced buildings, especially those built during pre or low-code eras (pre 1973)	Brick and masonry buildings that characterize areas like Pioneer Square in Seattle are extremely susceptible to even minor earthquakes. Unreinforced masonry buildings are likely to collapse or partially collapse and be a leading source of fatalities due to falling debris.
Structures, including roads and bridges, structures, built on vulnerable soils.	Structures on vulnerable or less stable soils are more likely to buckle or collapse. High risk areas cover the region, but are especially common in historic river valleys where sediment has been deposited over time.
Public facilities built to "life safety" codes that	Public facilities, such as city halls, schools, etc. are not required to be built to "immediate occupancy" standards. A major earthquake would render many of these facilities inoperable, leading to difficulties in organizing the recovery in affected jurisdictions.



will be unusable after a major earthquake	
Structures and populations on or near steep slopes	Steep slopes greater than 40% grade are likely to fail in an earthquake. This likelihood increases when the ground is saturated. Buildings on or below these slopes will be damaged or destroyed in these events.
Dams, especially older, less regulated dams	Dams are responsible for most of the region's electricity and are extremely important to any future recovery. A major event may damage these dams and require repair before they can resume electricity generation. Total failure of the major dams is unlikely. In addition to the large dams, however, there are many lower-priority dams that nevertheless meet the standards of high-hazard. These dams are scattered throughout King County and may not even be recognized by the jurisdictions in which they are located. A failure of some of these dams would likely result in numerous fatalities and the inundation of property and infrastructure.
Hazardous materials sites, especially those in aging warehouses or with weakened containment systems	Hazardous materials, or Hazmat, sites dot the region and FEMA has recognized hazardous materials as a community lifeline due to experiences dealing with recovery after recent disasters. Hazmat releases are likely to occur at industrial facilities, on pipelines, and elsewhere around the region. The cocktail of potential contaminants is likely to threaten the public, responders, and the environment, and to delay recovery in parts of the region for years.
Port facilities built on unstable soils	Ports, are almost always built on fill and other extremely unstable soils. Major earthquakes will damage and potentially destroy port facilities. Any seiche or tsunami will also have a greater impact on port facilities than inland facilities.
Rail systems	Rail systems require tracks to be perfectly aligned and will fail during an earthquake as the ground shifts and buckles. Landslides may also deposit material on the tracks. Trains traveling at high speeds during an earthquake have a significantly greater chance of de-railing, potentially injuring passengers, or spilling cargo, which may cause additional hazardous material incidents.
Water and sewer transmission lines, especially those built of cast iron, concrete, or wood	Water lines throughout the region are currently being replaced by ductile iron. Nevertheless, most special purpose districts undertaking this work are decades from completing it. Water systems will likely fail throughout the region and will be difficult to restore due to limitations in transportation



	capacity. Even systems able to complete conversion to ductile iron will experience failures, especially in areas of unstable soils.
Populations without the means to care for themselves over multiple weeks, especially those with Access and Functional Needs	The response and initial recovery following a catastrophic earthquake will take weeks. Homebound populations, those requiring medications, the chronically ill, or others with access and functional needs may need to sustain themselves for an estimated two weeks in some places.
Populations without insurance, especially those without renters insurance or homeowner insurance earthquake riders.	According to the Office of the Insurance Commissioner, which conducted a major earthquake insurance study in 2017, residential earthquake coverage in western Washington is 13.8%. Commercial coverage rates are much higher than residential, with 43.2% of insurance policies having some sort of earthquake coverage. A key finding is that, for both residential and commercial customers, insured properties have a much higher assessed value than uninsured properties, indicating that it is higher-income people that are, in general, purchasing earthquake insurance coverage. Earthquake insurance coverage rates are a good measure of resilience because insurance is the primary source of disaster recovery funding after an earthquake. Low levels of insurance coverage have stymied recovery efforts in major disasters, such as hurricanes, where hazard coverage is not automatically included in homeowner's policies.
Populations communicating in languages other than English	Information from responders, notifications, and other information will likely be communicated predominately in English. Special care will need to be taken to ensure that non-English speakers have access to relief supplies from established points of distribution.
Levees, dikes, and other flood control structures	Flood control structures are usually earthen and built on highly unstable soils. An earthquake during the winter months when these systems are running close to capacity could cause major failures and widespread flooding.

Priority Impact Areas

The severity of an earthquake is different depending on the conditions under which it occurs. Also, different sectors of the population, economy, or government will have different levels of exposure and vulnerability that impact their susceptibility to an earthquake. This risk assessment looks at impacts of various earthquake scenarios to a series of critical sectors. The impact data for physical structures is generated using the Hazus-MH tool for three different Seattle Fault M7.0 scenarios, a Tacoma Fault M7.1 scenario, and a Cascadia M9.0 scenario. These scenarios are chosen based on their probability and



potential impact. This earthquake model also includes information on liquefaction potential of soils and the age of buildings (as an instrument for building code levels).

This assessment considers impacts to physical and human elements of each of 11 impact areas. For example, for health systems, the locations of key facilities identified by Public Health Seattle – King County will be assessed against data on high hazard areas. The impacts to first the health system overall, including employees and existing patients, will also be examined.

The HAZUS scenarios used in this section were generated by the FEMA RiskMAP team for the 2018 King County Risk Report.⁶⁶

King County residents	The entire population of King County is potentially exposed to the direct and indirect impacts from earthquakes. The degree of exposure is dependent on many factors, including the age and construction type of residence, the soil type homes are constructed on, the proximity to the fault, etc. Business interruption could keep people from working, road closures could isolate populations, and loss of utilities could impact populations where no direct damage was experienced. Hazus estimates there are over 600,000 people living in 250,000 households on NEHRP Class D or E soils locally. This represents about 30% of the county population. The population over 65 and the population are the most vulnerable because of their concentration in areas with Class D and E soils. Impacts to the population are not restricted to displacement and sheltering. People may be injured, lose their jobs, schools may be closed from their own damages, government services may be interrupted, health facilities and care may also be interrupted or be completely unavailable. Family members may be separated, including children, institutionalized elderly and the infirm, may be moved to alternate facilities – and unaccounted for. Deaths of homeless and unidentified people may require burial before family can claim their remains. Following the 1995 Kobe, Japan earthquake, the total city population took over 10 years to recover. The population count of New Orleans following Hurricane Katrina still has not recovered to pre-storm levels. King County’s population is extremely mobile and many are relatively recent arrivals, drawn by the booming economy. A large earthquake may reverse this growth trend as people lose jobs, face housing recovery costs without insurance, and seek less hazard-prone areas after the trauma of a large earthquake.
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⁶⁶ Federal Emergency Management Agency, 2018. King County Risk Report.
https://fortress.wa.gov/ecy/gispublic/AppResources/SEA/RiskMAP/King/KingCounty_RiskReport.pdf



Vulnerable populations	Vulnerable populations are more likely to suffer losses during an earthquake and are likely to take longer to recover after. Factors influencing likelihood of damage include living in higher hazard areas, living in older buildings, being less likely to have emergency supplies, and having a higher rate of persons with disabilities. Slower recovery is exacerbated by poorer populations likelihood of not having access to institutions leading recovery, not having insurance, not having a stable job, wealth, or savings, being more likely to be renters who are ineligible for many federal recovery programs, and having a lower-level of education on average, making it more difficult to find a new job and to navigate the complex post-disaster system. In many catastrophic disasters, most notably Hurricane Katrina, poor communities may never recover.
Property	Lack of damage to structures built since the 1949 and 1965 earthquakes have demonstrated the value of building standards that resist earthquake damages. Overwhelmingly, damages in the Nisqually Earthquake of 2001 were to unreinforced masonry and buildings built before the 1949 earthquake. This held equally true for damages to roads and bridges. The FEMA project team completed an analysis to identify how many buildings were built to specific building codes. In the table below, “pre-code” refers to buildings built before 1950, low-code is 1951-1974, moderate is 1975-2003, and high is after 2003. Countywide, nearly 50% of buildings were built to pre or low code standards. This level of vulnerability is significant, especially for more intense earthquakes, such as the Seattle Fault M7.2.
The economy	King County alone contributes around 50% of Washington’s gross domestic product. The county has a diverse economy, which has made it especially resilient to other forms of disruption but is heavily dependent on a high degree of global interconnectedness. Losses to lifeline infrastructure, especially port facilities, communications hubs, and major highway corridors would be crippling if the loss was total and links could not be quickly restored. Some of western Washington’s key industries, such as Amazon and Microsoft, may be insulated somewhat from damage due to the highly global nature of their work and redundancy in their systems, while others such as Boeing would be severely impacted as rail and highway routes necessary for the transport of materials is restored. I-5, for example, suffers from limited redundancy and carries over 233,000 vehicles through Seattle, a number that has been steadily growing. Economic risk from a major earthquake is multi-faceted. Economic impacts from an earthquake include immediate loss of facilities and inventories, ongoing loss of

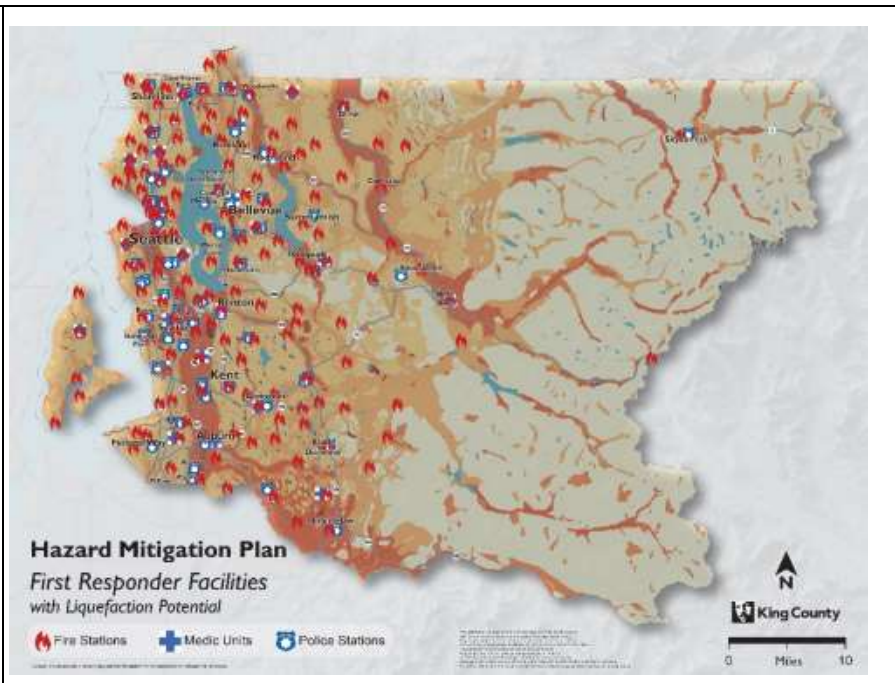
	employees and customers, and loss of businesses. Ongoing impacts will depend on the speed of infrastructure restoration, levels of insurance coverage, international economic conditions, and the ability of jurisdictions to develop and implement a long-term recovery strategy.
The environment	Impacts to the environment from an earthquake include the creation and disposal of large quantities of debris, releases of hazardous materials, the disruption of environmental conservation programs, and the relaxing of environmental programs during the cleanup and recovery. The greatest potential for environmental damage is from hazardous materials releases as fuel and waste pipelines rupture, underground fuel storage tanks fail, trains, including oil trains, may derail, port facilities are damaged by any tsunami or seiche, and other chemicals, including household items, are spilled. The multi-source nature of materials releases, the scale of potential releases, and the lack of resources for cleanup all complicate the scenario. While most common after rain and wind event hazards (approximately 75% of all disaster-triggered releases), hazmat releases after earthquakes are responsible for large releases over a wide area.⁶⁷ Earthquake-triggered hazmat releases have included hundreds of gas line ruptures and pipeline breaks, and releases of ammonia, chlorine, and sulfuric acid during the Northridge and Loma Prieta earthquakes.⁶⁸

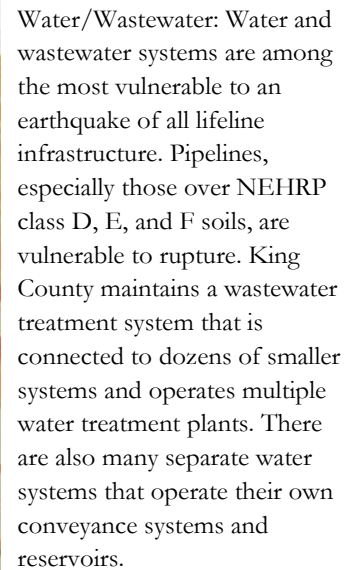
⁶⁷ Sengul et al, 2012. *Analysis of Hazardous Materials Releases Due to Natural Hazards in the United States*.

⁶⁸ Young, Stacy; Balluz, Lina; and Malilay, Josephine, *Natural and Technologic Hazardous Material Releases During and After Natural Disasters: A Review* (2004). Public Health Resources. 90.

Health systems	 Health system impacts from a major disaster include disruptions to emergency services, community health clinics, pharmacies, and hospitals. While new hospitals are required to meet criteria for seismic resilience and may engage in supply-chain and patient evacuation planning, much of the rest of the network is likely to be shut down after a disaster. This is an especially high threat to populations needing regular medical services, such as kidney dialysis and insulin injections (which require refrigeration). In Hurricane Maria in 2017, Puerto Rico was left without power for months and the majority of fatalities recorded due to the storm were from the elevated death rate among medically-fragile populations. In order to function, hospitals require significant infrastructure inputs, including power and water that are likely to be disrupted after an earthquake. Backup services are available; however, may be insufficient to meet the need if infrastructure recovery takes too long. Health system impacts therefore include large-scale disruptions to supply chains, disruptions to ongoing care regimens for certain medically-vulnerable populations, disruption of community care networks of pharmacies and local clinics, loss of trained staff, and potential damage to hospitals or loss of hospital functionality due to infrastructure damage.
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Government operations (continuity of operations)	Any damaging earthquake has the potential to impact delivery of essential government services in the days, weeks, months, and even years following the earthquake. The damages to infrastructure and residential or business locations may curtail or even prevent government employees from reaching their work locations or may prevent services from reaching populations in need scattered around the county. Even after initial short term repairs have been made, the impact on the taxable value of properties in the county may cause a revenue shortfall that reduces available services from budgetary impacts. Collection of available tax revenue, the revaluation process (including documentation), and appeals process might produce a further burden on already stretched government obligations. Earthquakes have the possibility of damaging any fixed facility at which services are provided. This may include: adult and juvenile detention facilities, waste water treatment facilities, solid waste disposal systems and facilities, the court system, health and medical institutions and clinics, fire and police stations or equipment, public transportation, schools, and libraries. 
Responders	First responders experience personal and professional impacts from an earthquake. Since responders are also local residents, they will be personally impacted by the disaster. Professionally, emergency services will be called upon to help with life safety operations while also seeking to restore day-to-day services.

	 Hazard Mitigation Plan First Responder Facilities with Liquefaction Potential Fire Stations Medic Units Police Stations 0 10 Miles
Infrastructure systems	Energy: Dams are the primary source of electricity generation for the region and may be impacted by a major earthquake, even if failure is relatively unlikely. Pipelines cross the region carrying fuel and are susceptible to earthquakes. Since Washington is home to the Northwest's only refineries, damage to this conveyance system will have far reaching, regional consequences. A major concern for maintaining power in facilities while the power grid is down after an earthquake is fuel distribution. With transportation networks seriously impacted, it will be difficult to ensure a supply of fuel is distributed to hospitals, public facilities, and communications centers. Without this fuel, systems are likely to fail after a few days of operation.



WSDOT has operated a seismic retrofit program since 1991 and has been steadily retrofitting bridges through a three-stage process of stabilizing the bridge superstructure, strengthening single-column bridge supports, and reinforcing multi-column piers. In response to the 2012 Resilient Washington State report, WSDOT began a program to completely retrofit three identified lifeline routes for a total cost in excess of \$1B (2015 dollars). As of 2019, there are 17 state-responsibility bridges in King County that are in poor condition.





	King County has 177 bridges in its bridge program. At least every two years, those bridges are inspected and recommendations are made for their repair or replacement. Between 2006 and 2016, 32 bridges were replaced and many more repaired. In 2008, the bridge program concluded a 14-year seismic retrofit, improving 115 bridges for \$22 million. This retrofitting has substantially improved the survivability (likelihood of collapse) of bridges in the King County inventory. One category of bridges is fracture critical truss bridges. The average age of these bridges in unincorporated King County is 42 years. Of the 11 bridges in this group, the Miller River Bridge was closed from damages in the January 2011 flood event and the Alvord "T" was closed June 2013. The Stossel Bridge is the lowest rated of those remaining in the inventory. Each carries thousands of vehicles daily. Bridges, however, are only part of the transportation puzzle. Bridge approaches, and pavement crossing unstable soils, are major threats. The WSDOT Seismic Lifeline route discussed above is only considering bridges, not pavement or approaches. Railways are another highly-vulnerable piece of transportation infrastructure. Tracks can become misaligned and require repair before train travel is possible. Even in the relatively small 2001 Nisqually Earthquake, rail travel was disrupted for several days. Port facilities are seriously threatened by a major earthquake due to liquefaction potential of port areas and tsunami threats. It is likely a major earthquake would completely destroy port facilities, requiring years of investment to completely recover. As with the 1995 Kobe, Japan earthquake, port operations may never again reach pre-disaster levels. Airports are also vulnerable to earthquakes. In the 2001 Nisqually Earthquake, the air traffic control tower at Seattle-Tacoma International Airport was damaged, drastically reducing takeoff and landing capacity. Runway damage is also common as the ground shifts and would require repair before large jets could land. While the region has a number of airports, many of them will also be critical facilities for disaster response, medical patient evacuation, and food and fuel deliveries.
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	 Hazard Mitigation Plan Transportation—Major Roads with Liquefaction Potential Highways 0 10 Miles King County Communications: While the public sector maintains critical radio communications networks, the networks on which most residents depend is privately owned. While cell towers are equipped with backup generators, these generators may only have enough fuel for a few days of continuous operation.
Public confidence in jurisdiction's governance and capabilities	Disasters of the magnitude we can expect from a damaging earthquake have the potential to shake public confidence in government's ability to maintain law and order, provide essential services, repair or replace needed infrastructure for employment, processing of building permits and inspections, clearing of debris and other needs. Restoration efforts may well take longer than the public is willing to accept. Amendments to zoning and building standards may not be embraced by those seeking to rebuild. If rapid restoration is not possible, the area may lose employers and the population may relocate to other areas of the country in search of employment. Earthquake hazards specifically have been the subject of significant reporting in recent years. Articles in the Seattle Times, the New Yorker, and on local television have argued that the Pacific Northwest is unprepared for the level of destruction



	expected following a Cascadia Subduction Zone 9.0 event. ⁶⁹ These articles have led to both stepped-up state and local action on earthquake preparedness and to more public awareness.
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⁶⁹ Schulz, Kathryn, "The Really Big One," The New Yorker (July 20, 2015).

Regional Risk Profile: Flood

Hazard Description

Flooding is King County's most persistent and recurrent natural hazard. Flooding affects tens of thousands of families and properties owners in communities across the county, with life safety, economic, and workplace impacts on tens of thousands more. The communities within King County take flooding seriously; the King County Flood Control District was established in 2007 to regionally manage flood hazards and reduce risk, in partnership with the Department of Natural Resources and Parks' River and Floodplain Management Section. The King County Flood Hazard Management Plan drives much of the work that both the District and King County do to reduce flood risk and manage flood-related hazards.

Flooding is the inundation of normally dry areas by overflowing rivers, increased coastal waves, or other accumulation of surface waters. A number of conditions can cause flooding from too much rainfall in a river's watershed to sustained offshore wind driving a high tide inland, but flooding can also be caused by events such as liquefaction of levees during an earthquake that release water the levees hold back. Other causes of flooding include dam failure, landscape changes after wildfires that exacerbate flooding, rapid snowmelt, channel migration, and debris in streams causing water to backup.



Figure 2. Flooding along the Snoqualmie River in 2015

Typically, King County sees at least minor flooding ever year in the fall and winter and big events are often driven by atmospheric river where moisture is picked up from the Pacific Ocean and brought by the jet stream to drop as prolonged heavy precipitation in western Washington.

A variety of factors affect how flooding occurs and its severity. One main factor for riverine flooding is the “hydrology,” which includes

how much rain falls, how fast it falls, how fast it reaches the stream, and the amount of water already in the stream. The second main factor for riverine flooding is the “hydraulics” of the watershed, which includes characteristics like the topography, stream channel dynamics, and the overall slope of areas of the watershed.

Flooding is a natural phenomenon and many ecosystems thrive because of the natural floodplain functions that rivers and coastlines provide. Flooding is considered a “problem” when humans construct buildings and infrastructure in the path of floodwater. The many aspects of natural floodplain functions help reduce impacts, slow floodwaters down, and preserve important habitat for endangered species.

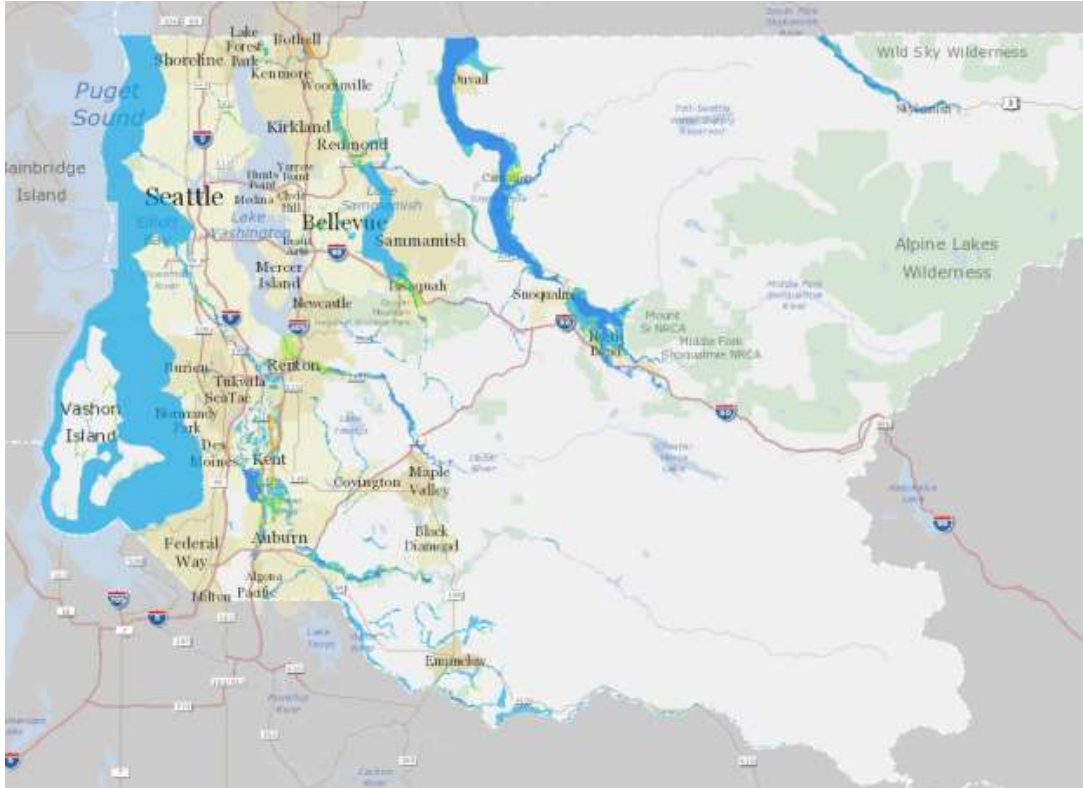


Figure 3. Map showing mapped 1% annual chance floodplains and floodways. Note that Lake Washington does not have an identified floodplain because its levels are controlled by the US Army Corps of Engineers operated Chittenden Locks.

Vulnerability Characteristics and Previous Occurrences

Flooding, no matter the source, causes widespread and long-lasting damage. The force of moving floodwaters can tear homes from their foundations, sweep cars off the road, and destroy public infrastructure. Houses and businesses damaged by flooding can take many months to repair and are often unsuitable to live in during the repairs. Certain types of flooding can leave buildings inundated for several days, which can further worsen property damage. Flood-damaged buildings can pose health risks including mold, contaminated food and drinking water, and mental health stresses from the traumatic experience.

The velocity, depth, and amount of floodwaters impact how dangerous riverine flooding can be. A floodplain where the velocity is more than 3 feet per second and the depth is more than 3 feet is an area dangerous for people to be living or working since those flood conditions can be fatal to someone walking through floodwaters. King County code, for example, prohibits buildings in unincorporated areas to be built in fast-flowing and deep floodplains. Rivers in King County also carry substantial debris, from fallen trees to boulders and sediment, and debris impacts can add to the severity of flooding.

Rivers are dynamic systems and can shift significantly during high flow events or gradually through erosion of streambanks. This risk is called “channel migration hazards,” and is a prevalent feature in northwest river systems. The scale of channel migration depends on the severity of the high flow event, geology of the banks and streambed, and characteristics of the surrounding land. King County regularly maps channel migration zones and has applicable development standards for proposals within these zones.



Figure 4. House destroyed due to channel migration along the Raging River.

In coastal floodplains, wave action is the most dangerous aspect of flooding. Buildings are required to be specially designed to withstand powerful wave actions and can only be built on open foundation systems, like piers or posts.

King County covers six large drainage basins and coastal flood hazard areas.

1. The South Fork Skykomish River basin lies primarily in the northeast portion of King County and flows into neighboring Snohomish County. The basin drains 234 square miles of mountainous terrain within King County and includes major tributaries such as the Foss, Tye, Miller, and Beckler Rivers. The cities of Skykomish, Baring, and Gold Bar as well as many unincorporated area neighborhoods are located near or on the banks of the rivers and frequently experience impacts from flooding. The basin features steep slopes in the upper portion, so significant runoff can cause major flooding relatively quickly. The rivers in the basin are also very prone to channel migration and it is a significant hazard that communities are focused on.
2. The Snoqualmie River basin drains much of the northeast and north-central part of King County and is typically divided into two areas: the Upper Snoqualmie and the Lower Snoqualmie, above and below Snoqualmie Falls, respectively. The basin also encompasses tributaries such as the Tolt River, the Raging River, Tokul Creek, Griffin Creek, Harris Creek, Patterson Creek, among others. The Upper Snoqualmie River and some of the major tributaries are characterized by steep gradient headwater systems and some lower gradient floodplains near the incorporated communities of North Bend and Snoqualmie. The Lower Snoqualmie River



features wide floodplains along the low gradient channel. The cities of Carnation and Duvall and the unincorporated community of Fall City all lie within the broad Lower Snoqualmie Valley.

3. The Sammamish River basin originates at Lake Sammamish and drains a 240 square mile watershed, including the tributaries of Bear, Little Bear, North, and Swamp Creek basins. The river has been channelized since the construction of the Lake Washington Ship Canal and is partially regulated by a weird outlet downstream of the mouth of the lake, which reduces frequency and severity of flooding.
4. The Cedar River basin stretches from the Cascade Mountains to Lake Washington, where the Cedar River terminates. The basin has been heavily altered from its natural condition, with major projects constructed including Masonry Dam and the Landsburg Diversion, both to serve as water supply infrastructure. Along the Cedar River are many unincorporated community neighborhoods as well as cities like Maple Valley and Renton. Naturally-occurring large wood is a prevalent hazard in the basin.
5. The Green River originates in the Cascade Mountains at an elevation of 4,500 feet and flows through many cities including Auburn, Kent, Renton, Tukwila, and Seattle. The basin is divided into four major sub-basins: the upper watershed above the Howard Hanson Dam, the middle Green below the dam and upstream of Auburn, the lower Green that flows through the incorporated cities, and the Duwamish estuary. The Green River basin features many large structural elements including Howard Hanson Dam, which provides flood control, and large levee and revetment systems on the lower Green River.
6. The White River originates in glaciers on the northeast face of Mount Rainier. The White River drains an area of about 490 square miles, approximately one third of which lies within King County. Major tributaries join the White River along its path like the Greenwater River and Boise Creek. Over one hundred years ago, the White River was diverted to flow into the Puyallup River in Pierce County. Mud Mountain Dam is a major flood control dam that has a significant effect on reducing flooding in the basin. Additionally, water is diverted from the river for hydropower generation near Lake Tapps. Along the river are a number of small unincorporated neighborhoods in addition to the Muckleshoot Indian Tribe Reservation and portions of the city of Auburn.
7. Coastal flood hazard areas pose potential risks to approximately 100 miles of shoreline, about half of which is on Vashon Island in unincorporated King County and the other half is the incorporated shoreline through the cities of Shoreline, Seattle, Burien, Des Moines, and Federal Way. Storm surge and wave action are significant flood hazards facing development along shorelines. Coastal erosion also is a prevalent hazard, including along the steep bluff areas around the shoreline in King County. Many miles of shoreline are variably armored by bulkheads and other structures. Coastal flooding will be exacerbated by sea level rise and other impacts of climate change.

Flooding is a prevalent threat during the fall and winter months due to atmospheric rivers, heavy rain, and king tides. Major floods occur on average every two to five years. Major river flooding has typically not caused fatalities, but rather significant property damage. Flooding along multiple rivers in 2006 and 2009 were the most recent major floods to cause many millions of dollars in damage. Flooding in 1990 is considered the largest flood of record for most of the county except for the Lower Snoqualmie and Tolt Rivers. There have been 28 flooding events since 1965 that have resulted in federal disaster declarations. At least minor flooding occurs every winter. Climate change is likely to have a significant effect in changing the patterns of flooding in the river basins.



Scenario Drivers

Most types of flooding caused by extreme weather are cyclical and are measured by their probability of occurrence in a given year based on the factors that drive flooding. The larger a flood event, the less likely it is to happen in a year. A flood with a 10% chance of occurring in a year is sometimes called a “10-year flood,” and that flood event will have less river flow and likely fewer impacts than a 1% annual chance flood event, or a “100-year flood.” These flood events can be modeled and maps created to show their extents.

The 1% annual chance flood, or 100-year flood, is the most important scenario because floodplain regulations and federal flood insurance are based on this flood event. This flood event represents the mapped floodplain on FEMA Flood Insurance Rate Maps and forms the basis for community regulations for participating communities in the National Flood Insurance Program. In King County communities, all new or substantially improved buildings must be constructed with their lowest floor at least one foot higher than the expected elevation of the 1% annual chance flood.

While the 1% annual chance flood is scenario most often discussed, the 10%, 2%, and 0.2% annual chance floods are often used for planning and certain regulatory purposes. The extents of the flood events are not consistently mapped throughout the county, but engineering data in flood models can be used in project planning or regulatory compliance.

Typically the recurrence interval floods are driven by cyclical natural factors like atmospheric rivers bringing heavy rain or severe winter storms and king tides. Other factors can drive flooding scenarios in different ways. For example, levee or dam failures may happen due to problems caused by inadequate maintenance. Flooding damage from earthquakes will likely only be seen if an earthquake damages a levee, for example, during times of high water.

King County has a long-established Flood Warning Program that has been monitoring river systems for over 50 years. The King County Department of Natural Resources and Parks’ River and Floodplain Management Section operates a Flood Warning Center that opens 24 hours a day when flooding occurs on any of the river systems with gages. For the Flood Warning Program, the rivers are measured by a “flood phase” system based on real-time flow information. When a river reaches flood phase 2, the Center opens, coordinates with local, state, and federal agencies, and accepts calls from the public requesting information about flooding. When a river reaches flood phase 3, patrol teams are sent out to monitor flood protection facilities and any potential flooding impacts. When a river reaches flood phase 4, additional staff are brought in to the Flood Warning Center, sent on flood patrols, and begin to collect damage information in case of a disaster declaration.

FLOOD WARNING PHASE THRESHOLDS							
PHASE	SOUTH FORK SKYKOMISH RIVER (at Skykomish)	TOLT RIVER (near Carnation)	SNOQUALMIE (Sum of Forks)	ISSAQUAH CREEK (near Hobart)	CEDAR RIVER (near Landsburg)	GREEN RIVER (Actual or expected flow near Auburn)	WHITE RIVER (Actual or expected flow release from Mud Mountain Dam)
1	6,000 cfs	2,500 cfs	6,000 cfs	6.5 ft	1,800 cfs	5,000 cfs	4,000 cfs
2	10,000 cfs	3,500 cfs	12,000 cfs	7.5 ft	2,800 cfs	7,000 cfs	5,000 cfs
3	18,000 cfs	5,000 cfs	20,000 cfs	8.5 ft	4,200 cfs	9,000 cfs	7,000 cfs
4	27,000 cfs	8,500 cfs	38,000 cfs	9.0 ft	5,000 cfs	12,000 cfs	9,000 cfs
Heavy rain and atmospheric rivers		Most riverine and urban flooding is caused by heavy rain and atmospheric rivers that drive significant weather systems into the Pacific Northwest. Intense rainfall can overwhelm rivers' ability to carry flows in their banks and cause inundation of the adjacent floodplains. These factors not only drive riverine flooding, but also urban flooding issues that can overwhelm local stormwater infrastructure and can cause flood damage.					
Severe winter storm, storm surge, king tides		Severe winter storms that have strong winds combined with king tides can cause significant coastal flooding, as seen in the 1982 king tide event that battered much of the shoreline in King County. Intense coastal storms and high tides can cause damage to coastal properties and damage infrastructure like roads and ferry docks.					
Sea level rise		As sea level rises in Puget Sound, the stillwater elevation level, or the water level without effect of waves, rises and pushes more water inland during times of severe storms. While the actual increase in flood risk will differ based on the localized geography and wind patterns, sea level rise is certain to worsen flooding along the coastlines in King County.					
Channel migration		Rivers natural erode banks and soils due to the energy of moving water. This erosion causes rivers to migrate or move laterally across a floodplain.					

	A channel can also move abruptly over a large distance in a single flood event. This can threaten development located in channel migration zones, some of which are mapped.
Dam failure and overtopping	If dams fail, the water held back will rush out quickly, potentially causing catastrophic flooding downstream. Dams both large and small can pose significant impacts. The potential for Howard Hanson Dam's failure in 2009 brought to light the incredible flooding, loss of life, and property damage that could happen if dams fail. Smaller structures that might be in a neighborhood can also lead to deaths and significant property damage. Dam failure can be caused by too much water for a structure to handle or by lack of maintenance that causes the dam to fail.
Levee failure and overtopping	Levees act as flood protection facilities, but only offer protection to a certain recurrence interval. They also are manmade earthen structures that require maintenance. Flooding can exceed a levee system's capacity or flaws in the structure can cause it to fail, and both would cause rapid inundation behind the levee. Water can seep through levees and cause weaknesses that lead to collapse.
Landslide and mudflow	Landslides can rapidly fill in rivers, causing a blockage in the river and immediate overflowing. This threat is particularly present on the Cedar River. Landslides can also add significant material to a river, causing a mudflow and rapid damage to property, similar to the Oso Landslide event in 2014 in Snohomish County.
Earthquake	Earthen levee systems are prone to liquefaction in an earthquake, which can cause major failure of the levee structures. If floodwaters are being held back at the time of an earthquake, the levees can fail and flooding could occur very quickly.
Volcanic eruption	In the event that Mt. Rainier erupts, lahars can fill river valleys and drastically change the course of rivers, streams, and shorelines. The amount of materials brought downstream in a lahar would affect the severity of impacts in future flooding.
Tsunami	Tsunamis are powerful waves that are caused by an earthquake or displacement of water from an underwater land feature collapse. Specific scenarios are outlined in the Tsunami and Seiche Risk Assessment. A tsunami that affects King County would cause significant wave action and likely major damage to properties on the coast.

Humanmade watershed changes	One major factor in understanding flood risk is the underlying land that floodwaters flow over. Harder and more impervious surfaces carry floodwater faster, so as humans continue to build buildings, roads, sidewalks, and other impervious features, floodwaters travel faster to streams, which can increase the severity of flooding.
Climate change	While climate change has an effect and influence on many of the factors already identified, it is a specific scenario driver because of the potential to change flooding in King County. Research is currently ongoing to better analyze, quantify, and understand the effect of certain emissions scenarios that could drive flooding in multiple ways. King County is likely to experience higher intensity rainfall events, which have the potential to cause more impactful flooding.

Priority Vulnerabilities

Families living in floodprone areas	Families with limited budgets are the top concern for flooding. Because flood damage can be very expensive and disruptive, families have a difficult time recovering from the effects of flooding. Without flood insurance, families must take money from savings; and even with flood insurance, flood damaged homes may not be livable for many months. Renters are particularly vulnerable since they often are lower income and do not have flood insurance. Additionally, families that don't speak English as a primary language can be more vulnerable to flooding because most flood warning systems are in English and much of the flood insurance, floodplain regulations, and any mitigation programs are made up of materials in English.
Major roads and sole-access roads	The many bridges, major roads, cross-valley roads, and sole-access neighborhood roads that cross floodplains are a top priority during flooding. Many people in Duvall, Carnation, and other communities in the Snoqualmie valley can be entirely cut off during major flooding since SR 203 and the cross-valley roads are often underwater. During high tide flooding events on Vashon Island, many coastal roads are underwater as well and can limit access via Vashon Highway.
Critical facilities	Schools, hospitals, nursing homes, hazardous materials storage facilities, and other critical facilities operations are threatened during flooding. Schools will be inaccessible and hospital operations and access routes vulnerable. Facilities like nursing homes house populations that cannot easily leave floodprone areas. And hazardous waste, sewage, or animal waste storage facilities threaten water quality and pose health risks during flooding.



Farms	There are many agricultural operations in King County's floodplains including major production areas in the Snoqualmie Valley, Green River Valley, Sammamish River Valley, and parts of the Enumclaw Plateau. Flooding can particularly affect harvest time in October and November as well as making it difficult to start planting in the spring. Farms with livestock faced significant losses in the 1990 floods, but now many dairy or other livestock operations have farm pads that offer refuge for animals in times of flooding.
Linear infrastructure	Linear infrastructure such as water and natural gas pipelines, sewage systems, and utility transmission lines cross rivers, streams, and floodplains. Significant water pipelines take water from protected watersheds down to Seattle, Renton, and other cities and often are threatened by flooding. A major capital project completed in 2019 added flood protection for the Tolt Pipeline, which is part of Seattle's water supply. Additionally, as sea levels rise and worsen coastal flooding,
Flood protection facilities	Levees and revetments are part of the flood protection facility systems in King County. During flood events, levees and revetments are tested by the force of floodwater. Revetments are intended to protect against channel migration, but if the flood is too large, they can fail and rivers can avulse. Levees similarly are put under serious pressure during flood events and a number of issues from seepage to sloughing can undermine levees and cause them to fail.

Priority Impact Areas

King County residents	Flooding can affect anyone who lives in or near floodplains. Most flood hazards are mapped and families living in these mapped 1% annual chance floodplains can expect at least a 26% chance of seeing floodwaters over 30 years, the length of a typical mortgage. Flooding can threaten lives, particular in areas where flooding can happen quickly and with little warning, in addition to those driving on flooded roads. Most deaths occur from people driving through floodwaters and being swept away in their cars. Flooding also causes significant property damage and, on average, one foot of water in an average size home can cause over \$50,000 in damage. Without flood insurance, this level of damage can overwhelm a family's finances. And those without many financial resources will be severely impacted by flood damage to their home and/or belongings. Flooding also affects those who work in floodplains or commute through them. Many farmworkers are employed on farms in the Snoqualmie or Sammamish Valleys and when flooding inundates or ruins crops, farmworkers can find themselves without jobs. Businesses in floodplains also will shut down during flooding, particularly if buildings and
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	access roads are damaged. After the 1993 Midwest Flooding, FEMA found that over 40% of small businesses don't reopen after being flooded.																				
Vulnerable populations	Flooding is a complicated hazard to understand and accessing flood warning, flood insurance, and other information often requires command of English, understanding of government bureaucracy, and access to financial resources. Populations that don't speak English, don't have access to government resources, and those that cannot afford or don't have flood insurance are particularly vulnerable to the long-term impacts of flooding. Renters can be particularly vulnerable to the impacts of flooding. Families that rent make up over 50% of the households in the floodplain, whereas they make up approximately 37% of households in the entire County. Renters are more often vulnerable because they're far less likely to have a flood insurance policy. Out of the many thousands of families that rent, there are less than 300 renters flood insurance policies, according to data from FEMA, and some of those may be business properties that the data cannot distinguish. Renters often have less wealth or savings to draw from to pay for uninsured losses.																				
Property	Flooding particularly impacts property and often causes many millions of dollars in property damage in major flooding events. Even a small amount of water inside a building can cause significant property damage and leave building owners with large repair bills. For families, damage to homes may mean difficult financial decisions, displacement for weeks, and lost belongings. For business owners, flood damage may mean lost economic output from shutdowns, destroyed inventory, and inability to pay employees. Throughout King County, there is at least \$5 billion of building value in floodplains. Federal flood insurance through the National Flood Insurance Program is the primary way building owners financially protect their property in floodprone areas. As of June 2019, flood insurance policies cover over \$2 billion worth of property throughout King County. Many larger commercial or industrial facilities are insured through private contracts, the value of which is not available to government agencies. <table border="1"> <thead> <tr> <th>Community</th><th>Repetitive Loss Properties</th></tr> </thead> <tbody> <tr> <td>Auburn</td><td>0</td></tr> <tr> <td>Bellevue</td><td>3</td></tr> <tr> <td>Burien</td><td>6</td></tr> <tr> <td>Carnation</td><td>0</td></tr> <tr> <td>Duvall</td><td>2</td></tr> <tr> <td>Issaquah</td><td>14</td></tr> <tr> <td>Kent</td><td>2</td></tr> <tr> <td>King County</td><td>108</td></tr> <tr> <td>Kirkland</td><td>1</td></tr> </tbody> </table>	Community	Repetitive Loss Properties	Auburn	0	Bellevue	3	Burien	6	Carnation	0	Duvall	2	Issaquah	14	Kent	2	King County	108	Kirkland	1
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Mercer Island	1
North Bend	4
Redmond	0
Renton	0
Skykomish	4
Snoqualmie	134
Woodinville	2

Most of these structures are residential. King County attempted to assess the use type of these properties; however, none of the available data sources on RL/SRL properties from the CRS or FEMA contained use types. Even the property-specific forms required to evaluate under CRS did not include use.

The economy	In 2007, an economic study was conducted to understanding the economic impact of flooding. The study found that 6% of the region's jobs are located in the floodplain and nearly 7% of the county's wages and salaries are generated in the floodplain (\$3.7 billion). 20% of the county's manufacturing employment and 30% of the county's aerospace employment are found in floodplains. A major flood that would shut-down economic activity in floodplains would result in at least \$46 million per day in lost economic output. Flooding will affect certain industries like agriculture, aerospace, manufacturing, and distribution more heavily because of their presence and reliance on floodplain locations. In the lower Snoqualmie valley, there are nearly 200 farms that produce a wide range of products from dairy to herbs and row crop vegetables. The Sammamish River valley supports a number of wineries and other small farms. And the Green River valley hosts many large fields of row crops as well as a large County-owned farm leased out by a diverse group of farmers. Flooding can negatively impact these operations, particularly if it occurs before harvest or late into the spring planting season. Farmers cannot sell food products from flood-damaged fields. Flooding, however, also provides nutrients to the soil that supports productive agriculture. While some agricultural sectors are dependent on natural floodplain functions, other economic sectors have located in the floodplain over decades for other reasons. Large warehouses in the Green River valley, many in the floodplain, make the region one of the largest logistics hubs in the nation. But, the square footage of warehouse and aerospace facilities means that billions of dollars are at risk of flooding every year as well as thousands of jobs.
The environment	Flooding is a natural process and supports unique ecosystems and habitats. Many riparian and aquatic ecosystems depend upon some amount of regular flooding or high water events. Various salmonid species use high water events to seek refuge as juveniles or



	access more favorable habitats, which makes flooding an important part of recovery for the endangered salmon species in Puget Sound. Natural floodplain functions typically result in slower-moving floodwaters with less intense flood height peaks. When upland forest areas are logged or burned, rain and snowmelt reach streams faster, which can cause flooding to be more intense and push water through the floodplain more quickly. King County often incorporates natural functions into the design of projects, which helps reduce flood risk as well as protect and restore ecosystems. Reconnecting rivers and coastlines to their historic floodplains through levee setbacks, creating side channels, and removing obstructions help restore natural functions and bring flood risk reduction benefits as well. The large Countyline project near Auburn restored 121 acres of floodplain along the White River and reduce flood risk for over 200 residential properties.
Health systems	Of the 127 medical facilities throughout King County, only 5 are located in the 0.2% annual chance floodplain (which includes the 1% annual chance floodplain) and of those, only 1 is located in the 1% annual chance floodplain. No hospitals are located in the 0.2% annual chance floodplain. While these 5 facilities are certainly at risk, the risk from flooding to the overall healthcare and medical system is low. One area of concern is the ability of residents in certain areas of the County, in particular sole-access neighborhoods and the lower Snoqualmie Valley, to evacuate for medical reasons during times of flooding. Neighborhoods with roads that are inaccessible during flooding are particularly vulnerable. The lower Snoqualmie Valley can also be isolated when the river reaches beyond a flood phase 4 level.
Government operations (continuity of operations)	Because few government facilities are located in floodprone areas, flooding does not pose a substantial risk to the continuity of government operations. Certain city buildings in Snoqualmie, North Bend, and Carnation are in floodprone areas, but some are elevated and others are outside floodprone areas.
Responders	Police, firefighters, and paramedics play key roles in the response to flooding. Police officers often help shut roads down to prevent people from driving through floodwaters; firefighters often rescue people trapped by flooding; and paramedics transport people hurt by flooding, often from hypothermia or other causes. If any of these first responders' buildings are in the 0.2% annual chance floodplain, their ability to respond is seriously threatened. Of the 64 police stations in King County, 3 are located in the 0.2% annual chance floodplain (in Skykomish, Redmond, and Issaquah). Of the 161 fire stations in King County, 6 are located in the 0.2% annual chance floodplain (in Skykomish, Seattle, North Bend, Renton, Issaquah, and near Enumclaw).



	Additionally, neighborhoods with roads that are inaccessible during flooding pose challenges to first responders. They may not be able to drive to homes and may require helicopters or boats to access.
Infrastructure systems	• Energy systems: most overhead powerlines are not susceptible to impacts from flooding unless the power poles are not resistant to flooding. Buried cables typically aren't affected by flooding very often. • Water/Wastewater: flooding, particularly from king tides and coastal storm systems can damage wastewater infrastructure such as the County's West Point Treatment Plant. Some city wastewater treatment plants are also located in floodprone riverine areas. Where these linear systems cross rivers, flooding can pose issues. The Tolt Pipeline, a water supply line for Seattle, was at risk from the Snoqualmie River migrating further toward its alignment. In 2019, a project was completed to provide some protection from that risk. • Transportation: roads through the Snoqualmie Valley are particularly susceptible to flooding and close regularly during high water events. Valley residents are often isolated. King County Road Services Division closes roads and will be working on an effort to study the impacts of flooding on various county roads. • Communications: most communications infrastructure is not vulnerable to flooding.
Public confidence in jurisdiction's governance and capabilities	Flooding occurs frequently enough in King County that residents often turn to the King County River & Floodplain Management Section for help and information during flooding events. Confidence is high in the government's ability to respond to flooding events. The multiple iterations of the Flood Hazard Management Plan have featured robust stakeholder involvement processes, which has inspired confidence in King County's ability to manage floodplains with higher regulatory standards and other programs to keep people and property safe from flooding.

Regional Risk Profile: Hazardous Materials

Hazard Description

Hazardous materials releases are one of the most common incident types. They can occur due to an accident or also be secondary to other primary hazards like: terrorist attack, earthquake and volcanic activity, severe flooding, and fires. Hazardous materials releases occur from leaking containers or pipelines when corrosion or a puncture occurs, accidental overflow of vessels when being transferred, loading dock and warehouse accidents, careless handling, illegal activities like drug labs, and traffic accidents. The person who dumps paint down a sewer is releasing a hazardous material. The illegal drug lab is using hazardous materials and leaving hazardous waste. The car accident that leaves a pool of fuel, oil, and anti-freeze has left hazardous materials to clean up. A growing source of materials releases is from electronic waste dumping, releasing chemicals like lead, zinc, nickel, flame retardants, barium, and chromium into the environment.

There are nine classes of hazardous materials.

1. Explosives
2. Gases
3. Flammable Liquid and Combustible Liquid
4. Flammable Solid, Spontaneously Combustible, and Dangerous When Wet
5. Oxidizer and Organic Peroxide
6. Poison (Toxic) and Poison Inhalation Hazard
7. Radioactive
8. Corrosive
9. Miscellaneous

Examples of common hazardous materials include anhydrous ammonia (used as a refrigerant), gasoline and diesel (used as transportation fuels), paints and dyes (for homes and clothing), and many corrosives (used in the local aircraft manufacturing industry).⁷⁰ Pipelines and rail lines transport crude oil to refineries and finished fuels to homes (natural gas) and retail fueling stations for vehicles.

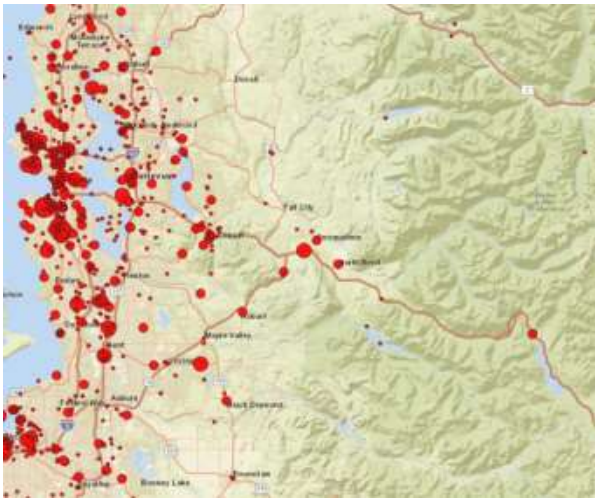
The risk of a CBRNe event (an attack using chemical, biological, radiological, or nerve agent) is low, if one were to occur this would have widespread impacts. There is little known day-to-day risk of an event, though this is a major focus of federal, state, and local counterterrorism planners. More information on hazardous materials in terrorist events will be provided in the terrorism hazard profile.

Although the likelihood of large numbers of fatalities from a single materials release is low, the effects can be devastating to impacted communities, the economy and the environment. A major oil spill in Puget Sound would destroy the fishery, including \$4.5 billion in commercial fishing, plus tourism, and sport fishing. The Puget Sound is also a culturally-sacred and environmentally-critical resource that

⁷⁰ Federal Motor Carrier Safety Administration. Nine Classes of Hazardous Materials. Accessed online on 7/2/19 from https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/Nine_Classes_of_Hazardous_Materials-4-2013_508CLN.pdf.

cannot be replaced or valued in dollars. In this way, the hazardous materials incident hazard is one of the most complex. It includes frequent spills and releases from day to day human activities, a threat of a major release from a massive spill or accident, and the threat of an intentional release from an attack. The impacts from hazardous materials are also complex, including slow-acting releases that kill people

and the environment over years and catastrophes that kill thousands, such as in Bhopal, India in 1984.



Class 1, 3, and 4 Spills Program-Regulated Facilities (W.A. ECY)

Between July 1, 2015 and March 31 2019 Washington State Department of Ecology received 748 reports of oil spills of one gallon or more reaching a water source, including both running into storm drains and running directly into a waterway. This only includes reported spills and only includes oil spills. This does not include the uncountable quantity of micro-spills that occur and are later washed into waterways by rain. For example, the rough spot of pavement in a parking lot that is the result

of fluids dripping onto the pavement from parked vehicles is an oil spill.⁷¹

In Washington, the state Department of Ecology is the lead agency for hazardous materials. Local response is led by fire services.

⁷¹ Washington State Department of Ecology. Coastal Atlas. Accessed online on 7/2/19 from https://fortress.wa.gov/ecy/coastalatlas/storymaps/spills/spills_sm.html.



Vulnerability Characteristics and Previous Occurrences



King County hosts a variety of unique transportation and geographic conditions, including one of the largest deep water seaports on the west coast, an International Airport in SeaTac that handles cargo from all over the world, as well as fuel pipelines running south from Whatcom County through King County and down into Portland carrying jet fuels, diesel, gasoline, etc. An estimated 18,833 oil tank cars travel through King County each quarter.⁷² Additionally, local highways like Interstate-5, Interstate-90, Interstate 405, US Highway 2, State Route (SR) 18, SR 516, SR 167, US Highway 99 and others transport hazardous materials throughout the region.

In the City of Seattle alone there are thousands of facilities with hazardous materials regulated under the fire code.⁷³ Other areas with high concentrations of hazardous materials usage include Auburn, Redmond and the Kent Valley.

Business types that commonly use hazardous materials include: hospitals, schools and universities, metal plating and finishing, the aircraft industry, public utilities, cold storage companies, the fuel industries, the communication industry, chemical distributors, research, and high technology firms. Each of these facilities is required to maintain plans for warning, notification, evacuation and site security under various regulations.

While the majority of incidents tend to involve petroleum products, a significant number involve extremely hazardous materials. Extremely hazardous materials include chemicals like chlorine, ammonia, sulfuric acid, nitric acid, some pesticides (EHS is a technical designation, so not pesticides- although the chemistries used as pesticides might be on the EHS list), and other chemicals that can cause immediate death or injury when inhaled, ingested, or come in contact with skin. Approximately 200 local facilities with extremely hazardous materials report to the county under Community Right to Know Act provisions. (plug with time and description of LEPC Seattle and King) These sites report their inventories annually with records being retained in databases in multiple locations.⁷⁴

Though they occur every day, many spills are not reported or go undetected. Some industrial spills from the 1970's and 1980's are still being cleaned up in the Kent Valley, Harbor Island, Duwamish corridor,

⁷² Washington State Department of Ecology. Coastal Atlas. Accessed online on 7/2/19 from https://fortress.wa.gov/ecy/coastalatlas/storymaps/spills/spills_sm.html.

⁷³ National Fire Protection Association. Materials Management Codes and Standards. Accessed online on 6/25/19 from <https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards?mode=code&code=400>.

⁷⁴ King County Local Emergency Management Planning Committee. 2015. Tier II Reports.



and Seattle/South Park as federal Superfund cleanup sites. There are currently 10 active Superfund cleanup sites in King County.⁷⁵ At least five other Superfund sites have completed cleanup and have been closed since the program began. Currently active sites include:

1. Harbor Island – groundwater contains benzene, ethyl benzene, xylene, mercury, cadmium, lead and zinc with poly chlorinated bi-phenols (PCB) sediments. 18
2. Lockheed West Seattle – heavy metal contaminants: arsenic, chromium, copper, lead, silver, and zinc with butyl tins and PCBs.
3. Lower Duwamish Waterway – River sediments are contaminated with mercury, arsenic, PCBs, dioxins, furans, and phthalates.
4. Midway Landfill – Ground water contaminated with heavy metals and volatile organics.
5. Pacific Car and Foundry – Soil is contaminated with heavy metals, PCBs and solvents. Approximately 37,000 obtain drinking water from wells within three miles.
6. Pacific Sound Resources – Soil and ground water contaminated by PCBs and heavy metals from former wood treatment operations.
7. Queen City Farms – the site is a former landfill. Ground water, surface water, and sludge contaminated by volatile organic compounds. Soil contaminated with PCBs and metals.
8. Quendall Terminals – Soil and ground water contaminated with benzene and creosote from former manufacturing plant. Contaminants release to Lake Washington.
9. Seattle Municipal Landfill (Kent Highlands) – Landfill contains volatile organic compounds like toluene, xylene, vinyl chloride, and others – plus heavy metals.
10. Western Processing – former industrial processing facility ground water and sediment contains volatile organic compounds, PCBs, phenols, and heavy metals

An example of the cleanup costs for a Superfund site is illustrated by the Harbor Island Cleanup. The former owner, RSR Corporation agreed to pay \$8.5 million in fines toward the cleanup that will cost (when completed) over \$32 million.⁷⁶ The cost to cleanup an illegal drug lab (in a home) can cost between \$5,000 and \$100,000 depending on the size of the home. Often the occupants vacate or abandon the sites – leaving a bank or credit union holding the mortgage and cleanup costs.⁷⁷

Scenario Drivers

It is difficult to find a home, school, hospital or place of business that isn't without chemicals, solvents, pesticides, lawn chemicals, cleaners and/or paints.

Pipeline rupture

Washington State hosts the only oil refineries in the Northwest. Multiple pipelines traverse the state, such as the Olympic Pipeline. Failures or shutdowns in the pipeline can cause fuel shortages and price increases. An explosion on the Olympic Pipeline in 1999 killed three people and cost over \$58 million in property damage.

⁷⁵ U.S. Environmental Protection Agency. Superfund Sites Where You Live. Accessed online on 6/25/19 from <https://www.epa.gov/superfund/search-superfund-sites-where-you-live>

⁷⁶ U.S. Department of Justice. 2006. Former Harbor Island Smelter Operator to Pay \$8.5 Million in Superfund Cleanup Costs. Accessed online on 6/25/19 from https://www.justice.gov/archive/opa/pr/2006/January/06_enrd_047.html.

⁷⁷ Dewan, Shaila and Robbie Brown. July 25, 2009. When an ex-meth lab is home. *The Seattle Times*. Accessed online on 6/25/19 from <https://www.seattletimes.com/business/real-estate/when-an-ex-meth-lab-is-a-home/>.

Chemical/oil train derailment	An oil spill in 2016 in Moser, Oregon along the Columbia River very nearly caused the destruction of the entire town and an ecological catastrophe in the river. The community was saved by luck of the weather and because most of the oil that spilled flowed into a water treatment plan, where it was safely contained.
Oil tanker spill	An oil tanker spill in the Puget Sound would devastate marine life and potentially cause a permanent shut-down in oil tanker traffic due to public outcry. A major spill would close the fishery economy leading to \$4.5 billion in losses for Washington alone and permanent, incalculable damage to tribal cultural resources.
Storage facility failure in a populated area	A facility failure, including an explosion or release of chemicals, could endanger or kill many people. In Waco, Texas in 2013, an ammonium nitrate explosion occurred at a distribution facility, leveling a neighborhood and killing 15 people. A train derailment in 2013 in Lac Megantic in Quebec, Canada killed 60 people and destroyed much of the town.
Vehicle accident on a major roadway	Vehicle accidents that release fuel and oil occur every day on Washington roads. A major incident, especially at an interchange, such as the I-5 and I-405 interchange in Tukwila/Renton would potentially close both freeways for an extended period while cleanup occurs.
CBRNe Attack	Another lower-risk, but high-intensity hazardous materials event is from a chemical, biological, radiological, or nerve agent (CBRNe) attack.

Priority Vulnerabilities

Low-income communities in or around industrial facilities	Low-income communities are more likely to be impacted from major releases due to the proximity of affordable housing to industrial areas and historic environmental injustices.
Individuals with respiratory issues	Individuals with respiratory issues are more likely to succumb quickly to an airborne release of a chemical.
Major transportation facilities such as the Port of Seattle	Major transportation facilities store huge amounts of chemicals and fuel in depots. A failure or fire at one of these facilities could damage or destroy these assets.
Rail facilities	Rail facilities transport chemicals and fuels, including highly combustible crude oil. There have been multiple derailments and spills. In Moser, Oregon



	in 2016, a train derailed causing a fire that nearly destroyed the town and the fuel was prevented from leaking in large quantities into the Columbia River by luck.
Interstate highways	Interstate highways are a major artery carrying chemicals. Accidents happen every day and major chemical spills can shut down a roadway for an extended period of time. (oil slicks contribute to traffic injuries and fatalities when it rains)
Oil tankers in Puget Sound	Oil tankers are expected to traverse Puget Sound in growing numbers due to Canada's approval of a major pipeline and terminal in Vancouver, BC. When this occurs, it will significantly raise the risk a spill that could destroy much of the aquatic life in Puget Sound.

Priority Impact Areas

King County residents	Potential Impacts to the public from a hazardous materials spill can vary widely. Temporary or even permanent displacement through evacuation from an unsafe area can result in relocation/displacement of populations. Employment disruption, school closure, impacts to private and community wellheads and other impacts can change whole communities. Long term exposure to toxic chemicals can cause birth defects and temporary or permanent health problems – especially for the young, old and infirm. ⁷⁸
Vulnerable populations	Vulnerable populations often live in closer proximity to facilities with the risk of hazardous materials release. In King County, this includes residences near the Duwamish industrial area, in Kent, Renton, and south Seattle. These are also the locations of the superfund sites in the region. In cases of major releases or system failures, the most impacted populations are frequently lower-income, often ethnic minority communities that live nearby. Populations with respiratory issues are also at a heightened risk of impacts due to an airborne release of chemicals.
Property	Spills of hazardous materials to soil or buildings can result in extensive and costly cleanup efforts. Cleanup standards are established by federal (U.S. EPA), state (Washington State Department of Ecology), and local standards (fire agencies and environmental agencies). Until a site is cleaned up to those standards, residential or business occupancy can be denied under the Health Code. The responsible party (property owner) may be required to pay for the cleanup. Often this can lead to bankruptcy and clean up by state or federal agencies and contractors. Contaminated property can drastically reduce the value of the property and the King County subsequent property taxes available to local and state

⁷⁸ U.S. Centers for Disease Control. Health Effects of Chemical Exposure. Accessed online on 6/25/19 from <https://www.atsdr.cdc.gov/emes/public/docs/Health%20Effects%20of%20Chemical%20Exposure%20FS.pdf>.



	government. Similar impacts can be expected for transportation accidents with hazardous material spills.
The economy	Small spills can close businesses and rather large impact on employment and land use including the properties of neighbors not responsible for the chemical release. Superfund sites can impact a community for decades until they are cleaned up. The large salmon and fishing fleet that calls King County home may be impacted when some of a year's fish stock – or even the entire run is impacted.
The environment	Any chemical spill on or along rails, roads, pipelines, fixed industrial facilities or illegal drug labs/dumping may impact the natural environment. Wetlands, streams and rivers, lakes, and reservoirs may all be damaged from chemical spills. In some cases these damages may injure the plant and animal life irreparably. Birds, reptiles, amphibians, fish, and mammals may all be impacted. Air pollutants may impact human inhabitants as well as the natural environment. Recreational areas can be closed until a suitable solution can be found to recover the natural environment.
Health systems	Hospitals can be overwhelmed by major releases of hazardous materials as populations, both those exposed and those who feel they may have been, check in at emergency rooms. Hospitals and pharmacies are also sources of hazardous materials, including some radioactive materials such as those associated with cancer treatment.
Government operations (continuity of operations)	King County is the operator of several facilities that are vulnerable to hazardous materials spills. The county has three waste water operations (South Plant, West Point Treatment Plant, and Brightwater). These expensive facilities are vulnerable to the introduction of chemicals (when in large volumes) to the sanitary sewer system. The county also has solid waste (garbage) transfer stations and a major landfill operation at Cedar Hills. While contaminants are avoided, some material may make its way into the landfill and the ground water table. Drinking water facilities including private and community well heads and reservoirs may also be vulnerable to introduction of chemical or biological contaminants. Any chemical spill that impacts a major roadway or rail line may impact public transit routes in the county.
Responders	Hazardous materials make response and recovery activities in all disasters a threat to the health and safety of responders. During local events, such as house fires, stores of chemicals can catch fire and explode, injuring responders. During larger events such as earthquakes, large-scale releases can surprise and overwhelm responders without proper equipment. It can also be extremely difficult to determine the chemical or chemicals that have been released from a given spill, adding to first responder danger.
Infrastructure systems	With hazardous materials being everywhere in our modern community, it is possible to impact almost any critical facility in the county. Any roadway or rail line is vulnerable to the many chemicals transported over them daily. Spills to soils and surface water sources



	can impact drinking water and the environment. Materials dumped into sanitary sewers can contaminate waste water treatment plants. Airborne chemicals can cause the evacuation of the area downwind of the spill, including critical facilities. Damage to road surfaces from chemical spills may require the removal and replacement of the entire road surface and foundational road bed. Transformers used in power transmission contain chemicals called PCB (Poly chlorinated bi-phenols) that can be released during wind storms or lightning strikes and traffic accidents. The impacts to business from interrupted commute/road or railroads closures can last for hours, days, weeks, or longer. White powder incidents have closed postal facilities and government buildings until the substance was identified and removed
Public confidence in jurisdiction's governance and capabilities	The Community Right to Know Act, and other related legislation, resulted from serious breaches in public confidence following massive releases, explosions, or other failures in hazardous materials systems. Any major incident in and of itself seems to offer proof to the public of a regulatory failure. Maintaining Local Emergency Planning Committees and a regular structure to report and analyze hazardous materials releases is critical to maintaining public confidence.



Regional Risk Profile: Health Incident⁷⁹

Hazard Description

Disease has been one of the most influential factors in human history. On many occasions, disease has shaped civilizations and altered the course of history. Throughout the 20th century great strides in medicine have produced many treatments and cures for the deadliest diseases. Many of these medical advances have given us a false sense of security that all diseases can be treated or cured in a timely manner, even though the potential for a devastating disease outbreak continues to threaten our community.

The impact of these diseases varies based on the virulence of the disease, duration of the illness, susceptibility of the population to the disease, and spread within the community.

An outbreak can be characterized by the extent of spread of the disease. Epidemic refers to an increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area. Pandemic refers to an epidemic that has spread over several countries or continents, usually affecting a large number of people. More common diseases are classified as endemic, as they are at baseline levels within a community. New or emerging diseases can quickly become an epidemic/pandemic if there is little or no immunity in the population.

Common disease outbreaks include influenza, norovirus, pertussis, hepatitis A, *Salmonella*, and *E. coli*.. Novel strains of influenza are a great risk to King County, because of lack of immunity to a new influenza virus strain, the potential for severe illness, and the high degree of transmissibility from person to person.

For King County, the Communicable Disease Epidemiology & Immunization Section within Public Health – Seattle & King County investigates and coordinates the surveillance of communicable disease cases and outbreaks.

The impact of a disease can be tracked and characterized using several different indicators. These indicators can help Public Health assess and respond to potential disease outbreaks.

- *Incubation period*: The stage of subclinical disease extending from the time of exposure to onset of disease symptoms.
- *Contagious period*: The duration after infection during which the person can transmit the infection to others.
- *Infectivity*: The proportion of exposed persons who become infected.
- *Pathogenicity*: The proportion of infected persons who develop clinically apparent disease.
- *Virulence*: The proportion of clinically apparent cases that are severe or fatal.

⁷⁹ This risk profile was developed for the Seattle and King County Hazard Mitigation Plans by Public Health Seattle & King County.



Vulnerability Characteristics and Previous Occurrences

Epidemics directly affect the health of people who live, work, and visit a community. They have the potential to be one of the deadliest hazards a community can face. Sickness is the most visible consequence of an epidemic, but outbreaks can also severely impact the community as schools, businesses, government agencies and non-profit organizations curtail operations due to employee illness or as countermeasures. The effects of these curtailments grow the longer the disease persists.

In many epidemic and pandemic situations, disease spreads quickly throughout a community. There are many factors that can increase King County's vulnerability to disease spread:

- Rapid population growth, such as is occurring in King County, increases the potential for acquisition and spread of infectious diseases.
- King County's large international air and seaports (including an active cruise ship industry) increase the number of visitors to our area and the risk for importation of infectious diseases. Diseases that are not endemic to Washington have the potential for introduction and spread among our residents. Vaccine preventable diseases (e.g., acute viral hepatitis, measles, and influenza) are significant contributors to morbidity and potential mortality in international travelers and can cause local outbreaks among susceptible persons.
- Persons experiencing homelessness often also have limited access to medical care, so many people living homeless and with health problems have difficulty getting prompt treatment. Living conditions – like crowding and fewer opportunities for personal hygiene – can contribute to the spread of disease. If someone has an underlying medical condition, alcohol or drug use, or weakened immune system, they are even more susceptible. In 2017 and 2018, CD-Imms responded to increases in several infectious diseases among persons experiencing homelessness; new infections and outbreaks in this population continue to be reported and might continue to rise given the increase in persons experiencing homelessness in King County.

Disease often affects those most vulnerable in our communities. Young children, the elderly, the poor and those with underlying health conditions are often the hardest hit by disease.

King County has a large concentration of healthcare resources, but in an epidemic or pandemic these resources can be stretched or overwhelmed by the outbreak situation. The area also provides specialized medical care for a large geographic area, including one of the area's only pediatric hospitals and the only Level 1 Trauma center for Washington, Idaho, Montana, and Alaska. In addition, Airlift Northwest located at Boeing Field is the only life-flight agency serving the same four-state region.

Other resources, such as food and water, are also a concern when planning for disease outbreaks. King County has many open reservoirs that provide water to the city. These reservoirs could become contaminated and be a source of infection for area residents. Food sources can become contaminated by improper food handling practices or ill food workers. Public Health conducts ongoing surveillance for food- and waterborne illnesses to identify and quickly control outbreaks.

Although it is impossible to predict the next disease outbreak, history has shown that outbreaks are not uncommon and can produce devastating effects on a community. While the revolution in medicine in the past century has increased our ability to counteract disease, increases in the number of people without adequate healthcare, the evolution of antibiotic resistant bacteria and globalization help make



outbreaks spread more quickly and increase their magnitude. Disease outbreaks not only cause increased morbidity and mortality in the community, but also put a greater strain on the healthcare and infrastructure system that could prevent the operation of critical services.

Throughout the 20th century several epidemics and pandemics have affected our community.

Influenza. 1918-1919: The influenza pandemic of 1918 was especially virulent, killing a large number of young, otherwise healthy adults. The pandemic caused more than 500,000 deaths in the United States and more than 40 million deaths around the world. The 1918 pandemic first arrived in Seattle in October 1918; over the next six months the virus claimed 1,600 lives.

Influenza. 1957-1958: The influenza pandemic of 1957 was less severe than the 1918 pandemic and caused a total of 70,000 fatalities nation-wide.

Influenza. 1968-1969: The influenza pandemic caused more than 34,000 deaths in the U.S. and cause severe morbidity and mortality around the world.

***E. coli.* 1993:** *E. coli*-contaminated hamburger meat from a local Jack in the Box caused illness in 400 people and led to the death of two people within one month in the Washington area. Cases were seen in California, Idaho, and Nevada as well.

Pertussis. 2002-2005: Between 2002 and 2003 Public Health reported an 82% increase in the number of Pertussis infections in infants, and a three-fold increase in the number of cases in children <6 months. The occurrence of Pertussis in adolescents and adults has been on the rise since 1990, culminating in a national epidemic in 2005 when 25,616 reported cases nation-wide. Outbreaks within healthcare facilities can occur quickly because the bacterial infection is highly contagious.

Influenza. 2009: Like the 1918 pandemic, the H1N1 outbreak of 2009 affected the young and healthy populations as well as those with chronic diseases. This increase in morbidity caused strain on the local healthcare system. Although the H1N1 virus was not as virulent and there were not nearly as many fatalities as previous pandemics, the outbreak caused a larger than usual amount of disease in the community than seasonal influenza virus does.

Scenario Drivers

The most likely scenario that activates the region's emergency management system would be a disease outbreak that just exceeds our public health system's capacity. We have chosen hepatitis A outbreak for the Most Likely Scenario. In 2017, several state and local health departments responded to hepatitis A outbreaks, spread through person to person contact, that occurred primarily among persons who use injection and non-injection drugs, and/or person who experienced homelessness and their close contacts. Multistate outbreaks of hepatitis A infections have also been linked to food products (i.e.



strawberries in 2016 and pomegranate seeds in 2013).⁸⁰ A large outbreak centered in Seattle would cause a strain on the public health system and potentially have strong impacts on local businesses, especially any that the public perceives as responsible for the outbreak.

Hepatitis A Outbreak	Seattle is the center of a hepatitis A outbreak that kills 20 people and makes hundreds severely ill, including hundreds of hospitalizations. The emergency is complicated, and infections are spreading among people who are living homeless who have limited access to adequate hygiene and prompt medical care.																																					
Pandemic Flu	The most severe disease outbreaks would involve pathogens that would infect a large percentage of an exposed population and hospitalize or kill many people. Pandemic influenza has the potential to cause this great a disaster. It poses a great threat to the health of our local community as well as the national/international community. In addition to human morbidity and mortality, pandemic influenza can have many socio-economic consequences. Cancellations of schools, work and public gatherings may be enacted to attempt to halt the spread of disease. Staff absenteeism can create a strain on government and healthcare systems causing limitations of services and care. The 2009 H1N1 flu outbreak showed how potentially easy it is to overwhelm the healthcare system, even though, as it happened, H1N1 was an influenza that caused less severe disease than a typical seasonal flu. A pandemic influenza that caused moderate or severe disease would have a much larger impact on the community. The following table outlines expected disease rates based on Center for Disease Control modeling. <table> <tr> <th rowspan="2">Characteristic</th><th colspan="2">Moderate (1958/68 - like)</th><th colspan="2">Severe (1918 - like)</th></tr> <tr> <th>US</th><th>King County</th><th>US</th><th>King county</th></tr> <tr> <td>Illness</td><td>90 million</td><td>540,000</td><td>90 million</td><td>540,000</td></tr> <tr> <td>Outpatient Care</td><td>45 million</td><td>270,000</td><td>45 million</td><td>270,000</td></tr> <tr> <td>ICU Care</td><td>128,750</td><td>733</td><td>1,485,000</td><td>8,910</td></tr> <tr> <td>Mechanical Ventilation</td><td>64,875</td><td>389</td><td>742,500</td><td>4,455</td></tr> <tr> <td>Deaths</td><td>209,000</td><td>1,254</td><td>1,903,000</td><td>11,418</td></tr> </table>				Characteristic	Moderate (1958/68 - like)		Severe (1918 - like)		US	King County	US	King county	Illness	90 million	540,000	90 million	540,000	Outpatient Care	45 million	270,000	45 million	270,000	ICU Care	128,750	733	1,485,000	8,910	Mechanical Ventilation	64,875	389	742,500	4,455	Deaths	209,000	1,254	1,903,000	11,418
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⁸⁰ Centers for Disease Control. Hepatitis A Outbreaks in the United States. Accessed online on 6/28/19 from <https://www.cdc.gov/hepatitis/outbreaks/hepatitisaoutbreaks.htm>.



Bioterrorism	Bioterrorism is another potential cause of on a catastrophic disease outbreak. The maximum bioterrorism scenario is estimated by Public Health – Seattle & King County to have impacts similar to the pandemic flu scenario identified above.
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Priority Vulnerabilities

Old and young people	People who are either old or young have weaker immune systems and are usually more likely to succumb during an outbreak.
Healthcare staff	Healthcare staff come into regular contact with sick patients and are likely to be exposed both before the illness is identified and during treatment.
People with compromised immune systems	People with compromised immune systems are most likely to become infected and succumb from a serious disease.
People without health insurance	People without health insurance are more likely to delay getting care, allowing the disease to spread farther before it is identified.
Health system	The health system is likely to be overwhelmed in any serious epidemic. In especially serious outbreaks, it may be inadvisable for patients to even come to the hospital and treatment may have to occur outside of hospital facilities.

Priority Impact Areas

King County residents	As many as 11,418 deaths are estimated to occur during the most severe pandemic scenario. Thousands more would be hospitalized, and hundreds of thousands sickened. As of May 4, 2019, there were 45 influenza fatalities in the 2018-2019 flu season.
Vulnerable populations	In 2017-2018 flu season, there were nearly 1,000,000 hospitalizations and 79,400 deaths. The most at-risk group is adults over 65 years of age (70% of hospitalizations). ⁸¹ Older adults account for nearly 90% of deaths. During a serious epidemic, older adults, individuals with compromised immune systems, children, people without health insurance, people who speak a language other than English, and people who are recent immigrants to the country are likely to be the most at-risk and suffer the worst impacts.
Property	There are no direct impacts to property.
The economy	The economy may come to a virtual standstill for weeks on end during severe outbreaks as people avoid public places. Many small businesses may lose too much revenue and be

⁸¹ Centers for Disease Control. Estimated Influenza Illnesses, Medical visits, Hospitalizations, and Deaths in the United States — 2017–2018 influenza season. Accessed online on 6/28/19 from <https://www.cdc.gov/flu/about/burden/2017-2018.htm>.



	forced to close. Nationally, the economic impact of seasonal influenza has been estimated as high as \$166 billion (2012 dollars). ⁸²
The environment	There are no expected impacts to the environment.
Health systems	Health systems will be overwhelmed and many nurses and doctors potentially sickened. As facilities become unable to take additional patients, it may be possible to treat people in outpatient facilities. During the worst-credible scenario, nearly 300,000 residents of King County would require treatment. This would be far beyond the capacity of the public health system.
Government operations (continuity of operations)	Many government operations may cease to function on a normal basis during the most severe outbreaks. Agencies may have to adopt work from home policies and take other steps to protect employees. Due to employee illness, many non-essential functions may have to be curtailed.
Responders	Emergency services would be severely impacted during a serious outbreak because they are likely to be exposed early due to public contact. As responders become sick, response times and capabilities would be severely limited.
Infrastructure systems	• Energy: There are no direct impacts, outside of employee absenteeism, to the energy sector. • Water/Wastewater: There are no direct impacts to the water and wastewater system from most outbreaks, although this system is a potential target of bioterrorist activities. • Transportation: A disease would not cause any direct damage to the transportation system, but high absenteeism would affect it. Public transit, shipping, and other services may only function at 50% during especially severe outbreaks. • Communications: There are no direct impacts, outside of employee absenteeism, to the communications sector.
Public confidence in jurisdiction's governance and capabilities	The public understands that an outbreak is a severe natural event; however, restrictions on public gatherings are not popular and create frustration. Some people may believe they are not getting enough attention from the medical community. Others may begin to doubt the efficacy of treatment options if the disease worsens. In the most extreme cases, confidence in the medical system can be shaken.

⁸² Mao, Liang, Yang, Yang, Qui, Youliang, and Yan Yang. 2012. Annual economic impacts of seasonal influenza on US counties: Spatial heterogeneity and patterns. *International Journal of Health Geography* vol. 11 no. 16. Accessed online on 6/28/19 from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3479051/>.



Regional Risk Profile: Landslide

Hazard Description

The term “landslide” covers a range of geomorphic processes in which masses of soil, rock, debris (a mixture of soil and rock) become detached and move downslope. This mass is usually wet, saturated, or suspended in water. This movement can happen quickly or slowly; displaced material can remain solid or move as a liquid. Landslides can range in size from a few cubic yards to millions of cubic yards. The detailed character of movement is referred to herein as the landslide style. The style of landsliding depends on the local geology, topography, and hydrology in the vicinity of the failure. Five general styles of landslide phenomenon have been identified in King County:⁸³

- Deep-seated landslides (including rotational slides, liquefaction spreads, debris flowslides, debris avalanches, and rock compound slides),
- Shallow debris slides,
- Processes that build depositional fans (including debris flows and debris floods),
- Rock fall, and
- Rock avalanches.

Landslides are usually a secondary hazard, typically driven by precipitation. Smaller and shallower landslides are often triggered by storm events lasting hours or days. Large deep-seated slides may be triggered by wetter than normal conditions that persist for months. Historical records and geologic evidence also show that large earthquakes, while relatively infrequent can be significant landslide triggers. Landslides can also be triggered by ill-advised clearing, grading, or stormwater discharge. Landslides tend to happen in areas where there is a history of previous occurrences. Another major determinant of landslide risk is local geology. King County’s landscape is very young and is largely a product of multiple glacial advances over the last two million years, with the most recent advance approximately 14,000 years ago. Landslides are most common where post-glacial erosion has created steep slopes in glacial deposits, primarily along beach bluffs, ravine slopes, and river valley walls. In addition to areas of steep slope some areas of lower slope are actually old, deep-seated landslides which may be at risk of reactivation. Characteristics of landslide hazard areas include:^{84,85}

- A slope greater than 40 percent
- Landslide activity or movement in the last 10,000 years
- Stream or wave action with erosion or bank undercutting

⁸³ King County. 2016. Mapping of Potential Landslide Hazards along the River Corridors of King County, Washington. Prepared by River and Floodplain Management Section, Water and Land Resources Division, Department of Natural Resources and Parks. Seattle, WA. August.

⁸⁴ Federal Emergency Management Agency. 2018. King County Risk Report: Landslide Exposure Assessment. Page 52.

⁸⁵ Washington State Emergency Management Division. 2018. Washington State Enhanced Hazard Mitigation Plan Risk Assessment. Page 308.



- The presence of a depositional fan that may indicate a history of debris flows, debris floods, or rockfall
- The presence of impermeable soils, such as silt or clay, which are mixed with granular soils such as sand and gravel

Landslides are dangerous and unpredictable. Some landslides may show indications of impending or incipient movement; others may happen suddenly without any warning signs. Warning signs of a potential or impending landslide include:⁸⁶

- Rapidly growing cracks in the ground; downslope movement of rock, soil, or vegetation.
- Sudden changes in creek water levels, sometimes with increased sediment, especially during or right after large or protracted storm events
- Sounds of cracking wood, knocking boulders, groaning of the ground, or other unusual sounds, especially if the sound increases
- A hillside that has increased spring and (or) seep activity, or newly saturated ground, especially if it was previously dry
- Formation of cracks or tilting of trees on a hillside
- New or developing cracks, mounds, or bulges in the ground
- Sagging or taut utility lines; leaning telephone poles, deformed fences, or bent trees
- Sticking windows or doors; new and (or) growing cracks in walls, ceilings, or foundations
- Broken or leaking utilities, such as water, septic, or sewer lines
- Separation of structures from their foundation; movement of soil away from foundations
- Changes in water well levels or water wells that suddenly run dry

Vulnerability Characteristics and Previous Occurrences

The most significant landslide risk in King County is during the rainy season from November through January.

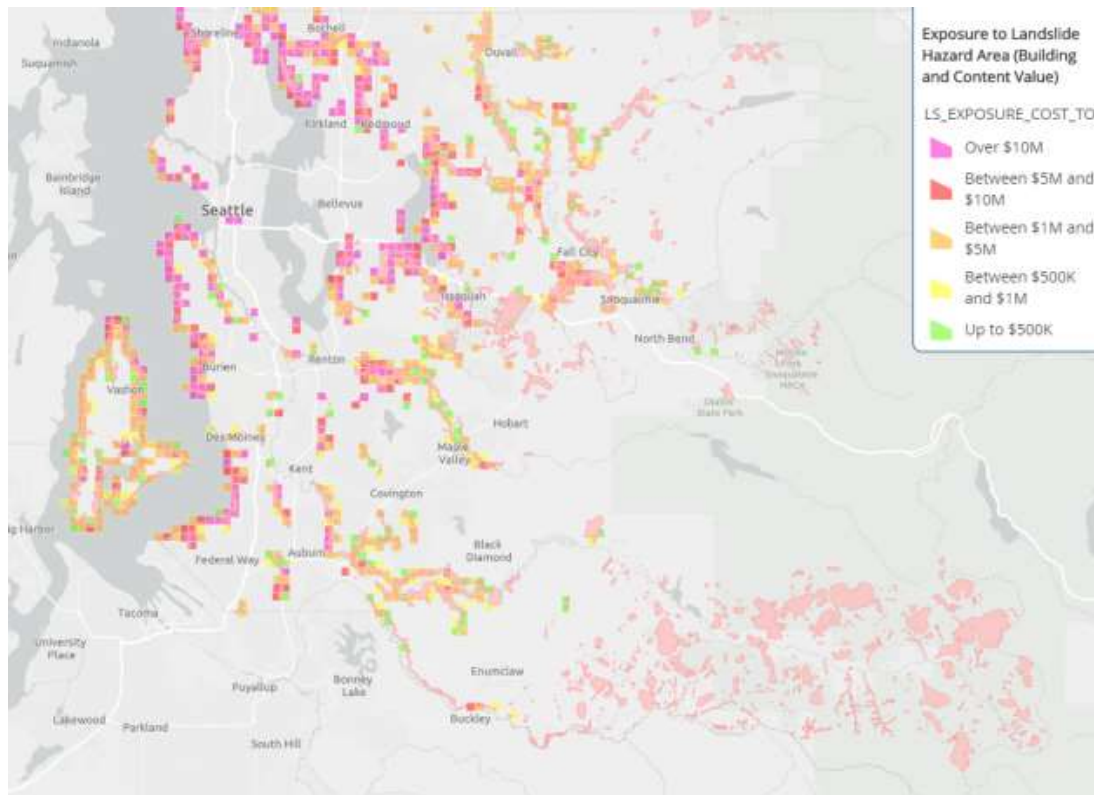
Areas in the County most at risk from landsliding include those on or near coastal bluffs, ravine and valley slopes, and in steep mountainous topography. Parcels on slopes greater than 40 percent are at an elevated risk of landsliding compared with more level sites. The landslide risk assessment used WA DNR Landslides and Landforms digital data identifying historic landslide areas, potentially unstable to intermediate-sloped areas, and potential deep-seated landslide areas.

Since 2006, there have been seven disaster declarations impacting the county, including DR-4168 for the SR 530 (Oso) landslide in Snohomish County. Landslides occur during virtually every major storm event and earthquake. Landslides are especially likely in areas where they have been recorded before. A good method of assessing likelihood of a future landslide is to know if the area has had a history of landslides.

⁸⁶ Washington State Department of Natural Resources. 2017. Landslide Hazards in Washington State. Accessed online on 6/7/19 from https://www.dnr.wa.gov/publications/ger_fs_landslide_hazards.pdf?h283k.



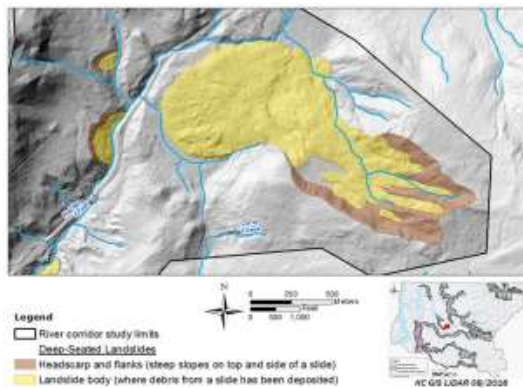
- 2001 – DR1361 – Nisqually Earthquake triggers landslides around the state. \$66.7M in Public Assistance was authorized.
- 2006 - DR-1737 – Severe storms trigger flooding and landslides. \$29.5M in Public Assistance (statewide) was authorized along with \$5.4M in Individual Assistance.
- 2007 – DR-1734 – Severe winter storms trigger landslides. \$61.3M in Public Assistance was authorized along with \$21.2M in Individual Assistance.
- 2009 – DR-1817 – Severe winter storms trigger flooding and landslide.
- 2011 – DR-1963 – Severe winter storms trigger flooding and landslides.
- 2014 – DR-4168 – A slope along SR 530 in Snohomish County fails, bringing with it an entire neighborhood and killing 43 people. This is one of the deadliest disasters in Washington State History. There is a long history of landslides in this area and the tragedy leads the state to invest in a new landslide mapping program.
- 2012 – DR-4056 – Severe winter storms trigger flooding and landslides. \$30.1M in Public Assistance was authorized.
- 2017 – DR-4309 – Severe winter storms trigger flooding and landslides. \$12.5M in Public Assistance was authorized.



Scenario Drivers⁸⁷⁸⁸

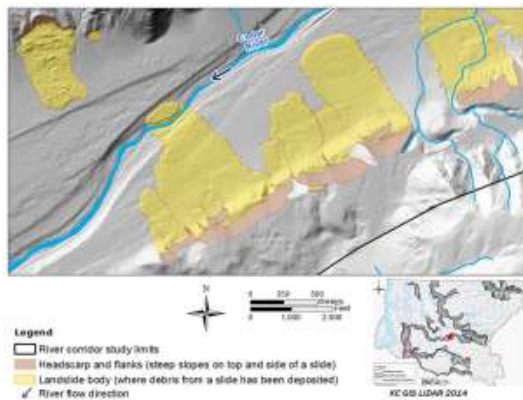
For planning purposes, King County looks at three common or particularly deadly landslides. These usually result after major weather events or due to human activities or other disturbances such as a major wildfire.

Deep Landslide



Deep-seated landslides are those that fail below the rooting depth of trees and vegetation. They are often slow moving but can also move rapidly. Deep-seated landslides can cover large areas and devastate infrastructure and housing developments. These landslides usually occur as translational slides, rotational slides, or large block slides. Deep-seated landslides are typically much larger than shallow landslides, in terms of both surface area and volume. A deep-seated landslide may appear stable for years, decades, or even centuries. These long-lived features can be partially or entirely reactivated for a variety of reasons.

Debris Flows

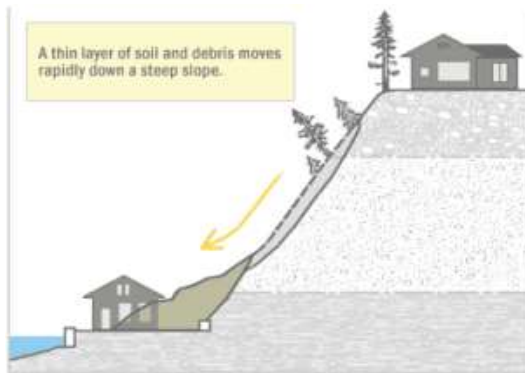


Debris flows usually occur in steep gullies, move very rapidly, and can travel for many miles. Slopes where vegetation has been removed are at greater risk for debris flows and many other types of landslides. The figure shows a series of flows located in the Cedar River Watershed. The ages of these slides are unknown, but they are geologically very young as they overlap (and therefore post-date) the entire suite of river terraces present here. The exact trigger for this assemblage of large, closely spaced landslides is unclear.

⁸⁷ King County Department of Natural Resources and Parks. Landslide Hazards Program website. Accessed online on 6/7/19 from <https://www.kingcounty.gov/services/environment/water-and-land/flooding/maps/river-landslide-hazards/landslide-types.aspx#Debris>.

⁸⁸ Washington State Geologic Survey. Landslide Hazards Program website. Accessed online on 6/7/19 from <https://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/landslides#types-of-landslides.8>

Shallow Landslides



Shallow debris slides (also known as shallow landslides) are a common style of slope movement both in the Puget Lowland and Cascade Mountains. Shallow debris slides are characterized by failure of a relatively shallow layer of soil typically sliding on a surface of more competent material, either bedrock or dense glacial sediments. Shallow debris slides are typically 3 to 6 feet (1 to 2 meters) and translational. Shallow colluvial soils on slopes are formed through a variety of processes, including breaking up of the underlying in-place substrate (either bedrock or Quaternary sediments) by freeze/thaw, wetting/drying, bioturbation, and chemical weathering. Soils on steep slopes in King County vary significantly with respect to soil thickness, soil strength, and hydraulic properties; this variability presents the central challenge in assessing their stability across a landscape.

Priority Vulnerabilities

Homes built above, on, or below bluffs or slopes

Homes built on bluffs or other slopes apply additional weight to a slope and increase the likelihood of slope failure. Homes built below bluffs have also been destroyed by slope failure.

Transportation corridors, including on I-90 and Seattle-Everett BNSF rail line

Transportation routes are often cut through steep areas or travel through valleys with a history of landslides.

Debris flows after vegetation removal

Vegetation removal due to logging, land development, view clearing, or wildfire reduces the root strength that often anchors and reinforces shallow soils. Shallow landslides often increase following vegetation removal and if debris from such a slide enters a hillside swale it may transition into a debris flow that can have devastating impacts far below and distant from the initial failure.

Coseismic Landsliding

This Risk Profile addresses primarily landsliding for which our region has significant collective experience. This includes landslides triggered by weather events and human disturbance. Geologic evidence is clear that this region is subject to earthquakes from several sources larger than those that have been well documented in the historical record. Widespread landsliding



is likely to be a secondary but significant and potentially catastrophic consequence of a future occurrence of such a large earthquake ^{xx}.

Priority Impact Areas

King County residents	While the total number of people exposed to landslides is relatively small, and the risk of a rapid slope failure has tended to be low, many homeowners do not carry insurance to cover losses from landslide hazards. The total number of people exposed to the landslide hazard is unknown since landslide hazards are spatially limited and do not align with population information in Census data.
Vulnerable populations	No additional impacts to vulnerable populations are expected from this hazard.
Property	In total, 2.6 percent of structures in King County are identified as being within a landslide hazard area, resulting in an estimated \$9.8 billion in exposed value. The City of Lake Forest Park has the highest percentage of structures exposed in a landslide hazard area at 16.4 percent. The cities of Bellevue and Seattle and unincorporated King County are estimated to each have over \$1 billion of estimated exposed value within landslide hazard areas.⁸⁹ The slopes of Magnolia, West Seattle, Burien, Des Moines, Vashon Island, Newcastle, Federal Way and many areas of Bellevue have long been developed for their magnificent views of Mount Rainier, the Cascade and Olympic Mountains, and Puget Sound. Homes with vistas of the Olympic Mountains provide sunsets that are breathe taking – and expose a risk of land movement damages to property build on poor soils.
The economy	There have been direct and indirect impacts to the greater King County community from landslide activity. Residential housing in the greater Puget Sound area that have been built to enjoy the spectacular mountain of the Olympics and Cascade ranges and water views of Lake Washington, Lake Sammamish, and Puget Sound are vulnerable to land movement. Loss of transportation can also have economic impacts. In November 2008, 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. These incidents resulted in SBA loans to

⁸⁹ Federal Emergency Management Agency. 2018. King County Risk Report: Landslide Exposure Assessment. Page 52.

^{xx} A scenario study of seismically induced landsliding in Seattle using broadband synthetic seismograms

Allstadt, K., Vidale, J.E., and Frankel, A., 2013, A scenario study of seismically induced landsliding in Seattle using broadband synthetic seismograms, Bull. Seism. Soc. Am., 103(6), 2971-2992



	impacted businesses. The SR 530 Oso landslide caused a complete reroute of the main highway between Everett and Darrington, devastating the local economy and forcing residents to commute several hours longer to work each day.
The 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 gravel and sediment or wood for building complex in-stream habitats, estuarine marshes, and beaches that are important for fisheries, wildlife and recreation. The Cedar River was partially dammed by slide debris from the Nisqually Earthquake in 2001. Similarly, in March of 2004, a landslide near Renton partially dammed the Cedar River again. All major rivers in King County support salmon and/or steelhead spawning populations.
Health systems	No special impacts to health systems are expected from this hazard.
Government operations (continuity of operations)	Most impacts to King County delivery of essential services are indirect. Roadways closed may impede the county work force from reaching work locations. Transfer stations for solid waste management and sewer lines and lift stations feeding the Metro South Plan, West Point Treatment facility or Brightwater facility may be impacted by slide activity. Only a small number of bus routes use roadways with the potential for impacts by slide activity. Slide activity has resulted in first responder access issues and diverted road and infrastructure maintenance resources. Resulting detours have also impacted the commute of essential workers to their normal work locations. Some slide activity has caused temporary access issues for solid waste transfer stations and to the Cedar Hills Landfill locations.
Responders	Most commonly, homes are isolated and ready access to communities by first responders is impeded by slide activity. Access to schools, businesses, and public services may be impeded by road blockages from slide activity. While no recent deaths or injuries have been reported in King County from land movement, the incident in Snohomish County referred to as the SR 530 Slide or the Oso Slide, 43 people were killed (2014).
Infrastructure systems	• Power: Landslides pose some risk to transmission lines that cross unstable slopes. Otherwise, landslides are not a primary concern for this sector. • Water/Wastewater: Landslides or debris flows in and around reservoirs or waterbodies that support water systems can cause disruptions in water services and the loss of infrastructure. Water supply pipelines may cross unstable areas and be damaged by slope movement. Even if not directly impacted by earth movement, systems that pull water directly from impacted waterbodies will have to deal with increased turbidity or a loss of supply if the water is temporarily cut off by earth damming or rerouting a river. Finally, failures in water system transmission mains can actually saturate a slope and trigger landslides.



	• Transportation: Transportation routes can be closed for long periods by landslides and rockslides. The following are some documented incidents. In November 2008, 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. These incidents resulted in SBA loans to impacted businesses. In May 2005, 11 homes were isolated after a small slide on Mercer Island. That September, two lanes of I-90 west of Snoqualmie Pass were closed after a rockslide. A January 15, 1997 slide at Woodward in southern Snohomish County derailed five cars of a freight train. Passenger and cargo rail traffic was interrupted for nine days. Cargo traffic resumed first. Amtrak remained concerned for passenger safety and did not travel on this section of track for several weeks. This type incident can happen almost annually and sometime more than once each year. • Communications: There is limited risk to communications systems as a whole from landslides. Given the redundancy in systems and proliferation of cell towers, which tend to be less vulnerable, landslides are not a primary concern.
Public confidence in jurisdiction's governance and capabilities	The 2014 SR 530 Oso landslide demonstrated some of the major weaknesses in emergency management capabilities. It also demonstrated a lack of regulation and foresight on the part of government in the permitting of development in the area, which was a known slide area. Local critical areas ordinances do require mitigation for construction in slide hazard areas, but in the Oso slide, this proved to be inadequate. A failure by developers, the government, and residents to properly account for slide risk and protect people from it led to multiple lawsuits and a general lowering of public confidence in government's ability to properly regulate land development.

Regional Risk Profile: Severe Weather

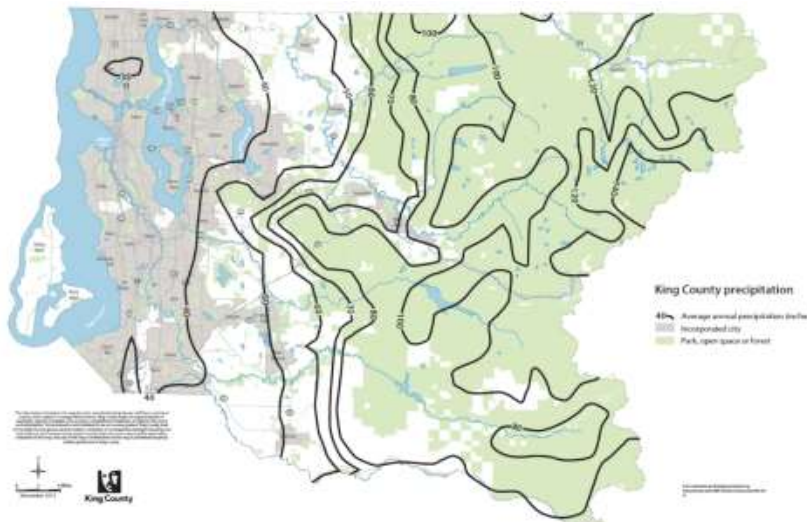
Hazard Description

Severe weather events occur annually in King County, especially between October and April. Severe weather can include heavy rain, snow, and ice; drought; extreme heat and cold; and high winds. Secondary effects of severe weather can include avalanche, flooding, landslides, power outages, and increased demand on medical services such as during extreme heat events. Many of these events are expected to increase in frequency, duration, and/or intensity as the climate changes, and new weather hazards are growing in importance, especially heat and drought. The most frequent impacts from severe weather events are in the rural or suburban parts of the county, where it can take days or weeks to clear roads or restore power; however, events such as extreme cold or heat have a greater impact on urban parts of the county, where there are large unsheltered populations.

The most common source of damaging/severe weather is the Pineapple Express or atmospheric river event. This phenomenon results from moisture picked up by the jet stream over warm areas of the Pacific Ocean that drops as intense precipitation when the moisture-laden air rises over the Olympic and Cascade Mountains. Atmospheric river events are a significant contributor to river flooding in King County.

Vulnerability Characteristics and Previous Occurrences

Though known for being wet, the Seattle metro area has around the same average annual precipitation as Dallas, Texas, and much less than New York City, Houston, Atlanta, or New Orleans. Higher amounts of rainfall occur as you move closer to the Cascades. King County owes its mild climate to the influence of Puget Sound and the Pacific Ocean, which moderate the climate, and to the protective barrier of the Cascade mountain range, which blocks cold air from the interior.





Given the rarity of extreme snow events, King County maintains a relatively low budget for snow removal services. When major incidents do occur, vehicles and drivers can be stranded almost anywhere in the county. Impacts from unusually heavy snowfalls and severe winter weather in King County tend to be short-lived, although there are exceptions. A well-known example is the 2008 winter storm, the largest event since 1996. In the 2008 'Seattle Snowpack,' snow blanketed Seattle and much of King County and remained on the ground from December 13 to December 27 due to a prolonged period of cold temperatures. At the time, Seattle did not use salt to clear roadways, due to environmental concerns. This decision was reversed after the storm event.

Climate change is a major concern for King County. Climate change is projected to lead to drier, hotter summers and more heavy rain events. The consequences of these events can include floods, landslides, avalanches, droughts, and wildfires. The economic consequences can be serious since communities generally are not prepared for extreme weather events, and some events (such as flooding and wildfire) can have widespread impacts on public and private infrastructure. Extreme weather can also affect public health. For example, some climate scenarios project that hundreds of Seattleites could die in each extreme heat event if global temperatures rise 5.4 degrees Fahrenheit over pre-industrial levels.⁹⁰

The majority of disaster declarations in King County are from severe weather events. Disasters are usually declared for a combination of severe storms or winter storms, mudslides, heavy rains, and straight-line winds. The primary impacts and costs triggering these declarations include emergency protective measures for, and damage to, utilities, roads, and bridges, and for costs associated with debris removal.

Major Weather Disaster Declarations Including King County

DECLARATION NUMBER	DESCRIPTION	FEMA-APPROVED DAMAGES (KING COUNTY ONLY)
852	1990, Jan - Flooding	\$5,246,411
883	1990, Nov - Flooding	\$3,694,824
896	1990, Dec – Flooding	\$477,737
981	1993, Jan – Inaugural Day Wind Storm	\$1,927,837
1079	1996, Jan – Winter Storm	\$3,031,519
1100	1996, Feb – Flooding	\$4,226,719

⁹⁰ Bush, Evan. June 14, 2019. Seattle unprepared for deadly heat waves made worse by global warming, researchers say. *The Seattle Times*. Accessed online on 6/17/19 from: <https://www.seattletimes.com/seattle-news/environment/heat-waves-could-kill-hundreds-more-in-seattle-as-globe-warms-researchers-say/>.



1159	1997, Jan Winter Storm	\$3,576,309
1172	1997, April – Flooding	\$1,266,446
1499	2003, Nov – Flooding	\$4,400,000
1671	2006, Nov Flooding	\$16,000,000
1682	2006, Dec – Hanukkah Eve Windstorm	\$29,000,000
1734	2007, Dec – Winter Storm	\$72,500,000
1817	2009, Jan – Winter Storm	\$17,000,000
1825	2009, Mar – Winter Storm	\$5,500,000
1963	2011, Feb – Winter Storm	\$8,697,563 (Statewide)
4056	2012, Feb – Winter Storm	\$32,345,445 (Statewide)
4309	2017, Feb – Winter Storm	\$26,612,080 (Statewide)

King County Drought Declarations

YEAR	DESCRIPTION	DESCRIPTION
1919	Water Shortage	Dry summer
1928-30	Statewide drought	Rainfall was 20% of normal
1952-53	Water shortage	Lack of winter precipitation
1977	Severe to Extreme Drought	Low Precipitation
1965-66	Water shortage	Dry throughout state
1967	Water shortage	Dry summer
2001	Moderate to Severe Drought; statewide	Low Precipitation
2005	Water shortage, March – King Co Drought Response Plan Activated	Record Low Precipitation, low snow pack, low river levels



2015	Water shortage record low snowpack	Snow pack at 0 in central Puget Sound by mid-May
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Scenario Drivers

Severe weather can occur in any season. This may include: rain, wind, tornados and funnels clouds, ice, snow, hail, extreme heat, or extreme cold. Climate change is expected to affect extreme weather incidents by changing the frequency, intensity, and/or severity of events.	
Rain and Snow Precipitation	The geographical location of northwestern Washington subjects it to several natural climatic controls: the effects of terrain, the Pacific Ocean, and semi-permanent high- and low-pressure regions located over the North Pacific Ocean combine to produce significantly different weather conditions within short distances. Rainfall in King County varies widely from city to city and area to area. The City of Seattle has an average of 37 inches annually, while Enumclaw has an annual average of 57.9 inches and Snoqualmie/North Bend has 61+ inches of precipitation. The majority of this precipitation occurs as rain in the lowlands between October and early May with substantial snow pack in the Cascades during the same time frames. Precipitation on Snoqualmie Pass in the unincorporated community of Hyak (2800 feet) average 410 inches of snowfall from October to May. Snow accumulations in King County at elevations below 2,000 feet are uncommon. On average, Seattle will have one or two snow storms during a winter season with appreciable accumulations. Snow accumulation rarely remains two days after such a storm. Heavy local snows and associated cold conditions have resulted in power outages, transportation system impacts, school closures, and adverse impacts to the regional economy.
Wind	High wind events in King County are fairly common and are usually experienced as part of a winter weather pattern. Annually, wind gusts of 40-45 miles per hour are recorded locally (NOAA) with severe wind incidents recording speeds of 90 miles per hour and greater. Winter wind incidents often include: widespread power outages, road and bridge closures, tree damage, airport closures/re-routing, hospitalizations or fatalities related to carbon monoxide poisoning, and injuries to utility workers, first responders, and the public. One of the best known wind events was the Inaugural Day Windstorm on January 19, 1993. Winds began mid-morning, lasted five hours and reached over 90 miles per hour in downtown Seattle. The Hanukkah Eve Windstorm of December 15, 2006 heavily damaged the Seattle area power grid, affecting hundreds of thousands in the subsequent weeks. Usually, these damaging winter winds are from the south.



Tornado	King County and the Puget Sound region do experience tornado activity. Tornadoes have reached F3 designation within the region, but the slower F0 and F1 class tornadoes are more common. In September of 2009 the Enumclaw area experienced a class F1 tornado. Though wind speeds of up to 110 mph were estimated, the most substantive damage recorded was the uprooting of trees and damage to roofs, much of which could be attributed to the preceding storm. Tornadoes are a result of strong weather systems and often times accompany severe wind, rain, and hail. It is not unusual to have funnel clouds spotted during the winter season.
Extreme Cold and Ice	King County's marine climate results in very few extreme cold/ice events. Regionally, temperatures below freezing occur for extended periods for 10-14 consecutive days in January or February each winter. Transportation impacts to buses, trains, roads, bridges include snow routes, shelter needs, and power outages. The December 26, 1996 storm lasted 11 days. Multiple consecutive freezing days can threaten the lives of unsheltered and lower-income individuals, requiring the opening of additional shelter beds or more heating assistance funding.
Extreme Heat	Climate change is expected to lead to warmer winters and hotter summers. Health sensitivity to heat events is higher in the Puget Sound region due to the lack of air conditioning in our region. Public Health Seattle-King County will activate cooling centers and public messaging for multiple days in the mid-80s.
Drought	With the anticipation that higher winter temperatures reduce our snowpack, drought conditions in the summer following low snowpack rises dramatically. Lower snow pack and drier summers can result in lower reservoirs and increased calls for water conservation, reduced water availability and higher mortality for salmon and steelhead runs (due to high water temperature and low river flows), impacts on local crops and livestock, and increased emergency room visits due to heat stress. Some degree of drought conditions exists where precipitation is less than 75% of normal. Drought has become a growing concern in the Northwest both because of variable rainfall patterns and because of observed increases in temperature in the summer. With a higher risk of drought and hotter temperatures, wildfire has become a higher risk for King County.

Priority Vulnerabilities

Unsheltered populations	Populations needing shelter are especially exposed during heat and cold events. Since King County has a moderate climate, many of these populations are unprepared. Cold events may require opening additional shelter spaces and canvassing areas to offer shelter services.
Rural transportation corridors	Rural transportation routes are lower priority and may not even be cleared at all during a snow event.

Immigrant populations and those with limited English proficiency	Populations with limited English proficiency or who are inexperienced with Northwestern climate are more likely to take risky actions, like operating a generator or grill indoors for heat. These populations are also less likely to receive information and warnings about weather systems and to know where to go for help.
Power transmission systems	Power transmission systems, especially power lines, are frequently damaged during storms with high winds by falling trees. During major wind events, it is not uncommon to have hundreds of thousands of residents without power.
Low-income and minimum-wage populations	Populations working in low-wage professions such as extractive industries and service industries can be severely impacted from multi-day weather events that impact transportation systems. These events can trigger a long-term decline in living standards or even homelessness in these populations.
Service industry during peak periods	Many service businesses, especially retail, are heavily dependent on income earned during certain months of the year. A major event around the Christmas holidays, for example, can threaten the viability of many businesses.
People dependent on public transportation	Public transit moved to the most restrictive routes ever recorded during the February 2019 snowstorm. These cutbacks had apparent disproportionate impacts on underserved areas, including some areas with populations dependent on transit. When transit services are cut, it can be impossible for these populations to get to work or appointments.
People with chronic medical conditions	People requiring regular care from doctors are negatively impacted by severe weather events. During heatwaves, people with chronic illnesses, especially heart and respiratory conditions, are also disproportionately impacted.
All residents during multi-day events	Although campaigns recommend having two weeks of food and supplies available, few residents follow this guidance, regardless of income. After more than a few days, many residents will run out of food for themselves and any pets.
Residents down private roads	Private roads are not eligible to be cleared by public snow removal services. Many homeowner's associations contract with the same set of snow removal companies. These companies may become overwhelmed during long-running events.



Water and wastewater systems facilities	Damage to water and wastewater facilities can occur due to a secondary hazard, flooding and tidal surge. These facilities are often built in low-lying areas. The severe damage and release of untreated water that occurred at King County's West Point Treatment Plan occurred during a severe weather event.
Buildings on slopes of greater than 40% grade	Landslides are a major secondary hazard of severe precipitation events. Buildings on or near slopes of greater than 40% grade are most at-risk.
Travelers at airport facilities	Airport facilities are frequently impacted by severe weather events, but often have plans and procedures to contain disruption. During multi-day events, however, passengers can be stranded and there can be a shortage of hotel rooms since many airlines contract with the same hotels.
Waste Management	Garbage pickup can be delayed for weeks. This causes significant public frustration.

Priority Impact Areas

King County residents	Anyone present in King County at the time of a weather incident is subject to the potential impacts of severe weather incidents. While the likelihood of a winter weather incident is high, the likely of direct and significant impacts is Moderate. Impacts to residents may include: personal property damages, interruption of sports and recreation, extension of the daily business commute, impacts to daycare and school closures, injuries, and sheltering needs from power outages. Avalanche control may be needed to reduce the impact to alpine and cross-country skiing enterprises. Injuries and deaths do occur from avalanche impacts to recreational skiers. Impacts from drought take time to materialize as water shortage cause restrictions to water usage and issue of burn bans to reduce the threat of wildfires, especially in suburban areas. Only the most severe weather incidents have an impact on local employment.
Vulnerable populations	Severe weather events, while usually concentrating impacts on infrastructure and agriculture, can seriously threaten the lives of vulnerable people. Cold and hot weather events can lead to an increase in fatalities among the elderly and homeless populations. Immigrant and low-income populations also have been known to succumb by carbon monoxide poisoning that can occur when generators or grills are lit indoors and without proper ventilation. Snow can trap people indoors for days, something especially threatening for people with food insecurity or chronic health conditions that require access to medical services. Any disruption to the economy is also especially threatening to those who are low-income or who work in hourly work or in the service

	sector. When those jobs are not open, they frequently do not pay wages, which can threaten the entire livelihood of a low-income family.
Property	All structures in the county are subject to the direct impacts of severe weather incidents. These same structures are subject to flood impacts where they may be in the flood plain. Structures along the coastline (seawalls) may be eroded. Local urban flooding also occurs from storm debris clogged sewers. High winds that accompany winter weather fronts often cause infrastructure damages, power outages, and communications interruptions. Rain saturated soils may cause mudslides that close roadways, damage bridges, and buried rail service interruptions Private property damages to homes and vehicles from floods, trees downed from wind and saturated soils are regular occurrences. Private property experiencing repeated flood damages may require elevation of the structure or offers of buy outs (mitigation efforts). High winds, snow, and icy conditions can close airports or cause flight delays and rerouting. Mountain pass conditions may be so severe that they are closed to all traffic for days at a time. The floating bridges over Lake Washington (I-90 and SR 520) experience closures for sustained winds over 45 miles per hour. These closures extend the business commute with increased traffic on surface streets and routes around Lake Washington. Impacts to emergency medical services from impacts to the roadways of the county can delay response times, restrict emergency room staff and supplies, and result in under staffing EMS and hospitals during severe weather emergencies.
The economy	There are several local ski areas important to King County: Crystal Mountain (Chinook Pass); Alpental, Hyak, and Ski Acres (Snoqualmie Pass); and Steven's Pass (Steven's Pass). Ski area closures can occur from both large snowfalls and where snow is too light or melts off. This can impact seasonal employment at the ski areas. Also associated with the passes, as outlined in the avalanche chapter, a WSDOT study claimed that a four-day closure at Snoqualmie Pass in the winter of 2007/2008 cost the state \$27.9M in economic output, 170 jobs, and \$1.42M in state revenue (2008 dollars). Businesses can be severely impacted when weather events impede mobility during high seasons, such as around the holidays. Since a large percentage of

	annual personal spending is spent during the November-December season, negative weather limits access to stores and can cause stores to close. Drought conditions can impact the regional agricultural output of fruits, vegetables, and flowers grown in all the major river basin areas of King County. Regional drought conditions can impact generation of hydroelectric power and drive up electric rates as well as increase usage during hot summers. The most serious and longest-lasting impacts may be to low-income individuals and families who may lose jobs or days of wages due to snow closures. Debt traps caused by missed bills due to lost wages can damage a family for months or years.
The environment	Severe weather can have impacts to the environment through flooding and floodplain damages to salmon and steelhead habitat, wetland impacts to amphibians and reptiles, and bird sanctuaries. Oddly, this can occur from both too much water (flooding or dam failure) or too little snow pack and resulting drought conditions. Hillside destabilization can occur where soil geology and saturation of soils occur. The moisture content of vegetation drops throughout the summer. Dry conditions can result in an increase in the threat of wildfires from lightning strikes, unattended campfires, fireworks, sparks from automobiles, cigarettes thrown from cars on roadways and other heat sources. The dilemma of drought conditions is the balance between human water needs and the protection of the environment including plants, wildlife, and fish that require minimum stream flows to support their annual spawning migrations. Dry conditions also contribute to higher water temperatures, which causes increased salmon mortality.
Health systems	Severe weather disrupts the regular schedule of patient visits and regularly-scheduled appointments for chronic care. Severe weather also can cause more demand on the health system as people are injured or are unable to leave the hospital to return home. Any disruptions to electricity and water supply also can be a threat, though hospitals generally maintain backup generators. During severe cold or warm spells, public health may be required to provide additional patient transport services and to canvass for homeless populations that may be in need of shelter. During the February 2019 snowstorm, hospitals suffered major staffing shortages as doctors and nurses were unable



	to get to work. Staff had to work longer than normal hours and potentially stay temporarily at or near the hospital. Although both requiring the expansion of sheltering services, heat and cold differ because older and less health populations are especially at risk to hot temperatures. One of the most famous examples is the 1995 Chicago heat wave, during with 739 people lost their lives, with the city unprepared to provide support to residents who may be home bound or offer sufficient cooling centers to support residents. In Seattle, where few residents have air conditioners, deaths from heat events is a growing threat.
Government operations (continuity of operations)	During the February 2019 snowstorm, King County took the unprecedented step of closing many government offices to protect employee safety. After two days, due to the growing amount of snow and the need to resume services, offices were reopened. Even with the reopening, many employees chose to telework due to safety concerns. An earlier activation of the EOC for the 1996 snow/ice storm saw activations for 11 days – 2 shifts per day when 16 inches of snow came and stayed for weeks. During that time frame, buses were on snow routes, up to 40% of the employees for King County government were either unable to get to work or arrived very late. A major improvement from 1996 to 2019 is that it is now much easier to telework, meaning that non-public-facing positions can work remotely for days. Hospitals, courts, detention facilities, businesses, law enforcement, fire and emergency medical services were all severely impacted. Search and Rescue volunteers transported medical personnel, emergency management staff, and other essential employees to work and between hospitals for the duration of the incident. During the February 2019 snowstorm, busses were on the most restrictive service routes ever seen. These routes were established in response to previous snow events. Similar impacts were observed for the January 2011 snow storm that impaired King County government operations for 8 days. Some damages were experienced at crucial facilities around the county. See FEMA Disasters 1079 and 1817 above. The recent February 2019 snowstorm did not receive a disaster declaration. During that time frame, most regional public services were impacted by absenteeism, access restrictions to critical facilities, and damage to vehicles like buses, police cruisers, and aid units. Busses and other vehicles that use tire chains are especially vulnerable to breaking down, which can delay a return to full service, even once the snow has melted.
Responders	Portions of the population may be stranded or isolated from the results of severe weather, like roads blocked by trees and power lines, snow- and ice-



	covered roads, water or slides over roadways. Closure of the mountain passes for heavy snow conditions or avalanche control is a fairly common occurrence. Excessive heat that extends over days or weeks or cold conditions for similar timeframes may result in the need for cooling or warming shelters. These especially impact the poor, elderly, young, and infirmed. First responders will be impacted by limited road access, impacts of heat and cold on operations. Conditions will require monitoring efforts during incident response.
Infrastructure systems	• Power: Downed trees caused by high winds and rain saturated soils can damage transmission lines and cause power outages in local areas for hours to days when multiple occurrences are experienced. Utility crews from Puget Sound Energy, Bonneville Power and Seattle City Light work around the clock to restore services. The Inaugural Day Windstorm left 750,000 customers without power. The Hanukkah Eve Windstorm winds and subsequent heavy rains cut electricity to more than 1.8 million customers, hundreds of thousand remained without power for days. Downed power lines pose an electrocution hazard to motorists, pedestrians and any unsuspecting by-standers. During extremely hot temperatures, demands on the power system can increase, especially as more residents install air conditioning. As a winter-peaking system, however, this power demand will still likely be lower than current winter demand. • Water/Wastewater: Water and wastewater systems are vulnerable to a multi-day loss of power as well as to serious flooding. In February 2017, as a result of heavy rains, high tides, and other severe weather, an equipment failure at King County's West Point Wastewater Treatment Plan led to the dumping of over 235 million gallons of untreated wastewater into Puget Sound. Drought can also impact water systems as water levels in reservoirs and groundwater wells drop. • Transportation: Events that impact transportation can include severe snow, ice, wind, and rain. Storms may cause downed trees and snow or ice that temporarily blocks roadways or can cause large floods that can wash out or undermine roads and bridges. For many parts of the state and county, such as around the town of Skykomish, the loss of a single route due flooding can completely cut the community off from the rest of the county. This is especially a problem in the eastern parts of the county that are more rural and have fewer transportation route options. • Communications systems can be knocked out by high winds or loss of power transmission. While the move to cell phones has reduced the vulnerability of telephone lines to outage caused by trees, a multi-day loss of power can still shut down a cell transmission site. Furthermore, high winds can damage or destroy critical equipment



	on cell towers. Most equipment is built to withstand inclement weather; however, especially severe conditions could still lead to outages.
Public confidence in jurisdiction's governance and capabilities	The 2008 and 2011 snowstorms highlighted the shortage of snowplows and the management of the general response to the snow incident in the City of Seattle. The February 2019 event can be regarded by many as much more successful on the public perception front. Successful coordination of a regional call center in the EOC to support other county departments and take snow plowing requests helped ensure the public always had someone to call. The county also maintained substantial engagement with media outlets. The County Executive was fully involved as well, helping to boost awareness and public perception that county government was engaged in the storm recovery effort.

Regional Risk Profile: Terrorism

Hazard Description

Title 18 of the United States Code defines terrorism and lists the crimes associated with terrorism. In Section 2331 of Chapter 113(B), defines terrorism as: "...activities that involve violent... or life-threatening acts... that are a violation of the criminal laws of the United States or of any State and... appear to be intended (i) to intimidate or coerce a civilian population; (ii) to influence the policy of a government by intimidation or coercion; or (iii) to affect the conduct of a government by mass destruction, assassination, or kidnapping; and...(C) occur primarily within the territorial jurisdiction of the United States..." . Within the government, combating terrorism is the Federal Bureau of Investigation's top investigative priority. The FBI further defines terrorism as either domestic or international:

- Domestic terrorism: Perpetrated by individuals and/or groups inspired by or associated with primarily U.S.-based movements that espouse extremist ideologies of a political, religious, social, racial, or environmental nature.
- International terrorism: Perpetrated by individuals and/or groups inspired by or associated with designated foreign terrorist organizations or nations (state-sponsored).

The terrorism threat has evolved significantly since the September 11, 2001 series of coordinated attacks by the Islamist terrorist group al-Qaeda against the United States. The threat landscape (referring to identified threats, trends observed, and threat actors) has expanded considerably. Three factors have contributed to the evolution and expansion of the terrorism threat landscape:⁹¹

- Internet: International and domestic threat actors have developed an extensive presence on the Internet through messaging platforms and online images, videos, and publications, which facilitate the groups' ability to radicalize and recruit individuals receptive to extremist messaging.
- Social Media: Social media has allowed both international and domestic terrorists to gain unprecedented, virtual access to people living in the US in an effort to enable homeland attacks. Islamic State of Iraq and Syria (ISIS), in particular, encourages sympathizers to carry out simple attacks where they are located against targets—in particular, soft targets. This message has resonated with supporters in the US and abroad. Several recent attackers have claimed to be acting on ISIS' behalf.
- Homegrown Violent Extremists (HVEs): The FBI defines HVEs as global-jihad-inspired individuals who are based in the US, have been radicalized primarily in the US, and are not directly collaborating with a foreign terrorist organization (FTO). HVEs may assemble in groups but typically act independently in attacks or other acts of violence.

⁹¹ Federal Bureau of Investigation. 2019. Terrorism Webpage. Accessed online on 8/26/19 from <https://www.fbi.gov/investigate/terrorism>.



Domestic terrorists can be 'right-wing' or 'left-wing' extremists such as white supremacists, anti-government militias or anarchists. Domestic terrorists can also be 'single-issue' groups such as animal rights or environmental rights extremists. And, domestic terrorists can also be 'lone wolves' with a personal agenda or grievance and prepares, commits violent acts alone outside of any group support.

According to FBI Director Senate testimony in July 2019, the bureau has recorded about 100 domestic terrorism arrests since December 2018 compared to about 100 international terrorism arrests.⁹² The FBI, according to the director's testimony, is most concerned with "lone offender attacks, primarily shootings." Earlier, at a congressional hearing in May 2018, the head of the FBI counterterrorism division testified that the bureau was investigating 850 domestic terrorism cases and of that approximately 350 of the cases involved racially motivated violent extremists⁹³. Most in that group, he said, were white supremacists.

In 2015, the Seattle division of the FBI revealed 70-100 active cases possibly linked to terrorism across the state.⁹⁴ In the years since revealing the breadth of terrorism investigations in Washington State, domestic terrorism arrests outpaced jihad-inspired terrorism arrests nationwide.⁹⁵ The US government acknowledged the problem in its October 2018 'National Strategy for Counterterrorism'. "Notably, domestic terrorism in the United States is on the rise, with an increasing number of fatalities and violent nonlethal acts committed by domestic terrorists against people and property," the strategy paper says.⁹⁶

Vulnerability Characteristics and Previous Occurrences

Terrorism events can be distinguished from other types of man-made hazards by three important considerations:⁹⁷

⁹² Zapotosky, Matt. July 23, 2019. Wray says FBI has recorded about 100 domestic terrorism arrests in fiscal 2019 and many investigations involve white supremacy. *The Washington Post*. Accessed online on 8/26/19 from https://www.washingtonpost.com/national-security/wray-says-fbi-has-recorded-about-100-domestic-terrorism-arrests-in-fiscal-2019-and-most-investigations-involve-white-supremacy/2019/07/23/600d49a6-aca1-11e9-bc5c-e73b603e7f38_story.html.

⁹³ Zapotosky, Matt. July 23, 2019. Wray says FBI has recorded about 100 domestic terrorism arrests in fiscal 2019 and many investigations involve white supremacy. *The Washington Post*. Accessed online on 8/26/19 from https://www.washingtonpost.com/national-security/wray-says-fbi-has-recorded-about-100-domestic-terrorism-arrests-in-fiscal-2019-and-most-investigations-involve-white-supremacy/2019/07/23/600d49a6-aca1-11e9-bc5c-e73b603e7f38_story.html.

⁹⁴ Kim, Hana. December 11, 2015. FBI investigating 70 to 100 cases in Washington State with possible ties to terrorism. *Q13 Fox News*. Accessed online on 8/26/19 from <https://q13fox.com/2015/12/11/fbi-investigating-up-to-a-100-cases-possibly-linked-to-terrorism-in-washington/>.

⁹⁵ Barrett, Devlin. March 9, 2019. Arrests in domestic terror probes outpace those inspired by Islamic extremists. *The Washington Post*. Accessed online on 8/26/19 from https://www.washingtonpost.com/world/national-security/arrests-in-domestic-terror-probes-outpace-those-inspired-by-islamic-extremists/2019/03/08/0bf329b6-392f-11e9-a2cd-307b06d0257b_story.html.

⁹⁶ Dilanian, Ken. August 9, 2019. There is no law that covers 'domestic terrorism.' What would one look like? *NBC News*. Accessed online on 8/26/19 from <https://www.nbcnews.com/politics/justice-department/there-no-law-covers-domestic-terrorism-what-would-one-look-n1040386>.

⁹⁷ Mid-America Regional Council. 2015. *Regional Multi-Hazard Mitigation Plan*. Accessed online on 8/26/19 from https://www.marc.org/Emergency-Services-9-1-1/pdf/2015HMPdocs/HMP2015_Sec4-HAZ-Terrorism.aspx.



- 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.
- Terrorist events evoke very strong emotional reactions, ranging from anxiety, to fear to anger, to despair to depression.
- Even failed attacks have long-term economic impacts for the targeted government and critical infrastructure sector disproportionate to the cost of the attack itself.

The form and locations of many natural hazards are identifiable and, even in some cases, predictable; however, there is no defined geographic boundary for terrorism. Based on previous historical events, it is presumed that critical facilities, services, and large gatherings of people are at higher risk.

King County is the most populous county within Washington State and is ranked 12th most-populous in the US according to the US Census Bureau. King County is geographically diverse characterized by high-density urbanization along the shores of Puget Sound, suburban communities to the east, and rural communities to the southeast. King County is the largest labor market in the state. In 2018, nearly 42 percent of all nonfarm jobs in Washington State were reported from King County-located businesses. Within King County, the Washington State Fusion Center tracks over 800 annual large-gatherings that encompass public assembly and outdoor events. These events include a diverse range of sites that draw large crowds of people for shopping, business, entertainment, sports or lodging, as well as for fireworks, marathons, festivals and parades.

English-language terrorist media continues to identify similar gatherings as “soft targets” and promote them as potential attack sites. For example, Inspire #12 magazine published online by Al Qaeda, suggested targeting locations “flooded with individuals, e.g., sports events . . . election campaigns, festivals, and other gathering [sic]. The important thing is that you target people and not buildings.”⁹⁸ Attacks targeting these types of events will continue to present security challenges to public safety personnel, because attendees are anonymous and generally unscreened for prohibited items. Violent extremist propaganda continues to urge lone actors to attack soft targets using small arms, knives, and vehicles because they are simple and effective. Foreign terrorist organizations implore followers to kill with whatever means available “whether an explosive device, a bullet, a knife, a car, a rock, or even a boot or a fist.”⁹⁹

Prior to the attacks on September 11, 2001, there were less than a dozen major terrorist events in Washington State. Since then, violent extremism has become commonplace, on a global and national

⁹⁸ National Counterterrorism Center. 2018. Planning and Preparedness Can Promote an Effective Response to a Terrorist Attack at Open-Access Events. Accessed online on 8/26/19 from <https://www.dni.gov/files/NCTC/documents/jcat/firstresponderstoolbox/First-Responders-Toolbox---Planning-Promotes-Effective-Response-to-Open-Access-Events.pdf>.

⁹⁹ Farivar, Masood. July 18, 2016. New, Low-tech Terror Tactics Simple and Deadly. *Voice of America*. Accessed online on 8/26/19 from <https://www.voanews.com/europe/new-low-tech-terror-tactics-simple-and-deadly>.



scale, and the number of local terrorism and violent extremism cases continue to rise.¹⁰⁰ Some of the most notorious terror cases in Washington State include the arrest of Ahmed Ressam, the “Millennium Bomber,” in December 1999, the Earth Liberation Front (ELF) firebombing of University of Washington’s (UW) horticulture center in May 2001, and the foiled Seattle Military Entrance Processing Station attack plot in 2011.

- On March 26, 2018, Thanh Cong Phan from Everett was arrested after mailing at least 11 suspicious packages to multiple military and government facilities in the Washington, D.C. metropolitan area, which contained potential destructive devices. He was charged with shipping of explosive materials, after the packages were found to contain small amounts of black explosive powder.¹⁰¹
- On March 31, 2017, Muna Osman Jama of Reston VA and Hinda Osman Dhirane of Kent WA were sentenced to 12 years and 11 years respectively, after being found guilty of conspiracy to provide material support to al-Shabaab. The two reportedly organized an all-female fundraising group, called the “Group of Fifteen,” who provided monthly payments to al-Shabaab; facilitating and tracking money sent through conduits in Kenya and Somalia.¹⁰²
- On August 25, 2017, Melvin Neifert from Selah was arrested and charged with receiving incendiary explosive device materials—specifically, potassium nitrate and other materials to make a potassium nitrate-sugar bomb—that were to be used in connection with the 2016 May Day events. Federal authorities seized evidence and questioned Neifert on May 1, the same day anti-capitalist demonstrations took place in Seattle.¹⁰³
- On September 4, 2016, a fire was intentionally set at the Planned Parenthood clinic in Pullman, WA. Authorities recovered a video from inside the clinic showing a flammable object had been thrown through the window. While no injuries were reported, and no suspects identified, there is a history of domestic terrorism against the Pullman clinic.¹⁰⁴
- On April 9, 2015, Blake Heger was arrested after attempting to place two shrapnel-laden pipe bombs near a high foot-traffic area outside a hardware store in Puyallup, WA. Police were called after a concerned citizen saw him sharpening large knives in the parking lot. He was found with

¹⁰⁰ United Nations Development Programme. 2016. Prevent Violent Extremism Through Promoting Inclusive Development, Tolerance and Respect for Diversity. Accessed online on 8/26/19 from <https://www.undp.org/content/dam/norway/undp-ogc/documents/Discussion%20Paper%20-%20Preventing%20Violent%20Extremism%20by%20Promoting%20Inclusive%20%20Development.pdf>.

¹⁰¹ Shayanian, Sara. March 28, 2018. Man charged with sending explosives to D.C. military sites. *United Press International*. Accessed online on 8/26/19 from https://www.upi.com/Top_News/US/2018/03/28/Man-charged-with-sending-explosives-to-DC-military-sites/5591522255789/.

¹⁰² Department of Justice. Friday, March 31, 2017. Two Women Sentenced for Providing Material Support to Terrorists. Accessed online on 8/26/19 from <https://www.justice.gov/opa/pr/two-women-sentenced-providing-material-support-terrorists>.

¹⁰³ Meyers, Donald W. August 31, 2016. Bail decision delayed in Selah explosives case. *The Seattle Times*. Accessed online on 8/26/19 from <https://www.seattletimes.com/seattle-news/crime/bail-decision-delayed-in-selah-explosives-case/>.

¹⁰⁴ The Associated Press. September 10, 2015. Video shows object thrown in Planned Parenthood arson. *The Seattle Times*. Accessed online on 8/26/19 from <https://www.seattletimes.com/seattle-news/video-shows-object-thrown-in-planned-parenthood-arson-in-pullman/>.



two additional pipe-bombs, four large knives, and a screwdriver that he had sharpened into a dagger.¹⁰⁵

- On January 1, 2014, Musab Masmari attempted to set fire to a gay nightclub on Capitol Hill in Seattle, WA by spilling gasoline down a set of stairs and lighting it, while 750 people packed the club's New Year's Eve event. According to investigative documents, Masmari told a friend that "homosexuals should be exterminated." In July 2014, he was sentenced to ten years in federal prison for arson.¹⁰⁶
- On July 18, 2014, Ali Muhammad Brown was arrested after killing four people in WA and a college student in NJ, as part of a personal vengeance against the U.S. government for its actions in the Middle East. In 2004, he was arrested and prosecuted for his role in a bank fraud scheme to finance fighters traveling abroad, and had known links to a disrupted terror cell in Seattle, WA and Bly, OR in 1999.¹⁰⁷
- On October 27, 2012, Abdisalan Hussein Ali, a 22-year old born in Somalia but raised in Seattle and Minnesota, was the third American killed as an al-Shabaab suicide bomber in Mogadishu. Ali was reportedly one of two bombers in an attack that killed "scores of African Union peacekeepers." He arrived in Seattle in 2000 and moved to Minneapolis before being recruited into al-Shabaab and travelling to Somalia in 2008.¹⁰⁸
- On September 8, 2011, Michael McCright was arrested and charged with second-degree assault for a July 2011 incident where he intentionally swerved his vehicle at a government-plated vehicle occupied by two U.S. Marines in Seattle. Known on the Internet as "Mikhail Jihad," McCright had ties to Abu Khalid Abdul-Latif, a man convicted of plotting to kill federal employees and military recruits in Seattle, WA.¹⁰⁹
- On June 22, 2011, Abu Khalid Abdul-Latif and Walli Mujahidh were arrested for planning to attack the Military Entrance Processing Station (MEPS) in Seattle with machine guns and grenades after previously planning, but discounting, an attack at Joint Base Lewis McChord (JBLM). According to FBI investigators, "Abdul-Latif said that 'jihad' in America should be a 'physical jihad,' and not just 'media jihad'."¹¹⁰
- On May 11, 2011, Joseph Brice of Clarkston WA was arrested for assembling, practicing, and detonating explosive devices after an incident that occurred on April 18, 2010, when an

¹⁰⁵ McCarty, Kevin. August 10, 2015. Man arrested after 2 bombs discovered outside Pierce County hardware store. *KIRO 7*. Accessed online on 8/26/19 from <https://www.kiro7.com/news/man-arrested-after-two-bombs-discovered-outside-pi/28802706>.

¹⁰⁶ Carter, Mike. July 31, 2014. Man who set fire in Capitol Hill nightclub sentenced to 10 years. *The Seattle Times*. Accessed online on 8/26/19 from <https://www.seattletimes.com/seattle-news/man-who-set-fire-in-capitol-hill-nightclub-sentenced-to-10-years/>.

¹⁰⁷ Collins, Laura. September 18, 2014. Revealed, one man's terrifying 'jihad' on U.S. soil: Extremist 'executed four in revenge for American attacks in the Middle East and carried out bank fraud for the Cause'. *Daily Mail Online*. Accessed online on 8/26/19 from <https://www.dailymail.co.uk/news/article-2759901/Revealed-terrifying-one-man-jihad-U-S-soil-Extremist-executed-four-revenge-American-attacks-Middle-East-carried-bank-fraud-Cause.html>.

¹⁰⁸ Kron, Josh. October 30, 2011. American Identified as Bomber in Attack on African Union in Somalia. *The New York Times*. Accessed online on 8/26/19 from https://www.nytimes.com/2011/10/31/world/africa/shabab-identify-american-as-bomber-in-somalia-attack.html?_r=0.

¹⁰⁹ Carter, Mike. May 29, 2012. Felon admits he tried to run Marines off I-5. *The Seattle Times*. Accessed online on 8/26/19 from <https://www.seattletimes.com/seattle-news/felon-admits-he-tried-to-run-marines-off-i-5/>.

¹¹⁰ The Associated Press. June 5, 2012. Seattle terror suspect wants evidence tossed. *Fox News*. Accessed online on 8/26/19 from <https://www.foxnews.com/us/seattle-terror-suspect-wants-evidence-tossed#ixzz28jz1MkOE>.



explosive device he made prematurely ignited, causing him significant injuries. He had a YouTube channel called “Strength of Allah,” where he posted the videos in an attempt to support terrorism.¹¹¹

- On January 17, 2011, Kevin Harpham, an admitted white supremacist, placed a remote-controlled backpack improvised explosive device (IED), with rat-poison coated shrapnel, at a park bench near the marching route on the morning of the Martin Luther King Jr. Day Parade in Spokane, WA. Prosecutors said the device was “constructed with a clear, lethal purpose,” and Harpham said it was intended to protest social concepts, such as unity and multiculturalism.¹¹²

Scenario Drivers

Terrorist attacks continue to take place at open-access events, mass gatherings, and outside the perimeter of secured events, possibly because of a perceived lack of security, the availability of publicized schedules, and largely unrestricted admittance. Examples of open-access events include marathons, parades, protests, rallies, festivals, fireworks displays, farmers markets, and high-profile funerals and vigils or memorials. Terrorists could also target gatherings located close to ticketed events, such as tailgating adjacent to major sporting events or concerts¹¹³. Judging from previous terrorist plots and attacks, terrorists will likely remain interested in conducting opportunistic attacks against civilian targets, most notably mass gatherings. Techniques used in recent terror attacks have included the use of vehicles as weapons, edged weapons, small arms, and improvised explosive devices (IEDs).

Coordinated
Domestic
Extremist
Attack on
Seattle

The radicalization of Pacific Northwest extremist groups has recently been promoted by other national terrorism movements which have called for violent resistance to destroy human life and disable critical infrastructure. Radicalization starts to build in the Winter of 2018. Over the next six months there is an increase in expression of on-line animosity towards the U.S. Government which calls for action on June 24. In recent weeks there has been an increase via social media of on-line extremist groups indicating an intense animosity and a belief of injustice by the U.S. Government. These local online indicators show lone actors, inspired by extremist ideology, have been able to circumvent security measures to take up small arms, make vehicle borne and rudimentary standalone improvised explosive devices (IEDs) with the stated intent to attack the Region. In addition, there are calls for “Leaderless Resistance” making it difficult to locate, mitigate, or prevent their stated intent. Within the Seattle Region, there is increasing concern about a number of these groups starting to influence public opinion, which may lead to violent actions. The on-line information promotes and warms of the need for longer and ongoing

¹¹¹ Pignolet, Jennifer. Wednesday, June 12, 2013. Clarkston man convicted of trying to aid terrorists *The Spokane Spokesman-Review*. Accessed online on 8/26/19 from <https://www.spokesman.com/stories/2013/jun/12/bomb-maker-sentenced/>.

¹¹² Clouse, Thomas. December 20, 2011. MLK bomb maker gets 32 years in prison. *The Spokane Spokesman-Review*. Accessed online on 8/26/19 from <https://www.spokesman.com/stories/2011/dec/20/mlk-parade-bomber-seeks-guilty-plea-withdrawal/>.

¹¹³ National Counterterrorism Center. 2018. Planning and Preparedness Can Promote an Effective Response to a Terrorist Attack at Open-Access Events. Accessed online on 8/26/19 from <https://www.dni.gov/files/NCTC/documents/jcat/firstresponderstoolbox/First-Responders-Toolbox---Planning-Promotes-Effective-Response-to-Open-Access-Events.pdf>.



acts of violence to achieve superiority over current government authority. On July 3, there are several online attacks which a precursor to the July 4th physical attacks on an iconic building are, multiple active shooter events, vehicle borne violence and IEDs, and unattended small items across the City of Seattle and surrounding areas.

Priority Vulnerabilities

Public events	Terrorists have increasingly targeted mass-gatherings in densely populated or high profile areas. Consequently any major urban area in Washington State could be considered at-risk as well as any crowded or high profile critical infrastructure. The specific motivations of terrorists will largely dictate target selection.
Terror tactics used by non-terrorists	A new challenge that is emerging is the increasing use of terror tactics by non-terrorists. A number of evolved weapons, tactics, and targets have emerged through the sheer volume of attacks within the last decade. This normalization of violence has been further exacerbated by extensive media coverage and the ease by which detailed instruction manuals, 'how-to' videos, and online forums dedicated to weapons, explosives, and tactics. It is "essentially shared community content, easily accessible for extremists of all stripes to consume and put into action" including those with no affiliation to foreign or domestic extremism ideologies. ¹¹⁴ Lessons learned from past attempts continue to shape the means by which attackers develop plots—the push for using small arms, edged-weapons and vehicle ramming against soft targets—instead of the often failed large-scale attacks.
Critical infrastructure	Infrastructure systems such as dams, water systems, bridges, and public buildings are high-value targets to terrorists that both stand for government order and, when lost, can cause significant regional harm to people, property, and the economy.

Priority Impact Areas

King County residents	Any King County resident attending a public event could be a victim of a terrorist attack.
Vulnerable populations	Some populations are more likely to be targeted by extremists than others. Terrorist attacks and attempted attacks in the northwest have been motivated by white supremacy (targeting non-white populations), xenophobia (targeting immigrants), homophobia/transphobia (targeting gathering places of gay, lesbian, and transgendered people), and anti-religious attacks against Muslims, Jews, Christians, or other religious groups.

¹¹⁴ Johnson, Bridget. March 21, 2018. The Austin bomber and our new age of open-source terrorism: How Mark Anthony Conditt likely benefited from Al Qaeda tutorials. *The New York Daily News*. Accessed online on 8/26/19 from <http://www.nydailynews.com/opinion/austin-bomber-new-age-open-source-terrorism-article-1.3888244>.



Property	Property, including commercial buildings, venues, vehicles, places of worship, or other areas are often damaged or destroyed during terror incidents. Trauma from the incident can prevent the rebuilding of the facility in the same place.
The economy	In addition to the economic costs of stepped-up security, attacks can have a huge impact on a region's economy. Places seen as less safe are less attractive to investors or visitors. Often, terrorist attacks attempt to destroy part of the economy by killing tourists or destroying an important piece of infrastructure.
The environment	A major attack can pollute the environment and poison water and food sources. This can have far-reaching, long-term consequences and damage animal and plant life as well as people.
Health systems	Health systems can be impacted as a target for attacks, by being overwhelmed with patients in the aftermath of attacks, and by personnel being injured or killed from secondary attacks or due to exposure to chemical or biological agents used in the attack.
Government operations (continuity of operations)	Government facilities and employees are a common target for anti-government extremists. These attacks can disrupt day-to-day operations for long periods of time and require additional security measures to protect facilities and employees.
Responders	Responders are often the first on the scene of an incident and therefore can be injured or killed in shootings or due to exposure of chemical or biological agents. Responder facilities, such as police stations, are also potential terrorist targets.
Infrastructure systems	• Energy: Energy facilities, including fuel pipelines, are common targets for terrorists and saboteurs around the world. Many power facilities, such as neighborhood substations, are relatively unguarded and, if lost, can have immediate impacts on people and property in an area. Cyber-attacks are one area where a large-scale attack on the energy system could cause widespread disruption. • Water/Wastewater: Water systems are considered a high-impact potential target. A chemical attack on a water system, if not immediately detected, could injure or kill thousands, depending on the size of the water-system targeted. • Transportation: transportation systems, especially public transit, have been targets around the world, such as in the Madrid Train Bombings or the London Subway Bombings. Attacks on busses are also common. These incidents can cause a loss in public confidence in the transit system. Furthermore, an attack on a tunnel, such as the I-90 tunnel across Lake Washington, can impede mobility in our region over the long-term. • Communications: Communications infrastructure, such as cell towers, are relatively redundant and so somewhat less vulnerable to terrorist attacks. There is a huge vulnerability, however, to cyber-terrorism, which can take multiple facilities offline quickly.



Public confidence in jurisdiction's governance and capabilities	A failure to protect the public from a terrorist attack, even one that is thwarted at the last moment, can cause a total failure in public confidence in government. As seen after 9/11/2001 or after attacks by white supremacists against African-American or Jewish congregations, groups begin to feel isolated, threatened, and isolated from the community. This is especially true in cases where government fails to quickly reassure impacted communities and support them morally and with security resources.
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Regional Risk Profile: Tsunami and Seiche

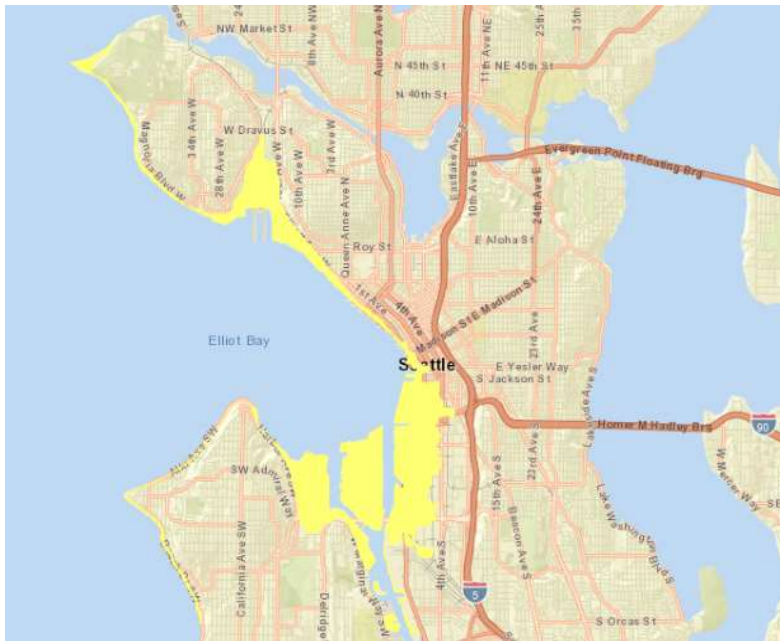
Hazard Description

A tsunami is a series of fast, powerful, and destructive waves that radiate outward in all directions from the source. Tsunamis are usually caused by a displacement of the ocean floor from an earthquake or the collapse of an underwater land feature. Seiches are waves that form in any enclosed or semi-enclosed body of water (i.e. lakes, bays, and rivers) from wind, atmospheric pressure, or seismic waves. Seiche action can also affect harbors and canals.

The primary tsunami threat in King County is from a Seattle fault earthquake, or other events originating in the Puget Sound Lowlands (such as big landslides into the water and possibly other faults). Not all of King County has been modeled for tsunami hazards but scientists are actively working on it. The tsunami inundation (flooding) impacts from a magnitude 7.3 Seattle fault event are shown below in yellow:¹¹⁵ In addition to the Seattle fault, a Pacific ocean sourced tsunami, like a Cascadia Subduction Zone event, can still affect King County. Wave arrival times for a Seattle fault and Cascadia-derived tsunami are extremely different. In a Seattle fault event, the first wave arrives within minutes, where in a Cascadia event, the first wave will arrive in approximately 2 hours and 20 minutes. In both cases, wave action will persist for multiple hours. An earthquake on the Seattle Fault could generate a seiche in Lake

Washington or Lake Sammamish that could impact cities including Sammamish, Kenmore, and Kirkland.

There can also be significant maritime hazard along the western United States' coastlines associated with smaller tsunamis. A tsunami from a local Seattle fault event would cause major damage to port infrastructure and navigational terminals. Additionally, powerful distant tsunamis generated across the Pacific Ocean



¹¹⁵ Washington Geologic Survey. Geologic Hazards Information Portal. Accessed online on 6/11/19 from <https://geologyportal.dnr.wa.gov/>.



can cause maritime hazards in the Puget Sound. Although these distant-sourced events generate relatively smaller tsunamis than local-sourced events, there waves can still cause damage to boats, docks, piers, and aids to navigation (e.g. channel markers, lighthouses, warehouses and port terminals used for loading and unloading cargo ships). Moored boats and vessels underway in the harbor may also be impacted by smaller distant-sourced tsunamis. For example, the 2011 earthquake off the coast of Japan caused a relatively small eight-foot tsunami in Crescent City, California, which led to one hundred million dollars in damaged boats and infrastructure. Anything near the shoreline that has the potential to float or be moved by the wall of water can be carried away – ramming into other structures.

Vulnerability Characteristics and Previous Occurrences

King County includes the deep-water Port of Seattle and several cities that border Puget Sound, including Shoreline, Seattle, Burien, Des Moines, and Federal Way. Together with Vashon Island, unincorporated King County includes a great deal of industry, import/export activity, and commercial and residential real estate that border bodies of water. These key waterfront areas are vulnerable to a tsunami or seiche generated from an earthquake up to hundreds, if not thousands of miles distant from King County.

The most significant documented risks are to port transportation and industrial facilities in the Seattle waterfront and Magnolia. It is likely a tsunami would impact docks, harbors, and other water-dependent facilities in communities such as Des Moines and Burien too. The consequences of a tsunami to the Port of Seattle would likely be catastrophic, causing permanent to semi-permanent harm to the region's economy. As described in the earthquake chapter, damage from the Kobe, Japan earthquake in 1995 led to a permanent reduction in the scale and importance of that port.

The table below summarizes the identified tsunami hazard area, the City of Seattle, following a magnitude 7.3 Seattle fault earthquake. Approximately 0.6 percent of structures within the city are exposed to a Seattle fault earthquake-induced tsunami, totaling an estimated value of \$5.1 billion (3.5 percent of the total building value within the city).¹¹⁶ The modeling to show potential impacts from a Seattle fault tsunami or a Cascadia tsunami for the remaining communities in King County is not yet complete.

City of Seattle Tsunami Exposure Assessment – Seattle Fault Scenario

STRUCTURES EXPOSED	EXPOSED BUILDING AND CONTENT VALUE	PERCENT OF EXPOSED VALUE
969	\$5.1 Billion	3.5%

Geologic evidence of previous shallow crustal fault-induced tsunami events has been recorded in the Puget Sound at Cultus Bay on Whidbey Island and at West Point in Seattle.¹¹⁷ This evidence suggests the last tsunami occurred around 900 AD when the local Seattle fault raised some landmasses around

¹¹⁶ Federal Emergency Management Agency. 2018. King County Risk Report: Tsunami Exposure Assessment. Page 58.

¹¹⁷ Moore, Andrew. Looking for paleotsunami evidence: an example from Cultus Bay, Washington. Accessed online on 6/11/19 from https://serc.carleton.edu/integrate/workshops/risk_resilience/activities/82019.html.



the Puget Sound shoreline by as much as 26 feet. A scientific study focused on seismic activity on the Seattle fault within the last 8,000 years found evidence for an additional earthquake that occurred ~6,900 years ago. This suggests a low probability of a large earthquake to occur on the Seattle fault as the recurrence interval could be thousands of years. Since 900 AD, tsunami waves in King County have been less than 18 inches in height and caused little damage to boats and shoreline property.¹¹⁸ Additional verbal accounts among the Snohomish Tribe reported by Colin Tweddell in 1953 described a great landslide-induced wave caused by the collapse of Camano Head at the south end of Camano Island around the 1820s.¹¹⁹ No injuries have been reported since the settlement of Seattle in the 18th century. The value and density of property along the waterfront suggests a potential for moderate impacts from such an event.

Multiple seiches have been generated in King County from various local and distant seismic events. Seiche events in the King County have been noted in the following years: 1) In 1891 two earthquakes near Port Angeles caused water in the Puget Sound to surge onto beaches two feet above the high-water mark and an eight-foot seiche in Lake Washington. 2) In 1906 the magnitude 7.9 San Francisco earthquake caused agitated wave activity on the west shore of Lake Washington “so violently that house boats, floats and bathhouses were jammed and tossed about like leaves on the water,” reported by the Seattle Post-Intelligencer (4/19/1906). 3) In 1949, a magnitude-7.1 deep earthquake occurred in Olympia that caused seiches within Lake Union and Lake Washington, but no damages were reported. 4) The magnitude 9.2 Great Alaska earthquake of 1964 created global seiches, including in Lake Union that damaged houseboats, buckled moorings, and broke water and sewer lines. 5) In 1965, a magnitude 6.5 deep earthquake occurred in the Puget Sound which caused a seiche where water “sloshing back and forth like soup in a shallow bowl” was observed at Green Lake, North Seattle (reported by the Seattle Times, 4/30/1965). 6) Lastly, in 2002 a magnitude 7.9 Denali earthquake caused seiches in Lake Union that damaged houseboats, buckled moorings, and broke water and sewer lines.

Tsunamis generated along the Pacific Rim have a hard time reaching Puget Sound with any destructive force. The tsunamis generated by the 2011 magnitude 9.0 earthquake in Japan and the 1964 magnitude 9.2 earthquake in Alaska did reach Puget Sound, but the maximum wave height recorded was only 0.04 meters (~2 inches) and 0.12 meters, respectively in (~5 inches) in King County.

¹¹⁸ National Geophysical Data Center / World Data Service (NGDC/WDS): Global Historical Tsunami Database. National Geophysical Data Center, NOAA. doi:10.7289/V5PN93H7 [accessed online on 09/11/2019 from <https://www.ngdc.noaa.gov/nndc/struts/form?t=101650&s=70&d=7>]

¹¹⁹ Koshimura, Shunichi and Harold O. Mofjeld. 2001. Inundation modeling of local tsunamis in Puget Sound, Washington due to potential earthquakes. ITS 2001 Proceedings, Session 7, Number 7-18. Accessed online on 6/11/19 from https://www.pmel.noaa.gov/pubs/docs/ITS2001/7-18_Koshimura.pdf.



Tsunami Scenario Drivers¹²⁰¹²¹

There are four likely triggers for a tsunami in King County. These include an earthquake on the Seattle Fault, an earthquake on the Cascadia Subduction Zone, a tsunami caused by a major landslide into Puget Sound or another major body of water, and an earthquake on the Alaska-Aleutian Subduction Zone.

Seattle Fault Tsunami	A tsunami triggered by a rupture of the Seattle Fault would compound damage caused by the initial earthquake. It would devastate low-lying areas of Puget Sound, but especially the port and industrial facilities around the Port of Seattle and Magnolia. Preliminary modeling suggests the first wave arrives within 2 and a half minutes after the earthquake starts at the Magnolia Bluff area of Seattle and all coastlines within Elliott Bay experience an average of 20 feet (6 meters) of inundation above Mean High Water during the first 10 minutes. Harbor Island also experiences major flooding with at least 13 feet (4 meters) of flow depth above the ground level. South of Elliott Bay has milder flooding compared to Seattle, but strong currents are prevalent at Portage Bay.
Cascadia Subduction Zone Tsunami	A Cascadia Subduction Zone tsunami would devastate the outer coast and seriously impact low-lying areas around Everett and the San Juan Islands. The islands and the strait of Juan de Fuca protect King County from the worst flooding impacts. Preliminary modeling suggests that little inundation would occur along the coastline of South King county, though some flooding may be expected in areas of Seattle SODO and Port. The worst flooding is expected to occur at Portage Bay with estimated wave amplitudes up to 13 feet (4 meters) above Mean High Water. Strong currents are also estimated at Portage Bay near spits of land and in the narrows, which can be hazardous to the maritime community. The first wave is expected to reach Seattle at approximately 2 hours and 20 minutes. Statewide, this tsunami is expected to cause over 15,000 fatalities, primarily in coastal communities in the outer coast counties.
Landslide 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. The slide itself is said to have buried a small village, and the resulting tsunami drowned people who were clamming on Hat

¹²⁰ King County Department of Natural Resources and Parks. Landslide Hazards Program website. Accessed online on 6/7/19 from <https://www.kingcounty.gov/services/environment/water-and-land/flooding/maps/river-landslide-hazards/landslide-types.aspx#Debris>.

¹²¹ King County Department of Natural Resources and Parks. Landslide Hazards Program website. Accessed online on 6/7/19 from <https://www.kingcounty.gov/services/environment/water-and-land/flooding/maps/river-landslide-hazards/landslide-types.aspx#Debris>.



Alaska-Aleutian Distant Source Tsunami	(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. ¹²² An Alaskan-Aleutian subduction zone earthquake can be as large as a magnitude 9.2 event, as experienced in 1964. A tsunami generated from Alaska is a distant-sourced tsunami for Washington state. The preliminary tsunami modeling results for a potential worst-case scenario magnitude 9.2 Alaska earthquake to King County is estimated to be somewhat similar to the Cascadia Subduction Zone event, but half as strong. The highest wave amplitudes can be up to 7 feet (2 meters) and predicted to occur inside Portage Bay, but not predicted to overtop the northern spit. Additionally, it is probable for some unsafe currents for the maritime community to occur, with the highest risk being at Portage Bay. The first wave is expected to reach Seattle's coastline approximately 6 hours after the earthquake.
Lake Washington or Lake Sammamish Seiche	A Seattle Fault earthquake could generate a seiche on Lake Washington that would impact low-lying areas of cities along the lake, including Sammamish, Kenmore, Kirkland, and others.

Priority Vulnerabilities

Port and harbor facilities	Tsunamis are expected to devastate near-shore port infrastructure, boats, and piers. This is the largest economic consequence of a tsunami.
Low-lying and waterfront homes and businesses	Homes and businesses along the many waterfronts would be damaged or destroyed by a mid-sized tsunami and devastated by a local crustal earthquake and tsunami.
Wastewater treatment facilities	West Point treatment plant is in the inundation zone for a Seattle Fault tsunami. Historical records also suggest tsunamis have impacted this area before.

Priority Impact Areas

King County residents	While it would take a rather sizable tsunami along the shoreline of King County, precautionary evacuations from houseboats, live aboard pleasure craft, cruise ships, and property immediately adjacent to waterfronts of Puget Sound and lakes Washington, Sammamish, and lake Union may be recommended.
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¹²² Koshimura, Shunichi and Harold O. Mofjeld. 2001. Inundation modeling of local tsunamis in Puget Sound, Washington due to potential earthquakes. ITS 2001 Proceedings, Session 7, Number 7-18. Accessed online on 6/11/19 from https://www.pmel.noaa.gov/pubs/docs/ITS2001/7-18_Koshimura.pdf.



Vulnerable populations	There are no additional anticipated direct impacts from tsunami to vulnerable populations. As always, any disruption to services, the economy, and infrastructure would cause more harm to lower-income and marginalized communities.
Property	Tsunami and seiche threats were not defined until recently. Most of the early 19th and 20th century structures located near the water were probably not engineered to withstand impacts from a tsunami, seiche, or earthquake. The properties along the entire Seattle Waterfront and those in Shoreline, Des Moines, Federal Way, and Vashon Island are at risk from tsunami activity.
The economy	A tsunami or seiche that impacts port facilities, such as one triggered by the Seattle Fault would have any sizable impact on the economy of the region. Damage would run potentially in the billions and have far-reaching consequences for Washington's export-based economy.
The environment	It is possible for a tsunami or seiche to have an impact on the natural environment immediately adjacent to Puget Sound through the release of fuels and hazardous materials or their storage facilities around the waterfront. This may include fish habitat or natural and farmed shellfish beds, wetlands, estuaries, and marsh areas.
Health systems	There are no major health centers located in the mapped tsunami inundation areas.
Government operations (continuity of operations)	It is possible that Sounder traffic between Everett and Seattle or Tacoma and Seattle could be impacted by any large tsunami in Puget Sound. Otherwise, it is unlikely that King County governmental operations would be directly impacted by a tsunami or seiche.
Responders	Along the shoreline of King County, precautionary evacuations from houseboats, live aboard pleasure crafts, cruise ships, and property immediately adjacent to waterfronts of Puget Sound and lakes Washington, Sammamish, and Lake Union would cause impacts to the public. The volume of search and rescue efforts along waterfronts affected from the tsunami may pose potential issues to first responders (police, fire, EMS). There are only small number of scenarios where this is a likely issue.
Infrastructure systems	• Power: Little to no impact directly from tsunami is expected. • Water/Wastewater: Tsunami may impact the West Point treatment plant. The damage would depend on the height of the tsunami and a significant event would be required. If such an event were to occur, the plant would be rendered inoperable. • Transportation: damage to port facilities and ferry terminals are the primary threat to infrastructure from a tsunami. Even relatively small tsunami surges, such as the aforementioned example from Crescent City, have caused tens of millions



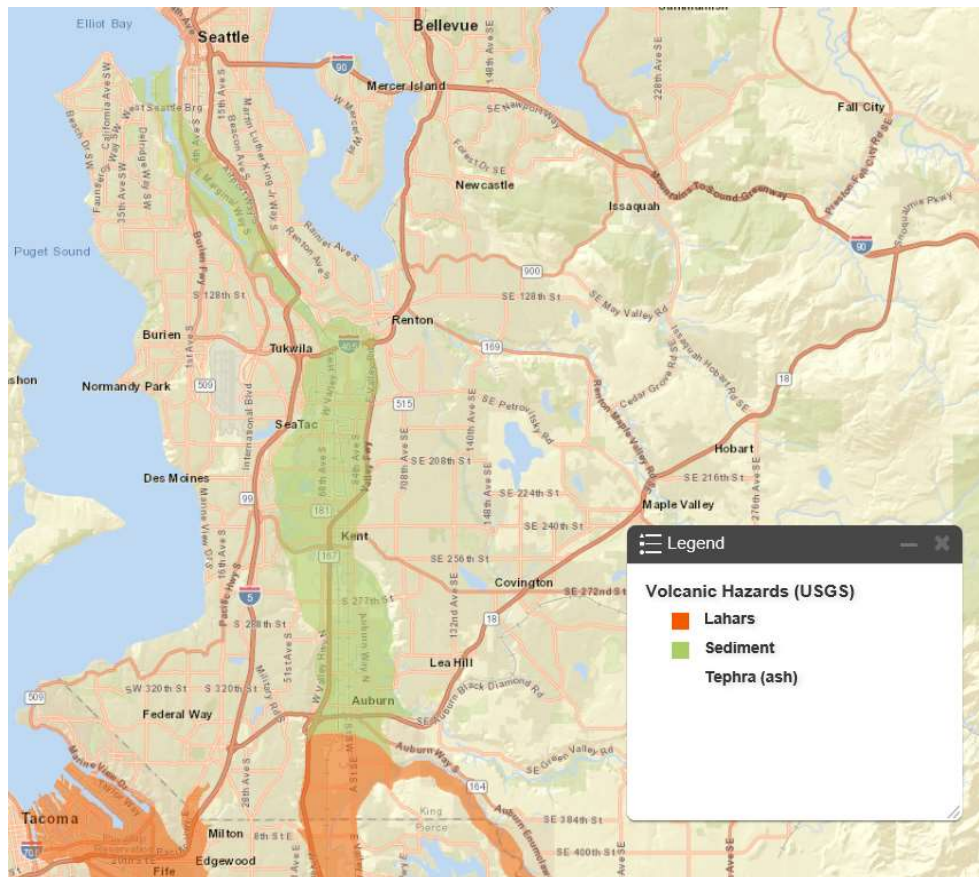
	of dollars. Damage to low-lying rail and roads is also likely, but less of a concern since it would not impact primary transportation routes. • Communications: There is limited risk to communications systems as a whole from tsunami.
Public confidence in jurisdiction's governance and capabilities	Coverage from major news outlets, including the Seattle Times and the New Yorker magazine, have argued that Washington is highly underprepared for a major seismic event large enough to generate a tsunami. Both media coverage and reports from state emergency management has led Washington's governor to convene a Resilient Washington Subcommittee to look into mitigation actions out of concern for the apparent low-level of public confidence in state and local ability to manage major disasters. Data is available from Japan and New Zealand that clearly demonstrate that policy level decisions and direct communication to the public will greatly influence the public confidence in King County government.

Regional Risk Profile: Volcano

Hazard Description

Volcanic eruptions are the result of geological activity, and may include lava, rock fragments, gases, and ash ejected from a vent on the surface. Deposits of rock, lava, and ash create the structures we call volcanoes. Washington State has five active volcanoes, four of which have been classified as “Very high” threat by the U.S. Geological Survey, and one considered “High” threat. Mount Rainier would cause the most significant local disruptions in the event of an eruption, but any of them could cause major disruptions due to ash or impacts on the transportation system.

Volcanoes can lie dormant for hundreds or thousands of years between eruptions. Hazards from eruptions are typically divided into near-volcano hazards, those which impact areas immediately on the slopes of the volcano, and distant hazards, which can put areas miles away from the volcano at risk. Near-volcano hazards include pyroclastic flows (hot avalanches of gas, ash, and rock fragments), lava flows, rock (tephra), debris flows, and landslides. Distant hazards, include Lahars – volcanic mudflows,





and volcanic ash. Lahars may travel tens of miles down river valleys, picking up debris and inundating floodplains, and leave a cement-like deposit of sediment where they stop. They are a hazard at all five of Washington's volcanoes, and the only personal protective action available to avoid a lahar is evacuation to higher ground. Volcanic ash – made up of tiny particles of glass – may be extremely widespread, as it travels in the direction of the wind. The fine particles may travel hundreds of miles or more downwind. Even in tiny quantities, volcanic ash can be very disruptive, as it lowers air quality, makes roads slippery to drive on, is abrasive, poses risks to aircraft, motor vehicles and electronics, and is extremely difficult to clean up, as it easily remobilizes into the air. Volcanic ash is also dense, and quite heavy when wet – 4 inches of wet volcanic ash is heavy enough to collapse most roofs.

Vulnerability Characteristics and Previous Occurrences

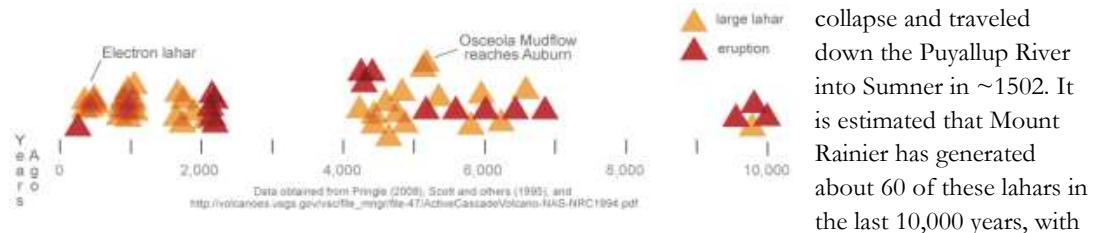
There are multiple hazards from a volcano, including lahars that could impact communities in the south of the county to ash that could impact the entire region and come from any of Washington's five active volcanoes.

Lahars, mudflows that can have the consistency of wet cement, are historically the most damaging element of a volcanic eruption. These flows pick up large and small debris like trees, houses, boulders – anything in its path. Lahars can move 20-40 miles per hour down slopes. They slow down once they reach floodplains, but are still an unstoppable mass of mud and debris, often pushing a flow of water ahead of it. While the lahar risk to King County is limited to a major eruption of Mt. Rainier and impacts primarily the cities of Algona, Pacific, and Auburn, the regional impacts would include a complete disruption of regional transportation routes, including through airport closures, damage to I-5, and damage to the Port of Tacoma.

The best examples of potential local damages from volcanic activity are from the Mt. St. Helens eruption in 1980. This eruption had significant ash-fall over eastern Washington, Oregon, Idaho, and Montana, with trace amounts falling over the Dakotas, Wyoming, Nebraska, Colorado, Oklahoma, and Minnesota as well as Canadian provinces. A long history of volcanic eruptions in the cascades is recorded by the Native Americans in the area. Volcanic activity occurs in geological timelines these events are spaced over hundreds if not thousands of years, during which time the number of exposed inhabitants and inventory of infrastructure has changed greatly. Even the difference between 1980 and today (39 years) has seen a marked increase in population and infrastructure in the possible impact area for volcanic activity. The Mt. St. Helens eruption in 1980 damaged or destroyed 200 buildings, ruined 44 bridges, and buried 17 miles of railway along with 125 miles of roadway. Community water supplies and sewer systems were disabled and reservoirs partly filled with silt and debris.



Mt. Rainier, however, is much closer (60 miles to Seattle) and poses a much more direct threat. Modern Mount Rainier started erupting 500,000 years ago and has had numerous eruptions and mudflows since then. About 5,600 years ago, an eruption created a massive debris avalanche, called the Osceola Mudflow, poured down from the summit of Mount Rainier, picking up sediment and anything else in its path as it traveled down the White River valley and into the Puget Sound. The mudflow filled valleys with up to ~400 feet of sediment and moved at speeds of 40 to 50 miles an hour. Following the Osceola Mudflow, many smaller volcanic eruptions and lahars occurred as the volcano continued to show signs of unrest. The most recent major mudflow, called the Electron Mudflow, began as a part of a crater



about 10 large enough to reach the Puget Sound. Many communities, including Orting, Puyallup, and Auburn, between Mount Rainier and the Puget Sound are built on top of these deposits.¹²³

An eruption of Mt. Rainier, or any other Cascade volcano, is likely to be preceded by warning signs, such as series of earthquakes, and deformation of the volcano. This volcanic “unrest” may last for days before an eruption, or possibly for weeks, to months, to years or more. Monitoring networks are in place to provide advanced warning. This advance warning is critical to communities downstream from the volcanoes, because Even a relatively small eruption could melt glaciers significantly, generating lahars that will reach heavily populated areas.¹²⁴

A lahar should not be seen as a singular event, but a mass movement of sediment requiring significant time to recover from. Deposition of feet to tens of feet of sediment through a watershed and over a floodplain creates long-term changes to the river environment. After a lahar, mitigation measures may be necessary to prevent continued sedimentation over the decades following the eruption, such as the sediment retention structure built following the Mt. St. Helens 1980 eruption. In lieu of this solution, dredging may be required to prevent shipping channels from filling with sediment. Deposition of a large amount of sediment within a floodplain may also change floodplains to a point where floods now occur in areas which were previously safe from flooding.

¹²³ Washington State Emergency Management. 2018. Enhanced Hazard Mitigation Plan: Volcano Risk Assessment, page 470-472.

¹²⁴ United States Geologic Survey. 2018. USGS Volcano Hazards Program website. Accessed online on 6/12/19 from https://volcanoes.usgs.gov/volcanoes/mount_rainier/geo_hist_future_eruptions.html.



Summary of Hazard Effects

Major types of volcanic hazard, their effects and extents are listed in the table below. The occurrence and scale of volcanic hazards are inversely related, with small events occurring more frequently (10-20 a month), and larger events occurring every hundred years or so.¹²⁵

Hazard	Threat to Life	Threat to Property	Areas Affected
<i>Ash and tephra fall</i>	Low except near vent; high for aviation	Depends on size of particles and amount of ash; can lead to roof collapse, bomb damage, fire	Local, Regional, National, International
<i>Pyroclastic flows</i>	Very high – Near vent and on slopes; low in King County	Very high	Local, Regional, National,
<i>Lava flows</i>	Low except near vent.	Very High	Local
<i>Lahars</i>	High to moderate	High	Local, Regional
<i>Flooding (post-lahar)</i>	Moderate	High	Regional
<i>Gases/ acid rain</i>	Low to moderate	Moderate	Local, Regional

Priority Vulnerabilities¹²⁶

Communities in the path of lahar hazards	Communities in the vicinity of Rainier, including the King County communities of Algona, Pacific, and Auburn, are most vulnerable from a large lahar generated by an eruption of Mt. Rainier.
Populations vulnerable to respiratory distress brought on by ash	Ash from any volcanic eruption can lead to disruption of daily life and is a major threat to people with medical vulnerabilities.

¹²⁵ Washington State Emergency Management. 2018. Enhanced Hazard Mitigation Plan: Volcano Risk Assessment, page 463

¹²⁶ Clark County Emergency Management. 2007. 2006 Volcanic Ashfall Exercise After Action Report / Improvement Plan.



Populations in the immediate vicinity of a volcano	Populations that use Mt. Rainier National Park or work in the area around the mountain are most susceptible to the immediate impacts. Although advanced warning is likely, it will be impossible to predict the exact moment of eruption. Residents from the town of Orting have approximately 45-minutes to evacuate following activation of their lahar sirens.
Roof collapse caused by ash fall	Buildings can collapse following large ash accumulation.
Electrical systems and the energy sector	Electrical systems may short out due to ashfall and power generation can be curtailed as generation systems are shut off to protect sensitive components.
Communications equipment	Communications equipment has the same vulnerability as general electrical systems and is subject to failure due to ash damage.
Air travel	Airports would likely be closed for the duration of major ash dispersal.
Roads and transportation systems	Traffic signals would likely short out during ashfall. Ash is also creates a very slippery driving surface. Ash can also damage vehicle engines, and scratch windshields when wipers are being used – Driving is not recommended during heavy ashfall.

Priority Impact Areas

King County residents	Cities in the south of the county, including Algona, Pacific, Auburn, and Kent all may be impacted by a lahar. The sedimentation zone spreads throughout the Green River Valley. This area includes some of the largest and fastest-growing cities in the county. The distance from Mt. Rainier makes direct impact of eruption from a pyroclastic event extremely unlikely. Prevailing winds make ash fall in the county unlikely or at least minor. Lava flows and landslide activity would impact Pierce County but are unlikely to reach any portion of inhabited King County. Indirect impacts from a major eruption might include a cooling climate from atmospheric suspended ash clouds but this too is unlikely. Fine ash may cause regional health impacts – especially respiratory for the duration of ash fall. Impact to vehicles and air handling systems in homes and work places may have an employment impact to the King County population.
Vulnerable populations	Impacts to individuals with access and functional needs will be extremely serious. Transportation will be impacted, resulting in difficulty accessing appointments. Individuals with chronic respiratory vulnerabilities will be most negatively impacted by ash. While there are limited numbers of King County residents in the path of the lahar, the communities that are most impacted have higher rates of disability and poverty than the statewide average.



Property	The cities of Algona and Pacific are the most at risk from a Mt. Rainier lahar event, with over 90 percent of their structures exposed to the lahar. While the percentage of structures is not as high, the City of Auburn has the highest potential dollar-value losses. Other damages would include the loss of HVAC and air filtration systems, electrical systems shorting out, and the danger of roof collapse from ash accumulation since ash is heavier than snow. Furthermore, following rains, ash hardens to a concrete-like consistency, which can clog gutters and drains and cause them to fail or collapse. Businesses that operate electronic systems will require decontamination rooms to prevent ash from getting inside and damaging electrical equipment.
The economy	Many of the impacts from a Mt. Rainier eruption to humans and the environment would also impact the economy of King County. Aviation interruption would likely occur from airborne ash. A lahar event would impact rail and port service from direct damages to infrastructure like bridges, rails, and roadways, or from inaccessibility to ports. Ash would cause interruption of all internal combustion engines or vehicles that require filters would impact the workforce and movement of food and supplies as well as repair crews. Abrasion from fine ash on all mechanical parts would cause longer term damages to industrial operations and the ports. Health and respiratory issues would make both indoor and outdoor professions difficult. Medical facilities and the patients that rely on them would have difficulty operating. The cost of debris removal following a lahar would be enormous, even similar to efforts from a major earthquake.
The environment	Any significant volcanic activity on Mt. Rainier would have an impact to the environment. Lava flows, tephra, ash, and lahar activity would directly impact birds, fish, mammals, reptiles, amphibians, trees, and vegetation. Sediment deposition would impact rivers that support salmon and steelhead spawning. Debris and lahar may change the course of rivers entirely. Lahars may cause hazardous materials releases that harm birds, fish and other wildlife. Recreational use of ski areas and hiking trails would also be impacted. It has been four decades, and Mt. St. Helens timber and wildlife have not yet returned to pre-1980 levels.
Health systems	Health systems would be impacted by an expected dramatic rise in demand for services as ash causes people to seek care for respiratory distress. Health systems would also be hindered by transportation system impacts. First responder vehicles should have air filters changed every 35 miles during volcano ash events and there are not enough air filters on hand to meet this requirement.
Government operations (continuity of operations)	Potential impacts to county delivery of services from a Mt. Rainier eruption would be the result of damages to infrastructure, equipment including machinery and vehicles, inaccessibility to service areas, impedance to transportation routes used by the county workforce, and health impacts to residents and the workforce. County services that might be interrupted might include: Medic One response, King County Sheriff's Office services



	like 9-1-1 dispatch, search and rescue and marine or aviation unit response, adult detention, solid waste and waste water services. Services provided by other government agencies and basic service providers might include interruption of: power, phone and cell phone service, emergency medical service, fire and law enforcement, water systems, and health/medical facilities.
Responders	Responder vehicles need regular air filter changes during ashfall. Air filters in the quantity required are likely not available. Responders will also be taxed by high numbers of calls and dangerous roads caused by slick ash.
Infrastructure systems	• Power: Ash can short out electrical systems and cause widespread power failure. Ash accumulation may also cause issues with power generation dams. Generation facilities may be shut down to prevent damage to sensitive components. • Water/Wastewater: Water systems, including reservoirs, could quickly clog with ash, potentially polluting water supply. • Transportation: volcanic ash is very slick and roadways would become treacherous. Vehicles would need regular air filter replacements and there are not sufficient air filters in the region to offset the need. Airports in the region would have to close, potentially for months. Any lahar could potentially destroy major transportation routes, including I-5. Traffic signal systems and communications systems could short out due to ashfall.¹²⁷ • Communications: Electrical and communication impact can be severely impacted during ashfall. Ash getting into electrical systems can cause systems to short out.
Public confidence in jurisdiction's governance and capabilities	The 1980 Mt. St. Helens eruption revealed that even heavy monitoring of a volcano, while effective, cannot predict exactly how the volcano will behave. Since that time, investments and public information have created confidence that USGS and local emergency management is capable of providing public warnings and evacuations in time to save lives. Continued investment in risk assessment and warning systems, for example, around Orting, WA, continue to build public confidence. An event could either undermine or strengthen this confidence, depending on losses and the speed of warning. A potential public confidence issue is from false positives that trigger evacuations. There have been numerous cases outside of the US where communities are evacuated, only for the volcano not to erupt at that time. Communities can become inured to warnings. When this happens, and an event does occur, there are much higher losses. A false alert is unlikely in the USGS monitoring system for Mt. Rainier as the danger of a false alert has been a central consideration in the design of the system.

¹²⁷ Clark County Emergency Management. 2007. 2006 Volcanic Ashfall Exercise After Action Report / Improvement Plan.

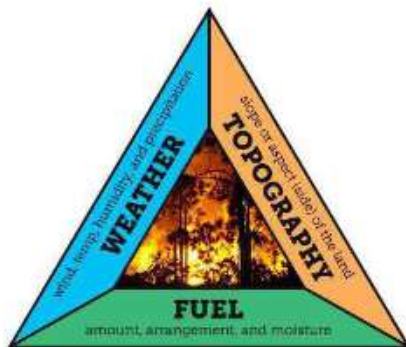


A period of unrest, leading to heightened monitoring and public awareness could last days or years before anything (or nothing) happens. Sharing information with the public on the uncertainty of volcanoes and the potential for long-term monitoring is important. Additionally, in the event of unrest and a potential lahar, the local jurisdiction are the only ones who can actually order the evacuation and so much be prepared to assess risk, inform the public, and act when needed.

Regional Risk Profile: Wildfire

Hazard Description

King County and Western Washington in general have historically been at a low risk from major wildland and wildland-urban interface fires. The historic return period for the heavily forested areas of the slopes of the Cascades in eastern King County is between 200 and 300 years. Western Washington fires are not unheard of, however – in 1902, dozens of wildfires burned nearly 239,000 acres in what is



now the Yacolt Burn State Forest, causing 38 deaths. This occurred after an extended period of hot, dry weather, high wind, and an over-accumulation of timber harvest slash.¹²⁸ Climate change is shortening this interval, though it is still unknown by how much. By 2040, a four-fold increase in the annual area burned by fires in Washington is projected.¹²⁹ Of a more immediate concern is the amount of new development in areas close to the wildland-urban interface. This new exposure is the primary driver of risk in the short and medium term.

Wildfires can occur when the necessary combination of weather (low humidity, low precipitation, high temperatures, high wind), topography (steeper slopes, gulches, canyons, and ridges), and fuel (higher amounts, higher concentration, continuous across the landscape, low in moisture) are brought together with an ignition source (lightening or human-caused). In the western United States, we have seen an increase in large wildfires due to more than a century of fire prevention efforts, rising temperatures, declining forest health, and increased development.

Wildfires can spread quickly when burning in areas with dense, dry, uninterrupted fuels. This is particularly true in areas with steep slopes and ridges and in windy weather with high temperatures and low humidity. This mix of requirements has meant that there have been very few serious fires in King County.

The wildland fire season in Washington usually runs from July through September. Drought, low snow pack, and local weather conditions can lengthen the fire season. Many of the worst fire years on record have occurred in the past decade. Suppression costs alone cost \$60 million for the Carlton Complex fire. Economic costs were estimated at \$98 million for that fire.¹³⁰

¹²⁸ Washington State Department of Natural Resources. Yacolt Burn State Forest website. Accessed online on 6/19/19 from <https://www.dnr.wa.gov/Yacolt>.

¹²⁹ King County. 2018. King County Strategic Climate Action Plan 2018 Biennial Report.

¹³⁰ Washington State Emergency Management. 2018. Washington State Enhanced Hazard Mitigation Plan Risk Assessment. Pp. 493-495.

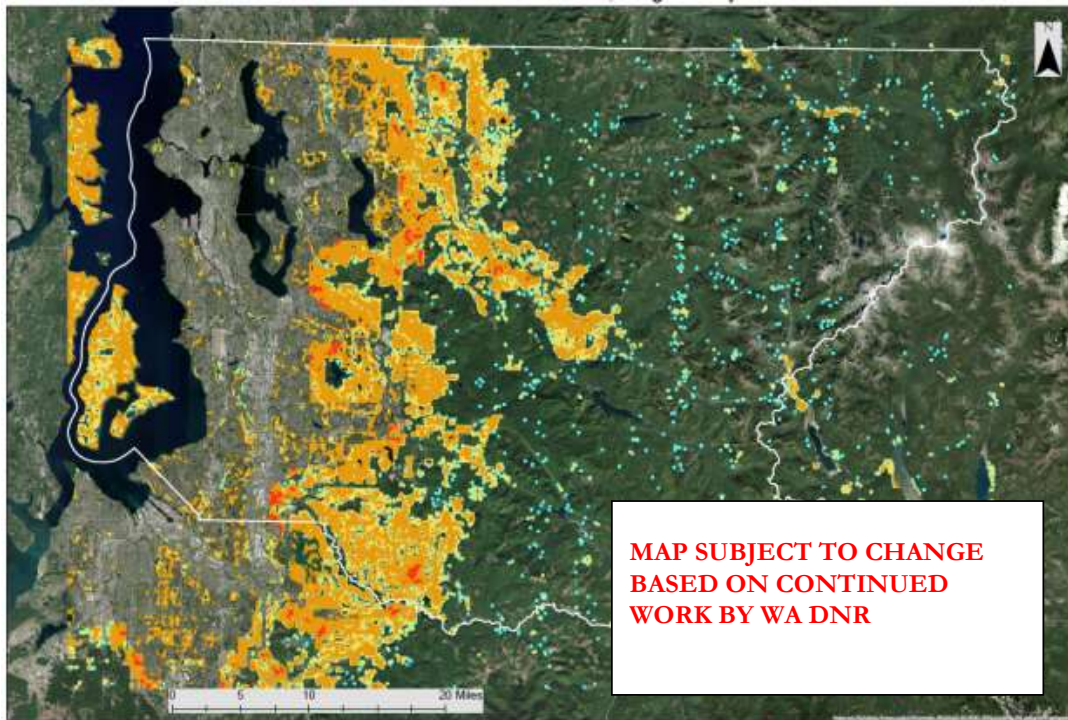


Washington State Department of Natural Resources lays out the scale of the problem in the new, 10-year strategic plan.¹³¹ “In 2018, wildland fires burned more than 350,000 acres in Washington state and cost more than \$112 million dollars to suppress—all before the end of August. ... Yet, 2018 was not the state’s worst for fire. In recent years, hotter, drier summers and longer fire seasons have led to a trend in increased fire starts and area burned. Fires in 2014 and 2015 burned approximately 425,300 and 1,064,100 acres and cost state and federal agencies nearly \$182 million and \$345 million in firefighting expenses, respectively. In addition to the significant structural and economic losses, three firefighter lives were lost in 2015.”

The largest fires in Washington State are usually sparked by lightning in wilderness areas. Small fires (often ignited due to human activity) can also be damaging, however. For example, a small 400-acre fire in Thurston County in 2017 led to the evacuation of nearly 100 homes and the loss of four homes. Human-caused ignition sources may include chains dragging behind trucks, cigarettes, arson, or the loss of control of fires set for recreational purposes.

Washington State Department of Natural Resources is leading an effort including King County to complete a statewide map of all wildland-urban interface areas. Once the mapping is complete, RCW 19.27.560 will take effect, adopting the ICC’s 2018 International WUI Code. The following map is a draft map developed using United States Forest Service land cover data and King County parcel data. Interface areas are at the boundary of urban and vegetated areas. Intermix areas are areas where structures and vegetation are mingled.

¹³¹ Washington State Department of Natural Resources. 2018. Washington State Wildland Fire Protection 10-Year Strategic Plan. Accessed online on 8/26/19 from https://www.dnr.wa.gov/publications/rp_wildfire_strategic_plan.pdf?ivvzxs.



Draft Wildland-Urban Interface Areas: red = interface/intermix areas with high structure density (Source: DNR WUI Mapping Program, 2018)

Wildfire hazards include the fire itself, but also smoke and post-wildfire erosion and flooding. Wildfire smoke is made up of particulate matter, carbon monoxide and other harmful pollutants from burning trees, plant materials, and combustion of plastics and other chemicals released from burning structures and furnishings. Exposure to fine particulate matter (2.5 micrometers and smaller) is a significant health concern, because the small size of the particle allows people to inhale it deep in the lungs where the particles can directly enter the blood stream. The effects of smoke exposure range from eye and respiratory tract irritation to more serious health problems including reduced lung function, bronchitis, and exacerbation of asthma, heart failure, and premature death. People with existing heart and lung diseases, older adults, children and pregnant women are especially at risk of smoke-related health problems.¹³²

Post-wildfire flooding, landslides, and mudslides is a deadly secondary hazard to extreme wildfires in areas with steep slopes. Soils in areas burned by fire not only lose their stabilizing vegetation but can also become hydrophobic (water repelling), leading to massive water runoff that carries debris down slopes and into nearby waterways. In Montecito, CA more than 17 people died, 100 homes were destroyed, and hundreds of people were rescued from a series of mudslides and mudflows that hit following heavy rains that drenched areas burned over earlier that summer.¹³³ Mudslides were a serious



threat in Eastern Washington following the 2014 and 2015 wildfires, and destroyed irrigation systems, roads, and bridges.

One aspect of post-fire flooding is that it can be predicted. King County would likely have weeks to months to prepare and plan for flooding events resulting from a major fire. The Department of Ecology maintains a post-fire flooding calculator to estimate runoff and prepare communities for flooding. In Montecito, for example, emergency managers had already evacuated thousands of people and it was those who chose to not heed the warnings that were most likely to be impacted by the mudslides.

Vulnerability Characteristics and Previous Occurrences

King County communities are rarely threatened by major wildfires, though roadside brush fires can still threaten even the most urbanized areas.¹³⁴¹³⁵ This has meant that land use and building codes in King County are not adapted to current and future wildfire risk. As the climate changes, there is a greater likelihood that high temperature and dry conditions will be present along with the already-existing topographic, wind, and fuel conditions necessary to support a large fire

Smoke has received the bulk of recent attention in King County due to multiple years of wildfire smoke in the Puget Sound region from wildfires in British Columbia, Oregon, and Eastern Washington. Air quality deteriorated to hazardous conditions in some parts of King County in 2017 and 2018. Recent studies of wildfire smoke exposure in Washington found a significant relationship between exposure to PM_{2.5} from wildfire smoke and an increase in emergency room and outpatient visits for asthma. Especially impacted were those with pediatric asthma and other childhood respiratory and chest symptoms, as well as Chronic Obstructive Pulmonary Disease across all age groups, and all respiratory outcomes.¹³⁶ Smoke will likely be an ongoing concern for the region and may represent a “new normal” though it will not occur every year.

Post-fire flooding is a serious threat to King County. A fire in one of the foothills communities could cause major mudflows and devastating flooding in communities in the watershed impacted by the fire and through which rivers and creeks pass. Communities with existing flood risk, such as along the Snoqualmie River, are especially vulnerable. Damage to homes caused by debris flows is typically not covered by regular homeowner’s insurance.

¹³² Washington State Emergency Management. 2018. Washington State Enhanced Hazard Mitigation Plan Risk Assessment. Pp. 493-495.

¹³³ Queally, James, Etehad, Melissa, and Brittny Mejia. Jan 10, 2018. Death toll rises to 17 in Montecito; 100 homes destroyed by mudslides. *The Los Angeles Times*. Accessed online on 6/18/19 from <https://www.latimes.com/local/lanow/la-me-ln-montecito-storm-mudflow-20180110-htmlstory.html>.

¹³⁴ Headwater Economics. 2018. Communities Across the US Are Experiencing Threats from Wildfires. Accessed online on 6/18/19 from <https://headwaterseconomics.org/dataviz/communities-wildfire-threat/>.

¹³⁵ KIRO 7 News Staff. July 27, 2011. Brush fires shut down portion of SR 509. *KIRO 7*. Accessed online on 8/27/19 from <https://www.kiro7.com/news/local/brush-fires-shut-down-portion-of-sr-509/970676697>.

¹³⁶ For more information, see Washington State Department of Health/Chelan-Douglas, Grant, Kittitas and Okanogan Counties (2015), Surveillance Investigation of the Cardiopulmonary Health Effects of the 2012 Wildfires in North Central Washington State; Gan, R. W., B. Ford, W. Lassman, G. Pfister, A. Vaidyanathan, E. Fischer, J. Volckens, J. R.

Scenario Drivers¹³⁷¹³⁸

Wildland-Urban Interface Fire



Although fires are currently rare in Western Washington, they are not unheard of and are expected to increase as climate change leads to warmer temperatures. Prolonged summer heat, combined with high density forests and areas of poor forest health, is increasing fire risk at the same time that people are building more and more into the wildland-urban interface. The building patterns in these areas are not in accordance with FireWise principles and many communities have limited ingress and egress routes.

Smoke



In 2017, and especially 2018, smoke from wildfires inundated Seattle, causing unhealthy air quality. This was due to wind patterns that blew smoke from fires in British Columbia, Oregon, and Eastern Washington. Warmer summers will increase the number of fires and with more fires, more smoky days are likely.¹³⁹

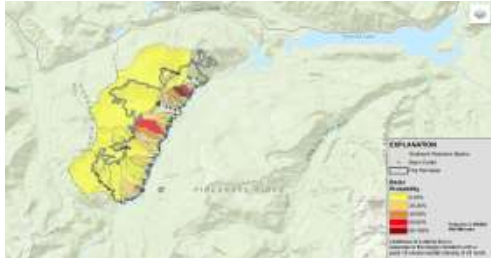
Source: Greg Gilbert, *Seattle Times*

¹³⁷ King County Department of Natural Resources and Parks. Landslide Hazards Program website. Accessed online on 6/7/19 from <https://www.kingcounty.gov/services/environment/water-and-land/flooding/maps/river-landslide-hazards/landslide-types.aspx#Debris>.

¹³⁸ Washington State Geologic Survey. Landslide Hazards Program website. Accessed online on 6/7/19 from <https://www.dnr.wa.gov/programs-and-services/geology/geologic-hazards/landslides#types-of-landslides.8>

¹³⁹ Gilbert, Greg. August 14, 2018. Smoky Seattle summers: expect more of them, scientists say. *The Seattle Times*. Accessed online on 6/19/19 from <https://www.seattletimes.com/seattle-news/smoky-seattle-summers-expect-more-of-them-scientists-say/>.

Post-fire flooding and debris flows



Wildfires burn vegetation on steep slopes, not only destabilizing the slopes but also making the soil hydrophobic in high-intensity fires. This can lead to large debris flows and mudslides when heavy rains occur that damage infrastructure and communities downstream for several years after a fire. USGS can conduct assessments on burned areas to determine the likelihood of major debris flows from a burned area.¹⁴⁰

Priority Vulnerabilities

Structures built in interface or intermix areas	Structures built in interface or intermix areas are more susceptible to fires, including from spotting and embers ahead of a fire. This is especially true for buildings with less than 100 feet of defensible space.
Foothills and interface communities	Communities in or around areas at a higher risk of fire, such as those in the foothills of the Cascades, are more susceptible to fire.
Communities in or near the floodplain, downstream of potential burn areas	Major wildfires can cause the soil to become hydrophobic. When rains come, large quantities of water and debris and rush down hillsides and destroy homes and infrastructure while causing flooding in downstream communities.
Communities built without multiple ingress and egress routes	Communities with a single ingress and egress route are much more difficult to protect and evacuate. Roads that are less than 24 feet wide, especially those less than 20 feet wide, and those driveways without a turnaround are highest risk.
Buildings built with flammable materials and with vegetation close to the structure	Buildings not meeting FireWise principles, including defensible space, are most at risk to wildfire. This includes proximity of dense brush or timber, flammable composition of structure roof, and siding.
Communities on slopes or hills	Fires tend to burn up slopes and ridges, endangering structures in those areas. Buildings less than 30 feet from a slope of greater than 30% grade are most vulnerable.

¹⁴⁰ USGS. 2018. Miriam Fire Preliminary Hazard Assessment. Accessed online on 6/19/19 from https://landslides.usgs.gov/hazards/postfire_debrisflow/detail.php?objectid=224.



Areas with more frequent severe fire weather days and winds	Fire weather, including low humidity and wind, is a major predictor for when ignitions, which are common, will spread and become a major fire. Areas prone to this weather are expected to expand due to climate change.
Areas greater than five miles from a fire station and with limited water source availability	Buildings more than five miles away from fire services and with limited pressurized fire hydrant access are more vulnerable.

Priority Impact Areas

King County residents	King County residents are most likely to experience fire impacts from smoke. Smoke can cause respiratory issues and prevent people from taking part in outdoor activities. There are limited populations exposed to wildfire hazard in interface areas, though this risk is growing due to climate change and new development.
Vulnerable populations	Populations suffering from respiratory ailments are at the greatest risk from wildfire since smoke from fire. People with existing heart and lung diseases, older adults, children and pregnant women are especially at risk of smoke-related health problems.
Property	The level of exposure of property and potential impacts to property from wildfire is not yet known in detail. The communities with the highest levels of exposure include Snoqualmie, North Bend, and unincorporated areas of the county in the foothills of the Cascades. King County is working on a better estimate of overall risk to property and will update this plan with that information when it is available. Likely impacts to property include smoke damage to total loss of facilities. Communities built with many homes close together and constructed of flammable materials can be completely burned in a short time, as seen in Fort McMurray, Canada, Paradise California, and Santa Rosa, California.
The economy	At present, there is relatively little economic impact from wildfires in most of King County. The fires are predominately a risk in the more rural parts of the county. There is some impact from smoke and fire to transportation systems; however, it is likely to be limited and temporary. The largest impacts are likely to be indirect, including losses in work days because of poor air quality, loss of capital required for suppression efforts, interrupted access, and losses in tourist income.
The environment	While fires are often beneficial to the landscape when regular and not intense, a major wildfire can be damaging in the near term. Fires can pollute water systems and destroy old growth habitat. They can burn over springs and increase evaporation. Following extreme fires, hydrophobic soils make it difficult for plants to regrow in and the runoff over these soils increases the turbidity of local streams, endangering fish and other water animal populations.



Health systems	Exposure to fine particulate matter (parts per million 2.5) is a significant health concern, because the small size of the particle allows people to inhale it deep in the lungs where the particles can directly enter the blood stream. The effects of smoke exposure range from eye and respiratory tract irritation to more serious health problems including reduced lung function, bronchitis, exacerbation of asthma and heart failure, and premature death. ¹⁴¹ During extreme smoke pollution events, public health systems are likely to be overburdened by populations suffering respiratory distress.
Government operations (continuity of operations)	Most King County operations and facilities are in the more urban areas of the county and unlikely to be directly impacted by wildfires. Smoke, however, can cause an increase in employee absenteeism as employees may need to stay home to avoid smoke exposure. Another risk is that a wildfire might occupy most of the region's firefighting capabilities, leaving less capability to continue regular structure fire and emergency medical missions.
Responders	Growing numbers of wildfires will increase risk to firefighters. Firefighters in the Puget Sound mostly respond to structure fires. With an increase in wildland or WUI fires, firefighting becomes more complex and dangerous. Also, communities without proper ingress/egress routes further increase risk to firefighters who may be called upon to attempt evacuations in such communities. According to the Washington State Enhanced Hazard Mitigation Plan, there are less than five first responder facilities exposed to wildfire. ¹⁴²
Infrastructure systems	• Energy: Washington's transmission lines run through wildland areas. Wildfires in King County could damage or destroy these systems, although brush is usually kept clear of the largest transmission facilities. Rural and other interface power lines would be burned in any fire, as has been seen in numerous communities in Eastern Washington. Utilities in California are increasingly powering down transmission systems during "red flag" fire conditions, affecting energy customers. • Water/Wastewater: Many water reservoirs are in forested areas and could be impacted by wildfire that may burn power supplies to pump stations or the pump stations themselves. Furthermore, post-fire flooding could damage or pollute reservoirs. • Transportation: Fire can cause road closures due to visibility concerns. A greater risk, however, is post-fire flooding and debris flows that can damage or destroy roads and bridges downstream or downslope from a burned area after a rain. Additionally, SeaTac Airport was forced to cancel flights in 2018 due to poor visibility during smoke events.

¹⁴¹ Washington State Emergency Management. 2018. Washington State Enhanced Hazard Mitigation Plan Risk Assessment. Pp. 493-495.

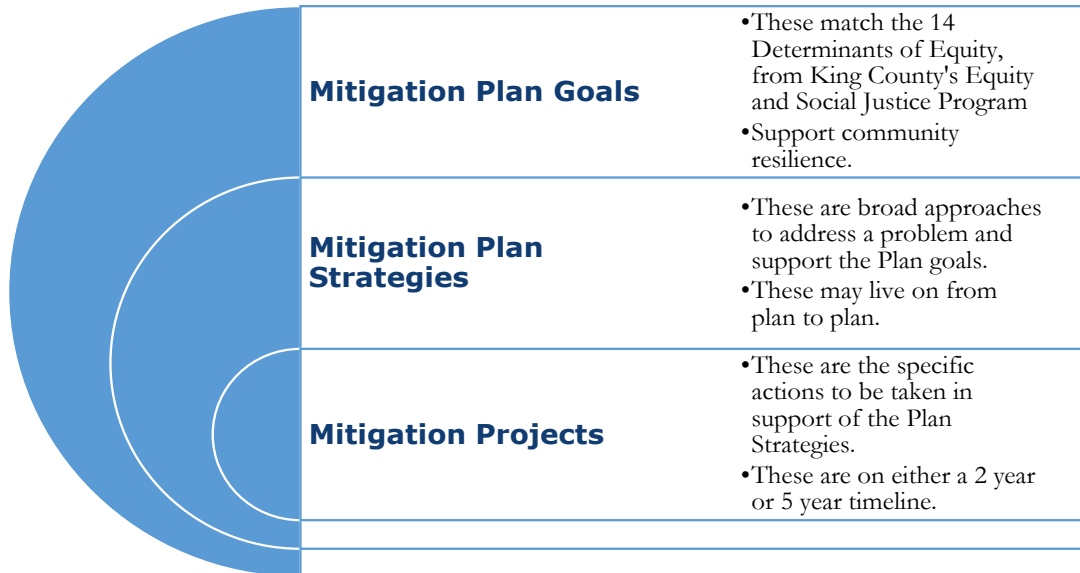
¹⁴² Washington State Emergency Management. 2018. Washington State Enhanced Hazard Mitigation Plan: Wildfire Risk Assessment. Page 533.



	• Communications: Cellular communications sites can lose power or be damaged by wildfire. During these events, it may be necessary to deploy cellular on wheels capabilities.
Public confidence in jurisdiction's governance and capabilities	Wildfire hazards have gained renewed importance in recent years due to the smoke problems of 2017 and 2018. Numerous articles in the Seattle Times and other media describe a "new normal" of smoke and fire danger in the Northwest. State and local jurisdictions have been working to prepare public information messaging due to health concerns and public interest. Government will need to be proactive in managing this hazard in order to maintain public confidence.

Hazard Mitigation Strategies

The primary focus of this plan update was the development of comprehensive, operationally viable hazard mitigation strategies and the establishment of a capability to supervise and promote their implementation. Plan strategies were developed using the following structure:



Hazard mitigation strategies were developed by each participating jurisdiction, supported by a series of workshops, described in the planning partner engagement section of the introduction. The workshops were hosted by King County Emergency Management and included state and FEMA staff associated with the RiskMAP program.

The half-day workshop series took participants from developing risk problem statements (December 2018), through identifying community assets and strategies to protect those assets (July 2019), to funding projects (August 2019). Using problem statements developed in the first workshop, participants identified assets and then developed strategies that could protect their assets in workshop 2. Participants were also guided through a strategy prioritization exercise using the King County method described below. They left the second workshop with a list of strategies drafted and prioritized. For the third workshop, participants learned about potential funding sources and how to seek funding for high-priority strategies and eligible projects that they could not fund internally.

For those unable to attend workshops in-person, the planning team provided handouts and met in-person over through Skype to walk jurisdictions through the same process. Unless indicated otherwise, this is the method planning partners used to develop and prioritize hazard mitigation strategies.



Each planning partner also convened those internal stakeholders who were responsible for projects or programs that supported or implemented mitigation along with those stakeholders with funding available or funding needs. In King County, the primary hazard mitigation agencies include:

- Department of Natural Resources and Parks – Water and Land Resources
- Department of Natural Resources and Parks – Wastewater Treatment
- Department of Local Services – Permitting
- Department of Local Services – Roads
- King County Information Technology
- Department of Executive Services - King County International Airport
- Department of Executive Services – Facilities Management Division
- Public Health Seattle – King County

The planning team met with each department individually, with each developing and submitting a list of potential hazard mitigation strategies and projects.

Departments attended the July Mitigation Strategy Workshop and August Mitigation Funding Workshop along with the local jurisdiction partners.

Mitigation Plan Goals:

Goals are broad policy statements of the community's vision for the future. They help describe the contribution each strategy makes toward major objectives that reach beyond any individual department or discipline. In alignment of this and with the Plan's purpose, King County's Regional Hazard Mitigation Steering Committee adopted King County's Determinants of Equity¹⁴³ as Mitigation Plan Goals:

Mitigation Plan Goals - 14 Determinants of Equity

1. Access to Affordable, Healthy Food
2. Access to Health and Human Services
3. Access to Parks and Natural Resources
4. Access to Safe and Efficient Transportation
5. Affordable, Safe, Quality Housing
6. Community and Public Safety
7. Early Childhood Development
8. Economic Development
9. Equitable Law and Justice System
10. Equity in Government Practices
11. Family Wage Jobs and Job Training
12. Healthy Built and Natural Environments
13. Quality Education

¹⁴³ Office of the King County Executive. 2016. Equity and Social Justice Strategic Plan. Accessed online on 7/24/19 from <https://kingcounty.gov/elected/executive/equity-social-justice/strategic-plan.aspx>.



14. Strong, Vibrant Neighborhoods

Supplemental Goals:

- 15. Resilient and safe high and significant-hazard dams
- 16. Proactive and innovative floodplain management to reduce Repetitive Loss and Severe Repetitive Loss properties

Mitigation strategies will be categorized according to these 16 factors.

Mitigation Plan Strategies

Mitigation Plan Strategies will be developed based on threats to essential assets and capabilities from hazards within cities and unincorporated areas of King County. In the past these have included strategies for risks such as land movement and flood impacts and projects such as bridge seismic retrofits and generators for critical facilities. For this plan, hazard mitigation strategies are sets of coordinated actions that, taken together, address a risk or vulnerability. They are comprehensive, long-term, and designed to be regularly updated as actions are completed.

The updated strategy format will be used going forward in order to better support long-term tracking of mitigation actions and strategies. The updated strategy template is displayed below.

Lead Points of Contact (Title)	Partner Points of Contact (Title) <i>Who else outside your jurisdiction benefits from the strategy or will help implement the strategy?</i>	Hazards Mitigated / Goals Addressed	Funding Sources and Estimated Costs
Strategy Vision/Objective <i>Long-term objective and vision for the strategy</i>			
Mitigation Strategy <i>Describe the program/proposed program</i>			
2-Year Objectives	5-Year Objectives	Long-Term Objectives	



Implementation Plan/ Actions

This can provide a timeline, indicate partners, discuss implementation stages, etc. Use this to discuss how the strategy/program will be implemented over the long term.

Performance Measures

This template will be built into a database where strategies can be entered, updated, and projects can be prioritized consistently and effectively. The goal is for strategies to remain in place through future plan updates, while implementation plan actions are changed.

Mitigation Plan Projects

Mitigation Plan Projects represent the specific work to be done and actions to be taken to mitigate a risk or hazard. Candidate projects will be developed and considered for and by each participating jurisdiction, with a process to engage the public in the prioritization of projects. Projects will be prioritized using the scoring method established by the Steering Committee to ensure alignment with the Plan Strategies and Goals and in keeping with the following values:

- Equity, Social Justice, and Vulnerability
- Collaborative
- Adaptation and Sustainability
- Multiple-Benefit
- Effectiveness
- Urgent
- Shovel-Ready

Prioritizing Hazard Mitigation Projects

King County developed a prioritization process based on criteria taken from national best practices¹⁴⁴ and priorities identified by the King County Executive. These criteria are used to prioritize projects within strategies. Strategies are also prioritized in this way to identify those areas of emphasis for KCEM and the mitigation steering committee, though this may not impact which strategies are implemented since many depend on exclusive funding sources. The below criteria will be used to establish priorities. These priorities will be applied to projects annually for submission to the FEMA BRIC program.

¹⁴⁴ Washington, District of Columbia Homeland Security and Emergency Management Agency. 2018. District Hazard Mitigation Plan, Discussion Draft.



King County uses the below matrix, scoring each factor from 0 (unsatisfactory) to 4 (outstanding) with the option of a score of -4 (actively harms the factor). Identifying projects that harm, and giving harmful factors more weight in the formula, is designed to encourage project proponents to modify their proposed design to better resolve any issues.

- -4 Project actively harms or is detrimental to this factor.
- 0 Unsatisfactory for this factor
- 1 Minimal level of standards for this factor
- 2 Satisfactory level of standards for this factor
- 3 High level of standards for this factor
- 4 Outstanding or beyond expectations for this factor.

Strategy:				
Factors for Consideration	Project 1	Project 2	Project 3	Project 4
Equity, Social Justice, and Vulnerability (project is designed to benefit, account for, and include vulnerable populations, especially those in the community most likely to suffer harm from a disaster and those likely to take longest to recover after a disaster)				
Collaborative (project is supported by multiple jurisdictions or agencies)				
Multiple-Benefit (project has benefits beyond hazard risk reduction, including environmental, social, or economic benefits)				
Adaptation and Sustainability (project helps people, property, and the environment become more resilient to the effects of climate change, regional growth, and development)				
Effectiveness (project is designed to attain the best-possible benefit-cost ratio)				



Urgent (project is urgently needed to reduce risk to lives and property)				
Shovel-Ready (project is largely ready to go, with few remaining roadblocks that could derail it)				
Total Scores				

Process Note: Once a jurisdiction has prioritized projects within that jurisdiction, those projects will be advanced to the regional plan. If ever there is competition between projects advanced from different jurisdictions, the RHMP Steering Committee, consisting of representatives from county departments and jurisdiction partners, will establish the order of priorities based on the values identified above. The Steering Committee will also organize priority projects with corresponding strategies. It should be noted that while prioritized projects will be included in the plan, they may not all receive funding. The Steering Committee may also seek to promote a diversity of projects so that all plan goals receive some benefits. In the case of a tie between projects during scoring, the higher prioritization may go to the less-represented mitigation strategy.

In addition to regular ranking of mitigation projects, the steering committee ranked mitigation strategies using the above tool to identify the highest priority strategy within each department and then the highest priority strategies for the county overall. These priorities are reported in the mitigation strategy section of this plan.

Crosswalk with the Strategic Climate Action Plan

Several strategies appear in some form in both the SCAP and this plan. This was done to ensure multiple avenues of implementation and monitoring and to help relevant actions gain a higher profile with other departments. Below are strategies that appear in some form in both plans.

Regional Hazard Mitigation Plan Strategy	Strategic Climate Action Plan Action
Wildfire Preparedness and Risk Reduction	Wildfire Preparedness and Risk Reduction
Accelerate Floodplain Acquisitions	Accelerate Floodplain Acquisitions
Public Information Flood Activities	Increase Technical Assistance to Property Owners for Flood Risk Reduction
Flood Risk Mapping	Flood Risk Mapping



Reduce Flood Impacts to King County Roads	Maintain Quick Response Budget for Emergency Repairs
Stormwater and Surface Water Risk Reduction	Stormwater and Surface Water Risk Reduction
Climate Integration Training	Engage Partners on Climate Preparedness Opportunities
Sea-Level Rise Resilience in Wastewater Facilities	Sea-Level Rise Resilience in Wastewater Facilities

Ongoing Plan Maintenance and Strategy Updates

King County leads the mitigation plan monitoring and update process and schedules annual plan check-ins and bi-annual mitigation strategy updates. Updates on mitigation projects are solicited by the county for inclusion in the countywide annual report. As part of participating in the 2020 update to the Regional Hazard Mitigation Plan, every jurisdiction agrees to convene their internal planning team at least annually. Partners will convene at least biannually to update hazard mitigation strategies. For the 2020 plan, progress updates will be due in 2022 and 2024, in advance of plan expiration in 2025.

In addition to the biannual strategy updates and annual planning check-ins, mitigation strategies that address flooding will be reviewed, revised, and updated annually. Special focus is warranted for flood hazards since flooding has historically been the most damaging hazard and the majority of Federal Disaster Declarations including the county are due to flooding.

Given the emphasis on plan integration described in the introduction, plan check-ins for all planning partners will include updates on integrating comprehensive, capital improvement, and other local and regional plans with hazard mitigation plans and data. This effort is already beginning with the integration of hazard risk and vulnerability information into the 2020 update of the countywide planning processes.

As part of leading a countywide planning effort, King County Emergency Management will send to planning partner any federal notices of funding opportunity for the Hazard Mitigation Assistance Grant Program. Proposals from partners will be assessed according the prioritization process identified in this plan and the county will, where possible, support those partners submitting grant proposals. This will be a key strategy to implement the plan.

The next plan update is expected to be due in April 2025. All jurisdictions will submit letters of intent by 2023, at least two years prior to plan expiration. The county will lead the next regional planning effort, beginning at least 18 months before the expiration of the 2020 plan.

To update and maintain the mitigation strategies, KC EM has worked with the King County Risk Management Services department to develop a reporting tool that will allow for easier updates on 2 and 5-year objective progress. These updates will be collected electronically and feed into a program that can track progress over time for each mitigation strategy. The strategy progress can then be reported out.



Alternatively, progress made on strategies can be organized according to mitigation plan goals. This will be done to show how projects undertaken by agencies and jurisdictions are supporting the 14 Determinants of Equity. Data parsed both in terms of the mitigation plan goals and by strategy will be reported to the County Executive and Council biannually in the annual report of the department.

In addition to the updates for mitigation strategies, the expected publication of data from several programs may trigger an update.

- Publication of the Department of Homeland Security Regional Resiliency Assessment Program report
- Publication of the countywide landslide susceptibility map from Washington Department of Natural Resources
- Publication of the Wildland Urban Interface wildfire risk map from Washington Department of Natural Resources
- Publication of tsunami inundation data from Washington Department of Natural Resources

Introduction
Add a strategy
Assess projects
Review
Submit
Reset form

Jurisdiction:

Strategy name:

Lead contacts:

Partner contacts:

Hazards

☐ Avalanche

☐ Civil disturbance

☐ Cyber incident

☐ Dam Failure

☐ Earthquake

☐ Flood

☐ Hazardous materials

☐ Health incident

☐ Landslide

☐ Severe weather

☐ Terrorism

☐ Tsunami

☐ Volcano

☐ Wildfire

Goals

☐ Affordable, healthy food

☐ Affordable, safe, quality housing

☐ Community and public safety

☐ Early childhood development

☐ Economic development

☐ Equitable law and justice system

☐ Equity in government practices

☐ Family wage jobs and job training

☐ Health and human services

☐ Healthy built and natural environments

☐ Parks and natural resources

☐ Proactive and innovative floodplain management

☐ Quality education

☐ Resilient and safe high and significant-hazard dams

☐ Safe and efficient transportation

☐ Strong, vibrant neighborhoods

Vision/purpose:

Description:

2-year objectives:

5-year objectives:

Long term objectives:

Performance measures:

Projects within this strategy

Name/description	Owner	Timeline	Score	Status

Funding

Source	Amount (\$)	Type



Introduction
Add a strategy
Assess projects
Review

Jurisdiction:

Strategy:

Project:

Submit

Reset form

Assessment

Equity, social justice, and vulnerability	Designed to benefit, account for, and include vulnerable populations, especially those in the community most likely to suffer harm from a disaster and those likely to take longest to recover after a disaster
Collaboration	Supported by multiple jurisdictions, agencies, or the impacted community
Multiple-benefit	Benefits beyond hazard risk reduction, including environmental, social, or economic benefits
Adaptability and sustainability	Helps people, property, and the environment become more resilient to the effects of climate change, regional growth, and development
Effectiveness	Designed to attain the best-possible benefit-cost ratio
Urgency	Urgently needed to reduce risk to lives and property
Shovel-readiness	Largely ready to go, with few remaining roadblocks that could derail it

Total score:

Scoring		
Determination	Meaning	Score
Outstanding	Outstanding or beyond expectations for this factor	4
High	High level of standards for this factor	3
Satisfactory	Satisfactory level of standards for this factor	2
Minimal	Minimal level of standards for this factor	1
Unsatisfactory	Unsatisfactory for this factor	0
Detrimental	Project actively harms or is detrimental to this factor	-4

Plan Approval and Adoption

The King County Regional Hazard Mitigation Plan is submitted first to Washington State Emergency Management for review and then to FEMA for final review and preliminary approval. Each jurisdiction, along with the base plan, must meet all FEMA requirements outlined in the FEMA Local Hazard Mitigation Plan Review Guide. If requirements are found to not be met, the jurisdiction involved must revise the plan and resubmit. Once preliminary approval is secured, FEMA will send a notice of Approval – Pending Adoption.

The RHMP is adopted by each participating jurisdiction, primarily through a resolution passed by the council or commission responsible. The King County Council adopted this plan on **DATE**, following notice of approval, pending adoption from FEMA and Washington State Emergency Management. This plan is effective upon adoption and will expire 5 years to the day after adoption.



Mitigation Strategy Status Updates from the 2015 Plan

The format for hazard mitigation strategies has been completely changed in the 2020 plan update. All actions previously identified have been removed and/or incorporated into new mitigation strategies. The updated strategy format will better support tracking and implementation of mitigation strategies and their constituent actions. Strategies that are preparedness focused have been removed, as well as those that are ongoing in nature and do not have specific targets or responsible entities.

The following tables are taken from the 2018 annual progress report for the 2015 King County Regional Hazard Mitigation Plan. This list only includes strategies submitted by King County departments and countywide strategies. Individual jurisdiction action progress reports are included in each annex. The new statuses for strategies include:

- Removed – Strategy is not carried forward into the new plan
- Complete – Strategy is complete and not carried forward into the new plan
- Updated – Strategy is updated and carried forward into the new mitigation plan.



CURRENT PROGRESS ON 2015 ACTION PLAN INITIATIVES				
Progress (Yes/No)	Timeline	Update Status	Comment (Describe progress or changed priority)	2018 Status
CW-1—Continue to participate in and support the “Resilient King County” initiative.				
Yes	Long-Term	Removed	King County is continuing work towards developing a Regional Recovery Framework. Recent efforts to vet content with King County’s Department Directors and Executive Office have been made to start to formulate a governance structure.	Ongoing
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.				
Yes	Long Term	Removed	King County’s Regional Hazard Mitigation plan and all updated documents will continue to be posted to the website.	Ongoing
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.				
Yes	Long Term	Removed	We continue to enhance public education campaigns and have now added climate resilience as part of our educational presentations.	Ongoing
CW-4—Continue to support the use, development and enhancement of a regional alert and notification system.				
Yes	Short Term	Removed	King County deployed a new Regional Alert and Notification System. Many King County departments and cities have signed on.	Complete
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.				
Yes	Long Term	Removed	KC DNRP has updated landslide hazard maps (see DNRP – WLR 3 & DNRP – WLR 4)	Ongoing
CW-6—Encourage signatories for the regional coordination framework for disasters and planned events.				
Yes	Long Term	Removed	New signatories were added in 2016.	Ongoing
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.				



Yes	Long Term	Removed	Ongoing communication and coordination was completed through the linkage process of Lake Forest Park and Kenmore, grants coordination for various applications, and ongoing communication for progress reporting.	Ongoing
DNRP-SWD-1—Seismic Design Standards. Continue to design and build facilities to meet or exceed seismic standards, including redundant essential equipment. Apply current seismic standards to all renovation or replacement of existing facilities and/or equipment.				
Yes	Short-term	Removed	Design standards exist and we will continue to design and build facilities to meet or exceed seismic standards, including redundant essential equipment. Apply current seismic standards to all renovation or replacement of existing facilities and/or equipment.	Complete
DNRP-SWD-2—Vulnerability Assessment of Cedar Hills Landfills Structures. Conduct a vulnerability assessment of buildings at the Cedar Hills Landfill to ascertain readiness.				
Yes	Long-term	Removed	Structural integrity to be addressed through seismic design standards; to be removed as part of standard work. Additional work completed to reduce vulnerability at the landfill includes: completed Emergency Action Plan, Dam Break Analysis, Potential Inundation Area Mapping for the Contaminated Stormwater (CSW) Pond dam and the SW Stormwater Pond dam (both state registered dams at Cedar Hills Regional Landfill). The SCADA system is being updated to monitor and automate operation adjustments for pumping at the CSW facility. The area 8 stockpile slope was regraded Q3 2018 in response to a Q4 2017 slope failure (a.k.a., landslide or land movement) and to mitigate future failure prior to the rainy season. Coordination between SWD and OEM enhanced, including use of mass notification system for incident response, support and community notification.	Complete
DNRP-WLR-1—Flood Insurance Program. Continue to maintain compliance and good standing under the National Flood Insurance Program. This will be accomplished through the implementation of floodplain management programs, at a minimum, will meet the minimum requirements of the NFIP, which include the following:				
• Enforcing the adopted flood damage prevention ordinance. • Participating in floodplain identification and mapping updates. • Providing public assistance and information on floodplain requirements and impacts.				
Yes	Long-term	Removed	Met minimum requirements of the NFIP by providing public assistance and information on	Ongoing



			floodplain requirements, enforcing the adopted flood damage reduction ordinance and participating in floodplain mapping updates. Maintain a CRS Class 2 rating, which verifies that King County meets and exceeds FEMA NFIP minimum requirements.	
DNRP-WLR-2—Landslide Hazard Coordination. Form an interdepartmental landslide hazard committee that includes DNRP, DPER, DOT, and OEM. The committee will address broad policy issues, including capital projects, communication, code changes, etc.				
No	Long-term	Updated	Form an interdepartmental landslide hazard committee that includes DNRP, DPER, DOT and OEM. The committee will address broad policy issues, including capital projects, communication, code changes, etc.	Ongoing
DNRP-WLR-3—Proposed Hazard Mapping Phase I. Update the current landslide hazard map with information that has been collected to date.				
Yes	Short-term	Removed	Low priority now that map is complete. Status: Complete for areas within major river corridors and Vashon-Maury Island. Comment: A Phase 1 map was completed in October 2014. Phase I mapping along river corridors was completed by Water Land Resources Division as the service provider to the King County Flood Control District and Phase 1 mapping for Vashon-Maury Island was provided by KC DPER. Areas outside of major river corridors were not included in this map.	Complete
DNRP-WLR-4—Proposed Hazard Mapping Phase II. Create a geo-database with detailed information on landslide types, run out, landslide dams, etc. Database will be searchable and updatable as new information is acquired.				
Yes	Short-term	Removed	Phase II mapping along river corridors was completed by Water Land Resources Division as the service provider to the King County Flood Control District (KCFCDD). Areas outside of the major river corridors (including Vashon-Maury Island) are not included in the geo-database. This mapping along river corridors includes five general landslide types, each of these were mapped separately to illustrate potential hazard areas. This mapping has been completed along with a supporting technical report, database and a user-	Complete

friendly web tool. It is anticipated that this mapping will be publicly available in August 2016. This mapping will be available in a GIS format. No suitable methodology was identified to predict future landslide runout beyond area of current landslide debris deposition. Therefore, neither such landslide runout, nor the resulting formation of landslide dams was mapped. At this time funding has not been secured for ongoing database management or further updates to the river corridor landslide mapping information. DPER completed a separate landslide hazard mapping project covering unincorporated King County largely outside of the forest production zone. This was an expansion of the Phase 1 mapping and was needed to identify areas for further geotechnical investigation during building and land use permit application reviews. This mapping does not distinguish between different landslide processes. The DPER mapping is complete to current specifications and is presently undergoing internal review. DPER's map of potential landslide hazards will be available in a GIS format. It will be updated at appropriate intervals as needed following receipt of new data. Landslide hazards in incorporated areas outside of major river corridors are not included in the Phase I or Phase II products. At this time no work is funded or planned to conduct landslide hazard mapping for incorporated areas that are outside of the major river corridors.				
DNRP-WLR-5—Flood Protection Facility Maintenance. Maintain and repair damaged structural elements for King County's extensive inventory of flood protection facilities.				
Yes	Long-term	Updated	County staff completed 421 inspections on 332 levees and revetments during the reporting period. Of these, 143 were routine inspections and 279 were post-flood inspections following the 2015-2016 flood season. Resulting in identification of damages to flood protection facilities and repairs or emergency management plan.	Ongoing



Maintenance of more than 70 sites included irrigation, signage, hazard tree mitigation, debris removal, planting, mulching, mowing and installation of a device to prevent beavers from blocking two large culverts which could result in flooding homes and roads in the North Bend area. Resulting in reduced potential for flooding.				
DNRP-WLR-6—River Corridor Restoration. Remove, slope back, or set back 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	Updated	Completed projects allowing for river corridor restoration include the Sinnema Quaale Revetment project on the Snoqualmie River. This revetment repair was completed in the summer of 2016 and has significantly decreased the risks to the Snoqualmie Valley Trail, regionally significant fiber optic lines and SR203. The Countyline to A Street levee setback on the White River is currently under construction. Additional setback projects are planned for construction in 2017.	Ongoing
DNRP-WLR-7—Flood Hazard Mitigation. Acquire repetitively damaged homes, purchase underdeveloped land to prevent future development in flood prone areas, and, where cost-effective and feasible, elevate residential homes that sustain recurring deep, low-velocity flooding.				
Yes	Long-term	Updated	Non-structural mitigation efforts are ongoing in flood prone areas. Eleven at-risk homes were elevated in the Snoqualmie basin during the reporting period; another 13 home elevations are underway. Elevating homes eliminates flood damage to living space, resulting in a more resilient community. Acquisition of the last at-risk parcel in the San Souci neighborhood along the Tolt River completed 20 years of effort to acquire 18 parcels from willing landowners. These actions have completely eliminated flood risks to the entire neighborhood and eliminated emergency monitoring and response to the neighborhood.	Ongoing



DNRP-WLR-8—Critical Facility Retrofit. Retrofit the Black River Pump Station by updating the fuel pumps to meet seismic requirements. Currently, the fuel supply tanks for King County flood facilities cannot withstand a moderate to major quake.				
Yes	Long-term	Updated	Recent improvements include: • Replacing the single-walled fuel system with double-walled tanks and lines to handle all diesel fuel in accordance with current code requirements • Replacing the pumphouse roof • Installing safety rails on the roof Sediment had accumulated in the pump inlet bays, hindering operation of pump screen systems. Accumulated sediment was emptied from the bays and inlet apron in 2016 to allow continued operation of the screens and pumps. This improves the certainty of flood protection the station provides too much of Renton and parts of Tukwila and Kent. Staff have completed update of Emergency Action Plans for 10 state registered dams in compliance with Washington Dam Safety Office. Improvements to these plans include automated notification applying King County Alert and King County Inform emergency notification platforms; upgrades to dam break analysis and Potential Inundation Area mapping; and enhanced coordination between operations and emergency planning.	Ongoing
DNRP-WLR-9—Flood Hazard Reduction Programs. Conduct activities that are vital to the mitigation of the natural hazards impacting King County, such as hazard identification, warning, information dissemination and public outreach.				
Yes	Long-term	Updated	Expansion of the King County Flood Warning System to include the South Fork Skykomish River. A four-phase warning system is being developed in time for the 2016–2017 flood season, following review and approval by the District. This system is expected to provide flood warnings to people who live, work or travel through the town of Skykomish and the surrounding area.	Ongoing



In October, the annual flood warning brochure was mailed to 19,222 addresses in the King County river floodplain. Significant outreach efforts during the reporting period include preparation for flood season, outreach about multiple construction projects, as well as outreach about floodplain planning, technical studies and maps, and other public engagement efforts.				
DNRP-WLR-10—Critical Facility Upgrade. Continue to update flood warning telemetry and gauging, computers, software applications, emergency power, and other response facilities.				
Yes	Long-term	Updated	Updates to the King County Flood App for iOS, Android, and Windows phones were completed for release by October 2015. All King County websites were migrated to a new "mobile responsive" template which adapts to a wide range of screen sizes, from small smartphone displays to big screen desktop displays. In addition, improvements were made to the back-end systems that manage the flood data used on the websites, apps and automated phone systems.	Ongoing
DNRP-WTD-1— Seismic Design Standards. Continue to design and build facilities to meet or exceed seismic standards, including essential equipment. Apply current seismic standards to all renovation or replacement of existing facilities and/or equipment.				
Yes	Long-term	Updated	This is an ongoing process- we apply current seismic standards to all renovation and/or replacement of existing facilities or equipment.	Ongoing



DNRP-WTD-2—Vulnerability Assessments. Conduct vulnerability assessments of WTD treatment plant facilities and conveyance system structures for flooding, earthquakes, large-scale power outages, and hazardous material spills into the conveyance system (accidental or deliberate, i.e. terrorist action). The assessments should include the following: • Review existing earthquake vulnerability assessments and identify facilities and structures that need further assessments. • Review existing emergency power generation capacities at treatment plants, offsite facilities and interceptors (pipelines) to identify vulnerabilities and response & restoration protocol enhancements. • Review existing spill response procedures and protocols for hazardous materials spills (both accidental and intentional releases) that impact flows into the WTD system. Update and coordinate emergency procedures with key fire departments and the Office of Emergency Management.				
Yes	Short-term	Removed	Request for Proposal issued on 7/12/2016	Ongoing
DNRP-WTD-3—Modification of Existing Facilities. Use the data gathered by the earthquake vulnerability assessments to identify capital projects that increase the resistance of the division's structures and conveyances to damage or that allow a rapid recovery from damage. Projects may include seismic bracing of equipment and piping, removal of z-beam structures, access road reinforcement for the West Point Treatment Plant, or seismic upgrade of underwater interceptors.				
No	Long-term	Updated	This task is driven by the results of the above vulnerability assessments which have yet to be conducted. See item 2 above	Ongoing
DNRP-WTD-4—Sea Level Rise Vulnerability Assessments. Implement cost-effective measures to address, through capital improvement and asset management programs, the vulnerability of 20 facilities at risk of saltwater inflow. The facilities were identified by a WTD analysis of the wastewater system to identify facilities at risk for saltwater inflow from future sea level rise, existing and predicted high tides, and storm surges.				
Yes	Long-term	Updated		Ongoing
DNRP-WTD-5—Control System/ Cyber Security Vulnerability Assessment and Procedure Audit. Implement the Ovation project—a multi-year, multi-million-dollar upgrade of the Wastewater Treatment Division's legacy control systems. WTD is in the process of updating its control systems. Vulnerability assessments are designed into the Ovation project. When the system is operational, a security audit would be conducted to ensure that policies and procedures are in place to protect the system.				
No	Long-term	Updated	This assessment will be conducted when the system is operational	Ongoing



DNRP-WTD-6—Emergency Communications Vulnerability Assessment. Perform an assessment to determine the number of radios necessary to support operational readiness in the event of a widespread telecommunications failure. Currently all key operational facilities and offsite operation and maintenance vehicles are equipped with 800 MHz radios, constituting WTD's core emergency communications method. The analog equipment currently deployed is first generation and is being sunsetted as the system is converted to a digital format. All the division's analog radios will need to be replaced in the next 3 to 5 years. Perform a further assessment of the reliability and deployment of other communications devices: cell phones, smart phones, iPads, text messaging, and the emergency notification system (MyState/AlertSense).				
No	Long-term	Updated		Ongoing
DNRP-WTD-7—GIS Emergency Response Mapping and Real-Time Flow Data. Update the WTD/DNRP Emergency Response map with the current priority roads, bridges, earthquake liquefaction, inundation and landslide zones and gas/petroleum pipelines, under-laid with WTD facilities and conveyance lines and emergency outfalls to facilitate emergency response and continuity of operations. Make this information available through a password-protected website for select users. Explore connecting the map to real-time flow data.				
Yes	Short-term	Updated	A GIS emergency mapping site is now operational on the WTD intranet that shows facilities and conveyance system. Working on moving it to an internet site so that it can be accessed 24/7 by off duty personnel.	Ongoing
DNRP-WTD-8—Emergency Event Management System. Determine the best method for WTD to manage and share emergency response and continuity of operations activities across the division's five treatment plants and the division headquarters in the King Street Center. Determine if the Regional Information System can fulfill this function and, if not, what alternative systems are available (WebEOC, CodeRed, etc.).				
No	Long-term	Updated	Tested the KC OEM SharePoint site during the CSZ exercise. Assessing the need for a separate WTD system	Ongoing
DNRP-WTD-9—Emergency Response/ Damage Assessment/FEMA Cost Tracking. To ensure maximum FEMA reimbursement for disaster repair/mitigation, implement a system to capture and track emergency response activities and expenses from the beginning of incidents through damage assessment and restoration. Use this tracking system for all out-of-the-ordinary emergency events. Include labor, equipment, mileage, supplies, expendables, and outside contracting associated with response and repair.				
No	Short-term	Updated		Ongoing



DOT-1—Updated response plans to address terrorism preparedness, including the following:				
- Improve existing systems to address new technologies that are available for early weapons-of-mass-destruction detection. - Leverage existing resources and partnerships (Securitas, King County Sheriff's Office, Seattle Police Department, Seattle Fire Department) to train and exercise together for continuity during real-world events.				
Yes	Long-term	Removed		Ongoing
DOT-2—Update messaging, response plans, and procedures to address winter weather, including the following:				
- Outreach to vulnerable and at-risk populations for transportation for individuals who need to get to life-saving medical appointments (dialysis, chemotherapy). - Coordination with healthcare and transportation partners to ensure access to medical care.				
Yes	Long-term	Removed		Complete
DOT-3—Update and improve plans to address continuity of transportation services, provision of medical care, and infrastructure resiliency, including the following:				
- Plans and procedures for workforce continuity and service provision. - Coordination with local partners on evacuation and responder routes, lifeline routes, and transportation routes. - Technical systems and IT infrastructure (e.g. computer programs, SCADA systems).				
Yes	Long-term	Removed		Ongoing
DOT-4—Install security cameras on public buses to deter crime associated with civil unrest and terrorist acts.				
Yes	Short-term	Removed	Metro will have at or near 100% of their fleet equipped with cameras by the end of 2018.	Complete
DPER-1—Continue inspection of existing and new construction.				
Yes	Long-term	Updated	Inspection to ensure code compliance of both new and existing building and sites are conducted for all permit work.	Ongoing
DPER-2—Provide plan reviews for noted construction.				
Yes	Long-term	Updated	Inspection to ensure code compliance of both new and existing building and sites are conducted for all permit work.	Ongoing
DPER-3—Work with schools and fire service public educators to deliver public safety messages.				
Yes	Long-term	Updated	Operational (annual) fire safety inspection of schools was initiated this past year after several years of inaction.	Ongoing



FMD-1—Replace Alder Tower, Alder Wing and Youth Detention Facility with a new modern juvenile justice center meeting all seismic standards. Planning is underway for the new, voter-approved \$210 million Children and Family Justice Center. Completion of the new facility is expected in 2019.				
Yes	Long-term	Removed	New facility is now expected in 2019 rather than 2018.	Complete
FMD-2—Mitigate structural damage at King County Facilities. This initiative also involves training to determine structural damage during and after hazard events.				
Yes	Long-term	Updated	The Facilities Management Division has undertaken replacement of some fire protection systems which as a result, will reduce fire damage during hazard events.	Ongoing
FMD-3—Mitigate non-structural facility damage at King County facilities. This initiative also involves training to determine non-structural damage during and after hazard events.				
Was an action taken?	Short-term	Updated	The Facilities Management Division recently received a report about serious deficiencies at the King County Courthouse. We will be updating the response to this issue outside of the cycle of this report.	Ongoing
KCIT-1—Enterprise Server Optimization Project. Implement a standard virtual environment at the King County Data Center to set the foundation for the King County Public Cloud Services to expand infrastructure service offerings.				
Yes	Short-term	Removed		Complete
KCIT-2—King County TV High-Definition Upgrade. Replace obsolete station infrastructure with industry standard high-definition and digital equipment, allowing for delivery of the highest level of service to the citizens of King County.				
Yes	Short-term	Removed		Complete
KCIT-3—Countywide Telephone System Replacement. Replace obsolete telephony infrastructure and telephone systems with a modern and feature-rich communications solution.				
Yes	Short-term	Removed	Complete by end of 2010.	Ongoing
KCIT-4—Business Empowerment and User Mobility. Improve the King County wide area network to meet business requirements and provide a solid foundation for growth within a resilient and stable network.				
Yes	Short-term	Removed		Complete
KCIT-5—Administration Building Rewire. Upgrade network cabling in King County Administration Building to meet infrastructure standards, provide a more robust network connectivity to the services provided at the facility, and take advantage of technological advancements.				



Yes	Short-term	Removed		Complete
PH-1— Inform the public on risk-reduction techniques for a communicable disease event. “Stop Germs, Stay Healthy” public education campaign increases awareness of healthy behaviors, including hand washing and “cover your cough”.				
Yes	Short-term	Removed	Public Health promotes infection control prevention every day as well as during outbreaks and flu season. Current focus is on fact sheets with pictograms for outbreaks such as hepatitis A and measles as well as guidelines for encampments and homeless service providers. Also actively using social media and blogs to promote messages.	Ongoing
PH-2—Update response plans to address emerging infectious disease outbreaks, including the following: • The allocation of resources (antivirals, vaccine, personal protective equipment) from the strategic national stockpile. • Improvements to surveillance systems to address new technologies • Leverage existing private and public partnerships (CBO, healthcare, pharmacies) to serve as medication centers and increasing access to medications for hard-to-reach communities. • Risk communications and messaging, including use of social media.				
Yes	Short-term	Removed	A number of response plans were updated including medical countermeasures, equity response plan, risk communication plan, and workforce mobilization plan. Tested new systems for surveillance and plans during hepatitis A and measles outbreaks, including easy to understand visual display of cases and vaccination efforts.	Completed
PH-3—Update response plans and procedures to address winter weather, extreme heat, and other climate-related events including the following: • Outreach to vulnerable and at-risk populations for carbon monoxide poisoning prevention. • Transportation for individuals who need to get to life-saving medical appointments (dialysis, chemotherapy). • Coordination with healthcare providers and NW Healthcare Response Network to ensure access to medical care. • Coordination with shelter providers for first aid teams and access for people to re-charge medical equipment.				
Yes	Short-term	Removed	Consolidated weather events into one extreme weather plan, updated winter weather transportation plan and added wildfire smoke protocols. Tested winter weather plans, including medical appointment protocol during 2019 snow events.	Completed



OEM-1—Inform the public on personal and community preparedness actions they can take to lessen their need for immediate response following a disaster. “Take Winter by Storm” and “What to Do to Make It Through” are two outreach campaigns designed to get the message across to the whole community. These campaigns include trainings, presentations, and tools to facilitate increased community preparedness.				
Yes	Long-term	Removed	Strategy is ongoing by nature and preparedness-focused. Removed.	Ongoing
OEM-2—Create a program to facilitate training for small businesses to increase their resilience to all hazards. Training content would include employee preparedness, business continuity, and recovery planning. Methods of training would include workshops, tools, and one-on-one help.				
Yes	Short-term	Removed	Initial steps to create Business EOC and conduct pilot test were taken in June during Cascadia Rising. As a result of early coordination with Seattle and King County, 7 companies representing more than 150,000 employees participated and were able to make faster operational decisions that could protect company resources and staff in a real event. Examples include early evacuation notifications, avoiding traffic disruptions, and setting up alternate modes of communication. Continuing to work with City of Seattle, WAEMD, and FEMA on building a Regional BEOC model.	Ongoing
OEM-3—Manage and facilitate the Resilient King County initiative, a countywide planning process for crafting a comprehensive long-term recovery strategy following an earthquake or major catastrophe. Develop the Resilient King County final report and the long-term recovery plan.				
Yes	Short-term	Updated	Conducted facilitated discussion with Executive Leadership Team as part of Cascadia Rising Exercise. Will vet plan content over summer and fall 2016.	Ongoing
OEM-4—Take advantage of technological and procedural improvements in regional alert and warning systems to provide the most effective, efficient, and cost-effective messaging to residents, businesses, and government, especially during emergencies.				
Yes	Short-term	Removed	Completed launch for new Alert & Notification system in May 2016. As a result, King County not only has the ability to provide alerts to all 2.1 million residents but also, 16 new cities have signed up and have direct ability to message their residents for local events. This allows a reduction in hazard impact as people will have more time to prepare themselves and their property by receiving alerts during an emergency.	Complete



OEM-5—Continue to update and improve the Comprehensive Emergency Management Plan (CEMP) and the Continuity of Operations Plan.				
Yes	Short-term	Removed	The CEMP has been updated in 2018/2019.	Complete
OEM-6—Integrate the hazard mitigation plan into other plans, ordinances or programs to dictate land uses within the jurisdiction.				
Yes	Short-term	Updated	Regional Hazard Mitigation Plan has been incorporated into the King County Strategic Climate Action Plan. Will also serve as a reference for recovery.	Ongoing
OEM-7—Continue to support the countywide initiatives in this plan.				
Yes	Short-term	Removed		Ongoing
OEM-8—Coordinate and actively participate in the plan maintenance strategy of this plan.				
Yes	Short-term	Updated	County is implementing additional support for grant administration and outreach to promote mitigation.	Ongoing
OEM-9—Continue to encourage community participation in incentive-based programs such as CRS, FireWise, and StormReady.				
Yes	Short-term	Removed		Ongoing

2020 King County Hazard Mitigation Strategies

King County identified the following strategies through meetings among county departments. These strategies were scored by each department using the prioritization criteria outlined earlier in this section. The highest priority from each department is highlighted below. From the list of top priorities for each department the highest countywide priorities were selected. These are:

- Integrate equity and social justice into planning, outreach, mitigation, response, and recovery
- Integrate hazards and vulnerability information into comprehensive planning
- Establish a resilient seismic transportation lifeline

STRATEGY	PRIORITY (SCORE)	LEAD AGENCY	KEY OUTCOMES
Reduce Flood Impacts to Unincorporated King County Road System	18	DLS - Roads	Lower road damage from repeated flooding, especially in the Snoqualmie Valley.



Increase Seismic Resilience of Bridges in Unincorporated King County	16	DLS - Roads	Seismic retrofits to King County bridges, especially those supporting the transportation seismic lifeline.
Stormwater Outfall Erosion Hazard Inventory	18	DNRP	Hazard inventory of stormwater outfalls and mapping of those areas in GIS.
Resilience in Design and Build of Critical Water Treatment and Conveyance Facilities	23	DNRP	Improvements, retrofits, and new construction of water treatment facilities that meets seismic resilience needs.
Landslide, Erosion, and Sedimentation Event Mapping	19	DNRP	Mapping of hazard areas and establishment of GIS layers.
Sea Level Rise Resilience in Wastewater Facilities	18	DNRP	Measures to move or reduce risk to wastewater facilities in areas projected to be impacted by sea-level rise.
Stormwater and Surface Water Risk Reduction	18	DNRP	Retrofits to endangered stormwater facilities. Focus on those areas at greatest risk of failure.
Control System Security and Performance	16	DNRP	Protection of wastewater system from cyber-attacks.
GIS Emergency Response Mapping and Real-Time Flow Data	15	DNRP	Real time GIS updates to critical facility information.
Emergency Communications Enhancements	12	DNRP	Improvements to, and resilience of, emergency communications tools.
Emergency Event Management System	12	DNRP	Improvements to WebEOC, including training on it.
Flood Warning Program	18	DNRP - Flood	Flood warning, including public information about warning system.
Post-Flood Recovery Efforts	19	DNRP - Flood	Resilient rebuilding following a flood disaster.



Home Elevations	18	DNRP - Flood	Elevations of homes out of base flood elevation when acquisition is not feasible.
Home Acquisitions and Relocations	19	DNRP - Flood	Prioritize acquisition as a tool of risk reduction and take advantage of post-disaster acquisition opportunities.
Protect and Restore Natural Floodplain Functions	17	DNRP - Flood	Take advantage of natural systems to reduce flood risk and restore flood risk areas to their natural state.
Flood Risk Mapping	16	DNRP - Flood	Improve and update flood risk maps, accounting for climate change.
Public Information Flood Activities	16	DNRP - Flood	Conduct outreach around flood hazard information.
Flood Insurance Promotion	16	DNRP - Flood	Promote flood insurance to all homeowners, renters, and business owners.
Enforce Higher Floodplain Management Regulations	13	DNRP - Flood	Enforce King County's higher standards to prevent the creation of new flood risk.
Manage Flood Protection Facilities	4	DNRP - Flood	Manage flood protection facilities to ensure they will not fail during a major flood or earthquake.
Seismic Evaluation of King County Courthouse and Maleng Regional Justice Center	16	FMD	Evaluate the vulnerability of major King County justice facilities and develop a strategy to address deficiencies.
Integrate ESJ into Mitigation, Response, and Recovery Activities	25	KCEM	Fully account for equity and social justice in all planning and activities to help ensure that disasters do not increase inequity.
Seismic Lifeline Route Resilience	23	KCEM	Establish transportation seismic lifelines and begin retrofitting vulnerable segments to a standard that will enable effective response



			and recovery following an earthquake.
Integrate Hazard Mitigation and Comprehensive Planning	21	KCEM	Integrate hazards and vulnerability information into comprehensive planning policies, mapping, and related activities to prevent the creation of new risk through development in high hazard areas.
Engage Community Organizations in Emergency Management	20	KCEM	Leverage existing community capabilities and engage with communities to promote emergency preparedness and catalogue potential needs.
Climate Integration Training	18	KCEM	Train local jurisdictions on how to integrate climate change information into planning, projects, and emergency management.
Disaster Skills Risk Reduction Training	18	KCEM	Train communities on what to do in a disaster and how to protect themselves and their families.
Dam Failure Risk and Impact Reduction	16	KCEM	Identify and remove or rehabilitate high hazard dams and conduct outreach on dam safety for good condition dams that will not be removed.
Wildfire Preparedness and Risk Reduction	15	KCEM	Convene partners engaged in wildfire planning activities to coordinate community outreach and reactions to new mapping and potential building codes.
Hazard Mitigation Assistance Grant Support	15	KCEM	Support local jurisdictions who have little experience in developing applications for FEMA HMA.
Public Assistance Grant Support	15	KCEM	Support local jurisdictions and county agencies with PA following a disaster declaration and expand the use of PA Mitigation funds.
Language Accessible Video Emergency Messaging	26	PHSKC	Develop video and other emergency messaging that is accessible to non-English speakers



			and those who are blind or hearing impaired.
King County Facilities Indoor Air Quality Monitoring Network	16	PHSKC	Monitor and mitigate air quality in King County facilities.
Medical Gas Seismic Detection & Emergency Shut Off	10	PHSKC	Install automatic gas detection and shutoff systems for hospitals and medical centers.



Reduce Flood Impacts to the Unincorporated King County Road System

Lead Jennifer Knauer, King County Department of Local Services, Road Services Division	Partners King County Flood Control District Cities	Hazards Mitigated / Goals Addressed Flood Goal 4, 6	Funding Sources and Estimated Costs \$500,000 (Snoqualmie Valley study) Additional design, construction costs TBD
Vision Reduce the impacts of major river flooding to the unincorporated King County Road system within the Snoqualmie Valley and other major river valleys			
Description The Snoqualmie Valley is located approximately 8-10 miles east of Seattle, Washington and chronic localized and larger-scale flooding regularly impacts and closes roads within the floodplain. During major flood events, King County has identified that countywide, eleven roads are frequently closed, of which ten are located in the Snoqualmie River Basin. During major flood events, cross-Snoqualmie Valley routes are not passable and approximately 15,000+ residents are cut off from emergency services and accessing other critical destinations during a flood event. When cross-valley road closures occur, they impact over 25,000 drivers per day. There is a need for a permanent flood tolerant cross-valley route, in part due to growth in eastern King County cities and increasing traffic volumes on unincorporated King County roads. In addition to selecting, designing and constructing one cross-valley flood tolerant route, there is a vital need for improved resiliency across other unincorporated King County roads in flood prone portions of the Snoqualmie Valley, as well as other unincorporated King County floodplain locations. A joint study is proposed to be completed by the King County Road Services Division and the King County Flood Control District. The purpose of the study is to evaluate a subset of primary cross-valley routes for the purpose of identifying a cost-effective option that can be built to withstand major flood events and provide east-west access across the valley during major flood events. Improving the flood resiliency of existing county roads, as well as designing and constructing a flood tolerant cross-Snoqualmie Valley route will be complex and costly. King County Road Services Division continues to struggle to meet its preservation service goals for unincorporated King County roads and bridges, due to current and future forecast financial constraints. The activities identified through this strategy are unfunded needs and a funding strategy will need to be prepared and successfully implemented.			
2-Year Objectives • Fund cross-valley study • Scope cross-valley study		5-Year Objectives • Complete cross-valley study • Complete planning level cost estimates for study • Pursue grant opportunities	Long-Term Objectives • Obtain grant funds to design and build a flood tolerant cross-valley route • Construct the route
Implementation Plan/Actions • Fund study to evaluate options to assess which major roadway across the Snoqualmie River Valley may be improved to withstand chronic river flooding. • Initiate and complete the study			
Performance Measure • Study completion • Route selected, as informed by the study			



Increase Seismic Resilience of Bridges in Unincorporated King County

Lead Jennifer Knauer, King County Department of Local Services, Roads Division	Partners Cities KC EM WSDOT PHSKC	Hazards Mitigated / Goals Addressed Earthquake Goal 4, 6	Funding Sources and Estimated Costs \$500,000 (study costs) TBD design and construction costs FEMA BRIC Grants
Vision Improved seismic stability for unincorporated King County lifeline route bridges			
Description Evaluate the seismic stability of unincorporated King County lifeline route bridges and complete seismic retrofits as informed by the results of the study. Seismic improvements to unincorporated King County lifeline route bridges were completed from 1995 through 2008, to retrofit these bridges to level 2 standards, the standard adopted by the King County Council that reflected the contemporary standards of that time. Subsequent to completion of these retrofits, seismic evaluation standards have changed. This strategy involves evaluating all unincorporated King County lifeline bridge routes to a retrofit level 3 (highest level), which reflects the current evaluation standard. Bridges retrofitted to a seismic level 3 would likely withstand a seismic event and still be in serviceable status. Outcomes from this strategy includes a prioritized list of lifeline bridge seismic retrofit needs and total program cost estimates. This strategy also involves securing the funding and completing the seismic retrofits identified within the prioritized needs list. King County Road Services Division continues to struggle to meet its preservation service goals for unincorporated King County roads and bridges due to current and future forecast funding constraints. The activities identified through this strategy are unfunded needs and a funding strategy will need to be prepared and successfully implemented.			
2-Year Objectives - Fund UKC bridge seismic assessment study - Complete seismic assessment study		5-Year Objectives Secure capital funds	Long-Term Objectives Complete seismic upgrades to UKC lifeline route bridges
Implementation Plan/Actions - Secure funds for the study - Complete the study and produce prioritized list of lifeline route bridge seismic retrofit needs and costs - Prepare funding strategy - Secure capital funds in support of seismic retrofits - Complete seismic retrofits			
Performance Measure - Study completed - Funding strategy prepared and successfully implemented - Bridge seismic retrofits completed			



Stormwater Outfall Erosion Hazard Inventory

Lead DNRP Water and Land Resources Division	Partners N/A	Hazards Mitigated / Goals Addressed Goal 6 Goal 12	Funding Sources and Estimated Costs SWM Fee; FCD Grant; FEMA Hazard Mitigation
Vision To minimize risk to public safety, properties, and water quality/aquatic health associated with landslides, severe erosion, and sediment deposition caused or threatened by discharges from stormwater system outfalls, both public and private. There are hundreds of stormwater system outfalls throughout unincorporated King County that discharge onto slopes or into ravines that are prone to landslides or severe erosion, or where sediment deposition is a hazard downstream. Many of these are known from past events but are not inventoried in any organized way. Many others are not known without an inventory effort to identify them.			
Description 1. Establish a GIS mapping layer/database to inventory locations where the discharges from stormwater system outfalls have caused or pose a risk of causing landslides, severe erosion, and/or sediment deposition impacts downstream. Include in the inventory a description of the landslide and erosion processes at play if known or determined through geotechnical evaluation. Include potential causal agents such as slope, soil composition, drainage area, and discharge rates. Include descriptions of observed or potential impacts to structures, facilities, roads, driveways, water quality, and fish habitat. Include a description of the potential mitigation improvement (e.g., tightline, channel stabilization, settling facility, etc.) and its approximate cost. 2. Populate the GIS database with known incidents of erosive problems downstream of outfalls. If additional information is needed on an incident, conduct a field investigation to collect it. In addition to known incidents, review existing stormwater system maps, landslide hazard area maps, erosion hazard area maps, and steep slope hazard area maps to identify outfalls that are potentially at risk of causing erosive problems downstream. Conduct field investigations of these outfalls and their drainage path downstream to determine the nature of any hazards that might exist. If hazards do exist, inventory the location and record the information mentioned above in the GIS database. 3. Use the GIS inventory information to identify and prioritize hazard mitigation projects for feasibility analysis to determine an updated cost and other information needed for ranking against other competing projects. This information can also be used to provide technical assistance to affected property owners if funding is not readily available for a mitigation project. In addition, the information would be beneficial to setting mitigation requirements during the County's permit review of new development projects upstream of problematic outfalls. At this time, funding has not been appropriated for a program that would implement this mitigation strategy. WLRD Stormwater Services is currently developing a strategic plan that will consider this along with other along with other program ideas for minimizing risk and optimizing stormwater management.			
2-Year Objectives • Complete Stormwater Services strategic plan to determine support for this program.	5-Year Objectives If there is support for the program in the strategic plan, seek funding for its implementation.	Long-Term Objectives • N/A	


Implementation Plan/Actions

- Establish GIS database as described under mitigation strategy.
- Populate GIS database with outfall locations known to be a problem based on past incidents.
- Populate database with outfall locations that could be a problem based on hazards that exist downstream either mapped or determined in the field.
- Use the GIS database to identify and prioritize mitigation projects for feasibility analysis to determine an updated cost and other information needed for ranking the project against other competing projects.
- Implement the highest priority projects as funding becomes available. Until funding becomes available, implement stop gap measures (e.g., sandbagging) if needed to minimize severity of hazard.
- Where funding is not readily available for a mitigation project, offer technical assistance to affected property owners.

Performance Measure

- Number of problematic outfalls inventoried
- Number of problematic outfalls fixed
- Number of property owners to which technical assistance was provided for private solutions



Resilience in Design and Build of Critical Water Treatment and Conveyance Facilities

Lead DNRP Water Treatment Division	Partners Strategic Climate Action Plan	Hazards Mitigated / Goals Addressed Earthquake Goal 12	Funding Sources and Estimated Costs Capital Budget, Revenue Backed.
Vision WTD Treatment Plant Facilities and Conveyance system structures are protected against identified potential vulnerabilities, including but not limited to flooding, earthquakes, large-scale power outages and hazardous materials spills into the conveyance system (whether those spills are accidental or deliberate, e.g. terrorist action).			
Description Design, build, and retrofit facilities to meet or exceed seismic standards, including essential equipment. Apply current seismic standards to all renovation or replacement of existing facilities and/or equipment. In April 2018 the division completed a Resiliency and Vulnerability Review of its entire conveyance system to identify critical structures and facilities. The project which was conducted by an engineering consultant conducted initial structural earthquake assessments of the key facilities. The report included recommendations for mitigation projects in order of priority. Work is underway on multiple projects.			
2-Year Objectives • Vulnerability assessment review. • Emergency power systems review. • Complete retrofit of 3 facilities identified as most critical/vulnerable.		5-Year Objectives • Implement changes identified in the reviews conducted in the 2-year window. • Update to spill response procedures is completed. • Complete retrofit of 6 additional facilities in order of priority/vulnerability.	Long-Term Objectives • Facilities that are resilient and able to withstand damage from earthquakes or other hazards
Implementation Plan/Actions • Review existing earthquake vulnerability assessments and identify facilities and structures that need further assessments. • Review existing emergency power generation capacities at treatment plants, offsite facilities and interceptors (pipelines) to identify vulnerabilities and response & restoration protocol enhancements. • Review existing spill response procedures and protocols for hazardous materials spills (both accidental and intentional releases) that impact flows into the WTD system. Update and coordinate emergency procedures with key fire departments and the Office of Emergency Management.			
Performance Measure • % of buildings, pipelines and equipment that are built to seismic resilience standards. • % of identified vulnerabilities and plan priorities addressed with improvements and resolutions. • % of retrofit projects planned that are completed.			



Landslide, Erosion, and Sedimentation Event Mapping

Lead DNRP Water and Land Resources Division	Partners Cooperating agencies	Hazards Mitigated / Goals Addressed Goal 4 Goal 6 Goal 12	Funding Sources and Estimated Costs SWM Fee; FCD Grant; FEMA Hazard Mitigation
Vision Develop a GIS mapping layer to establish a record of observed landslide, erosion, and sedimentation events. Include in the record a description of landslide and erosion processes if available from geotechnical evaluation. Identify landslide, erosion, and sedimentation events caused by stormwater discharge. Use this information to identify and prioritize corrections and mitigations to reduce events. These corrections and mitigations would be prioritized as part of the overall WLRD Stormwater Services strategic plan (currently development) to ensure the highest risk areas are addressed first. At this time, funding has not been secured for implementation of a corrective program for stormwater discharges that cause or contribute to landslides, erosion, and sedimentation events.			
Description Mapping of landslide, and high erosion areas and sedimentation events provides current information for development review and infrastructure planning, and utility protection measures to be implemented. Reconnaissance has identified multiple sites of stream ravine slope destabilization due to stormwater discharge from both public and private stormwater conveyance systems. Multiple measures are readily available to relocate discharge outfall, dissipate flow erosion potential, and implement flow control measures to reduce landslide risk and channel erosion. Sediment discharge and debris flow incidences cause increasing cost of sediment management and property damage and environmental impact to receiving stream habitat. This effort will also reduce inform the business risk exposure of assets that drain to locations impacted by past events. This could result in and identify proper use of different maintenance techniques, effective inspection/maintenance intervals, and the priority of improvement projects needed seek to avoid emergency repairs.			
2-Year Objectives Develop mapping to include landslide prone areas, event tracking and include highly erosive process. Identify impact areas and vulnerability to stormwater discharges.	5-Year Objectives Develop program to correct stormwater discharges causing landside activation and high erosion processes. Provide assistance to private system owners to correct stormwater discharges to unstable slopes in high impact areas	Long-Term Objectives Reduce progressive degradation of streams, wetlands and lake habitats and reduced conveyance and flood protection capacity resulting from sediment deposition.	
Implementation Plan/Actions - Establish ArcGIS mapping of landslide and erosion hazard areas that identify documented incidences, type of landslide or erosion processes and impact zones. - Prioritize local systems with high impacts to community, public infrastructure, and environment. - Identify corrective actions and mitigation strategies to reduce impacts and emergency response services provided by King County. - These actions present opportunities to improve system resilience and capacity buffering from the impacts of climate change variability.			



Performance Measure

- Mapping area completed in relation to unincorporated area.
- Identification and prioritization of problematic outfalls
- Strategy to address individual sites.
- Technical assistance to citizens to implement corrective actions



Stormwater and Surface Water Infrastructure Risk Reduction

Lead DNRP Water and Land Resources Division	Partners N/A	Hazards Mitigated / Goals Addressed Goal 6 Goal 12	Funding Sources and Estimated Costs SWM Fee; FCD Grant; FEMA Hazard Mitigation
Vision To minimize risk to public safety, properties, and water quality/aquatic health resulting from: 1) The failure of existing stormwater and surface water infrastructure due to aging. Growing numbers of stormwater and surface water infrastructure assets operated by or under the purview of the Water and Land Resources Division (WLRD) are at or approaching the end of their effective life where structural failure could cause flooding, erosion, sedimentation, and/or fish habitat damage. 2) More frequent overflow or functional impairment of existing stormwater and surface water infrastructure due to expected increases in rainfall intensities over the next 50 years from climate change. This too could cause flooding, erosion, sedimentation, and/or habitat damage. 3) The lack of stormwater control infrastructure for managing runoff from lands that were developed before stormwater controls were required on new developments. Over two thirds of the developed landscape in King County was built before modern stormwater controls were required on new developments. This lack of runoff quantity and quality control has been linked to degraded water quality and aquatic health in numerous streams and other water bodies throughout King County as documented by a network of monitoring stations. It may also contribute to existing flooding, erosion, sedimentation, and/or habitat damage.			
Description WLRD is planning to do the following to achieve the vision/objective stated above: 1) Proactively manage existing infrastructure through inspections, maintenance, risk assessments, and repair/replacement of the highest risk infrastructure components before they fail to avoid the high cost of emergency repairs and the damages or injuries that can result from component failure. This proactive management program is already in place for WLRD-operated infrastructure assets but needs further policy development for assets managed by private parties. WLRD Stormwater Services is currently developing a strategic plan that should address this policy development need. 2) Develop a methodology and standards for predicting and designing to future runoff quantities that will be generated by the increased rainfall intensities expected from climate change. To ensure new infrastructure is resilient, this methodology and standards will be incorporated into the County's stormwater regulations for new development and redevelopment. It will also be used by the County to assess the need for and design of future infrastructure improvements to reduce risk. Development of this methodology and standards is a priority of the County's Strategic Climate Action Plan (SCAP) and has been started but additional funding will be needed to finish it. 3) Build new and modify existing stormwater control infrastructure to mitigate for the lack of runoff quantity and quality controls on older developed lands. Projects that do this are called "stormwater retrofits" and several pilot projects are currently underway at various locations across King County. WLRD Stormwater Services is currently developing a strategic plan and retrofit prioritization framework that will give direction to future planning and implementation of stormwater retrofits. A formal planning program to identify, prioritize, and steward future retrofits is currently unfunded.			



2-Year Objectives • Implement actions to reduce risk on 48 high risk facility assets and continue inspections, maintenance, and risk assessments on remaining inventory of WLRD facility assets. Complete Stormwater Services strategic plan to identify policy direction for assets managed by private parties. • Seek funding to develop methodology/standards	5-Year Objectives • Implement actions to reduce risk on 120 high risk facility assets and continue inspections, maintenance, and risk assessments on remaining inventory of facility assets. • Develop methodology/standards	Long-Term Objectives • Implement actions to reduce risk on 192 high risk facility assets by 2027 and continue inspections, maintenance, and risk assessments on remaining inventory of facility assets. Implement actions to reduce risk on any newly identified high risk facility assets. • Incorporate new standards into stormwater regulation.
Implementation Plan/Actions • Implement actions to reduce risk on high risk facility assets. • Seek funding to further develop a methodology and standards for predicting and designing to future runoff quantities generated by the increased rainfall intensities expected from climate change. • Continue progress on existing pilot projects to inform future stormwater retrofits. Complete the Stormwater Services strategic plan and retrofit prioritization framework. • Complete development of the methodology and standards described at left and vet with elected officials and community stakeholders (e.g., developers, NGOs, tribes, etc.) • Obtain funding for and begin implementing a formal planning program to identify, prioritize, and steward future retrofits. • Incorporate the new methodology and standards into the County's stormwater regulations for new development and redevelopment. Conduct planning efforts to identify and prioritize predicted infrastructure problems using the new methodology and standards. This can and should be merged with the planning program described below for stormwater retrofits. Implement highest priority projects to address predicted infrastructure problems. • Conduct planning efforts to identify, prioritize, and steward stormwater retrofits. This can and should be merged with the efforts mentioned above for addressing predicted infrastructure problems resulting from climate change. Implement highest priority retrofits.		
Performance Measure • High risk facility assets mitigated. • Climate change infrastructure problems solved • Acres of developed land retrofitted with stormwater controls		



Sea Level Rise Resilience in Wastewater Facilities

Lead DNRP WTD	Partners PHSKC	Hazards Mitigated / Goals Addressed Sea Level Rise (Flooding) Goal 4, 12	Funding Sources and Estimated Costs Capital Budget
Vision Waterfront wastewater treatment facilities and road networks that will be affected by the rise of sea level due to global warming are built and enhanced to improve system resilience to these impacts.			
Description Developing and implementing adaptation strategies for cost-effective measures to address, through capital improvement and asset management programs, the vulnerability of 24 major and 380 minor facilities and 52 miles of conveyance at risk of saltwater inflow and/or inundation. The facilities were identified by a recent update to the WTD analysis of the wastewater system to identify facilities at risk for saltwater inflow and inundation from future sea level rise, existing and predicted high tides, and storm surges. This update was based on recent (2018) local and probabilistic sea level rise projections developed by network of governmental and non-governmental organizations and universities. A parallel effort is necessary for roadways in unincorporated King County, especially on Vashon Island and with ferry docks that service the islands. This will be addressed through the KC Roads strategy.			
2-Year Objectives • Work is ongoing		5-Year Objectives • Work is ongoing	Long-Term Objectives • Facilities that are resilient and able to remain operational as the sea level rises
Implementation Plan/Actions • The facilities were identified by a recent update to the WTD analysis of the wastewater system to identify facilities at risk for saltwater inflow and inundation from future sea level rise, existing and predicted high tides, and storm surges.			
Performance Measure • % of identified projects to improve resilience to sea-level rise completed.			



Stormwater and Surface Water Infrastructure Risk Reduction

Lead DNRP Water and Land Resources Division	Partners N/A	Hazards Mitigated / Goals Addressed Goal 6 Goal 12	Funding Sources and Estimated Costs SWM Fee; FCD Grant; FEMA Hazard Mitigation
Vision To minimize risk to public safety, properties, and water quality/aquatic health resulting from: 4) The failure of existing stormwater and surface water infrastructure due to aging. Growing numbers of stormwater and surface water infrastructure assets operated by or under the purview of the Water and Land Resources Division (WLRD) are at or approaching the end of their effective life where structural failure could cause flooding, erosion, sedimentation, and/or fish habitat damage. 5) More frequent overflow or functional impairment of existing stormwater and surface water infrastructure due to expected increases in rainfall intensities over the next 50 years from climate change. This too could cause flooding, erosion, sedimentation, and/or habitat damage. 6) The lack of stormwater control infrastructure for managing runoff from lands that were developed before stormwater controls were required on new developments. Over two thirds of the developed landscape in King County was built before modern stormwater controls were required on new developments. This lack of runoff quantity and quality control has been linked to degraded water quality and aquatic health in numerous streams and other water bodies throughout King County as documented by a network of monitoring stations. It may also contribute to existing flooding, erosion, sedimentation, and/or habitat damage.			
Description WLRD is planning to do the following to achieve the vision/objective stated above: 4) Proactively manage existing infrastructure through inspections, maintenance, risk assessments, and repair/replacement of the highest risk infrastructure components before they fail to avoid the high cost of emergency repairs and the damages or injuries that can result from component failure. This proactive management program is already in place for WLRD-operated infrastructure assets but needs further policy development for assets managed by private parties. WLRD Stormwater Services is currently developing a strategic plan that should address this policy development need. 5) Develop a methodology and standards for predicting and designing to future runoff quantities that will be generated by the increased rainfall intensities expected from climate change. To ensure new infrastructure is resilient, this methodology and standards will be incorporated into the County's stormwater regulations for new development and redevelopment. It will also be used by the County to assess the need for and design of future infrastructure improvements to reduce risk. Development of this methodology and standards is a priority of the County's Strategic Climate Action Plan (SCAP) and has been started but additional funding will be needed to finish it. 6) Build new and modify existing stormwater control infrastructure to mitigate for the lack of runoff quantity and quality controls on older developed lands. Projects that do this are called "stormwater retrofits" and several pilot projects are currently underway at various locations across King County. WLRD Stormwater Services is currently developing a strategic plan and retrofit prioritization framework that will give direction to future planning and implementation of stormwater retrofits. A formal planning program to identify, prioritize, and steward future retrofits is currently unfunded.			



2-Year Objectives - Implement actions to reduce risk on 48 high risk facility assets and continue inspections, maintenance, and risk assessments on remaining inventory of WLRD facility assets. Complete Stormwater Services strategic plan to identify policy direction for assets managed by private parties. - Seek funding to develop methodology/standards	5-Year Objectives - Implement actions to reduce risk on 120 high risk facility assets and continue inspections, maintenance, and risk assessments on remaining inventory of facility assets. - Develop methodology/standards	Long-Term Objectives - Implement actions to reduce risk on 192 high risk facility assets by 2027 and continue inspections, maintenance, and risk assessments on remaining inventory of facility assets. Implement actions to reduce risk on any newly identified high risk facility assets. - Incorporate new standards into stormwater regulation.
Implementation Plan/Actions - Implement actions to reduce risk on high risk facility assets. - Seek funding to further develop a methodology and standards for predicting and designing to future runoff quantities generated by the increased rainfall intensities expected from climate change. - Continue progress on existing pilot projects to inform future stormwater retrofits. Complete the Stormwater Services strategic plan and retrofit prioritization framework. - Complete development of the methodology and standards described at left and vet with elected officials and community stakeholders (e.g., developers, NGOs, tribes, etc.) - Obtain funding for and begin implementing a formal planning program to identify, prioritize, and steward future retrofits. - Incorporate the new methodology and standards into the County's stormwater regulations for new development and redevelopment. Conduct planning efforts to identify and prioritize predicted infrastructure problems using the new methodology and standards. This can and should be merged with the planning program described below for stormwater retrofits. Implement highest priority projects to address predicted infrastructure problems. - Conduct planning efforts to identify, prioritize, and steward stormwater retrofits. This can and should be merged with the efforts mentioned above for addressing predicted infrastructure problems resulting from climate change. Implement highest priority retrofits.		
Performance Measure - High risk facility assets mitigated. - Climate change infrastructure problems solved - Acres of developed land retrofitted with stormwater controls		



Control System Security and Performance

Lead DNRP Water Treatment Division	Partners N/A	Hazards Mitigated / Goals Addressed Cyber Incident Goal 12	Funding Sources and Estimated Costs Capital Budget General Fund
Vision The operational control system for Wastewater Treatment Operations is secure from cyber-attack or system failure.			
Description The wastewater treatment system is operated from three control centers which monitor the facilities and conveyance system that flows to the treatment plants. The Ovation project is a multi-year, multi-million-dollar upgrade of the Wastewater Treatment Division’s legacy control systems. WTD is in the process of updating its control systems. Vulnerability assessments are designed into the Ovation project. When the system is operational, a security audit would be conducted to ensure that policies and procedures are in place to protect the system			
2-Year Objectives - Project is staged to include in the 2-year timeframe upgrades to system controls in order of priority based on assessed vulnerability. - Upgraded systems will be tested in this time frame.	5-Year Objectives - All control systems are upgraded and have passed security testing. - Completion of project.		Long-Term Objectives A secure system.
Implementation Plan/Actions This is a multi-year multi-million-dollar project that is being staged by addressing the most vulnerable systems first and working through the system.			
Performance Measure % of QA/QC system security tests passed.			



GIS Emergency Response Mapping and Real-Time Flow Data

Lead DNRP Water Treatment Division	Partners KCIT-Geographic Information Systems (GIS) King County Roads Services Division King County Office of Emergency Management Public Health SKC	Hazards Mitigated / Goals Addressed All Goal 6	Funding Sources and Estimated Costs Operating Budget
Vision Critical information conveyed in the WTD/DNRP Emergency response map is available and updated in real time.			
Description Update the King County facilities Emergency Response maps with the current priority roads, bridges, earthquake liquefaction, inundation and landslide zones and gas/petroleum pipelines, under-laid with King County facilities and conveyance lines and emergency outfalls to facilitate emergency response and continuity of operations. Make this information available through a password-protected website for select users. Explore connecting the map to real-time flow data. A GIS emergency mapping site is now operational on the WTD intranet that shows facilities and conveyance system. Working on moving it to an internet site so that it can be accessed 24/7 by off duty personnel.			
2-Year Objectives Fully deploy the system where it can be accessed remotely without having to log into the KC computer system.	5-Year Objectives - System is tested and use in activations. - Necessary modifications are made. - Project completion	Long-Term Objectives Emergency mapping is reliable and accessible.	
Implementation Plan/Actions - Work is ongoing and includes: - Work with KCIT to consider improvements that include integration with real-time flow data, integration with Roads Emergency updates and migration of mapping tool from intranet to password secured Internet site. - Testing to ensure access and timeliness and accuracy of information conveyed. - Use in emergency activations. - Socialize process and tools with partners such as Public Health Seattle and King County to aid in environmental health emergency response.			
Performance Measure % of successful attempts to securely access the mapping tool. - Ratio of accuracy and timeliness as compared to real life in real time.			



Emergency Communications Enhancements

Lead Allen Alston	Partners PSERN Project King County Radio Services/KCIT	Hazards Mitigated / Goals Addressed All Goal 6	Funding Sources and Estimated Costs Operating Budget
Vision Ability to effectively communicate in large scale emergency situations where the telecommunications may be disrupted.			
Description The division performed an assessment to determine the number of KC 800 MHz radios necessary to support operational readiness in the event of a widespread telecommunications failure. Currently all key operational facilities and offsite operation and maintenance vehicles are equipped with 800 MHz radios, constituting WTD’s core emergency communications method. A regional replacement project is underway to replace the entire 800 MHz system. It is managed by a regional agency Puget Sound Emergency Radio Network. Inventories have been provided to PSERN. The King County Office of Emergency Management has deployed a communications tool called KCInform. It has been incorporated into the division’s operational procedures			
2-Year Objectives • Deploy the new radios. • Train and test the radios and other emergency communications. • Analyze benefits and costs of FirstNet	5-Year Objectives • Continue training and testing of communications to ensure maximum communications reliability in emergencies.	Long-Term Objectives • Redundant emergency communications are reliable.	
Implementation Plan/Actions • Deploy the new radio equipment and incorporate into the day to day communications protocols. • Regularly test radios and other emergency communications methods, including KCInform and FirstNet (if used).			
Performance Measure • % of successful communications systems tests.			



Emergency Event Management System

Lead DNRP Water Treatment Division	Partners King County Office of Emergency Management King County Information Technology (KCIT)	Hazards Mitigated / Goals Addressed All Goal 6	Funding Sources and Estimated Costs Operating Budget
Vision WTD manages and shares emergency response and continuity of operations activities across the division’s five treatment plants and the division headquarters in the King Street Center using WEBEOC and other systems as necessary.			
Description Assess WEBEOC’s ability to manage information and communication within the division and with its 34 component agencies, and especially the discrete tracking of multiple incidents. Continue working with the WEBEOC team, KCIT and others as necessary to explore alternative or additional solutions if WEBEOC can’t meet all requirements.			
2-Year Objectives • Test current system for a variety of scenarios. • Identify and work through questions and gaps identified. • Consider alternatives where WEBEOC doesn’t fulfill requirements.	5-Year Objectives • Deploy an operational system or systems. • Document, train to and test the system(s).	Long-Term Objectives • There is a single system or integrated systems (whether manual or not) sufficient to manage emergency events.	
Implementation Plan/Actions • Test use of WEBEOC for a variety of scenarios with multiple contributors. • Identify and work through questions and gaps. • Consider alternatives where WEBEOC doesn’t fulfill requirements. • Document progress and final systems approach. • Communicate systems approach to users and stakeholders. • Develop and deliver trainings on the use of the system(s). • Test the system(s). • Continuously improve the system(s).			
Performance Measure • Post-test system performance ratings. • Post use (activations) system performance ratings.			



Flood Warning Program

Lead Points of Contact King County River & Floodplain Management Section, Office of Emergency Management	Partner Points of Contact Cities and special purpose districts, US Army Corps of Engineers, NOAA, FEMA Region 10	Hazards Mitigated / Goals Addressed Flood Goal 5, 6	Funding Sources and Estimated Costs Existing resources
Strategy Vision/Objective When flooding is imminent, having a robust notification system helps people who live, work, or travel through floodprone areas prepare themselves and their property for the impacts of flooding. It can also mean fewer flood losses and less damage.			
Mitigation Strategy The River and Floodplain Management Section operates the Flood Warning Program, which includes a Flood Warning Center that opens when river systems reach specified flows or heights. The Flood Warning Center gives people that live, work, or travel through floodprone areas early notifications and the opportunity to call in and receive information about ongoing flooding issues. The Center also coordinates with local first responders, the Office of Emergency Management, the US Army Corps of Engineers, and other stakeholders to ensure the region is as ready as possible to respond to flooding problems.			
2-Year Objectives Improved outreach efforts.	5-Year Objectives Annual exercises are conducted to prepare the region for flooding.		Long-Term Objectives Smooth operation of the Flood Warning Program and integration with local communities' programs.
Implementation Plan/Actions Implementation Plan/Actions - Continue monitoring the status of streamgages to ensure they are collecting data accurately. Streamgages provide the underlying data that are used as the basis for Flood Alert notifications and openings of the Flood Warning Center. - Review on an annual basis the various components of the Flood Warning Program and make improvements where necessary. - Conduct an annual flood response exercise with other agencies to ensure the region is prepared for flood response and recovery actions necessary. Write up an after-action report. - Improve public outreach materials such as flood inundation maps and online interactive map applications that show the inundation areas of the four flood phases.			
Performance Measure - Subscribers to the Flood Alert app. - CRS points for Activity 610.			



Post-Flood Recovery Efforts

Lead Points of Contact DNRP Water and Land Resources Division; King County Office of Emergency Management; King County Permitting Division	Partner Points of Contact King County Flood Control District; FEMA Region 10; Washington Department of Ecology; Washington Division of Emergency Management	Hazards Mitigated / Goals Addressed Flood Goal 3, 5, 12, 14	Funding Sources and Estimated Costs King County Flood Control District; FEMA Hazard Mitigation Assistance Grants; Increased Cost of Compliance; FEMA Public Assistance Section 406 Mitigation
Strategy Vision/Objective After a major flood event, there are many opportunities to rebuild in a more resilient way. Being prepared to rapidly address them is key to realizing those opportunities. Many mitigation grants, including the FEMA Hazard Mitigation Assistance grants, can take over 5 years from obligation to a property owner having their house acquired. King County is uniquely positioned to utilize local resources to complete mitigation projects much quicker to help property owners with flood-damaged property.			
Mitigation Strategy While many other flood mitigation strategies referenced in the Hazard Mitigation Plan will be used to reduce future flood risk, a separate mitigation strategy for post-flood actions is necessary. Property owners are often more willing to sell and consider mitigation efforts after a flood. Additionally, conducting substantial damage determinations quickly is important for flood insurance policyholders to be able to access Increased Cost of Compliance coverage funds for rebuilding. King County needs to be prepared before a flood occurs to move mitigation efforts forward quickly. This strategy should also consider the permitting environment after a major flood and consider short-term rebuilding moratoriums, permit assistance, and substantial damage letters for Increased Cost of Compliance claims. Additionally, an update to the comprehensive plan may be needed to address long-term recovery efforts.			
2-Year Objectives - Communications plan prepared. - Substantial damage strategy prepared and deployable.	5-Year Objectives - Substantial damage assessments have either taken place or have been practiced. - Communication plan reviewed.	Long-Term Objectives Successful mitigation efforts occur after major flood events.	
Implementation Plan/Actions - Prepare communications plan prior to a flood event for reaching affected property owner to inform them of mitigation grant opportunities to purchase their damaged property or elevate their home. - Ready a set of funds to deploy quickly after a major flood event. - Create a deployable substantial damage inspection strategy and team, and prepare the team to rapidly conduct substantial damage determinations after a flood event or other wide-spread natural disaster. - Inspect flood protection facilities and other public infrastructure to ensure public safety is protected and to also identify opportunities for applying for FEMA Public Assistance Section 406 mitigation funding.			
Performance Measures - Property owners engaged after flood event. - Employees trained on substantial damage assessments.			



Home Elevations

Lead Points of Contact	Partner Points of Contact	Hazards Mitigated / Goals Addressed	Funding Sources and Estimated Costs
King County River & Floodplain Management Section; Permitting Division	King County Flood Control District, FEMA Region 10; Washington Department of Ecology, Washington Division of Emergency Management	Flood Goal 5, 6	King County Flood Control District; FEMA Hazard Mitigation Assistance grants
Vision Elevating floodprone homes is an important tool in making buildings safer from flooding. The buildings will be better able to withstand inundation and a family's, or occupant's belongings will be well above the expected level of the 1% annual chance flood. The result will be less risk to people, pets, and property as floodwater remains below the finished floor of elevated homes.			
Description Home elevations are appropriate in areas where floodwaters are slow moving and relatively shallow, offer significant warning time, and are not subject to channel migration hazards. In areas of flash floods, fast-moving floodwaters, and channel migration, the most appropriate mitigation strategy is acquisition. King County and the King County Flood Control District have a robust home elevation grant program for properties in the Snoqualmie River basin that has elevated nearly 80 homes. Elevation projects, however, are complex and require significant public investments from the County, Flood Control District, or FEMA. Typically, home elevations cost over \$200,000. Current standards require homes to be elevated to the higher of 3 feet above the 1% annual chance flood elevation and 1 foot above the 0.2% annual chance flood elevation. Most homeowners prefer to elevate on enclosed foundations like a crawlspace or full story enclosure. This technique, when done with proper flood openings, can be a safe alternative, but can lead to negative consequences such as future owners converting the lower level to finished living space, thus reducing the benefit of the home elevation. Elevating on post or piling foundation techniques lessens the likelihood of lower level conversion, although to some, results in a visually less desirable home. There is a balance that the public elevation grant program needs to weigh between producing homes that people think look nice and homes that are likely to remain safe from flooding for 50 years.			
2-Year Objectives Have code compliance strategy implemented.	5-Year Objectives Home elevations grants are awarded outside of the Snoqualmie Valley.	Long-Term Objectives All homes in shallow and slow-moving floodplains are elevated at least 3 feet above the 1% annual chance flood elevation.	


Implementation Plan/Actions

1. Continue requiring home elevations to have the lowest floor elevated to 3 feet above the 1% annual chance flood elevation or 1 foot above the 0.2% annual chance flood elevation. Continue requiring a nonconversion agreement to protect the lower enclosed levels from being converted to living space.
2. Create a strategy to address potential code compliance issues that make elevated structures more dangerous, including addressing:
 - a. Potential to convert enclosed lower level into living space.
 - b. Potential to install noncompliant utilities in lower level.
 - c. Potential to block flood openings.
 - d. Potential to rent out lower level.
3. Complete home elevations in appropriate floodprone areas outside of the Snoqualmie Valley, including in coastal floodplain areas.
4. Encourage grantees to elevate using post or piling foundation techniques rather than full story enclosures.

Performance Measure

- Repetitive loss properties elevated.
- Reduced flood insurance claims.
- Number of homes successfully and compliantly elevated.



Home Acquisitions and Relocations

Lead Points of Contact King County River & Floodplain Management Section; Ecological Restoration and Engineering Services Section	Partner Points of Contact Snoqualmie Watershed Forum, Snohomish Basin Salmon Recovery Forum, WRIA 9 Watershed Ecosystem Forum, WRIA 8 Salmon Recovery Council, Puget Sound Partnership, King County Flood Control District	Hazards Mitigated / Goals Addressed Flood Goal 5, 6	Funding Sources and Estimated Costs King County Flood Control District, FEMA Hazard Mitigation Assistance grants, Salmon Recovery Board Grants, Floodplains by Design
Strategy Vision/Objective Acquiring floodprone properties, removing buildings, and restoring the property to a natural state is the most effective strategy to reduce flood risk in perpetuity. Fewer families living in floodprone areas and fewer businesses operating in floodprone areas so the region recovers quicker after a major flood.			
Mitigation Strategy Property acquisitions have been a tool that King County has employed for many decades to reduce flood risk. Acquisitions are done on a willing seller basis and result in the demolition or removal of the building from the property. Sometimes the seller moves the house to a location outside of the floodplain. Acquisitions are mostly fee simple purchases. While acquisition is the most effective tool to eliminate flood risk, many people perceive downsides, including that acquisitions mean lost tax revenue and that a checkerboard approach leaves neighborhood with missing pieces. Wherever possible, a neighborhood or area-specific strategy is the best approach. Acquisitions also offer many additional benefits including enhanced natural floodplain functions, floodwater storage, and recreation potential. Because of multiple benefits, acquisitions can be done by various agencies for different primary purposes. Some are done for ecological restoration or salmon habitat protection while others are done primarily for flood risk reduction. An area of new opportunity for flood risk reduction acquisitions is along the unincorporated coast on Vashon-Maury Island. Very few have been completed for flood risk reduction purposes, but as sea levels rise and coastal flooding worsens, King County needs to be prepared for coastal shoreline acquisitions.			
2-Year Objectives Develop prioritized acquisition list.	5-Year Objectives Complete acquisitions in coastal areas.	Long-Term Objectives Acquire as many floodprone properties as possible.	
Implementation Plan/Actions - Continue proactively purchasing floodprone properties for the purpose of flood risk reduction. - Accelerate coastal floodplain acquisitions. - Create and maintain a prioritized acquisition list so that properties can be purchased whenever the opportunity arises. - Consider other tools to purchase land over time or future development rights, such as a program where a property owner receives an upfront payment with an agreement that the County will fully purchase the property if it's flooded or the owner seeks to sell. - Purchase and remove infrastructure as part of neighborhood-level acquisitions.			
Performance Measures ions per year. l hazard areas owned by private landowners with buildings. Repetitive loss properties mitigated.			



Protect and Restore Natural Floodplain Functions

Lead Points of Contact DNRP Water and Land Resources Division	Partner Points of Contact Snoqualmie Watershed Forum, Snohomish Basin Salmon Recovery Forum, WRIA 9 Watershed Ecosystem Forum, WRIA 8 Salmon Recovery Council, Puget Sound Partnership, King County Flood Control District	Hazards Mitigated / Goals Addressed Flood Goal 3, 12	Funding Sources and Estimated Costs FEMA Hazard Mitigation Assistance Grants, Floodplains by Design, King County Flood Control District
Vision Flooding is a natural process. Rivers and coastlines evolve and change because of flooding. Encouraging the protection and restoration of natural functions of floodplains is key in creating healthy and resilient systems.			
Description The natural functions of floodplains include storing floodwater and lowering flood heights and velocities, all of which reduces flood risk. Natural coastlines attenuate waves distribute sediment and large wood on beaches, and allow coastal erosion, all of which reduce coastal wave energy on properties in the floodplain. King County has a robust focus on protecting and restoring natural floodplain functions, but progress still needs to be made to accelerate progress and connect restoration projects to flood risk reduction projects. Additionally, upland forested areas provide a source of natural functions that reduces fast runoff, manages sediment flow, and protects water quality. These upland areas should be considered vital parts of natural floodplain functions.			
2-Year Objectives Incorporate floodplain connectivity and aquatic habitat improvements in majority of flood risk reduction projects in the county.	5-Year Objectives Double the amount of spending on floodplain restoration and protection by leveraging local funding to obtain state and federal grants.	Long-Term Objectives Every floodplain project achieves multiple benefits such as endangered species habitat, salmon rearing habitat, water quality improvements, climate resilience, agricultural resilience, and flood risk reduction.	


Implementation Plan/Actions

1. Proactively acquire floodprone properties to utilize for future restoration projects.
2. Complete restoration projects that reconnect rivers to their floodplains, remove bank armoring, create side channels, reconnect oxbows, and encourage natural features such as beaver dams and large wood in channels for increased flood storage and fish habitat. These projects will create places for flood storage, which will reduce downstream flood heights and provide habitat for endangered species.
3. Restore coastal shorelines by removing bulkheads wherever possible, creating pocket estuary habitats, and allowing erosion to nourish beaches. Softening shorelines and creating estuaries will result in reduced wave energy and fewer negative coastal flooding impacts.
4. Incorporate beaver habitat in restoration projects to provide flood storage and keep instream water cooler.
5. Continue enforcing regulations that stop negative impacts on habitat and encourage net ecological benefit. Shoreline management, critical area, and floodplain management regulations that adhere to FEMA's Biological Opinion are among the regulations that seek to improve natural floodplain functions.

Performance Measure

- Acres of floodplain reconnected and/or restored.
- Large wood per mile in large rivers.
- Linear feet of bulkhead removed; and coastal shoreline restored
- Demonstrated losses avoided by increasing flood storage
- Chinook, coho, and steelhead population numbers, including annual adult spawner returns and juvenile outmigrants.



Flood Risk Mapping

Lead Points of Contact DNRP Water & Land Resources Division; DLS Permitting Division	Partner Points of Contact FEMA Region X, Washington Department of Ecology, US Army Corps of Engineers	Hazards Mitigated / Goals Addressed Flood, Dam Failure Goal 3, 5, 6, 12, 14	Funding Sources and Estimated Costs FEMA Cooperating Technical Partners Program; King County Flood Control District
Vision Having updated flood risk data helps government agencies, property owners, and other stakeholders make better risk-informed decisions. High quality flood data also more accurately ties regulations to reducing flood risk.			
Mitigation Strategy While updating flood risk maps is an ongoing activity to take into account landscape and hydrology changes, there are many flood hazards that need robust data and maps: 1. Floodplain maps – update the Flood Insurance Rate Maps used for regulatory and mitigation planning purposes, including updating the South Fork Skykomish River and various streams that only have approximate Zone A flood zones with no base flood elevation information. Additionally, King County should work with incorporated urban communities to better study, understand, and map urban flood risk. 2. Climate-influenced flood risk maps – King County and the University of Washington have been collaborating on downscaling global climate models to generate river-basin scale hydrology data based on the effects of climate change scenarios. King County can also evaluate other climate-influenced changes in hydrology such as low summer flows, less snowpack, and other effects to incorporate into maps showing climate-influenced flood risk. These data will be used to generate maps of predicted changes in flood risk that can be used for planning and regulatory purposes. 3. Sea level rise flood risk maps – as part of the coastal flood hazard study, maps were produced showing the effect on base flood elevation of a 2-foot rise in sea level around Vashon-Maury Island. This study shows the broader effects of sea level rise on flood risk. These maps should be updated with different sea level rise scenarios and also the resulting increased flood risk landward of the edge of the 1% annual chance mapped floodplain should be considered. 4. Channel migration zone maps – currently 8 river sections have been mapped on the South Fork Skykomish, Tolt, Cedar, South Fork Snoqualmie, Middle Fork Snoqualmie, North Fork Snoqualmie, Green, and Raging Rivers. In addition to continually updating these maps, new river sections need to be studied and mapped, including the Lower Snoqualmie. Channel migration zone maps will help property owners best understand the risk from channel avulsion and help keep more development safe. 5. Dam failure maps – every owner of a high hazard dam with the potential in a dam failure for loss of life or structures must develop a dam inundation map as part of the Emergency Action Plan. However, many of these inundation maps are out of date and are not accessible to the public. Levee failure maps – King County will, where possible, study levee failure impacts and produce maps that show areas of levee failure risk. The data and maps should be made available to the public so people who live and work behind levees have an understanding of their flood risk.			
2-Year Objectives • Complete detailed flood study on streams with approximate Zone A floodplains. • Complete levee breach analysis.	5-Year Objectives • Identify a timeline for updated Flood Insurance Rate Maps with FEMA Region 10.	Long-Term Objectives • Flood Insurance Rate Map and other regulatory flood data	



• Create plan for integrating flood maps and downscaled climate model data. • Begin sea level rise scenario mapping for coastal shorelines.	• Establish plan for using climate-influenced flood risk data for planning and regulatory purposes.	will be updated on a regular basis. • Highest quality flood risk data that incorporates effects of climate change.
Implementation Plan/Actions 1. Update Flood Insurance Rate Maps to utilize better flood risk data, including the South Fork Skykomish River and streams with Zone A maps. Also identify a strategy and timeline for updating other streams/rivers that need updated flood risk data. 2. Create climate-influenced flood risk maps that can be used for planning purposes. 3. Create sea level rise flood risk maps for various sea level rise scenarios to be used for planning and regulatory purposes. 4. Continue updating channel migration zone maps. 5. Release dam failure maps where appropriate and provide technical assistance to high hazard dam owners to complete updated inundation maps. 6. Complete levee failure maps and release them to the public where appropriate.		
Performance Measures • Stream miles and linear feet of shoreline with updated flood risk, channel migration, and climate-influenced flood risk data. • Properties covered by updated flood risk, channel migration, and climate-influenced flood risk data. • Number of dams with updated inundation maps that are publicly available. • Linear feet of levees with failure analyses publicly available.		



Public Information Flood Activities

Lead Points of Contact King County River & Floodplain Management Section, Office of Emergency Management	Partner Points of Contact FEMA Region 10; Washington Department of Ecology; Washington Division of Emergency Management; King County Flood Control District	Hazards Mitigated / Goals Addressed Flood Goal 5, 6	Funding Sources and Estimated Costs Existing resources
Vision Flooding is a complicated hazard to understand and a responsibility of floodplain management agencies is to help people understand it well enough to prepare themselves. A more informed public means property owners who make decisions based on flood risk and fewer unexpected losses during flooding.			
Description Effective outreach efforts are a key piece of comprehensive floodplain management. Letters sent annually, outreach events, project-specific meetings, and providing technical assistance are all components of effective outreach. Repetition of messages and continued outreach activities are also important to ensuring that messages are delivered. Engaging as many types of communication mediums as possible will also ensure that outreach efforts are effective.			
2-Year Objectives New initiatives are implemented.	5-Year Objectives Documentation that more floodprone residents are engaged.	Long-Term Objectives An informed public that is prepared for the effects of major flooding.	
Implementation Plan/Actions The following activities should be conducted on an annual basis as a way to make the public more aware of flood hazards and risks: - Flood brochure – sent to every property owner in the floodplain. - Repetitive loss letter – sent to properties with known repeated losses. - Realtor, insurance agent, and other stakeholder outreach – workshops, meetings, or other outreach to professionals who need flood risk information. - News media outreach – coordinated effort to share stories about flood risk with the news media. - Annual event – separate or coordinated event every year that focuses on flood risk . The following activities are not annual occurrences, but should be maintained to help facilitate the availability of flood risk information: - Videos demonstrating flood risk, flood preparedness, and property protection measures that can be taken. - Technical assistance to property owners on reducing flood risk on their property, including home elevation support and small actions to reduce localized flood risk. - Maintaining a robust website, including an interactive map, with flood preparedness, mitigation, regulation, and other flood risk information. The website will be updated at least annually and the interactive map will incorporate new data when available. - Floodplain management permitting bulletins will be created to help permit applicants understand the regulations and their purpose.			
Performance Measures - Number of stakeholder groups reached - CRS points for outreach and public information activities			



Flood Insurance Promotion

Lead Points of Contact King County River & Floodplain Management Section	Partner Points of Contact Floodprone cities; FEMA Region 10, insurance agents, landlords, realtors, mortgage lenders	Hazards Mitigated / Goals Addressed Flood Goal 5, 12, 14	Funding Sources and Estimated Costs Existing sources
Strategy Vision/Objective Flood insurance is the most important financial protection tool for a family against flood damage. Promoting flood insurance is important to help property owners and renters be prepared for flooding and reduce their financial risk.			
Mitigation Strategy Since homeowners and renter's insurance policies do not cover flood damage, helping people understand that flood insurance is the best financial protection tool is an important strategy. Homeowners with a federally-backed mortgage are required to have flood insurance, so those who are required most likely have a policy. Renters and those who own their houses free and clear are far less likely to actively purchase a flood insurance policy. If their homes and apartments are flooded, they may have to drain savings to pay for the damage. Of all of the families that live in floodplains in King County, over 50% are renters, 14% own their house without a mortgage, and 35% own with a mortgage. Families living in floodplains are much more likely to be renters than those outside of the floodplain (only 40% of families outside of floodplains rent). Additionally, people of color living in the floodplain are even more likely to rent. Census data shows that 83% of African American families and 90% of Native Hawaiian or Pacific Islander families living in the floodplain are renters. So, promoting flood insurance should be primarily targeted toward renters and those who own their house outright. The strategy should also strive to incorporate concepts of equity and social justice in the approach and content of outreach.			
2-Year Objectives • Outreach plan developed via stakeholder committee. • Technical assistance contact identified.	2-Year Objectives • Outreach plan developed via stakeholder committee. • Technical assistance contact identified.	2-Year Objectives • Outreach plan developed via stakeholder committee. • Technical assistance contact identified.	
Implementation Plan/Actions 1. Identify and convene stakeholder committee to help assess problem and create strategy for promoting flood insurance. 2. Develop and implement outreach plan that targets renters/tenants and those who own their home with no mortgage. 3. Identify a flood insurance technical assistance contact for King County residents and businesses to be able to ask questions.			
Performance Measures • Number of flood insurance policies in force and percentage of covered buildings. • CRS points for Activity 370.			



Enforce Higher Floodplain Management Regulations

Lead Points of Contact DLS Permitting Division; DNRP Water & Land Resources Division	Partner Points of Contact FEMA Region X, Washington Department of Ecology	Hazards Mitigated / Goals Addressed Flood Goal 5, 12, 14	Funding Sources and Estimated Costs Minimal, on-going • Permit fees • Existing resources
Vision Higher floodplain management regulations play an important role in ensuring future development in floodplains is as safe from flood risk as possible. For example, requiring that new buildings have their lowest floor elevated 3 feet above the 1% annual chance flood elevation means fewer flood losses and safer buildings. While instituting a regulation prohibiting development in floodprone areas would ultimately reduce future flood risk potential, the flood portion stakeholder committee decided not to include a development prohibition mitigation action due to likely political and community opposition.			
Description The King County Comprehensive Plan sets out a policy that regulations should follow the concept of “no adverse impact,” such that any particular development must not cause any effect to worsen flooding on another property owner. The key higher standards that do this include a requirement that all development in the entire floodplain meet a zero-rise requirement and a compensatory storage requirement for fill and other materials. This approach reduces any potential flood risk from new development. King County also has higher regulations that protect new or substantially improved buildings, including a requirement that the lowest floor be elevated to 3 feet above the 1% annual chance flood elevation.			
2-Year Objectives • Demonstrate that King County is enforcing its higher standards by showing full compliance with the FEMA floodplain management audit. • Establish stakeholder committee to review potential higher standards to include in King County Code.	5-Year Objectives • Submit to King County Council flood code amendments that include other higher standards.	Long-Term Objectives • Ensuring all potential development in floodplains meet flood-safe standards.	
Implementation Plan/Actions • King County agencies will continue to fully enforce the higher regulations currently in King County Code. • King County will consider the following higher standards in future updates of the King County Code and will establish a stakeholder committee to evaluate the following: ○ Prohibiting hazardous materials storage in the regulated flood hazard area to lessen potential health impacts from flooding. ○ Requiring non-conversion agreement for structures built on crawlspaces or full-story enclosures to ensure fewer structures converted to unsafe and noncompliant conditions. ○ Requiring building restriction agreements for properties that are removed from the floodplain via a Letter of Map Amendment to ensure freeboard standards are extended to properties surrounded by or close to the edge of the mapped floodplain.			



- Establishing a cumulative or lower substantial improvement requirement to encourage more homes to be elevated.
- Extending 1% annual chance flood requirements to the edges of the 0.2% annual chance floodplain to account for higher flooding events and the potential for increasing flood risks due to climate change.
- Adopting standards to regulate development in areas likely to face increasing flood risks due to sea level rise to protect against future flood risk.
- Establishing coastal high hazard area regulations that require permit applicants to demonstrate that their proposed action will not cause adverse impacts on other property owners, including the potential for wave energy reflection on to neighboring shoreline properties.
- The Floodplain Management Plan update will consider higher regulatory standards.
- Adopt the latest version of the International Building Codes.

Performance Measure

- Fewer and less extensive flood damage during a major flooding event.
- More points in the FEMA Community Rating System category for higher regulatory standards.



Manage Flood Protection Facilities

Lead Points of Contact DNRP Water and Land Resources Division; King County Flood Control District	Partner Points of Contact US Army Corps of Engineers, local governments, levee and dam owners	Hazards Mitigated / Goals Addressed Flood, Earthquake Goal 5, 12	Funding Sources and Estimated Costs King County Flood Control District; Floodplains by Design
Strategy Vision/Objective Flood protection facilities should be managed in a way that foremostly considers residual flood risk. Alternative management practices should also incorporate improving natural floodplain functions.			
Mitigation Strategy Flood protection facilities include levees and revetments that provide some degree of flood and erosion protection depending on their design and maintenance. All flood protection facilities leave residual risk behind them and above their protection level. In certain areas of King County, flood protection facilities have reduced flood damage, but they have also facilitated growth in homes, warehouses, and businesses built behind them. The expanded neighborhoods and business activities are then more at risk of a 0.2% annual chance flood event or flooding from a levee failure, and if climate change increases the severity of flooding events, then the flood risk will grow. Thus, it is important for existing flood protection facilities to be managed well to protect property owners, but also for King County to where possible reduce areas that need to be protected with expensive flood protection facilities.			
2-Year Objectives Updated Floodplain Management Plan that reflects these priorities.	5-Year Objectives - Flood protection facilities are managed in way that considers multiple benefits. - Fewer people face residual flood risk from being behind a flood protection facility.		Long-Term Objectives Flood protection facilities are minimally needed for communities to be resilient.
Implementation Plan/Actions The following are strategies supported by the King County Flood Hazard Management Plan that should continue: - Where possible, King County should remove flood protection facilities and allow rivers to reconnect to their floodplains. - If flood protection facilities cannot be removed, King County should consider setting the facilities back to allow floodplain storage. - Utilize bioengineering in repairs, enhancements, or temporary measures. Bioengineering incorporates live plants and large wood in an effort to reduce flood velocities while protecting aspects of flood protection facilities. - Create criteria for when these flood protection facility alternatives would be utilized. - Create criteria based on King County Code and the Flood Hazard Management Plan for the conditions to construct a new flood protection facility or a new dam. - Ensure levees and dams are designed for earthquakes and are inspected immediately one. Flood protection facilities should also be continually managed considering seismic risks.			
Performance Measures - Number of properties and buildings in the levee-protected areas. - Linear feet of flood protection facilities set back or removed. - Flood protection facilities damaged by earthquakes.			



Seismic Evaluation of King County Courthouse and Maleng Regional Justice Center

Lead Aaron Bert, Deputy Director Jim Burt, Capital Projects Section Manager	Partners N/A	Hazards Mitigated / Goals Addressed Goal 6 Goal 9	Funding Sources and Estimated Costs FEMA PDM, KC Capital Budget, \$200,000
Vision Seismic evaluation of the King County Courthouse and Maleng Regional Justice Center, per the current standards of FEMA-178 and ASCE 41-13, Seismic Evaluation and Retrofit of Existing Buildings. An updated assessment of building risks is needed for further seismic hazard mitigation planning and seismic retrofit, to protect and mitigate against potential loss of life, loss of asset, and loss of essential function capabilities during and immediately after an earthquake event.			
Description King County last completed a seismic hazard assessment of its essential facilities in 1993, based on building codes and seismic hazard protection data available at that time. Since then, earthquakes have produced unexpected and major infrastructure damage and loss of life from relatively small seismic events and have contributed to new data supporting major revisions to seismic mitigation strategies and building codes. An ASCE 41-13 seismic evaluation is the first step toward earthquake hazard mitigation. Evaluation findings will be used to plan, design, fund and construct needed seismic retrofit projects.			
2-Year Objectives Seismic evaluations, per the current standards of FEMA-178 and ASCE 41-13, Seismic Evaluation and Retrofit of Existing Buildings.	5-Year Objectives Identify funding for planning, design and construction of all needed seismic retrofit measures.		Long-Term Objectives Seismic retrofit to meet or exceed current standards of protection.
Implementation Plan/Actions - Pre-Application submitted to Washington Emergency Management Division for a 2020 FEMA Pre-Disaster Mitigation grant for Advance Assistance. - Draft and release RFP for complete building seismic evaluation. - Based on evaluation findings and available funding, plan and budget building retrofit work and/or apply for future FEMA Building Resilient Infrastructure & Communities to fund seismic retrofit.			
Performance Measure Achievement of Pre-Disaster Mitigation Advance Assistance grant, or feedback from WA EMD on strength of application, achievement of assessment in 2 years, achievement of retrofit project funding in 5 years.			



Integrate ESJ into Mitigation, Response, and Recovery Activities

Lead Preparedness Senior Manager	Partners Office of Equity and Social Justice, Public Health SKC	Hazards Mitigated / Goals Addressed All Hazards Goal 2, 6, 10, 14	Funding Sources and Estimated Costs Existing Funding
Vision King County Emergency Management considers impacts and benefits to populations more likely to suffer damage or long recovery times during disaster mitigation, response, and recovery activities.			
Description Vulnerable populations, defined here as those more likely to suffer losses during disasters and recover more slowly afterward, should be a primary focus of an emergency management program. This is fully consistent with our charge of identifying and addressing the greatest sources of vulnerability. As part of this strategy, King County Emergency Management will identify vulnerable areas and develop action plans to ensure that populations more likely to suffer damage are prioritized in accordance with need. This includes prioritized mitigation projects to reduce risks, identification and prioritization of resources during response, and additional support and assistance to increase resilience and reduce recovery times after a disaster.			
2-Year Objectives Develop a geospatial tool to ensure that resources are distributed equitably and according to need.	5-Year Objectives Implement prioritized mitigation strategies benefitting populations more vulnerable to hazards.	Long-Term Objectives Emergency management activities are prioritized according to a comprehensive understanding of vulnerability and need.	
Implementation Plan/Actions - Expand identification sources of population vulnerability and likely impacts to vulnerable populations from different hazards. - Use identified priority languages to expand outreach and notification capabilities. - Compile a database of infrastructure vulnerability/inequity for use in mitigation, response, and recovery planning activities by working with KC GIS. - Increase outreach in priority areas with vulnerable populations by engaging with community partners through the preparedness program. Potentially mimic Seattle’s Ambassadors program. - Include insurance information in preparedness outreach. - Build a geospatial tool to track impacts and resource delivery during disaster response activities and develop ESJ objectives for EOC operations. - Develop SOPs for use during activations that ensure staff consider population vulnerability with or without requests from communities. Consider creating an ESJ-specific position or ESJ-specific position responsibilities for work within the EOC. - Work with county agency partners to prioritize projects that reduce risk in areas with vulnerable populations (as defined in this plan), including through planning efforts such as subarea plans. - Develop an infrastructure equity map. - Develop a hazard vulnerability component map to use in comprehensive planning. - Crosswalk climate risk and population vulnerability with SCAP actions.			



Performance Measure

- # mitigation projects specifically benefitting vulnerable communities/populations
- KCEM did/did not identify potential needs in vulnerable communities, regardless of resource requests received from those communities.



Seismic Lifeline Route Resilience

Lead KC EM	Partners DLS PHSKC FMD DNRP	Hazards Mitigated / Goals Addressed Earthquake / Goal 4	Funding Sources and Estimated Costs Capital Budget FEMA HMA General Fund
Vision King County is able to conduct life-safety response and recovery operations throughout the county following a catastrophic Cascadia Subduction Zone or Seattle Fault earthquake.			
Description Following a major earthquake, at least three-quarters of all state-managed bridges will be inoperable for at least one-three months. This threatens the ability of responders to conduct life safety operations, for life saving resources to be distributed, and for communities to begin to transition to recovery. This strategy will build on state and federal assessments of transportation vulnerability to identify regional lifeline routes for King County and prioritize vulnerable segments for mitigation investments.			
2-Year Objectives • Convene a multiagency committee to develop a strategy • Identify potential lifeline routes and route vulnerabilities.	5-Year Objectives • Develop a prioritized list of lifeline routes and submit to the Executive and Council		Long-Term Objectives • Develop, maintain, and expand the resilient transportation lifeline.
Implementation Plan/Actions • KC EM will work with WSDOT, DLS, and others to review the completed RRAP for critical transportation and to identify potential seismic lifeline routes. Work with UW to verify RRAP results. • Based on identified lifeline routes, identify necessary mitigation to protect and expand those routes. • Prioritize investments based in part on population vulnerability and likelihood of self-sustaining for a longer period of time. • Continue this effort through the strategy identified by King County Roads to retrofit seismically-vulnerable bridges.			
Performance Measure • Lifeline routes are identified • # projects completed to strengthen the seismic lifeline routes			



Integrate Hazard Mitigation and Comprehensive Planning

Lead KC EM	Partners Office of the Executive DLS PSRC	Hazards Mitigated / Goals Addressed All / Goal 12 Goal 14	Funding Sources and Estimated Costs FEMA HMA Grants
Vision Comprehensive planning and regional initiatives like Vision 2050 account for hazard risk and the role that development patterns and climate change play in increasing hazard risk. These plans adopt policies and land use patterns designed to limit hazard risk.			
Description The most cost-effective mitigation measures are those that prevent the creation of risk through codes and development standards. At present, hazards are barely mentioned in most countywide/region wide planning documents. This strategy seeks to increase the integration between mitigation, response, and recovery concerns and major land-use policies and plans, including the Growth Management Act, PSRC Visions, and the Comprehensive Plan.			
2-Year Objectives • Provide comments on Vision 2050 updates. • Provide feedback on 2020 Comp Plan policies		5-Year Objectives • Fully participate in the next major update of the comprehensive plan, ensuring hazard risk and risk reduction is represented throughout.	Long-Term Objectives • Integrate hazards into desired planning and development outcomes.
Implementation Plan/Actions • Work with planning agencies to identify a list of areas where hazard information would be helpful in designing good policies. • Socialize the concept of integrating hazard mitigation and comprehensive planning by attending regional meetings around the GMA and Comprehensive Plan as well as of City Manager and Planning Director groups. • Look into developing a land-use tool platform similar to Colorado’s planningforhazards.com page and that identifies tools that can be used to reduce hazard risk, such as purchase of development rights. • Add hazard mitigation policies and strategies to the King County countywide planning policies to be updated in 2020. • Integrate concepts of social vulnerability into comprehensive planning efforts in order to promote the use of comprehensive planning to both reduce hazard risk and build equity. • Participate in WA Commerce and FEMA-led activities on how to consider hazards in comprehensive planning.			
Performance Measure • # of countywide planning policies addressing natural and manmade hazards.			



Engage Community Organizations in Emergency Management

Lead KC EM	Partners Public Health SKC	Hazards Mitigated / Goals Addressed All / Goal 12 Goal 14	Funding Sources and Estimated Costs FEMA HMA Grants
Vision Increase the participation of communities to identify local preparedness priorities and opportunities to do hazard mitigation, risk prevention, and community preparedness activities through the creation of “community resiliency networks” using a model similar to the Public Health community health networks. Use feedback from these community groups to influence response planning and prioritization, including for catastrophic response and recovery planning.			
Description Emergency planning typically underutilizes existing community capabilities and undervalues the resilience built into many communities, especially those that are marginally represented or of lower-income. Examples from around the country point out that a partnership with individuals and organizations from these communities can result in better emergency management, reduced risk, aid in more rapid recovery, and even improve day-to-day quality of life indicators. King County Emergency Management will partner with other agencies to work more closely with communities to identify opportunities to strengthen the 14 Determinants of Equity through mitigation, establish response needs, recovery priorities, and account for community capabilities that can be valuable during disasters.			
2-Year Objectives - Bring together agencies to identify potential community partners for emergency management. - Complete a community capability map. - Complete an infrastructure equity map.		5-Year Objectives Establish community priorities for each mission area and ensure those priorities are executed through plans and actions.	Long-Term Objectives Sustain a community equity in emergency management coalition.
Implementation Plan/Actions - Develop tools to identify areas of inequity in emergency management, including for outreach, language support, and the quality of public infrastructure and services that may be damaged during a disaster. - Investigate developing a community equity committee for emergency management similar to those used by King County Parks and Metro. - Work with Public Health SKC and other agency partners to expand the Trusted Partners Network identify potential community organization partners with whom KC EM could engage to learn more about capabilities and gaps. - Record community-identified mitigation and preparedness priorities and invest in them.			
Performance Measure King County Emergency Management has prioritized/carried out # of community-identified actions.			



Climate Integration Training

Lead KC EM	Partners DNRP Local Jurisdictions	Hazards Mitigated / Goals Addressed All Hazards	Funding Sources and Estimated Costs Existing Staff Time
Vision All jurisdictions consider climate and climate-induced hazard impacts in their planning.			
Description The King County Hazard Regional Hazard Mitigation Plan provides a framework for local and regional action to reduce the impacts of natural and human-caused hazards in King County. Many of the natural hazards covered in the Plan, including flooding, wildfire, and landslides, are exacerbated by climate change. Building from work initiated in the 2019-20 Plan update, the Office of Emergency Management will host trainings with partner jurisdictions on incorporating climate change into hazard mitigation. The trainings will include information on how climate change affects natural hazards in King County; how to evaluate and adjust hazard mitigation strategies to account for climate impacts, including the potential for disproportionate impacts on frontline communities; and best practices for sharing information about climate risks with the public.			
2-Year Objectives • Develop training plan/curriculum • Conduct training	5-Year Objectives • Host periodic trainings and integrate climate considerations into classes or seminars on wildfires, severe weather, and planning.	Long-Term Objectives • N/A	
Implementation Plan/Actions • Work with SCAP team to develop climate planning training curriculum. • Identify and schedule opportunities to host climate trainings for King County and constituent jurisdictions. • Host trainings during mitigation plan update meetings, winter weather seminars, wildfire seminars, and other related opportunities that bring local and county staff together to discuss hazards that are impacted by climate change.			
Performance Measure • # trainings hosted			



Disaster Skills Risk Reduction Training

Lead KCEM Public Outreach Program Manager	Partners Community Outreach Workgroup Zone Coordinators King County Libraries PHSKC	Hazards Mitigated / Goals Addressed All Hazards Goal 6 Goal 14	Funding Sources and Estimated Costs EMPG, UASI, SHSP
Vision King County Emergency Management delivers the county’s disaster education, and provides year-round free training and education to county employees, residents, and organizations/businesses via several programs and activities aimed at promoting personal and community risk reduction.			
Description Disaster Skills Risk Reduction Training will provide education on natural and man-made hazards that are present and could occur in King County and ways to mitigate and reduce impacts in addition to increase community disaster preparedness, self-sufficiency, and protection of property.			
2-Year Objectives • Complete one Basic Disaster Skills Trainings (General Preparedness/Risk Reduction) within each jurisdictions/unincorporated area in King County. • Train at least 1,500 residents through Basic Disaster Skills Trainings and MYN Facilitator Trainings.	5-Year Objectives • Complete Advanced Disaster Skills Trainings (Fire Safety & Bleeding Control) within each jurisdictions/unincorporated area in King County. • Train at least 2,500 residents in advanced skills such as fire extinguisher and bleeding control • Train at least 50 individuals to serve as instructors for their respective organization, community, department, or jurisdiction.	Long-Term Objectives • Maintain consistent outreach to high-risk communities. • Maintain consistent advanced disaster skills risk reduction trainings.	
Implementation Plan/Actions • Hold two trainings a month at the King County Libraries or with local jurisdictions • Connect with the Seattle King County Public Health Ethnic-centric boards and ESJ newsletter for trusted partners to support sharing events and training opportunities. • Hold four quarterly workshops for public educators to provide continuing education for community engagement specialists and public education and outreach coordinators. • Modify outreach efforts to mirror need so that 80% of outreach goes to the 20% of the population at highest risk. • Look into partnering with public health to teach post-disaster environmental health risk reduction skills, including emergency drinking water, toxin exposure reduction, etc.			
Performance Measure • Using sign-in sheets, keep track of how many individuals are attending Basic and Advanced trainings • Social Media hits • Ethnic social media connections			



Dam Failure Risk and Impact Reduction

Lead KC EM Dam Safety Program Coordinator	Partners DNRP, WLRD DNRP, Rivers WA Depot of Ecology, Dam Safety Office WRIA 8 WRIA 7 Salmon Recovery Funding Board Tribes Local Jurisdictions	Hazards Mitigated / Goals Addressed Dam Failure / Goal 5 Goal 6 Goal 12 Goal 14 Supplemental Goal 15	Funding Sources and Estimated Costs FEMA Rehabilitation of High Hazard Potential Dam Grant Program King County Flood Control District FMA PDM Various Salmon & Environment Recovery Grants
Vision Lower the risk and impacts of dam failure in King County.			
Description Washington State Dam Safety Office will identify high and significant hazard dams that are in poor condition. King County will gather information from other sources about low hazard dams of interest. King County will assist in seeking alternative funding structures to lower the risk of failure. Additionally, King County will seek alternative funding structures to decommission identified dams that threaten environmental resources. Lastly, resources will be sought to strengthen the integrity and security of high and significant hazard dams in the County that are not feasible to remove.			
2-Year Objectives Identify dams in King County that are assessed to be in poor condition by the Washington State DSO and identify funding structures to mitigate their risk. Begin dam removal projects.	5-Year Objectives Eliminate the risk associated with all dams in the County assessed to be in poor condition by the Washington State DSO.	Long-Term Objectives Decommission dams that have outlived their functional use, but still remain operational and pose a threat to the County.	
Implementation Plan/Actions - Washington State DSO will identify poor condition dams in the County and rely them to KCEM. - KCEM will work with DNRP, local jurisdictions, and tribes to identify potential funding/mitigation strategies. - Ensure vulnerable populations are accounted for in outreach and risk assessments. - Where applicable, KCEM will assist in grant application development and administration.			
Performance Measure - Number of mitigation actions for high hazard and significant dams that are in poor condition dams. - Number of dams removed. - Number of dams with lowered hazard classification through mitigation actions.			



Wildfire Preparedness and Risk Reduction

Lead KC EM, Hazard Mitigation	Partners DNRP, WLRD, DNRP, Parks, DLS, Permitting KC Fire Districts, WA DNR, King Conservation District, Tribes, USFS, KC Climate Preparedness Public Health Seattle-KC	Hazards Mitigated / Goals Addressed Wildfire / Goal 3 Goal 5 Goal 12	Funding Sources and Estimated Costs Existing Resources
Vision As King County grows, and awareness of climate change-driven wildfire risk grows, King County has a coordinated strategy to support individuals and local jurisdictions in identifying and managing wildfire risk, including risk to property and public health.			
Description Partner with King County communities, fire districts, and other organizations to develop an integrated King County strategy for wildfire. The strategy will review current efforts to address wildfire risk in King County and develop recommendations for addressing identified gaps and opportunities. These recommendations will be carried out through a coordinated Firewise technical assistance program, likely led by DNRP. This effort will be coordinated with a SCAP action seeking a similar outcome. This strategy will be based in part on the results of WA DNR effort to map the Wildland Urban Interface in King County.			
2-Year Objectives - Convene a multiagency committee to develop a strategy - Request funding for outreach		5-Year Objectives Implement the strategy through coordinated technical assistance between the county and local communities	Long-Term Objectives Maintain consistent outreach to potentially-impacted communities.
Implementation Plan/Actions - KC EM will work with DNRP, WLRD and the Climate Preparedness team to identify partners. - Continue to partner with WA DNR and DLS to map WUI areas – ultimately use this map to target strategy priorities. - Socialize results of WUI mapping efforts with comprehensive plan staff and look into planning policies that could limit density or development in fire-prone areas. - Convene multiagency committee once WA DNR WUI maps are closer to being finalized - Identify existing preparedness actions and gaps, including areas that are/are not receiving Firewise outreach and support. - Develop wildfire preparedness and mitigation coordination strategy and socialize it. - DNRP to request \$150k funding for an additional FTE to support Firewise efforts. - Look into model codes, ordinances, or other strategies to promote in addition to Firewise. - Host an annual tabletop at the wildfire workshop held each year by KCEM.			
Performance Measure KC EM was successful/not successful in convening <i>all</i> the necessary partners to establish a unified strategy for community wildfire preparedness and risk reduction.			



Hazard Mitigation Assistance Grant Support

Lead KC EM	Partners WA EMD Local Jurisdictions	Hazards Mitigated / Goals Addressed All / Goal 10	Funding Sources and Estimated Costs FEMA HMA Grants
Vision Hazard Mitigation Assistance grants go to the communities and projects most needed and more effective at reducing risk, regardless of a community's internal capacity to administer federal grants.			
Description With the passage of the Disaster Recovery Reform Act (DRRA) in 2018, the amount of federal grant funding for hazard mitigation will top \$300-700 million annually, at least a 3-fold increase over historical averages. For 2019, grants of up to \$4 million, federal cost-share, will be available. The experience-barrier to seeking these grants has prevented jurisdictions and county departments from applying. King County Emergency Management is establishing a grant assistance program to lower these barriers by providing support in administering FEMA grants. To pay for this service, King County will leverage local management costs, provided to grant recipients.			
2-Year Objectives Publish assistance guidelines and implement at least one test case.	5-Year Objectives - Expand local capacity to administer grants. - Expand KC EM capacity to support on application development	Long-Term Objectives Communities that need grants consistently are able to seek them, regardless of internal capacity.	
Implementation Plan/Actions - Administer FEMA grants - King County will administer grants, to include submitting reimbursements and documentation, completing quarterly reports, and managing grant kickoff and closeout. - Provide application technical assistance - King County will, as time allows, provide support and technical assistance in developing applications. Jurisdictions will take the lead in application development. King County may provide more support in the future. - Establish a process to collect documentation and reimburse expenditures - King County will establish a process to identify and track expenditures, and collect documentation necessary for submission to FEMA and the State. King County will work with partners to ensure this process is clear and straightforward. - Develop an interlocal agreement process - King County will develop and establish an internal sub-award agreement process that lays out expectations for both parties in successfully administering the grants and completing mitigation projects. - Look into other fund sources post-disaster and accelerate projects like flooded home buyouts before rebuilding occurs.			
Performance Measure # Grants administered on behalf of other agencies/communities.			



Public Assistance Grant Support

Lead KCEM Business & Finance Officer	Partners King County Public Assistance Team membership	Hazards Mitigated / Goals Addressed All	Funding Sources and Estimated Costs FEMA 406 Mitigation
Vision Post-Disaster Recovery following a Presidentially Declared Disaster will include taking full advantage of the utilization of 406 Hazard Mitigation funding made available exclusively to eligible agencies within a qualifying jurisdiction.			
Description The federal Public Assistance (PA) Disaster Recovery Grant Program supports governmental and government-type agencies recovery from major disaster declared by the President. While billions of PA grants are provided and provide significant support to recovering agencies; mitigating future occurrences of similar nature supports and strengthens resiliency on a long-term basis. The recognition of this is carried out through the provision of 406 Hazard Mitigation funds which are only available to agencies to mitigate damages suffered from a Presidentially Declared Disaster. These funds are added to Project Worksheets for PA Grant funds. King County Emergency Management serves as the County’s Applicant Agent for PA and oversees the disaster financial recovery efforts for King County government agencies. This strategy seeks to increase the number of 406 Hazard Mitigation projects added to Public Worksheets to increase King County government resilience in all county agencies.			
2-Year Objectives • Provide the KC PA Team (KCPAT) education and outreach on the 406 Hazard Mitigation Grant Program. • 50% of all impacted eligible KC government agencies will identify at least one mitigation project for each PA PWs to mitigate/ prevent/eliminate future damage directly attributable to the declared disaster.	5-Year Objectives • 75% of all impacted eligible KC government agencies will identify at least one mitigation project for each PA Project Worksheet to mitigate/prevent/eliminate future damage directly attributable to the declared disaster.	Long-Term Objectives • 95% of all impacted eligible KC government agencies will identify at least one mitigation project for each PA Project Worksheet to mitigate/prevent/eliminate the damage directly attributable to the declared disaster.	
Implementation Plan/Actions • Prepare training materials on 406 Hazard Mitigation Program • Conduct trainings for the King County Public Assistance Team • DNRP will train operations and engineering staff in the assessment of earthquake damaged facilities. A WTD specific ATC- 20 class will be conducted in early 2020 for operations and engineering staff. Response guides and ATC-20 placards for post-earthquake inspection and FEMA cost tracking forms are being placed in all offsite facilities. • Develop a KCPAT Disaster Recovery Financial Management Plan • Develop KCPAT Disaster Recovery Profiles • Represent and support each KCPAT agency during post-disaster recovery process			



- Work with each impacted agency during a declared disaster to identify eligible 406 HM project(s)

Performance Measure

- # of KCPAT members receiving training/outreach
- # of 406 Hazard Mitigation Projects funded
- % of Impacted King County government agencies receiving a 406 Hazard Mitigation Project
- Identify local cost-share opportunities, including the flood control district.



Language Accessible Video Emergency Messaging

Lead Risk Communications Specialist Public Health Seattle & King County, Office of the Director	Partners King County OEM	Hazards Mitigated / Goals Addressed All-Hazards Goal 6	Funding Sources and Estimated Costs \$100,000 +
Vision Increase the inventory of pre-scripted and translated language accessible materials for public health emergencies to aid in the rapid dissemination of public information and warning for all-hazards. Using audio-video media, increase the reach of emergency messaging for individuals with English as a second-language and persons who use American Sign Language (ASL).			
Description 28.5% of King County citizens are speakers of a non-English language and in some local language communities, there is also a low rate of literacy in the spoken language. This mitigation strategy aims to develop language accessible materials in an audio-video format to assist in public information and warning for known hazards within King County. By providing emergency messaging in an audio-video format, King County will be able to provide equitable access to culturally appropriate emergency messaging for individuals who do not read (in English or in their spoken language) and individuals with language access needs (including individuals who speak American Sign Language). This mitigation strategy will aid in the rapid dissemination via web and social media of critical life-safety/risk reduction emergency messaging to all persons present in King County in the event of an emergency.			
2-Year Objectives - Secure videographer - Secure and train ASL interpreter service and spokespeople from language communities - Develop language accessible emergency messaging using audio-video format - Conduct trial runs for language accessible emergency messaging	5-Year Objectives - Implement language accessible emergency messaging for public use - Conduct public awareness campaign to socialize language accessible emergency messaging		Long-Term Objectives Reduce delays in issuing language accessible/translated emergency messaging
Implementation Plan/Actions - Identify, script, and translate/transcreate emergency messaging for key hazards - Issue request for proposals for content videographer and interpreter services (including American Sign Language) - Film and produce language accessible emergency messaging content - Engage communities in review and testing of language accessible emergency messaging - Implement language accessible emergency messaging for public use and dissemination - Conduct public awareness campaign to socialize language accessible emergency messaging - Develop a social media strategy to support the accessible video tools.			
Performance Measure Time for issuance/public broadcasting of language accessible emergency messaging during emergency activation(s)			



King County Facilities Indoor Air Quality Monitoring Network

Lead Environmental Health Emergency Response Planner Public Health – Seattle & King County	Partners King County Facilities Maintenance Division	Hazards Mitigated / Goals Addressed Wildfire Smoke Goal 2, 12	Funding Sources and Estimated Costs \$100,000
Vision Develop and implement network of indoor air quality monitoring devices in King County operated facilities to ensure the health and safety of King County employees during periods of poor air quality due to wildfire smoke inundation.			
Description Procure and deploy 280 Dylos DC1100 true laser particle counters (indoor air quality monitors) across 28 facilities owned and/or managed by King County to aid in continuity of operation decision making during periods of poor air quality during wildfire smoke events. Indoor air quality network would enable the county to make informed decisions regarding the health and safety of employees working in county owned/managed facilities and base facility closure decisions along established state recommended action thresholds for PM2.5 levels. The Dylos DC1100 systems are portable units that run at an estimated cost of \$260.99 per unit and have the capability of relaying recorded PM levels to a central computer for active indoor air quality monitoring via integrated system telemetry.			
2-Year Objectives • Procurement of Dylos DC1100 indoor air quality monitors • Deployment of Dylos DC 1100 indoor air quality monitors across 28 king county owned/managed facilities • Establishment of centralized computer telemetry system for active monitoring of indoor air quality network • Increase situational awareness regarding indoor air quality of King County facilities during wildfire smoke events	5-Year Objectives • Assess indoor air quality performance of King County facilities during wildfire smoke events • Identify mitigation strategies to further improve indoor air quality of King County facilities during wildfire smoke events • Improve the overall indoor air quality performance of King County facilities during wildfire smoke events	Long-Term Objectives • Increase situational awareness regarding indoor air quality of King County facilities during wildfire smoke events • Increase the overall air quality performance of King County facilities during wildfire smoke events to aid in maintaining continuity of operations during periods of poor air quality	


Implementation Plan/Actions

- Procurement of Dylos DC1100 indoor air quality monitors
- Deployment of Dylos DC1100 indoor air quality monitors across 28 King County Facilities
- Establish centralized computer telemetry system for active monitoring of indoor air quality monitoring network
- Assess the performance of each King County facility during periods of poor air quality due to wildfire smoke
- Determine if facility closures are warranted based upon state recommended air quality action thresholds during periods of wildfire smoke inundation
- Identify subsequent indoor air quality mitigation recommendations for improving facility performance during wildfire smoke events

Performance Measure

- Prioritization of facilities warranting further indoor air quality mitigation actions to improve performance during periods of poor outdoor air quality
- Development of indoor air quality mitigation recommendations for prioritized facilities



Medical Gas Seismic Detection & Emergency Shut Off

Lead PHSKC – Environmental Health Services Division, Community Environmental Health Section	Partners Harborview Medical Center	Hazards Mitigated / Goals Addressed Earthquake Goal 2, 12	Funding Sources and Estimated Costs ≤\$500,000
Vision Reduce the disruption to level 1 trauma centers in King County following the event of a large earthquake by retrofitting level 1 trauma centers with medical gas seismic detection and emergency shut off systems.			
Description Harborview Medical Center is the only level 1 trauma center within King County and the State of Washington. In the event of a large earthquake impacting the Puget Sound region, disruptions to medical gas piping and delivery systems can significantly increase the recovery time to resume operations. This strategy proposes retrofitting the medical gas piping and delivery systems with early warning seismic detection and emergency shut off valves in order to increase the capability of rapid restoration of medical services following the event of a large earthquake in order to expedite the restoration of life saving operational capacity.			
2-Year Objectives • Fund feasibility study • Select consultants to complete study	5-Year Objectives • Update medical gas piping and plumbing code to require seismic detection and emergency shut off valves for Level 1 trauma centers.		Long-Term Objectives • Expedite the restoration of critical life-saving operational capacity for trauma centers with a level 1 designation.
Implementation Plan/Actions • Allocate funding to conduct a feasibility study for seismic detection and emergency shut off valve upgrades for level 1 trauma centers in King County • Issue Request for Proposal to contract conduct of feasibility study • Based upon findings of feasibility study, update medical gas piping and plumbing code to require seismic detection and emergency shut off valves for medical gases for level 1 trauma centers.			
Performance Measure • Completion of a feasibility study assessing cost-benefit outcome for seismic detection and emergency shut off valve system upgrades • Update medical gas piping and plumbing code to require seismic detection and emergency shut off valves for level 1 trauma centers.			



City of Kenmore Plan Annex

Introduction

The City's Comprehensive Plan Vision Statement states that, "Kenmore is a place that residents, businesses and visitors find welcoming, with courteous people, and that offers a high quality of life to live, raise children, shop, work, recreate, and socialize." The City recognizes its Lake Washington waterfront as a significant local and regional asset and efforts to connect the community to the waterfront through a variety of park projects continue. After a concerted planning effort, Kenmore has developed an identifiable, walkable downtown that will soon be supported by regional bus rapid transit (BRT). Kenmore is home to the Kenmore Air seaplane base and the City is pursuing plans for future regional pedestrian ferry service between the City and Seattle. Kenmore supports the character of its single-family residential neighborhoods but offers a diversity of housing types to provide a choice of attractive living accommodations for all residents. The City has significant natural and environmentally sensitive areas, including Swamp Creek, the Sammamish River, Lake Washington, steep slopes, and a great blue heron rookery.



Jurisdiction Profile

Date of Incorporation—
August 31, 1998

Type of Government—
Seven-member City Council that selects one of its members as the Mayor. The Council appoints a City Manager to provide direction to all City departments.

Current Population—
23,320

Location and Description—Kenmore is about 6 square miles in size, located in north King County 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. Swamp Creek and its extensive wetlands divide the northern portion of the city. Kenmore is primarily developed with single-family neighborhoods. Most commercial and multifamily development stretches along SR-522 which crosses the City from east to west.



Development Trends

The City anticipates that an additional 3,667 housing units will be built in Kenmore over the 25 years between 2010 and the 2035. An additional 3,079 jobs are expected. The City continues work to support development of a very large (40+ acre) parcel adjacent to Lake Washington and the Sammamish River.

Regional policy documents assume Kenmore will become an important subregional job, service, cultural, and housing center with strong links to the regional transportation system. Bus rapid transit (BRT) is scheduled to arrive in Kenmore in 2024. The City has put in place a transit-oriented development district to encourage high density development—including affordable housing—near the proposed BRT station.

This new residential and commercial development, along with additional commuter traffic through Kenmore, will increase the City's at-risk population.



The City will be replacing its main bridge over the Sammamish River in the next few years, reducing the City's hazard vulnerability. Additional significant pedestrian and bicycle improvements are planned along major arterials.

Recent updates to Kenmore's critical area regulations (including geologically hazardous area and flood regulations) will protect environmental resources and improve public safety. In particular, improved information on steep slopes should help ensure reduced risks for future development.

Jurisdiction Point of Contact:

Name: Lauri Anderson
 Title: Principal Planner
 Entity: City of Kenmore
 Phone: 425-398-8900
 Email: landerson@kenmorewa.gov

Plan Prepared By:

Name: HMP Team
 Title:
 Entity: City of Kenmore
 Phone: 425-398-8900
 Email: landerson@kenmorewa.gov





City of Kenmore Risk Summary

Hazard Risk and Vulnerability Summary

HAZARD	RISK SUMMARY	VULNERABILITY SUMMARY	IMPACT SUMMARY
Avalanche	There is no risk of avalanche in Kenmore	N/A	N/A
Earthquake	Kenmore is near several faults including the Seattle Fault. Since incorporation the City has experienced a significant earthquake, the 6.8 magnitude Nisqually Earthquake in 2001. Kenmore is also located within the Seismic Design Category D ₁ . The City has adopted good earthquake regulations for new structures and infrastructure as well as alterations to existing buildings. Kenmore is mostly built out as a bedroom community and has existing single-family structures. Most of these existing structures are light-weight, wood-framed structures better suited to seismic activities.	Kenmore has two bridges that are nearing the end of their life that may be vulnerable is a severe earthquake. The West Sammamish River Bridge was constructed in the 1930's, and its current sufficiency rating is 6.75 out of 100. 100 is considered as an entirely sufficient bridge, typically new. The City plans to replace the bridge over the next few years. Reconstruction is expected to begin in 2020. The Little Swamp Creek Bridge at NE 175 th St has a sufficiency rating of 40 out of 100; which requires retrofitting. However, retrofitting costs are equivalent to replacement costs. The City is currently exploring funding options.	Although Kenmore has experienced a significant earthquake, no significant damage was reported.
Flood	Portions of land adjacent to the Swamp Creek and Sammamish River are within the Special Flood Hazard Zone. The city has good floodplain management regulations for new construction and has limited development in this area; however, there are some structures already present in the floodplain. The City has previously purchased vulnerable property via grants and City funding. However, there are still a few single-family	There are approximately 10 single-family residences, 5 multi-family parcels and a few commercial properties located in the Special Flood Hazard Zone along Swamp Creek that experience flooding when the water is high. Although the properties floods, only a few structures experience flooding.	A few single-family residences experience repetitive damage due to flooding.



	residential properties that experience flooding.		
Landslide	Kenmore has steep slopes that have been designated Landslide Hazards. The city has good Critical Area regulations that limit new development. However, there were homes built on the Landslide Hazards prior to these regulations being in place.	The City has recently studied the City for potential landslide hazards based on Lidar technology. Based on the information from the study the City has updated its Landslide Hazard maps and regulations.	The study identified slopes potentially subject to landslides. Some landslides appear to be active and some are not. The active landslides are being monitored by the City and mitigation measures are being considered.
Severe Weather	Kenmore is at risk for heavy rain, heavy wind as well as snow & ice weather events.	Heavy rain can result in localized flooding and saturated soils. Erosion can occur which may litter the sidewalks, bike lanes and roadways with debris. Saturated soils can weaken tree stability and there is a potential for trees to fall in this type of weather event. Heavy wind can result in leafy and woody debris scattered on sidewalks/paths, bike lanes and roadways as well as other City owned property. There is also a potential for large branches or entire trees to fall onto public property. Snow and ice have the potential to affect all sidewalks, bike lanes and roadway making it dangerous and difficult to travel by vehicle or as a pedestrian.	Severe weather events can impact all City infrastructure including but not limited to sidewalks/paths, bike lanes, roadways and other public property.
Tsunami	Kenmore is not at risk for a tsunami, but could experience a “seiche”—a wave off of Lake Washington. Studies have not been done to show the potential inundation area in the City.	Most of the area potentially at risk is developed with commercial uses, including Kenmore Air, CalPortland, and two marinas; however, a large condominium complex also borders the north end of the Lake.	Significant damage could be done by a seiche. Total impact cannot be evaluated since mapping is incomplete and no recorded incidents exist.
Volcano	Kenmore could be affected by ashfall from nearby volcanoes (Mt. Rainier, for example).	Ash fall models are not available to assess vulnerability. Although Mt. Rainier is not presently active, the potential threat is ongoing.	Ashfall could impact City infrastructure and waterways as well as private property. Ash can also clog machinery.



Wildfire	The city has only a small amount of open natural space that has the potential for wildfire, but a seasonal risk impacted by climate change does exist. The majority of structure fires in the city are residential homes averaging about 3 per year requiring additional outside resources.	Swamp Creek and Saint Edward State Park are large natural areas bordered by residential homes and Bastyr University. Limited access and difficult terrain pose challenges for firefighting. Existing mutual aid agreements have been sufficient to provide additional resources for fighting structure fires and building codes requiring fire sprinklers in single family residential homes should offset the increase in number of homes in the city.	In the past 5 years, 12 small fires (less than 100' x 100') have been reported and extinguished. Structure fires pose a limited impact for the city as a whole but can have devastating isolated impact.
Civil Disturbance	Civil disturbances reacting to activities in the community have not occurred in Kenmore.	The City encourages public participation in regulatory or other changes that would affect the citizenry so that voices can be heard before action is taken. Kenmore police are trained to recognize and respond to this type of incident should it occur.	No civil disturbances have been located in Kenmore.
Cyber Incident	Increasingly, cyberattacks are plaguing local governments. Valuable information may be held hostage or important systems corrupted.	City government is vulnerable to these attacks although software solutions are constantly updated and staff are trained to avoid this type of attack.	The City has not, to date, suffered a successful cyberattack.
Hazardous Materials Incident	With limited commercial facilities in the city and none of them storing large supplies of hazardous materials, the primary risk is limited to those materials being transported through Kenmore.	The transportation of hazardous materials on State Route 522 is the primary source and location of hazardous chemicals in the city. SR522's proximity to Lake Washington, its tributaries and the city's downtown core with higher residential density put hazardous chemicals in close proximity to high impact areas.	Hazardous material incidents have been limited in size, less than 50 gallons, of flammable liquids in the past 5 years, but much larger quantities are transported through the city daily.
Health Incident	Like most primarily-residential cities the risk of a public health emergency is limited by the lack of large public gathering spaces (stadiums, etc.)	The city's population has limited vulnerabilities within the community however epidemics can still interrupt normal services and negatively impact the city.	An epidemic that reduced the availability of staff for the city or our service providers could interrupt regular business activity.
Terrorism	As with any U.S. city, the possibility of a mass shooting or other terrorist attack is present in Kenmore. Minor	Kenmore police are trained to recognize and respond to this type of incident.	Kenmore police have responded to and investigated the hate graffiti incidents. The City has alerted its

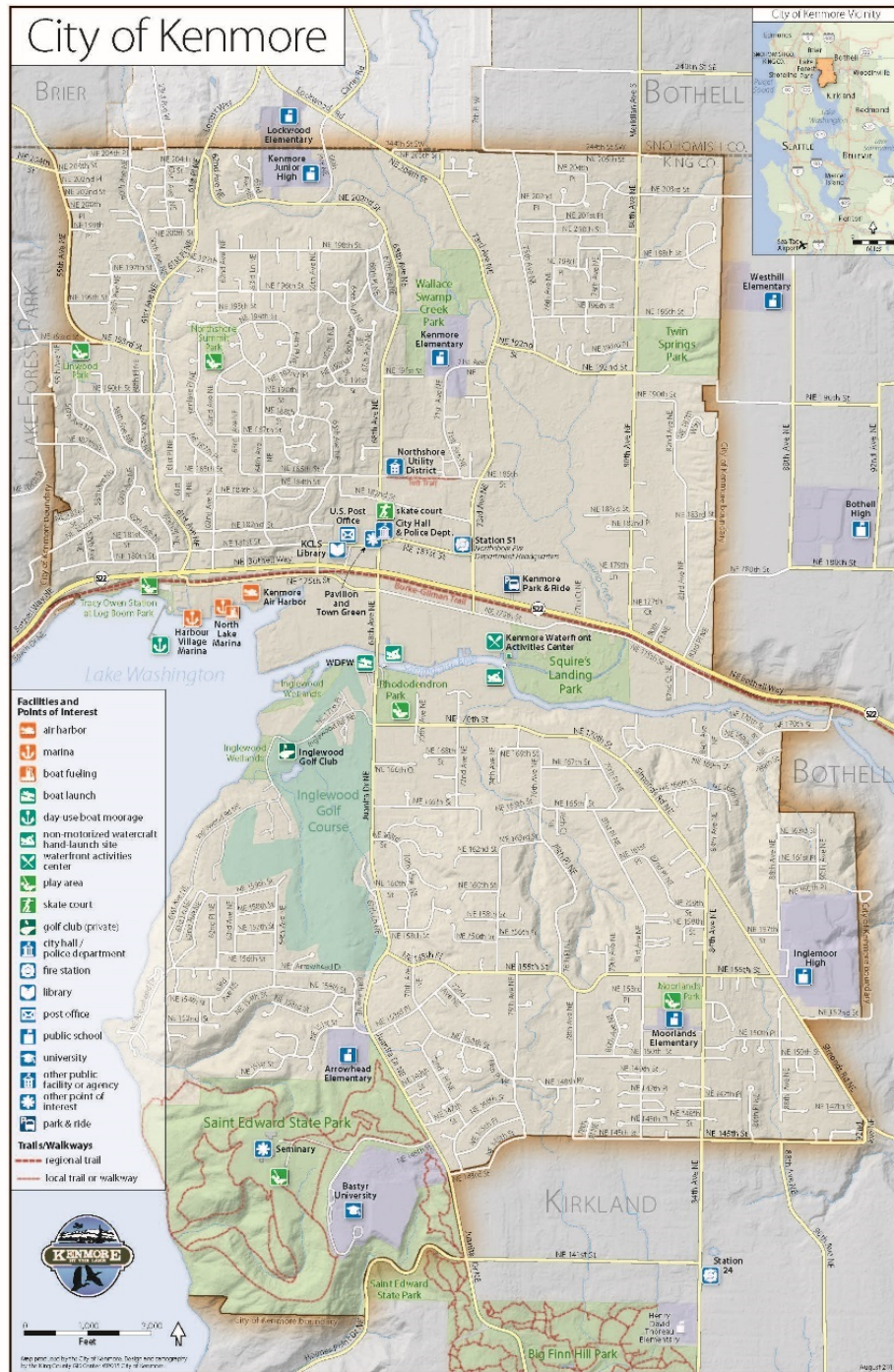


	instances of hate graffiti have been documented in the City.		citizens to combat hate speech. Fortunately, no terrorist attacks have occurred in the City.
Dam Failure	There is no risk of dam failure in Kenmore.	N/A	N/A



Hazard and Asset Overview Map(s)

Figure 1: Kenmore Facilities



Kenmore Critical Areas Geologically Hazardous Areas

Legend:

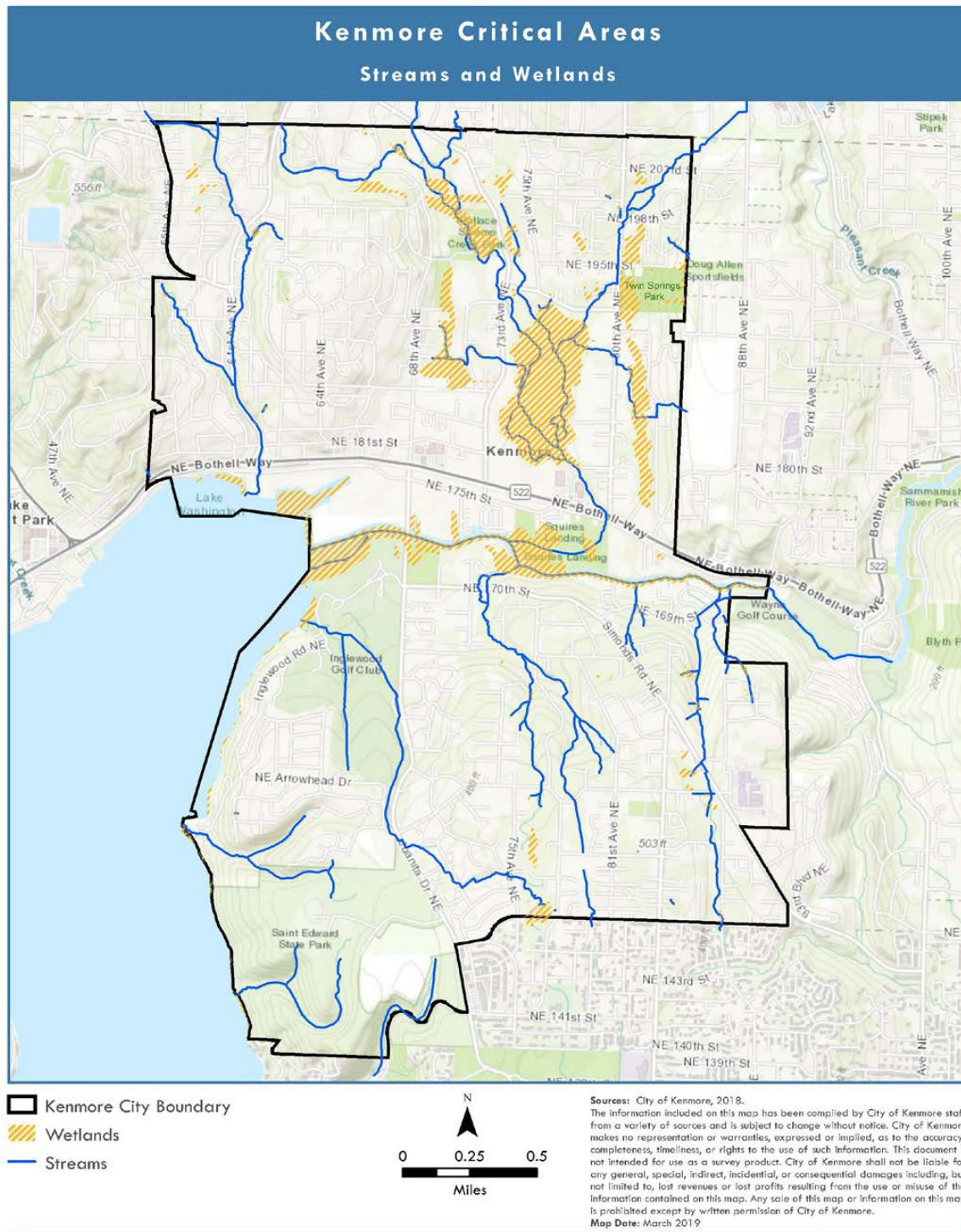
- Kenmore City Boundary
- WA DNR - Scarps
- Erosion Hazard Areas
- Seismic Hazard Areas
- Landslide Hazard Areas
 - High Hazard
 - Moderate Hazard

Scale: 0 0.25 0.5 Miles

Sources: City of Kenmore, 2018.
The information included on this map has been compiled by City of Kenmore staff from a variety of sources and is subject to change without notice. City of Kenmore makes no representation or warranties, expressed or implied, as to the accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. City of Kenmore shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of City of Kenmore.
Map Date: March 2019



Figure 3: Streams and Wetlands





Assets at Risk (Northshore Utility District only)

ASSET	VALUE (\$)	RISK SUMMARY	VULNERABILITY SUMMARY	IMPACT SUMMARY
Inglemoor Water Transmission Main		This major water transmission main connects two halves of Northshore Utility District's water system dissected by the Sammamish River and is essential to efficiently serve the city.	The pipeline runs through a major liquefaction area and under the Sammamish River through unstable soils and steep slopes.	The loss of the pipeline would eliminate the connection between the north and south side of the water system dramatically reducing the ability of the District to move water and serve customers.

Plan Update Process

This planning process can be divided into three steps:

1. What is valued in our community? (asset assessment)
2. What values are at risk or exposed to hazards? (risk assessment)
3. How will we protect what we value? (strategies)

The City of Kenmore has participated in the multi-jurisdictional planning process led by King County. A City hazard mitigation planning (HMP) team was established to prepare the HMP and identify possible mitigations.

The team met over several months, beginning on April 24, 2019. The first meeting was held with Derrick Hiebert, Hazard Mitigation Specialist with King County, to discuss plan expectations and review the plan template.

Additional team meetings were held on 5/23, 6/25, 8/6, 9/9, and 9/24/19 to assign responsibilities, review draft sections of the plan, discuss and prioritize mitigation strategies, and prepare for public participation in the HMP's development.

On August 21, 2019 team members Carl Lunak and Bryan Hampson, along with Derrick Hiebert, conducted a public outreach event, including a prioritization survey of potential mitigations, at the City's Movie Night event. On September 21, 2019, team member Carl Lunak and six volunteers staffed a table at the Northshore Safety and Emergency Preparedness Fair to provide information on the Hazard Mitigation Plan.

City of Kenmore Planning Team

NAME	TITLE	ORGANIZATION	CONTRIBUTION
Bryan Hampson	Development Services Director	City of Kenmore	Helped prepare HMP and identified mitigation strategies. Emergency Operations Manager.
Carl Lunak	Emergency Operations Manager	NEMCO	Helped prepare HMP and identified mitigation strategies. Liaison with Northshore Utility District.



Lauri Anderson	Principal Planner, Community Development	City of Kenmore	Helped prepare HMP. Prepares Comprehensive Plan and Municipal Code amendments.
Jennifer Gordon	Public Works Operations Manager	City of Kenmore	Helped prepare HMP and identified mitigation strategies. Responsible for maintenance of City facilities and infrastructure.
Richard Sawyer	Environmental Services Manager	City of Kenmore	Helped prepare HMP and identified mitigation strategies. Supervises surface-water program and participates on regional environmental committees.

Plan Update Timeline

PLANNING ACTIVITY	DATE	SUMMARY	ATTENDEES
King County HMP training	12/13/18	Reviewed plan expectations with interjurisdictional planning group.	Lauri Anderson
Initial meeting with Derrick Hiebert	4/24/19	Reviewed planning expectations and HMP template	HMP Team
King County HMP workshop	7/25/19	Mitigation strategy workshop	Carl Lunak
HMP team meetings	5/23/19 6/25/19 8/6/19 9/9/19 9/24/19	Responsibilities for completing sections of the plan were assigned. The group identified upcoming public participation opportunities. Each team member reviewed the 2015 plan and the 2019 template. Mitigation strategies were identified and prioritized.	HMP Team



Public Outreach

Public Outreach Events

EVENT	DATE	SUMMARY	ATTENDEES
Kenmore Movie Night	8/21/19	Information provided and survey taken on mitigation priorities. A raffle was held for participants to win emergency supplies.	Derrick Hiebert, Bryan Hampson and Carl Lunak
Northshore Safety and Emergency Preparedness Fair	9/21/19	Information provided on the mitigation plan and planning process.	Carl Lunak and volunteers Dawn Teel-Friedman, Asa Louis, Robin McKenzie, Gail Siani, John Cornaby and Jiles Baggett

City of Kenmore Hazard Mitigation Program

Hazard mitigation strategies were developed through a two-step process. The internal planning team met to identify a comprehensive range of mitigation strategies. These strategies were then prioritized using a process established at the county level and documented in the base plan. Input from a community survey was used to help with prioritization.

Hazard mitigation strategies in the City of Kenmore are managed through a collaborative process involving multiple departments and the Northshore Utility District (NUD). The City's Emergency Operations Manager, along with the Emergency Operations Manager from NEMCO (also representing NUD), monitor status of the mitigation actions and convene the annual meeting of the planning team as described below.

Plan Monitoring, Implementation, and Future Updates

King County leads the overall mitigation plan monitoring and update process and schedules the annual plan check-ins and bi-annual mitigation strategy updates. Updates on mitigation projects are solicited by the county for inclusion in the countywide annual report. As part of participating in the 2020 update to the Regional Hazard Mitigation Plan, Kenmore agrees to convene its internal planning team at least annually to review their progress on hazard mitigation strategies and to update the plan based on new data or recent disasters.

As part of leading a countywide planning effort, King County Emergency Management will send to planning partner any federal notices of funding opportunity for the Hazard Mitigation Assistance

City of Kenmore Hazard Mitigation Plan

King County Plan Goals

1. Access to Affordable, Healthy Food
2. Access to Health and Human Services
3. Access to Parks and Natural Resources
4. Access to Safe and Efficient Transportation
5. Affordable, Safe, Quality Housing
6. Community and Public Safety
7. Early Childhood Development
8. Economic Development
9. Equitable Law and Justice System
10. Equity in Government Practices
11. Family Wage Jobs and Job Training
12. Healthy Built and Natural Environments
13. Quality Education
14. Strong, Vibrant Neighborhoods



Grant Program. Proposals from partners will be assessed according the prioritization process identified in this plan and the county will, where possible, support those partners submitting grant proposals. This will be a key strategy to implement the plan.

The next plan update is expected to be due in April 2025. All jurisdictions will submit letters of intent by 2023, at least two years prior to plan expiration. The county will lead the next regional planning effort, beginning at least 18 months before the expiration of the 2020 plan.

Mitigation Plan Integration

In the past, Kenmore has used the Hazard Mitigation Plan to guide the development of additional programs and City policies including but not limited to the Comprehensive Emergency Management Plan, capital expenditure plans and the Critical Areas Ordinance. To continue that ongoing integration, the City's Hazard Mitigation Plan will be identified as a reference document in other planning documents, including the updated Comprehensive Plan, and members of the hazard mitigation planning team will be included in the development of additional programs and policy updates.

Continued Public Participation

King County and its partner cities already maintains substantial public outreach capabilities, focusing on personal preparedness and education. Information on ongoing progress in implementing the hazard mitigation plan will be integrated into public outreach efforts. This will provide King County residents, already engaged in personal preparedness efforts, with context and the opportunity to provide feedback on the county's progress and priorities in large-scale mitigation. In the vertical integration of risk-reduction activities from personal to local to state and federal, it is important that the public understand how its activities support, and are supported by, larger-scale efforts.

The outreach and mitigation teams will also continue to work with media and other agency partners to publicize mitigation success stories and help explain how vulnerabilities are being fixed. When possible, public tours of mitigation projects will be organized to allow community members to see successful mitigation in action.

Hazard Mitigation Authorities, Responsibilities, and Capabilities

Plans

PLAN TITLE	RESPONSIBLE AGENCY	POINT OF CONTACT	RELATIONSHIP TO HAZARD MITIGATION PLAN
Comprehensive Plan	City of Kenmore	Lauri Anderson	Provides overall guidance to City policy and priorities
Comprehensive Emergency Management Plan, 2016	City of Kenmore	Bryan Hampson	The Hazard Mitigation Plan is an annex of the City's CEMP
Capital Facilities Plan and Capital Improvement Program	City of Kenmore	Joanne Gregory	Provides a list of approved Capital Improvement Projects.
Surface Water Master Plan, 2015	City of Kenmore	Richard Sawyer	Provides detail on the City's surface water assets, policies, programs and capital projects.



Northshore Utility District (NUD) Comprehensive Emergency Management Plan, 2019	Northshore Utility District	Ethan Maiefski	NUD's Hazard Mitigation Plan is also an annex to the King County Plan. NUD is a participant in NEMCO.
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Programs, Policies, and Processes

PROGRAM/POLICY	RESPONSIBLE AGENCY	POINT OF CONTACT	RELATIONSHIP TO HAZARD MITIGATION PLAN
Municipal Code, including building code, zoning and subdivision codes, critical areas rules, and shoreline regulations	City of Kenmore	Lauri Anderson	City regulations
National Flood Insurance Program	City of Kenmore	Bryan Hampson	The NFIP insures properties in and around the floodplain
State Environmental Policy Act	City of Kenmore	Bryan Hampson	Environmental analysis of proposed projects

Entities Responsible for Hazard Mitigation

AGENCY/ORGANIZATION	POINT OF CONTACT	RESPONSIBILITY(S)
City Council	Rob Karlinsey	Approval and oversight of City actions
City Manager's Office	Rob Karlinsey	Management of departmental activities
Development Services	Bryan Hampson	Permit review and Emergency Operations Manager
Community Development	Debbie Bent	Long-range policy planning and parks development
Engineering	John Vicente	Engineering
Public Works Operations	Jennifer Gordon	Public works operations
Environmental Services	Richard Sawyer	Surface water management and environmental issues
Finance and Administration	Joanne Gregory	Budget development and administration
Police	Peter Horvath	Police services and traffic control
NEMCO (Northshore Emergency Management Coalition)	Carl Lunak	Coalition of the cities of Kenmore and Lake Forest Park and the Northshore Fire Department and Northshore Utility District to address emergency preparedness and provide public education

National Flood Insurance Program

National Flood Insurance Program Compliance

What department is responsible for floodplain management in your community?	Development Services
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Who is your community's floodplain administrator? (title/position)	Bryan Hampson, Development Services Director
What is the date of adoption of your flood damage prevention ordinance?	6/17/19
When was the most recent Community Assistance Visit or Community Assistance Contact?	April 23, 2019
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 so, please state why.	Yes.
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of training/assistance is needed?	No.
Does your community participate in the Community Rating System (CRS)? If so, what is your CRS Classification and are you seeing to improve your rating? If not, is your community interested in joining CRS?	No, therefore Kenmore is a Class 10.
How many Severe Repetitive Loss (SRL) and Repetitive Loss (RL) properties are located in your jurisdiction?	SRL: 0 RL: 2-5
Has your community ever conducted an elevation or buy out of a flood-prone property? If so, what fund source did you use? If not, are you interested in pursuing buyouts of flood prone properties?	Yes, through various grants and City funding. The City is interested in buying more flood prone properties as additional funding becomes available.

Hazard Mitigation Strategies

2015 Hazard Mitigation Strategies

This section of the plan identifies Kenmore's 2015 hazard mitigation strategies and an update on their status.

STRATEGY	DESCRIPTION	PRIORITY	STATUS
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:	High	Provide public assistance on floodplain requirements and impacts through permit counter contacts and telephone inquiries. Continue to enforce flood regulations through permitting. Adopted updated flood regulations, with FEMA's review and approval, in 2019.



	• 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		
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.	High	The Northshore Fire District completed its annual full survey from the WA Survey and Rating Bureau and rated Kenmore as a Class 3.
KM-3	Integrate the hazard mitigation plan into other plans, ordinances or programs to dictate land uses within the jurisdiction.	High	The City updated its critical areas regulations and Shoreline Master Program based on new information on landslide hazard areas using new LiDAR technology.
KM-4	Consider participation in incentive based programs such as the CRS, Firewise and StormReady.	High	The City is considering these programs.
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.	Medium	The City has bought some properties prone to flooding and is interested in pursuing additional buy outs as funding is available.
KM-6	Continue to support the county-wide initiatives identified in this plan.	High	The City supports the county-wide initiatives identified in this plan.
KM-7	Actively participate in the plan maintenance strategy identified in this plan	High	The City participates in the maintenance strategy identified in this plan.
KM-8	Strive to capture perishable data (i.e. high water marks, preliminary damage estimates, and damage photos) after	Medium	The City continues to capture essential data following significant events.



	significant hazard events to support future updates to the risk assessment of this plan.		
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 84 th Ave. NE and 88 th Ave. NE between NE 157 th Street and NE 169 th Street, and in areas of previous landslides.	Medium	Participated in the King County LiDAR mapping process and had Kenmore-specific information prepared.
KM-10	Identify and begin acquisition of City equipment necessary for safety and operations during a natural hazard event.	Medium	Emergency Operations Center Logistics Section identified potential businesses that have necessary equipment that we could acquire if needed during a natural hazard event
KM-11	Continue to facilitate and support hazard education programs, such as CERT training or providing educational materials for family disaster preparedness.	High	Formed the Northshore Emergency Management Coalition (NEMCO) with the City of Kenmore, City of Lake Forest Park, Northshore Fire District, and Northshore Utility District. Conduct monthly volunteer emergency meetings; conduct monthly Radio Amateur Civil Emergency Service meetings; conducted 2 CERT classes in 2016 and 2018; conducted Radio Technician Class; and conducted 2 citizen emergency preparedness workshops in 2018.



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.	Medium	Incomplete. No longer a priority.
KM-13	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and other government offices.	High	Website includes information on securing furniture and appliances, and other measures, under “do1thing” program.
KM-14	Identify city-owned buildings and infrastructure that require structural retrofitting.	High	Inspected all city-owned buildings and infrastructure for potential structural retrofitting. No city-owned buildings require retrofitting.
KM-15	Develop public information to educate citizens on tsunamis/seiches.	Medium	Incomplete. No longer a priority. Need information about the hazard.
KM-16	Encourage King County to develop ash fall models that are specific to the north King and south Snohomish Counties area.	Low	Incomplete. Relying on County for action.
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.	High	Communication and coordination complete for new development at Saint Edward State Park.



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.	High	Provided information on City's website.
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2020 Hazard Mitigation Strategies

STRATEGY	LEAD AGENCY/POC	TIMELINE	PRIORITY
Sammamish River Bridge detour routes	City of Kenmore/ John Vicente or Tobin Bennett-Gold	2020-2025	High
Flood reduction and resiliency	City of Kenmore/ Richard Sawyer	2020-2025+	Moderate
Severe weather event debris disposal procedures	City of Kenmore/ Jennifer Gordon	2020-2025	Moderate
Inclement weather (snow and ice) procedures manual	City of Kenmore/ Jennifer Gordon	2020-2022	High
Landslide hazard area education and outreach	City of Kenmore/ Bryan Hampson	2020-2022	Moderate
Stabilization of hazardous slopes in City right-of-way	City of Kenmore/ Jennifer Gordon	2020-2025+	Moderate



Hazard Mitigation Strategy

Lead Points of Contact City Engineer Traffic Engineer	Partner Points of Contact Kenmore Chief of Police Private boat operators	Hazards Mitigated / Goals Addressed Interruption of transportation connectivity	Funding Sources and Estimated Costs City funds
Strategy Vision/Objective Prepared detour routes and development of transportation alternatives in the event of loss of transportation access across one or both 68 th Av NE Sammamish Bridges in order to mitigate negative effects of loss of transportation connectivity on effectiveness of city-wide and regional traffic operations. Effective traffic operations are necessary for emergency response and / or evacuation in addition to preserving normal transportation access as much as possible until connectivity is restored.			
Mitigation Strategy Prepare and maintain traffic detour plans, including temporary signage and signal adjustments, to redirect traffic in the event that one or both 68 th Av NE (Sammamish River) Bridges need to be closed or have collapsed. Make relevant staff and police aware of detour plans so that they can be implemented quickly in the event of a bridge closure. Contact adjacent jurisdictions on traffic impacts if needed. Work with local boat operators to ferry people back and forth across the river in the event of an emergency. One such relationship has already been established with a local tour boat company. West Sammamish bridge construction includes detours in the event of bridge closure during construction. Project will be complete in 2022. After Project is completed, a new detour plan will be prepared for the permanent state of the infrastructure.			
2-Year Objectives Detours related to West Sammamish Bridge Project have already been developed and will be made available to relevant staff and police. Establish relationships with local boat operators.	5-Year Objectives Prepare new detour routes based on permanent infrastructure and make plans available to relevant staff and police.	Long-Term Objectives Review and update detour routes and ferry opportunities and make information available to relevant staff and police.	
Implementation Plan/Actions Detour plans to be used during West Sammamish Bridge Project are already developed and in place. New detour plans will be prepared after bridge construction is complete in 2022. Expand relationships with local boat operators to provide ferry service across the Sammamish River in the event the bridge is closed.			
Performance Measures Was access to all streets preserved while detour was in effect (including streets not cut off by gridlocked traffic)? How quickly was the detour implemented (did the appropriate people have access to the detour plan)? Were road users able to clearly follow detour signing? Are agreements in place with local boat operators?			



Hazard Mitigation Strategy

Lead Points of Contact Public Works Environmental Services Manager	Partner Points of Contact Private property owners Flood control district	Hazards Mitigated / Goals Addressed Flood reduction	Funding Sources and Estimated Costs City funds, Grants
Strategy Vision/Objective Flood reduction and resiliency: Determine specific stream culvert and public drainage facility projects and priorities for flood reduction, road safety and water quality protection; remove homes and businesses from flood prone properties and restore floodplain function while simultaneously improving riparian habitat and stream health; and eliminate recurring flooding issues at known “hot-spots” by evaluating underlying causes and addressing the root issues.			
Mitigation Strategy Conduct a citywide stream culvert assessment to identify specific projects; Conduct a citywide assessment of public drainage facilities (stormwater vaults, ponds) to identify retrofit opportunities; Acquire property to restore stream corridors and floodplains and reduce flooding hazards; and Develop a list of specific projects to reduce hazards in known flash-flooding hotspots.			
2-Year Objectives - Identify, map and document all stream bearing culverts in the City, including information on type, diameter, length, public impact and ownership. - Assess public drainage facilities. - Identify, map and document all potential properties for floodplain restoration and all hot-spot flooding locations.	5-Year Objectives - Complete conditional assessments of culverts and hydraulic modeling of built-out conditions for flow capacity and flood analysis. Prioritize replacement. - Prioritize identified floodplain restoration properties for acquisition. - Complete assessments of hot-spot flooding issues and prioritize based on effectiveness of solution, benefit, cost and scope of work needed.		Long-Term Objectives Incorporate projects into on-going capital improvement program to provide funding for implementation.
Implementation Plan/Actions Identify projects to reduce flooding. Prioritize those projects. Obtain funding. Complete projects.			
Performance Measures Flooding of private property and roadways Water quality Functioning riparian habitat			



Hazard Mitigation Strategy

Lead Points of Contact	Partner Points of Contact	Hazards Mitigated / Goals Addressed	Funding Sources and Estimated Costs
Public Works Operations Manager	Public Works Operations Crew Allied Waste Waste Management	Debris Removal	City funds
Strategy Vision/Objective Standard operating procedures for debris management after a severe weather event.			
Mitigation Strategy Make a plan for debris disposal after severe weather events or natural disasters (tree debris, other vegetation, etc.)			
2-Year Objectives Create a written document containing standard operating procedures for debris management after a severe weather event.	5-Year Objectives Develop a routine review of plan to ensure agreements are in place for the debris removal strategy. Schedule a routine debrief annually in late spring if the City experienced severe weather during that time period.		Long-Term Objectives To have an up-to-date standard operating procedures manual for debris management that is being reviewed and updated routinely.
Implementation Plan/Actions Draft document and have it reviewed by partners. Finalize plan and provide training.			
Performance Measures Plan completion			



Hazard Mitigation Strategy

Lead Points of Contact	Partner Points of Contact	Hazards Mitigated / Goals Addressed	Funding Sources and Estimated Costs
Public Works Operations Manager	Public Works Operations Department	Snow & Ice Inclement Weather	City funds
Strategy Vision/Objective Create a standard operating procedures manual for snow and ice inclement weather.			
Mitigation Strategy Develop written snow and ice removal procedures, including priorities, for Kenmore (formerly handled by Lake Forest Park Public Works).			
2-Year Objectives Create a written document containing standard operating procedures for snow and ice weather events.	5-Year Objectives Develop a routine review of plan on an annual basis to incorporate new infrastructure and assess priority routes. Schedule a routine debrief annually in early spring if the City experienced inclement weather during that time period.		Long-Term Objectives To have an up-to-date standard operating procedures manual for snow and ice that is being reviewed and updated routinely.
Implementation Plan/Actions The plan will be developed prior to the beginning of the 2019 winter season. The plan will layout work items that may be done in preparation for the winter season as well as procedures and priorities to be followed during the winter season.			
Performance Measures Vehicular accidents due to snow and ice conditions. Volume of requests for service.			



Hazard Mitigation Strategy

Lead Points of Contact Development Services Director	Partner Points of Contact Private property owners King County Emergency Management Insurance companies FEMA	Hazards Mitigated / Goals Addressed Landslide	Funding Sources and Estimated Costs City funds, Grants
Strategy Vision/Objective Property owners are aware of hazard and can make informed land use decisions			
Mitigation Strategy Provide education and outreach to property-owners in identified landslide hazard areas.			
2-Year Objectives Notify and educate property owners.	5-Year Objectives		Long-Term Objectives
Implementation Plan/Actions Identify properties. Prepare educational materials. Distribute materials or discuss findings with property owners.			
Performance Measures Number of landslide hazard area property owners contacted			



Hazard Mitigation Strategy

Lead Points of Contact Public Works Operations Manager	Partner Points of Contact Public Works Engineering Public Works Environmental Services	Hazards Mitigated / Goals Addressed Stabilize hazardous slopes.	Funding Sources and Estimated Costs City funds
Strategy Vision/Objective Identify and stabilize possible hazardous slopes within the right-of-way that need to be stabilized.			
Mitigation Strategy Stabilize hazardous slopes in City right-of-way (for example, at 61 st Place and NE 150 th Street and at 66 th Avenue NE and NE 196 th St.)			
2-Year Objectives Develop a capital project for each hazardous slope identified. Design repair.	5-Year Objectives Projects identified to be added to the Capital Improvement Plan and given a budget. Create a timeline for projects to be completed.		Long-Term Objectives Complete capital projects to stabilize hazardous slopes within the right-of-way.
Implementation Plan/Actions Develop capital projects that address the hazardous slopes, including an engineer estimate. Evaluate projects as part of the Capital Improvement Plan (CIP) Create a timeline for project completion.			
Performance Measures Hazardous slopes have been stabilized.			

**CITY OF KENMORE
WASHINGTON
RESOLUTION NO. 20-341**

**A RESOLUTION OF THE CITY OF KENMORE,
WASHINGTON, ADOPTING THE 2020-2025 KING
COUNTY REGIONAL HAZARD MITIGATION PLAN
AND CITY OF KENMORE 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, proactive 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 was 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, the 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, the King County Regional Hazard Mitigation Plan includes localized, jurisdiction-specific information, including a Kenmore Plan 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 the King County Regional Hazard Mitigation Plan and Kenmore Plan Annex 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 2020-2025 King County Regional Hazard Mitigation Plan and the Kenmore Plan Annex which are herein incorporated by reference as if set forth in full.

PASSED BY THE CITY COUNCIL AT A REGULAR MEETING THEREOF ON THE 22nd DAY OF JUNE, 2020.

CITY OF KENMORE

David Baker, Mayor

ATTEST/AUTHENTICATED:

Kelly Chelin, City Clerk

APPROVED AS TO FORM:

Dawn Reitan, City Attorney

Subject/Topic: Ordinance 20-0508, Federal Emergency Management Agency (FEMA) Flood Hazard Area Zoning Code Amendments Proposed Council Action/Motion: Adopt Ordinance 20-0508 amending the Zoning Code as requested by FEMA.	For Council Meeting Agenda of: June 22, 2020 Department: Community Development Prepared by: Debbie Bent, Community Development Director Lauri Anderson, Principal Planner <u>Initial & Date</u> Approved by Department Head: _____ Approved by City Attorney: _____ Approved by Finance Director: _____ Approved by City Manager: RK 6/11/20 Exhibits/Attachments: 1. Ordinance 20-0508 2. FEMA letter dated 2/19/20 3. Follow-up email from FEMA representative
<u>INFORMATION/BACKGROUND:</u> Staff recommends that the City Council adopt Ordinance 20-0508 (see Attachment 1) to ensure ongoing participation in the National Flood Insurance Program (NFIP). The program allows homeowners in floodprone areas to obtain affordable flood insurance. <u>Background</u> On February 19, 2020, the City of Kenmore was notified that the flood hazard determination for the city had been finalized and that an updated Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) will become effective on August 19, 2020 (see Attachment 2). As a result, the City must adopt floodplain management regulations that meet the standards of paragraph 60.3(d) of the National Flood Insurance Program (NFIP) regulations (44 CFR 59, etc.) by the effective date of August 19, 2020. In anticipation of the FIS and FIRM amendments, during last year's update of the critical area regulations the City worked extensively with FEMA and Ecology representatives to be certain that the new flood hazard area regulations would be compliant with these requirements. FEMA has now notified the City (see Attachment 3) that the revised flood hazard regulations previously adopted by Ordinance 19-0488 are compliant, with the exception of the dates of the flood hazard determination documents specified in KMC 18.55.710. Ordinance 20-0508 would amend these dates as required by FEMA, effective on August 19.	
<u>FISCAL CONSIDERATION:</u> Staff time was spent to work on this project. A small amount of consultant time (remaining on the critical areas/shoreline master program contract) was used to respond to an initial email from FEMA and to verify that	

information requested by FEMA had previously been presented. The critical areas/shoreline master program contract totaled \$150,000 in 2018 and \$50,000 in 2019.

COUNCIL PRIORITY/BUDGET OBJECTIVE BEING ADDRESSED:

Comprehensive Plan Goal 14: “Protect life and property in areas of natural hazards.”

**CITY OF KENMORE
WASHINGTON
ORDINANCE NO. 20-0508**

**AN ORDINANCE OF THE CITY OF KENMORE,
WASHINGTON; REVISING CHAPTER 18.55, ARTICLE
XIX, SECTION 18.55.710 OF THE KENMORE MUNICIPAL
CODE ENTITLED BASIS FOR ESTABLISHING FLOOD
HAZARD AREA; AND PROVIDING AN EFFECTIVE
DATE.**

WHEREAS, on February 19, 2020, the City of Kenmore was notified by the Federal Emergency Management Agency (FEMA) that the flood hazard determination for the city had been finalized; and

WHEREAS, the updated Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) will become effective on August 19, 2020; and

WHEREAS, as a condition of continued eligibility in the National Flood Insurance Program (NFIP), the City must adopt floodplain management regulations that meet the standards of paragraph 60.3(d) of the NFIP regulations (44 CFR 59, etc.) by the effective date of August 19, 2020; and

WHEREAS, during the development of Ordinance 19-0488, the City worked with FEMA representatives to be certain that the revised flood hazard area regulations would be compliant with these requirements; and

WHEREAS, FEMA has notified the City that the revised flood hazard regulations adopted by Ordinance 19-0488 are compliant with the NFIP regulations with the exception of the date of the flood hazard determination documents specified in KMC 18.55.710; and

WHEREAS, the City Council desires to amend Article XIX, Chapter 18.55, Section 18.55.710 of the KMC to clarify the effective dates of the new FIS and FIRM; now therefore

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

Section 1. Findings Adopted. The City Council adopts the foregoing recitals as findings for this Ordinance, which are incorporated by reference as if set forth in full.

Section 2. Amendment of Chapter 18.55, Article XIX, Section 18.55.710, KMC Flood Hazard Areas, Basis for Establishing Flood Hazard Area. The City Council amends Chapter 18.55, Article XIX, Section 18.55.710 of the Kenmore Municipal Code as follows:

18.55.710 Basis for establishing flood hazard area.

• • •

B. The *areas of special flood hazard* identified by the Federal Insurance Administrator (FIA) in a scientific and engineering report entitled "The Flood Insurance Study of King County, Washington and Incorporated Areas," dated ~~November 8, 1999~~ **August 19, 2020**, and any revisions thereto, with an accompanying effective *flood insurance rate map (FIRM)*, dated ~~November 8, 1999~~ **August 19, 2020**, and any revisions thereto, are hereby adopted by reference and declared to be a part of this article. The *flood insurance study* is on file at Kenmore City Hall. In areas where the *flood insurance study* for the *City* includes detailed *base flood elevation* calculations, those calculations will be used until projections of future flows are completed and approved by the *City* and FEMA.

• • •

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 on August 19, 2020.

PASSED BY THE CITY COUNCIL AT A REGULAR MEETING THEREOF ON THE
___ND DAY OF _____, 2020.

CITY OF KENMORE

David Baker, Mayor

ATTEST/AUTHENTICATED:

Kelly Chelin, City Clerk

Approved as to form:

Dawn Reitan, City Attorney

Filed with the City Clerk:
Passed by the City Council:

Ordinance No.:
Date of Publication:



Federal Emergency Management Agency

Washington, D.C. 20472

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

IN REPLY REFER TO:
15P

February 19, 2020

Mr. Rob Karlinsey
City Manager, City of Kenmore
18120 68th Avenue Northeast
Kenmore, Washington 98028

Community: City of Kenmore,
King County,
Washington
Community No.: 530336
Map Panels Affected: See FIRM Index

Dear Mr. Karlinsey:

This is to formally notify you of the final flood hazard determination for the City of Kenmore, King County Washington, in compliance with Title 44, Chapter I, Part 67, Section 67.11, Code of Federal Regulations (CFR). This section requires that notice of final flood hazards shall be sent to the Chief Executive Officer of the community, all individual appellants, and the state coordinating agency, and shall be published in the *Federal Register*.

On February 1, 2013, the Department of Homeland Security's Federal Emergency Management Agency (FEMA) provided you with Preliminary copies of the FIS and Flood Insurance Rate Map (FIRM) that identify the existing flood hazards in your community including elevations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood). The proposed flood hazard determinations (FHDs) for your community were published in the *Seattle Times* on September 4, 2013 and September 11, 2013, and in the *Federal Register*, at Part 67, Volume 78, Page 48702, on August 9, 2013.

The statutory 90-day appeal period, which was initiated on the second newspaper publication date cited above, has ended. FEMA did not receive any appeals of the proposed FHDs during that time. Accordingly, the FHDs for your community are considered final. The final notice for FHDs will be published in the *Federal Register* as soon as possible. The FIS report and FIRM for your community will become effective on August 19, 2020. Before the effective date, FEMA will send you final printed copies of the FIS and FIRM.

The FIRM panels have been computer-generated. Once the FIRM and FIS report are printed and distributed, the digital files containing the flood hazard data for the entire county can be provided to your community for use in a computer mapping system. These files can be used in conjunction with other thematic data for floodplain management purposes, insurance purchase and rating requirements, and many other planning applications. Copies of the digital files or paper copies of the FIRM panels may be obtained by calling our FEMA Mapping and Insurance eXchange (FMIX), toll free, at 1-877-FEMA-MAP (1-877-336-2627). In addition, your community may be eligible for additional credits under our Community Rating System if you implement your activities using digital mapping files.

Because the FIS report establishing the FHDs for your community has been completed, certain additional requirements must be met under Section 1361 of the National Flood Insurance Act of 1968, as amended, within 6 months from the date of this letter. Prior to August 19, 2020, your community is required, as a condition of continued eligibility in the National Flood Insurance Program (NFIP), to adopt or show evidence of adoption of floodplain management regulations that meet the standards of Paragraph 60.3(d) of the enclosed NFIP regulations (44 CFR 59, etc.) by the effective date of the FIRM. These standards

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are the minimum requirements and do not supersede any State or local requirements of a more stringent nature.

It must be emphasized that all the standards specified in Paragraph 60.3(d) of the NFIP regulations must be enacted in a legally enforceable document. This includes adoption of the effective FIS report and FIRM to which the regulations apply. Some of the standards should already have been enacted by your community in order to establish initial eligibility in the NFIP. Your community can meet any additional requirements by taking one of the following actions:

1. Amending existing regulations to incorporate any additional requirements of Paragraph 60.3(d);
2. Adopting all the standards of Paragraph 60.3(d) into one new, comprehensive set of regulations;
or
3. Showing evidence that regulations have previously been adopted that meet or exceed the minimum requirements of Paragraph 60.3(d).

Communities that fail to enact the necessary floodplain management regulations will be suspended from participation in the NFIP and subject to the prohibitions contained in Section 202(a) of the 1973 Act as amended.

To assist your community in maintaining the FIRM, we have enclosed a Summary of Map Actions to document previous Letter of Map Change (LOMC) actions (i.e., Letters of Map Amendment (LOMAs), Letters of Map Revision (LOMRs)) that will be superseded when the revised FIRM panels referenced above become effective. Information on LOMCs is presented in the following four categories: (1) LOMCs for which results have been included on the revised FIRM panels; (2) LOMCs for which results could not be shown on the revised FIRM panels because of scale limitations or because the LOMC issued had determined that the lots or structures involved were outside the Special Flood Hazard Area as shown on the FIRM; (3) LOMCs for which results have not been included on the revised FIRM panels because the flood hazard information on which the original determinations were based is being superseded by new flood hazard information; and (4) LOMCs issued for multiple lots or structures where the determination for one or more of the lots or structures cannot be revalidated through an administrative process like the LOMCs in Category 2 above. LOMCs in Category 2 will be revalidated through a single letter that reaffirms the validity of a previously issued LOMC; the letter will be sent to your community shortly before the effective date of the revised FIRM and will become effective 1 day after the revised FIRM becomes effective. For the LOMCs listed in Category 4, we will review the data previously submitted for the LOMA or LOMR request and issue a new determination for the affected properties after the revised FIRM becomes effective.

In addition to your community using the FIRM and FIS report to manage development in the floodplain, FEMA will use the FIRM and FIS report to establish appropriate flood insurance rates. On the effective date of the FIRM, actuarial rates for flood insurance will be charged for all new structures and substantial improvements to existing structures located in the identified Special Flood Hazard Areas, the areas subject to inundation by the base flood. These rates may be higher if structures are not built in compliance with the floodplain management standards of the NFIP. The actuarial flood insurance rates increase as the lowest elevations (including basement) of new structures decrease in relation to the FHDs established for your community. This is an important consideration for new construction because building at a higher elevation can greatly reduce the cost of flood insurance. Also, on the effective date of the FIRM for your community, additional "second-layer" coverage will become available. First-layer coverage on existing structures built prior to the effective date of the FIRM will continue to be available at subsidized rates (unless substantial improvements are made); it will also be available at actuarial rates

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and can be purchased at whichever rate is lower.

If your community is encountering difficulties in enacting the necessary floodplain management measures, we urge you to call the Director, Federal Insurance and Mitigation Division of FEMA in Bothell, Washington, at (425) 487- 4600 for assistance. If you have any questions concerning mapping issues in general or the enclosed Summary of Map Actions, please call our FMIX at the number shown above. Additional information and resources your community may find helpful regarding the NFIP and floodplain management, such as *The National Flood Insurance Program Code of Federal Regulations*, *Answers to Questions About the National Flood Insurance Program*, *Use of Flood Insurance Study (FIS) Data as Available Data*, *Frequently Asked Questions Regarding the Effects that Revised Flood Hazards have on Existing Structures*, and *National Flood Insurance Program Elevation Certificate and Instructions*, can be found on our website at <https://www.floodmaps.fema.gov/lfd>. Paper copies of these documents may also be obtained by calling our FMIX.

Sincerely,



Luis Rodriguez, P.E., Director
Engineering and Modeling Division
Federal Insurance and Mitigation Administration

Enclosure:

Final Summary of Map Actions

cc: Community Map Repository
Bryan Hampson, Development Services Director, City of Kenmore
David Radabaugh, CFM, NFIP State Coordinator, Washington Department of Ecology
Jerry Franklin, Washington Risk MAP Coordinator, Washington Department of Ecology

SOMA-2

FINAL SUMMARY OF MAP ACTIONS

Community: KENMORE, CITY OF

Community No: 530336

To assist your community in maintaining the Flood Insurance Rate Map (FIRM), we have summarized below the effects of the enclosed revised FIRM panels(s) on previously issued Letter of Map Change (LOMC) actions (i.e., Letters of Map Revision (LOMRs), Letter of Map Revision based on Fill (LOMR-Fs), and Letters of Map Amendment (LOMAs)) that will be affected when the revised FIRM becomes effective on August 19, 2020.

1. LOMCs Incorporated

The modifications effected by the LOMCs listed below will be reflected on the revised FIRM. In addition, these LOMCs will remain in effect until the revised FIRM becomes effective.

LOMC	Case No.	Date Issued	Project Identifier	Original Panel	Current Panel
			NO CASES RECORDED		

2. LOMCs Not Incorporated

The modifications effected by the LOMCs listed below will not be reflected on the revised FIRM panels or will not be reflected on the revised FIRM panels because of scale limitations or because the LOMC issued had determined that the lot(s) or structure(s) involved were outside the Special Flood Hazard Area, as shown on the FIRM. These LOMCs will remain in effect until the revised FIRM becomes effective. These LOMCs will be revalidated free of charge 1 day after the revised FIRM becomes effective through a single revalidation letter that reaffirms the validity of the previous LOMCs.

SOMA-2

FINAL SUMMARY OF MAP ACTIONS

Community: KENMORE, CITY OF

Community No: 530336

2A. LOMCs on Revised Panels

LOMC	Case No.	Date Issued	Project Identifier	Original Panel	Current Panel
LOMA	09-10-0792A	07/14/2009	QUINAULT ESTATES, TRACT A, BLOCK 4 -- 8646 NE 170TH STREET	53033C0063G	53033C0063H
LOMA	15-10-1455A	09/16/2015	SHORT PLAT NO. 876057, LOT 3 -- 18923 72ND CT NE	53033C0063G	53033C0063H
LOMR-FW	16-10-1537A	11/04/2016	SECTION 7, T26N, R5E, W.M. -- 8828 NE 170TH STREET	53033C0063G	53033C0063H
LOMR-FW	17-10-0435A	03/16/2017	LOT B -- 17402 83RD COURT NE	53033C0063G	53033C0063H
LOMR-FW	17-10-1505A	08/15/2017	SECTION 7, T26N, R5E -- 8819 NE BOTHELL WAY	53033C0063G	53033C0063H
LOMR-FW	18-10-0072A	12/29/2017	SECTION 7, T26N, R5E, GOVERNMENT LOT 3 -- 8803 NE BOTHELL WAY	53033C0063G	53033C0063H
LOMR-FW	19-10-0123A	03/26/2019	SECTION 7, T26N, R5E -- 8715 NE 175TH STREET	53033C0063G	53033C0063H
LOMR-FW	19-10-1290A	01/07/2020	SECTION 7, T26N, R5E -- 8909 NE BOTHELL WAY	53033C0063G	53033C0063H

2B. LOMCs on Unrevised Panels

LOMC	Case No.	Date Issued	Project Identifier	Original Panel	Current Panel
			NO CASES RECORDED		

SOMA-2

FINAL SUMMARY OF MAP ACTIONS

Community: KENMORE, CITY OF

Community No: 530336

3. LOMCs Superseded

The modifications effected by the LOMCs listed below have not been reflected on the Final revised FIRM panels because they are being superseded by new or revised flood hazard information or the information available was not sufficient to make a determination. The reason each is being superseded is noted below. These LOMCs will no longer be in effect when the revised FIRM becomes effective.

LOMC	Case No.	Date Issued	Project Identifier	Reason Determination Will be Superseded
			NO CASES RECORDED	

1. Insufficient information available to make a determination.
2. Lowest Adjacent Grade and Lowest Finished Floor are below the proposed Base Flood Elevation.
3. Lowest Ground Elevation is below the proposed Base Flood Elevation.
4. Revised hydrologic and hydraulic analyses.
5. Revised topographic information.
6. Superseded by another LOMC.

4. LOMCs To Be Redetermined

The LOMCs in Category 2 above will be revalidated through a single revalidation letter that reaffirms the validity of the determination in the previously issued LOMC. For LOMCs issued for multiple lots or structures where the determination for one or more of the lots or structures is no longer valid, the LOMC cannot be revalidated through this administrative process. Therefore, we will review the data previously submitted for the LOMC requests listed below and if appropriate issue a new determination for the affected properties after the effective date of the revised FIRM.

LOMC	Case No.	Date Issued	Project Identifier	Original Panel	Current Panel
			NO CASES RECORDED		

From: [Sarpong, Suzanne](#)
To: [Lauri Anderson](#)
Cc: [david.radabaugh@ecy.wa.gov](#); [Debbie Bent](#); [Bryan Hampson](#)
Subject: RE: Flood Hazard Area Regulations
Date: Tuesday, February 25, 2020 1:23:44 PM

Lauri,

Per our conversation today, the regulations as noted online Chapter 18.55 are compliant. The only revision necessary at this time is the date of the Flood Insurance Study (FIS) and the Flood Insurance Rate Maps (FIRM), which needs to be August 19, 2020. This revision must be done prior to that date to avoid suspension from the National Flood Insurance Program (NFIP).

Please forward to me the signed and dated Ordinance updating the dates of the effective FIS and FIRM once adopted by the Mayor and Council. That is necessary for me to update the system to avoid automatic suspension.

Thanks so much for talking with me today!

Suzie

From: Sarpong, Suzanne <suzanne.sarpong@fema.dhs.gov>
Sent: Tuesday, February 25, 2020 11:51 AM
To: Lauri Anderson <landerson@kenmorewa.gov>
Cc: david.radabaugh@ecy.wa.gov; Debbie Bent <Dbent@kenmorewa.gov>; Bryan Hampson <bhampson@kenmorewa.gov>
Subject: RE: Flood Hazard Area Regulations

Hi Lauri,

I think we had cross-emails!

You are right, I worked with Amy a lot last year on the Kenmore Ordinance revisions. In looking back over my emails and saved work, tho, I did not see a final draft. Before scheduling the Ordinance to be adopted, please send to me the final draft of the sections of the City Code that were updated. I believe it is 18.55 and 18.20, is that correct?

Thanks,

Suzie

From: Lauri Anderson <landerson@kenmorewa.gov>
Sent: Tuesday, February 25, 2020 11:39 AM
To: Sarpong, Suzanne <suzanne.sarpong@fema.dhs.gov>
Cc: david.radabaugh@ecy.wa.gov; Debbie Bent <Dbent@kenmorewa.gov>; Bryan Hampson <bhampson@kenmorewa.gov>
Subject: Flood Hazard Area Regulations

Good morning! Last year we worked with you extensively to update our flood hazard regulations in anticipation of the new FEMA mapping information. Given the formal notification from FEMA (letter to us dated 2/19/20), we are submitting the final regulations, again, to be sure we comply with NFIP regulations. We understand that the deadline for compliance is August 19 of this year.

Here is a link to the Municipal Code regulations:

<https://www.codepublishing.com/WA/Kenmore/#!/Kenmore18/Kenmore1855.html#18.55.700>

Please review the materials and let me know as soon as possible if there are any issues. If you need to review our previous correspondence or any other information, please don't hesitate to contact me. You also communicated extensively with our consultants, Amy Summe and Dave Cline, throughout the amendment process.

Thanks!

Lauri

Lauri Anderson

Principal Planner | City of Kenmore

18120 68th Ave NE | Kenmore, WA 98028

Tel: (425) 398-8900 | Fax: (425) 481-3236

landerson@kenmorewa.gov | www.kenmorewa.gov



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

Subject/Topic: Design and construction management consultant services for the Local Road Safety Plan (LRSP) Signing and Lighting projects Proposed Council Action/Motion: Authorize the City Manager to execute an agreement with Transpo Group in an amount not to exceed \$70,000 (includes 10% contingency) for design and construction management services of the Local Road Safety Plan (LRSP) Signing and Lighting projects.	For Council Meeting Agenda of: June 22, 2020 Department: Public Works Prepared by: Kent Vaughan <table style="width: 100%;"> <tr> <td style="width: 70%;">Approved by Department Head:</td> <td style="width: 30%; text-align: right;"><u>Initial & Date</u> JFV 06/05/2020</td> </tr> <tr> <td>Approved by City Attorney:</td> <td style="text-align: right;">NA</td> </tr> <tr> <td>Approved by Finance Director:</td> <td style="text-align: right;">_____</td> </tr> <tr> <td>Approved by City Manager:</td> <td style="text-align: right;">RK 6/11/20</td> </tr> </table> Exhibits/Attachments: NA	Approved by Department Head:	<u>Initial & Date</u> JFV 06/05/2020	Approved by City Attorney:	NA	Approved by Finance Director:	_____	Approved by City Manager:	RK 6/11/20
Approved by Department Head:	<u>Initial & Date</u> JFV 06/05/2020								
Approved by City Attorney:	NA								
Approved by Finance Director:	_____								
Approved by City Manager:	RK 6/11/20								
<u>INFORMATION/BACKGROUND:</u> In January 2019, the City received notifications from WSDOT re: Highway Safety Improvements Program (HSIP) grant awards for Local Road Safety Plan (LRSP) Signing and Lighting projects. These two capital projects will add light emitting diode (LED) lighting, radar speed feedback signs and pedestrian actuated rectangular rapid flashing beacon systems in various locations identified throughout the city. In October 2019, staff advertised a Request for Qualifications (RFQ) for qualified engineering firms to complete design and construction management of the LRSP Lighting and Signing Projects. The City received 3 Statements of Qualifications (SOQ) from the following engineering firms: Transpo Group, KPFF Engineers and DN Traffic Consultants. Upon reviewing the submittals, staff short-listed Transpo Group and KPFF for follow-up interviews. Interviews were conducted on January 16, 2020. The City's interview panel consisted of Kent Vaughan, Janet Quinn and Mehrdad Moini (WSDOT). Transpo Group was selected based on their demonstrated qualifications and experience. <u>RECOMMENDATION:</u> Staff has successfully negotiated a contract with Transpo Group to complete the design and construction management for these projects. Staff recommends that City Council authorize the City Manager to execute an agreement with Transpo Group in an amount not to exceed \$70,000 (includes 10% contingency) for design and construction management of the Local Road Safety Plan (LRSP) Signing and Lighting projects.									
<u>FISCAL CONSIDERATION:</u> The LRSP Lighting and Signing projects are funded by WSDOT (\$380,000) and city funds (\$9,800). City Council formally accepted the WSDOT Highway Safety Improvements Program grant funds on May 11, 2020. Construction funds must be obligated with WSDOT by April 30, 2021 to waive the 10% match requirement for the construction phase.									
<u>COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:</u> Council goal 1: To focus and emphasize multimodal transportation safety in the City of Kenmore with a specific focus on pedestrian, bicycle and other means of travel.									

Subject/Topic: Environmental Services Division vehicles.	For Council Meeting Agenda of: June 22, 2020 Department:_Public Works, Env Services Division Prepared by: Richard Sawyer, Env Services Manager <u>Initial & Date</u> Approved by Department Head: RS____ Approved by City Attorney: _____ Approved by Finance Director: _____ Approved by City Manager: KC for NO 6/19/20
Proposed Council Action/Motion: Authorize City Manager to purchase two Environmental Services Division vehicles up to the approved budget amount of \$60,000.	Exhibits/Attachments: NA
<u>INFORMATION/BACKGROUND:</u> The Public Works Environmental Services Division (ESD) has a staff of 2 full time inspectors and 2-4 seasonal inspectors, who work between June and September each year. ESD currently has one vehicle, which was purchased in 2011. To date, ESD has borrowed vehicles from the Public Works Operations pool, which are needed by Operations (particularly with additional restrictions imposed by Covid-19). City Council approved \$60,000 for the purchase of two vehicles to be utilized by ESD staff and paid for out of the Surface Water Management fund.	
<u>FISCAL CONSIDERATION:</u> The City is collecting quotes for two vehicles, which are estimated to cost between \$50,000 and \$60,000. City Council approved a budget of \$60,000 in the 2019-2020 biennium budget (Surface Water Management fund).	
<u>COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:</u> Council’s 2020-2021 Priority #3 “Develop a Kenmore Climate and Environment Action Plan including water, air, forest, and habitat restoration.	



City Council Business Agenda Item
City of Kenmore, WA

Subject/Topic: Environmental Sustainability Initiatives Move to: No formal action requested. Consider the enclosed policy memos, discuss, and provide direction for next steps.	For Council Meeting Agenda of: June 22, 2020 Department: City Manager's Office Prepared by: Rob Karlinsey, City Manager Approved by City Attorney: _____ Approved by Finance Director: _____ Approved by City Manager: _____ <u>Initial & Date</u> _____ _____ ___RGK___
<u>INFORMATION/BACKGROUND:</u> Earlier this year, the Kenmore City Council adopted its 2020-2021 priorities, including priority #3: Develop a Kenmore Climate and Environment Action Plan including water, air, forest, and habitat restoration At the City Council retreat in January, the City Council asked staff to research several environmental sustainability initiatives, including the process for creating a climate action plan as well as Tree City USA, ICLEI (Local Governments for Sustainability), and Forterra Green City Partnership. Whether to pursue Salmon Safe Certification has also been raised as a question. Included with this agenda bill are the following policy papers and memos: • Enacting a Climate Action Plan • ICLEI (Local Governments for Sustainability) • Forterra Green City Partnership • Tree City USA • Salmon Safe Certification Please note that it will take time and resources to implement any of the above initiatives. If the City Council wishes to implement most or all of them, a new full-time employee (FTE) position would likely need to be created. Cuts elsewhere in the City's budget or new revenues would need to be identified to pay for a new FTE and the new programs. A big thank you to our management intern, Adam Nebenzahl, for his excellent work in researching these initiatives and writing these policy papers. Adam will be at the June 22nd City Council meeting to present on each one of these issues.	



Kenmore Environmental Sustainability Initiatives

June 22nd, 2020

Enacting a Climate Action Plan

“Action is needed urgently to forestall and reduce the magnitude of climate change. Cities have an important role as they own buildings and are responsible for zoning and urban form; building and energy codes; and streets, bikeways and sidewalks.”

-Councilmember Srebnik

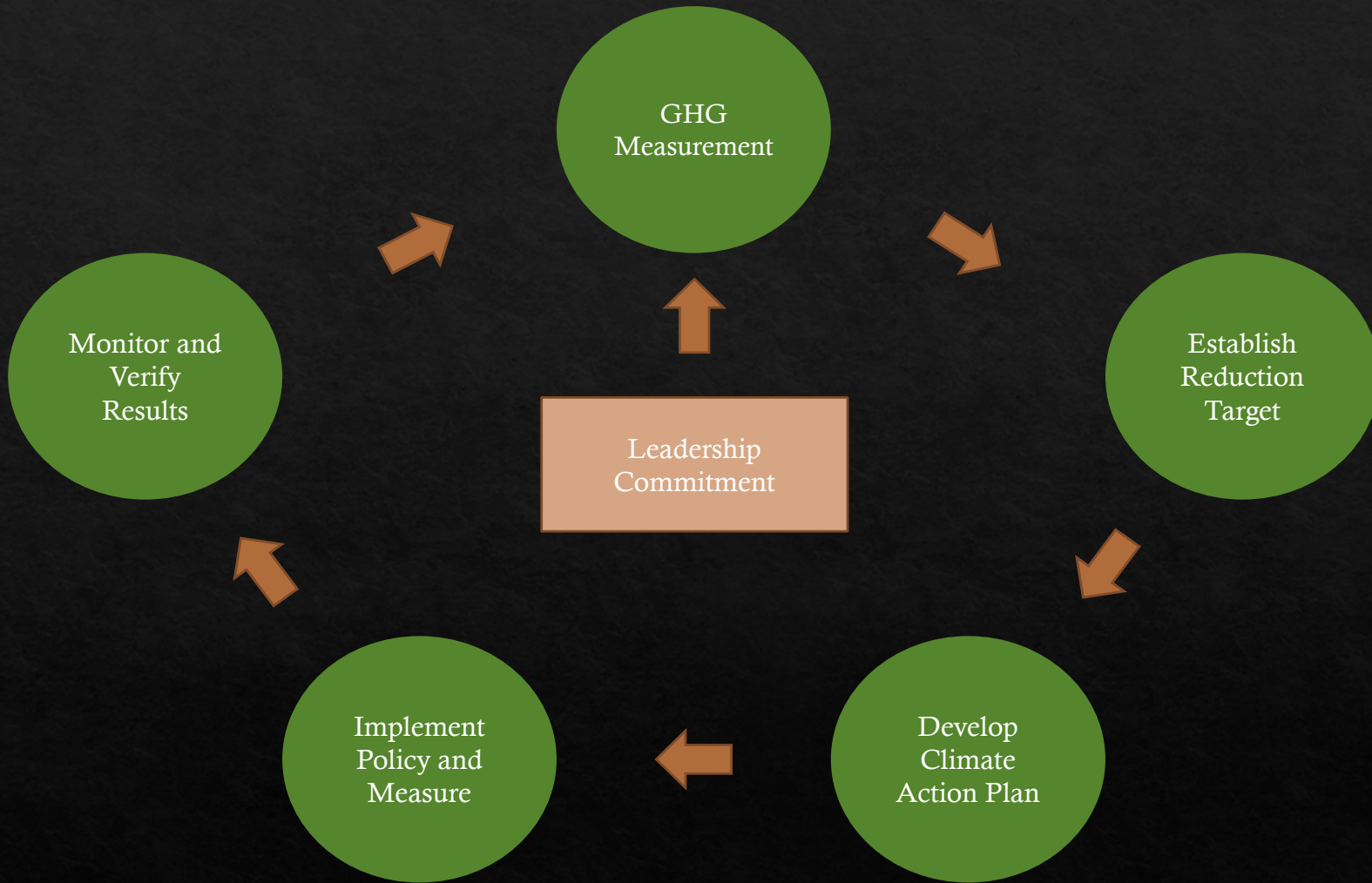
Current Impacts of Climate Change the Puget Sound Region

Rising Temperature: Since 1900, annual air temperature has increased by 1.3 degrees Fahrenheit. This is causing a decrease in our snowpack over time.

Weather Extremes: Heavier rains are getting heavier, followed by increasing periods of drought, compromising our stormwater systems as well as our valuable watershed systems.

Rising seas: Sea levels are rising with levels predicting to be 2.5 feet to 5 feet higher by 2150.

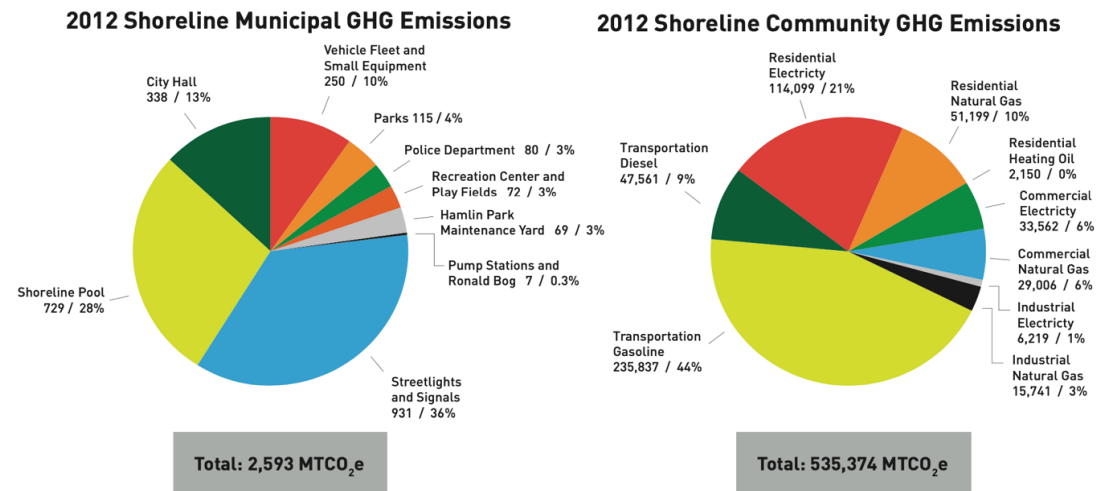
Health problems: Climate change will harm people and communities based on age, gender, health. Links shown between climate change and diseases like the recent COVID-19 show that large scale diseases could be more of risk in the future.



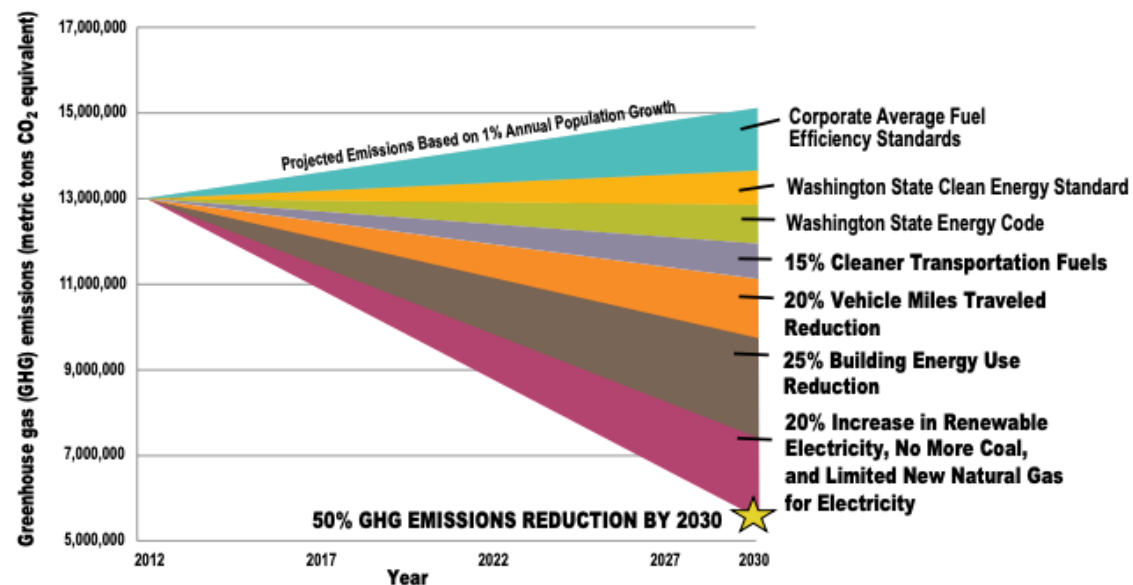
Source: Taken from ICLEI Five Milestones of Emission Management

Step 1: Measuring Greenhouse Gas Inventories

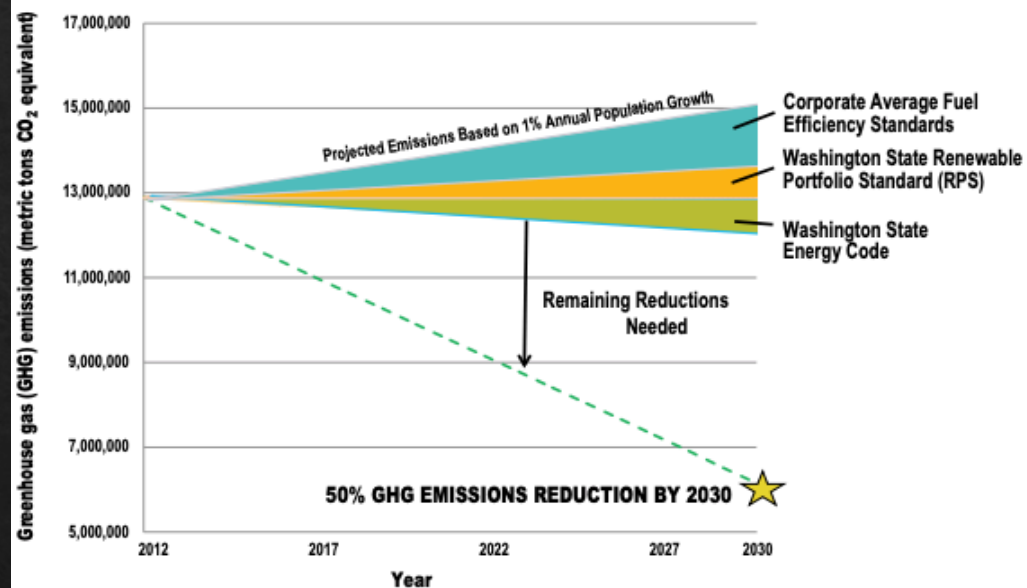
Courtesy of Shoreline's 2012 Climate Action Plan



ACHIEVING COUNTYWIDE GHG EMISSIONS TARGETS-THE IMPACT OF K4C PATHWAYS



ACHIEVING COUNTYWIDE GHG EMISSIONS TARGETS-THE IMPACT OF FEDERAL AND STATE POLICIES



Step 2: Establish Reduction Targets

Courtesy of King County's Strategic Climate Action Plan

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**TAKE
ACTION!**
See Page 55

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Step 3: Create a Climate Action Plan

Courtesy of Portland's Strategic Climate Action Plan (Left) and Shoreline's 2012 Climate Action Plan

Step 4:
Implement Policy
and Measure

Step 5: Monitor
and Verify
Results



Photo Courtesy of University of Illinois at Chicago

Estimated Budget for Developing a Climate Action Plan (CAP): Proposed Uses and Sources							
Proposed Uses*	2020	2021	2022	2023	2024	2025	2026
Greenhouse Gases Inventory and Calculation	15,000						
Emission Reduction Targets	4,000						
CAP Development, Including Community Engagement	2,666	70,334					
CAP Implementation		30,000	30,000	30,000	30,000	30,000	30,000
CAP Update, including GHG Calculation						12,000	
Total	\$ 21,666	\$ 100,334	\$ 30,000	\$ 30,000	\$ 30,000	\$ 42,000	\$ 30,000
Proposed Sources	2020	2021	2022	2023	2024	2025	2026
Strategic Opportunities Fund	19,066	88,294					
Surface Water Management Utility	2,600	12,040					
Unknown - To Be Determined			30,000	30,000	30,000	42,000	30,000
Total	\$ 21,666	\$ 100,334	\$ 30,000	\$ 30,000	\$ 30,000	\$ 42,000	\$ 30,000
* Does not include staff time or new FTE to manage and implement.							
Assumes we utilize the consulting firm at the lowest and fund two GHG inventory years.							

Estimated Budget for Developing a Climate Action Plan (CAP): Proposed Uses and Sources							
Proposed Uses*	2020	2021	2022	2023	2024	2025	2026
Greenhouse Gases Inventory and Calculation	68,000						
Emission Reduction Targets	10,000						
CAP Development, Including Community Engagement	6,000	184,000					
CAP Implementation		30,000	30,000	30,000	30,000	30,000	30,000
CAP Update, including GHG Calculation						50,000	
Total	\$ 84,000	\$ 214,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 80,000	\$ 30,000
Proposed Sources	2020	2021	2022	2023	2024	2025	2026
Strategic Opportunities Fund	73,920	188,320					
Surface Water Management Utility	10,080	25,680					
Unknown - To Be Determined			30,000	30,000	30,000	80,000	30,000
Total	\$ 84,000	\$ 214,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 80,000	\$ 30,000
* Does not include staff time or new FTE to manage and implement.							
Assumes we utilize the consulting firm at the highest level and fund two GHG inventory years.							



Global Challenge, Local Action
ICLEI-Local Governments for Sustainability USA
Membership Overview

ICLEI-Local Governments for Sustainability

- ◆ ICLEI is the leading global network of more than 1,750 cities, towns and regions committed to building a sustainable future. As the *only organization serving counties, towns and cities of all sizes*, ICLEI provides technical assistance, tools and resources, and facilitates an interactive network of local climate leaders across the U.S. and globally.
- ◆ They help local governments build capacity and knowledge to make more informed decisions using protocols, data and best practices to reduce carbon pollution and respond to an ever changing climate.

MEMBERSHIP BY REGION



U.S. POPULATION SERVED BY ICLEI MEMBER CITIES AND COUNTIES

56,558,370

How we work

The Five Pathways promote systems-wide sustainability

**LOW EMISSION
DEVELOPMENT**



**RESILIENT
DEVELOPMENT**



**CIRCULAR
DEVELOPMENT**



**EQUITABLE AND
PEOPLE-CENTERED
DEVELOPMENT**



**NATURE-BASED
DEVELOPMENT**



Participate in exclusive cohort trainings

Cohorts bring 10 to 20 communities together from around the U.S. to tackled a shared priority.

4- to 15-month facilitated group trainings

Work with leading resources, including templates and toolkits, ICLEI Community online peer-city platform, and expert speakers

Work toward shared outcomes: draft sustainability action plans, GHG inventories, climate action plans, zero net energy buildings, and more



Engage in international collaboration

A network of 1,750 global cities, towns, and counties

Voluntary Local Review Preparation

Access to United Nations Sustainable Development Goal Summit

Facilitated web trainings and international project coordination

International events, including tri-annual ICLEI World Congress

ICLEI is the focal organization to the UNFCCC





Tools: ClearPath overview

User-friendly interface with easy data entry and calculators

Online, “Cloud-Based” Application

Collaboration supported w/ multiple users per jurisdiction and multiple jurisdictions per user

**Secure data storage with daily backups
Remote support and training curriculum with data collection templates**

Track progress over time

Constant development mode



FORT&RRA





Photo Courtesy of Tree City USA

Requirements to Becoming a Tree City Member



A Tree Board of Department: Someone must be legally responsible for the care of all trees on city-owned property. This can be a professional forester, arborist, city department, citizen-led tree board or some combination.



A Tree Care Ordinance: A key section of a qualifying ordinance is one that establish the tree board or forestry department and gives them responsibility of tree care.



A Community Forestry Program with an Annual Budget of at Least \$2 per capita



An Arbor Day Observance and Proclamation

Benefits of Becoming a Tree City Member



Reduce costs for energy, stormwater management, and erosion control. Trees yield 3-5 times their cost in overall benefits to the city.



Cut energy consumption by up to 25%. Studies indicate that as few as three additional trees planted around each building in the U.S. could save \$2 billion annually in energy costs.



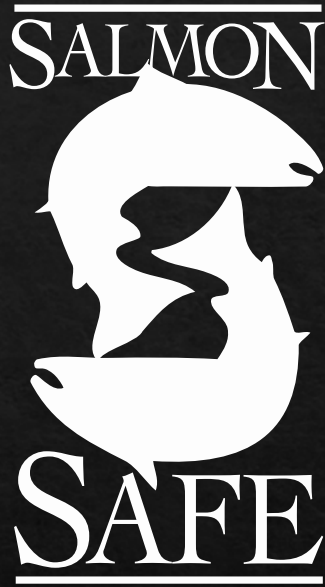
Boost property values across you community. Properly placed trees can increase property values from 7-20%.



Build stronger ties to your neighborhood and community. Trees and green space directly correlate to greater connections in the community



Educate people living in your city about the value of trees and the importance of sustainable tree management.



Salmon Safe Certification

Requirements to Becoming Salmon-Safe Certified

- ◆ Scope and Planning:
- ◆ Water Quality Protection Gap Analysis: Expert review of current practices and infrastructure.
- ◆ Key Operational Site Assessments
- ◆ Science Team Certification
- ◆ Decision/Report Development:
- ◆ Certification Finalization/City Review of Certification Report:
- ◆ City Adoption
- ◆ Certification Implementation Support
- ◆ Public Education and Awareness Support



Photos Courtesy of Salmon Safe

Citations

- ◆ ICLEI, 2020. *Global Challenge, Local Action: ICLEI-Local Governments For Sustainability USA Membership Overview*.
- ◆ Ray, M. and Kent, D., 2020. *An Introduction To Certification For Parks And Municipal Operations*.
- ◆ Lakehart, A. and Nelson de Flores, J., 2020. *Green City Partnership*.
- ◆ City of Portland Bureau of Planning and Sustainability, 2009. *City Of Portland And Multnomah County Climate Action Plan 2009*. City of Portland, p.6.
- ◆ City of Shoreline, 2013. *Shoreline Climate Action Plan*. City of Shoreline: City of Shoreline.
- ◆ Tree City USA, 2020. *Tree City USA Logo*. [image] Available at: <https://www.arborday.org/programs/treecityusa/about.cfm> [Accessed 16 June 2020].
- ◆ University of Illinois at Chicago, 2020. *Climate Action Implementation Plan*. [image] Available at: <https://sustainability.uic.edu/plans/caip/exceutive-summary/> [Accessed 16 June 2020].
- ◆ King County, 2015. *King County Strategic Climate Action Plan*. King County.



City of Kenmore, Washington

Enacting a Climate Action Plan

June 22nd, 2020

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Executive Summary

Climate Action Plans (CAPs) are a relatively new policy framework to help decrease the impacts of climate change. Kenmore City Councilmember Srebnik poignantly emphasized the need for a climate action stating “action is needed urgently to forestall and reduce the magnitude of climate change. Cities have an important role as they own buildings and are responsible for zoning and urban form; building and energy codes; and streets, bikeways and sidewalks.” Multiple cities in the King County-Cities Climate Collaboration (K4C) have enacted CAPs, and Kenmore wishes to join them.

A CAP can be broken up into five steps: 1) Greenhouse gas (GHG) measurement, 2) establishing a reduction target, 3) developing a CAP, 4) implementing policy and measure, and 5) monitor and verify results. Each step poses its own challenges that the city will have to adjust but it has a great opportunity to make a difference.

Cost and funding will have to be decided by the city and will determine either performing it fully in house or hiring a consultant to help with measurement, outreach, and development. For the cost of development of the CAP, we have reached out to Cascadia Consulting Group with interest in partnering with the agency and they have proposed how much it would cost to work with them:

Table 1. High End Expected Budgetary Requirements for the Climate Action Plan

<i>Estimated Budget for Developing a Climate Action Plan (CAP): Proposed Uses and Sources</i>							
Proposed Uses*	2020	2021	2022	2023	2024	2025	2026
Greenhouse Gases Inventory and Calculation	68,000						
Emission Reduction Targets	10,000						
CAP Development, Including Community Engagement	6,000	184,000					
CAP Implementation		30,000	30,000	30,000	30,000	30,000	30,000
CAP Update, including GHG Calculation						50,000	
Total	\$ 84,000	\$ 214,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 80,000	\$ 30,000
Proposed Sources	2020	2021	2022	2023	2024	2025	2026
Strategic Opportunities Fund	73,920	188,320					
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* Does not include staff time or new FTE to manage and implement.							
Assumes we utilize the consulting firm at the highest level and fund two GHG inventory years.							

Table 2. Low End Expected Budgetary Requirements for the Climate Action Plan

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Estimated Budget for Developing a Climate Action Plan (CAP): Proposed Uses and Sources							
Proposed Uses*	2020	2021	2022	2023	2024	2025	2026
Greenhouse Gases Inventory and Calculation	15,000						
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* Does not include staff time or new FTE to manage and implement.							
Assumes we utilize the consulting firm at the lowest and fund two GHG inventory years.							

In addition to the costs outlined in the table above, departments will need to assess the staff time required to develop the CAP and implement it. Then the departments will recommend what in their current workplan will need to be delayed, decreased, or deleted in order to make room for the development and implementation of a CAP. We do not yet have this workload impact analysis completed but expect to bring it forward at a future City Council meeting.

Overall, the city has a great opportunity to move forward and enact a plan to reduce GHG as well as build a greater sense of community during these uncertain times.

Background

History

Climate Action Plans (CAPs) are a relatively new policy framework to help lessen the impact of greenhouse gas (GHG) emissions on climate change. One of the earliest municipality CAPs that can be found is from the year 2000.¹ Some of the earliest Climate Action Plans in the state of Washington came into existence as recently as 2006.² These action plans implemented at the time called for lowering of GHG emission levels from previous years at rates as low as 7% (City of Bellevue) to 15% in short periods of time, usually 5-10 years. These smaller goals were set by the Kyoto Protocols that went into effect in 2005.

Many of the CAPs being produced today have imposed loftier goals of reducing government and community GHG by 80% by the year 2050, which many determine to be the requirement to avoid the most devastating impacts of climate change.³

Why Have a Climate Action Plan?

On January 11, 2020, Kenmore City Councilmember Srebnik pointed out one of the reasons for a climate action plan. She stated, "action is needed urgently to forestall and reduce the magnitude of climate change. Cities have an important role as they own

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buildings and are responsible for zoning and urban form; building and energy codes; and streets, bikeways and sidewalks. Also, Kenmore has joined K4C which has set forth joint commitments to reduce greenhouse gases (GHG)” (See Attachment at end of Document).

Building off of her statement, we have already begun to see the impact of climate change and rising carbon dioxide (CO₂) levels in the Puget Sound region:

- Rising Temperature: Since 1900, annual air temperature has increased by 1.3 degrees Fahrenheit. This is causing a decrease in our snowpack over time.
- Weather Extremes: Heavier rains are getting heavier, followed by increasing periods of drought, compromising our stormwater systems as well as our valuable watershed systems.
- Rising seas: Sea levels are rising with levels predicting to be 2.5 feet to 5 feet higher by 2150.⁴
- Health problems: Climate change will harm people and communities based on age, gender, health.⁵ Links shown between climate change and diseases like the recent COVID-19 show that large scale diseases could be more of risk in the future.⁶

These risks posed will only be exacerbated with rising GHG emissions. It is prudent for the city of Kenmore to join other cities, counties, states, and countries in reducing their GHG emissions before the damage becomes irreparable.

Finally, along with these risks, it is prudent that we follow a scientific, measured approach. Since Kenmore is not sure what its priorities are yet to achieve effective GHG reduction, it is important to go through these steps, as outlined, to ensure that we maximize our implementation of GHG reduction while minimizing cost during these uncertain times.

Who Already has a Climate Action Plan?

As stated above, many municipalities, counties, states, and countries have their own CAP. When the Trump Administration removed the United States out of the Paris Climate Accords, which set out a global framework to keep the world below the 2 degree Celsius temperature mark,⁷ Washington state was one of the founding states in the U.S. Climate Alliance, which are a group of states that signed back on to the Paris Climate Agreement to achieve the goals set forth.

Looking more closely at King County, several cities have CAPs in place. These cities include Seattle, Bellevue, Kirkland, Shoreline, Redmond, among others. King County also has created the King County-Cities Climate Collaboration (K4C), which aims to coordinate and enhance the effectiveness of local government climate and sustainability action. The city of Kenmore has already signed on to be a member of the collaboration,

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and one way to help achieve the commitments set forth by K4C would be through implementing and CAP.

Trade Offs of a Climate Action Plan

Below are some benefits and drawbacks for enacting a climate action plan:

Table 3. Trade Offs of a Climate Action Plan

<i>Benefits</i>	<i>Drawbacks</i>
• Having the city do its part in these changing times is important to continue its upward growth • Create an influx of investment from people and organizations into the local community • Help the physical image (views, looks, overall curb appeal) of the city.	• Require fiscal investment at a current period where other issues are more prominent (i.e., COVID-19 and the consequences from that, Homelessness) • Influx of other resources (i.e., staff hours, outside technological investments) that may have to come from elsewhere that may be needed somewhere else.

Roadmap to Development and Implementation

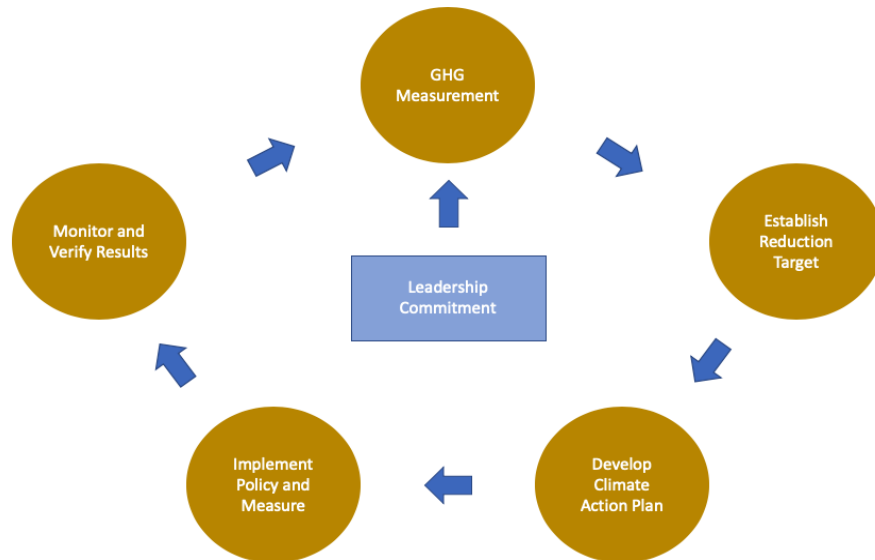
Steps of a Climate Action Plan

The International Council for Local Environmental Initiative (ICLEI) has produced the “5 Milestones of Emission Management” that cities locally took to implement their CAP. The steps are as follows:

Figure 1. ICLEI’s 5 Milestones of Emission Management

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Source: Taken from ICLEI Five Milestones of Emission Management

Writing this report is the pre-first step: achieving leadership commitment. Once the city council has provided the direction and resources to develop a climate action plan, the city can move toward the first milestone, measuring greenhouse gas emissions.

Step 1: GHG Measurement

Once leadership has pushed forward with development of a CAP, the first real step is to figure out what levels of CO₂ the city is producing. Measurement will come from two sources: the government and the community. Measurement of Kenmore's carbon footprint is crucial – it identifies where the city is doing well in terms of low CO₂ emissions, as well as where there is room for improvement. Prior to implementing a CAP, this measurement will set baseline levels that that city can use to monitor their progress over the years.

The city can go about measuring this in two different ways. One way is to hire a consultant to perform the measurement; or at least assist Kenmore in gathering the data. We will not cover costs in this section, that occurs below in *Cost of Developing a Climate Action Plan*. By using a consultant, we will benefit from their expertise and experience, knowing that there will be a financial cost to do so.

The second way to measure GHG is by purchasing and using software from the ICLEI called "ClearPath" and having city staff use the software to determine the city's GHG. The software allows for completing GHG inventories for Climate Action Plans and instructs the user exactly what is needed. It is then up to the user to gather the data from contractors and department staff to input into the software to return results. To achieve this in a timely manner, it will be up to the city and department staff to dedicate time specifically to gathering this data on an hours/month basis. Other cities like Shoreline

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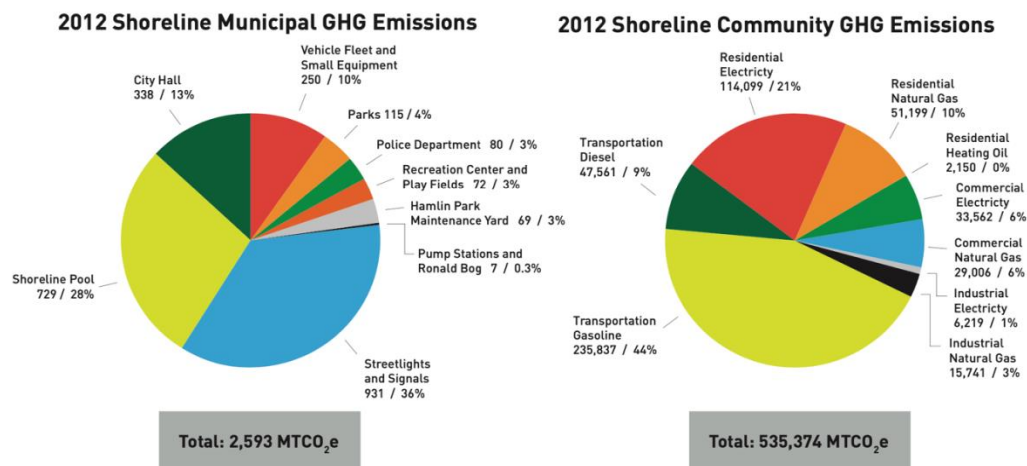
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and Kirkland have enacted the use of this software with city staff entering and interpreting the data.

Also, even if we go to the expense of hiring a consultant, purchase of the ClearPath or similar software will still be required. Cascadia Consulting Group, a potential candidate for performing such work, will require that we obtain the ClearPath software through ICLEI.

Shoreline went further and also used the U.S. EPAS's WARM model to also measure GHG emission. The WARM model was developed to help solid waste planners and organizations track the GHG reductions, energy savings, and economic impacts from different waste management practices.⁸ The city of Redmond also used another application through the EPA called eGRID to gather data on electric power generated in their region. Figure 2 is the city of Shoreline's emission inventories and shows an example of what they might look like:

Figure 2. Shoreline's 2012 Emission Inventory as an example of what data may need to be collected.⁹



Regardless of the process to collect data chosen, meticulous notes on how the process is conducted is crucial to ensure future inventories that are taken are able to replicate similar methods used and return future results at a quicker pace. Once baseline emission levels are established, the next milestone is to create reduction targets.

Step 2: Establish Reduction Target

Once emissions have been gathered, it will be up to the city to determine how much it wants to reduce its emissions by and in what timeline. The K4C drafted recommendations when it established its own commitments establishing the following reduction targets:

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- Reduce communitywide greenhouse gas emissions by at least 25% below 2007 levels by 2020, 50% by 2030, and 80% by 2050.
- Achieve zero net greenhouse gas emissions from government operations by 2030.

Two things appear from these recommendations: 2007 levels are from 13 years ago and would probably not be the year that Kenmore would measure and achieving 50% reduction in 10 years may appear difficult. However, working with staff it will be possible to reduce these overall emissions with proper budgeting and time spent developing the right goals to meet. Regarding the “2007 levels,” establishing our current inventories and focus on reducing GHGs by 80% by 2050 will still accomplish the recommendations necessary to make a significant difference in GHG emissions.

Step 3: Develop Climate Action Plan

Once inventories have been made and targets have been established, then can a CAP be developed. This process will not happen overnight; it will require staff as well as community involvement. As was mentioned above, involvement and information gathering should occur with two groups of people: staff and the community.

- **Staff:** Working with staff members from each department (also known as a Green Team) for a minimum of a recommended 5 hours per month per department,¹⁰ the goal would be to figure out ways that they could reduce their department CO2 production. Ideas could be as simple as changing government building lightbulbs and computer screens, to as invested as installing EV charging stations. Kenmore City Councilmember Srebnik presented a list of possible policy options that the city can utilize to implement (see Attachments). It has been highly recommended that choosing a point person (either through hiring or dedicating a staff member) to gather information from staff and the community would be beneficial to making the CAP as effective as possible.
- **Community:** Working alongside with the community is just as important, if not more important along with our dedicated staff. Soliciting feedback from the community should come in the form of workshops. A series of workshops could be held to inquire about what community members know about GHG emissions, what they are currently doing to reduce the GHG emissions, what else they think they could do to reduce GHG, among other important information gathering questions. Establishing workshops with local businesses and community groups along with individual residents will help understand what the community holistically is willing to commit to.

It is extremely important for this climate action to be equitable, from soliciting feedback, to ideas to be implemented. Ensuring how Kenmore solicits feedback to make sure all voices are heard, whether through breaking down language barriers, implementing equitable distribution of resources, reaching out to faith or social service groups, will increase the likelihood that everyone's voice is heard and that the plan to be as effective as possible.

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The greenhouse gas inventory results will determine the direction that the city wants to put its efforts towards when choosing policy options. Many of these policy options will come from the reducing emissions in the areas of energy, transportation, industry, commercial/residential, and land use.

When finally developing the plan, below are examples of what the table of contents might look like to show the crux of a CAP:

Figure 3. Table of Contents from the City of Portland's 2009 original Climate Action Plan.¹¹

Executive Summary	7	5 Food and Agriculture	52
2030 Objectives and 2012 Actions	10	6 Community Engagement	54
Introduction	15	7 Climate Change Preparation	56
Vision for 2050	16	8 Local Government Operations	58
The Opportunity for Climate Prosperity	17	Appendix 1: Climate Change Overview	60
Climate Action in Portland and Multnomah County ..	19	Appendix 2: Assumptions in Calculating	
Sources of Carbon Emissions	20	Expected Emissions	63
The Framework for Local Climate Action	23	Appendix 3: Emissions Inventory Methodology	65
Climate Action Plan Development	24		
Portland and Multnomah County's			
Action Plan Process	26		
The Plan: Objectives and Actions	27		
1 Buildings and Energy	30		
2 Urban Form and Mobility	38		
3 Consumption and Solid Waste	47		
4 Urban Forestry and Natural Systems	51		



Figure 4. City of Shoreline's Climate Action Plan Table of Contents.¹²

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Step 4: Implement Policy and Measure

Once the plan has been created, it can be implemented in phases using a tiered approach (similar to the housing strategy plan). When identifying steps in the CAP to implement, they should be separated into tiers. Each tier will be based on a set of criteria. These criteria can include, but are not limited to:

- *Effectiveness*: How much greenhouse gas be reduced by implementing this policy?
- *Cost*: How much will the city have to pay to implement this policy? Is cost short-term, long-term?
- *Equity*: Are these policies measure equitably and fairly?
- *Time*: How long will this take to implement? A CAP should have policies that will take short, medium, and long periods to implement.
- *Sustainability*: Will these policies options last a long time, or will there be a high-level of maintenance involved?
- *Manageability*: How many actors (i.e., departments, organizations) are required to implement this? How will this affect the projects that city staff are already working on?

Ensuring that the community is involved in the implementation along with feedback will be key to the CAP's success. With growing political support for creating action to reduce GHG emissions, giving the citizens ways to change and helping them enact things they can do on their own is becoming easier. Speaking with a representative for the city of Kirkland, he mentioned having a small fund that would help with enacting community involvement.¹³

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It is also recommended that every year, the CAP should be reviewed showing what goals will be achieved that calendar year to show that progress is being made in a timely manner.¹⁴ This yearly review will state clearly what actions will be taken for the year, what time the implementation will take place, and how much it will cost.

Step 5: Monitor and Verify Results

Climate Action Plans are not a one-off process; they are an on-going process and require continuous improvement. This step of monitoring and verifying results should be included in the plan and be transparent and verifiable by outside sources. The steps taken throughout the process should be noted clearly, including roles and responsibilities as well as monitoring and accountability.

To be transparent and verifiable, the city should allow all data and information to be available to relevant stakeholders and be accessible on all relevant platforms. Finally, the city should also be candid when assessing the plan, clearly stating the successes and failures of the goals set forth.

Finally, GHG inventory reassessment of the CAP has been recommended every 3-5 years as well as adaptation into the new comprehensive plan every ten years due to constant changing technology and ideas into reducing GHG emissions.¹⁵

Cost and Funding of Developing a Climate Action Plan

How Much Will this Cost?

Depending on the direction that the city chooses, prices will be determined differently. I will briefly go through two options as mentioned above and provide estimates of what things could cost.

- **In House:** Working in house would lower consultant costs which would help during this time of unknowns with the outbreak of COVID-19. However, attaching another on-going project onto staff members will push other projects back or even push the CAP back. Working with the K4C, the point person can reach out and K4C members can help them set up the GHG inventories. Using the ClearPath software for free as part of the \$600 ICLEI membership dues would save money as well. Having the K4C tool kit as well as other K4C members to consult with for planning, combined with re-prioritizing staff workload, will be the keys to success to maintaining the CAP in house.
- **Hiring a Consultant:** Hiring a consultant could be as minimal as helping only with community involvement, with a few staff trainings for long term planning, and city staff doing most of the work. This could also range to a consultant performing every task with high levels of training and city staff involved in managing the consultant and providing the necessary information to the consultant. Using a consultant would be more costly to the city (see table below). Assigning a staff person to oversee staff and consulting sides would still be necessary to ensure

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proper direction, and staff workloads would still need to be reprioritized accordingly. Where a consultant becomes most useful tends to be with community engagement. They have training specifically to help interact with community members whether through useful advertising to knowing the right questions to ask in workshops and how to steer the direction of feedback properly.

The costs presented in Tables 3 and 4 below show estimated costs on the high- and low- end upon working with Cascadia Consulting to measure GHGs and assist in the development of the CAP. Both options have their costs and benefits. Assumptions were made that the city invest in a 2-year GHG inventory report to analyze trends in the data rather than a one-year inventory which would only produce baseline carbon dioxide numbers.

In addition to the costs outlined in the table above, departments will need to assess the staff time required to develop the CAP and implement it. Then the departments will recommend what in their current workplan will need to be delayed, decreased, or deleted in order to make room for the development and implementation of a CAP. We do not yet have this workload impact analysis completed but expect to bring it forward at a future City Council meeting.

How Will the City be Funding this?

Funding will be another key debate. Speaking with multiple cities, once a CAP has been developed, they recommend having a small yearly interdepartmental budget that would help with community outreach and projects that might span multiple departments for implementation. One city estimated \$30,000 a year allocated to this fund.¹⁶

Paying for this Climate Action Plan, we anticipate the money could come out of two funds: Strategic Opportunities and Surface Water Management. Surface water infrastructure and management plays a crucial role in environmental management, so we felt having that fund participate in covering 12% of costs (a similar percentage to the overall revenue they receive) while the other 88% of costs would be funded by the Strategic Opportunities fund. The budgeted fund balance of the Strategic Opportunities Fund is about \$3.03 million. See Tables 3 and 4 below for further breakdown of costs.

Table 3. High End Expected Budgetary Requirements for the Climate Action Plan

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Estimated Budget for Developing a Climate Action Plan (CAP): Proposed Uses and Sources							
Proposed Uses*	2020	2021	2022	2023	2024	2025	2026
Greenhouse Gases Inventory and Calculation	68,000						
Emission Reduction Targets	10,000						
CAP Development, Including Community Engagement	6,000	184,000					
CAP Implementation		30,000	30,000	30,000	30,000	30,000	30,000
CAP Update, including GHG Calculation						50,000	
Total	\$ 84,000	\$ 214,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 80,000	\$ 30,000
Proposed Sources	2020	2021	2022	2023	2024	2025	2026
Strategic Opportunities Fund	73,920	188,320					
Surface Water Management Utility	10,080	25,680					
Unknown - To Be Determined			30,000	30,000	30,000	80,000	30,000
Total	\$ 84,000	\$ 214,000	\$ 30,000	\$ 30,000	\$ 30,000	\$ 80,000	\$ 30,000
* Does not include staff time or new FTE to manage and implement. Assumes we utilize the consulting firm at the highest level and fund two GHG inventory years.							

Table 4. Low End Expected Budgetary Requirements for the Climate Action Plan

Estimated Budget for Developing a Climate Action Plan (CAP): Proposed Uses and Sources							
Proposed Uses*	2020	2021	2022	2023	2024	2025	2026
Greenhouse Gases Inventory and Calculation	15,000						
Emission Reduction Targets	4,000						
CAP Development, Including Community Engagement	2,666	70,334					
CAP Implementation		30,000	30,000	30,000	30,000	30,000	30,000
CAP Update, including GHG Calculation						12,000	
Total	\$ 21,666	\$ 100,334	\$ 30,000	\$ 30,000	\$ 30,000	\$ 42,000	\$ 30,000
Proposed Sources	2020	2021	2022	2023	2024	2025	2026
Strategic Opportunities Fund	19,066	88,294					
Surface Water Management Utility	2,600	12,040					
Unknown - To Be Determined			30,000	30,000	30,000	42,000	30,000
Total	\$ 21,666	\$ 100,334	\$ 30,000	\$ 30,000	\$ 30,000	\$ 42,000	\$ 30,000
* Does not include staff time or new FTE to manage and implement. Assumes we utilize the consulting firm at the lowest and fund two GHG inventory years.							

Conclusion

What has been presented in this report is just a brief overview of what a CAP would look like. Developing and enacting a plan will not happen overnight, or even within the next calendar year. It will take time and commitment from the city and the community to help make a difference in lowering GHG emissions. Once the plan is developed and implemented, it will need to be consistently reviewed, planned, and re-planned over the years. However, this does not mean that Kenmore should push off a CAP. Quite the opposite actually, as time goes on, making the necessary changes to reduce GHG emissions will become more costly and more difficult to enact. Now is the time to act and be a leader for other small cities in our region who might be interested in developing their own CAP.

It will be important moving forward to work more hand-in-hand with the K4C. This organization will be one of the most helpful tools at Kenmore's disposal. With the development of the K4C's toolkit, it will help give the city recommendations of where to cut emissions. Regardless of which direction the city uses (In house, hiring a consultant,

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or a variation of the two), working with the K4C will help with the long-term implementation of the CAP.

Finally, ensuring that the community is equitably participating in the entire process will be crucial to the success of this plan. Reducing GHG emissions is not just an environmentalist issue or a government issue, it is a *human* issue, and Kenmore has a responsibility to do its part in reducing GHG emissions.

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Attachments

Kenmore Climate Action Plan - Proposal

Why does Kenmore need a Climate Action Plan? Action is needed urgently to forestall and reduce the magnitude of climate change. Cities have an important role as they: own buildings and are responsible for zoning and urban form; building and energy codes; and streets, bikeways and sidewalks. Also, Kenmore has joined K4C which has set forth joint commitments to reduce greenhouse gases (GHG).

What are the focus areas of a Climate Action Plan?

K4C goals and climate plans reviewed denote action areas with the largest impact on GHG emissions:

- a. Building energy use
- b. Clean energy for buildings (i.e., reducing fossil fuels in production of electricity)
- c. Transportation/vehicles Climate action plans also address:
- d. increasing carbon uptake — through trees
- e. planning for climate change (e.g., flood management). Proposal below doesn't include this

Who's taking the Action?

All plans have strategies that cities can take that impact two levels: government controlled facilities/activities and community level

What are proposed first steps?

1. Join ICLEI. Has free webinars, software and technical assistance for establishing baseline, determining best strategies, and monitoring over time — for Kenmore size just \$600/yr (Bellevue pilot tested their software — ICEI in 42 states, 1000s of cities and 86 countries)
2. Adopt Environmentally Preferable Purchasing policies (including fleet and recycled products) — see KC 2018 policy
3. Analyze and implement building code changes — per RCC
4. Promote the various actions residents can take to lower GHG emissions to residents in each qtrly newsletter (e.g., PSE incentives, home energy audit, alternatives to driving, inflating tires)
5. Use and promote high efficiency irrigation and use of native plants (do we need policy?)
6. Provide discounted ORCA cards to employees as part of a Commute Trip Reduction program
7. Analyze 'connectedness' of Kenmore neighborhoods — using Portland model
8. Become a Tree City USA city
9. Develop a tree planting program
10. Become a Forterra Green City partner
11. Locate recycling and foodwaste recycling bins at all City facilities
12. Offer food scrap buckets (\$Istore) and LED lights to residents

Kenmore Climate Action Plan - Proposal

Why does Kenmore need a Climate Action Plan? Action is needed urgently to forestall and reduce the magnitude of climate change. Cities have an important role as they: own buildings and are responsible for zoning and urban form; building and energy codes; and streets, bikeways and sidewalks. Also, Kenmore has joined with other cities in our region to be part of 1<4C which has set forth joint commitments to reduce greenhouse gases (GHG) via: reducing energy use in buildings, increasing green building, using clean electricity, reducing fuel emissions, reducing driving, concentrating growth near transit, increasing recycling, and increasing carbon uptake through increasing tree canopy.

What are the focus areas of a Climate Action Plan?

K4C goals served as the framework of the proposed plan as they were also included Shoreline and Portland's plans. They fall into three areas:

1. Reducing GHG Emissions - focus areas that can make the largest contributors to GHG emission reductions are:
 - a. Building energy use — new and existing
 - b. Clean energy for buildings (i.e., reducing fossil fuels in production of electricity) — new and existing
 - c. Transportation/vehicles
2. Increasing Carbon uptake
3. Planning for Climate change — proposal below doesn't include this... but mainly: flood/storm and landslide management; EmergOps

Note: Strategies listed in the proposed plan are those that could reasonably be implemented by Kenmore. Larger cities and counties also suggest: transit operations changes; landfill emissions reductions; support to farmers, etc.

Who's taking the Action?

All plans have strategies that cities can take that impact two levels: government controlled facilities/activities and community level

How can we create a Plan with limited resources?

1. Join ICLEI. Has free webinars, software and technical assistance for establishing baseline, determining best strategies, and monitoring over time — for Kenmore size just \$600/yr (Bellevue pilot tested their software — ICEI in 42 states, 1000s of cities and 86 countries)
2. Use locally-available data: PSE energy monitoring; Energy Star Portfolio mngr (K4C); Metro/Sound Transit ridership; PSRC vehicle use
3. Use and promote use of existing tools:
 - a. Carbon footprint calculators — Seattle's or <https://coolclimate.org/calculator>

b. EPA's WARM model

4. Apply for grants. Shoreline used: Wash State Coordinated Prevention Grant (DOE —for solid waste planning); and KC Solid Waste Reduction and Recycling Grant. NOTE: Maureen worked on Shoreline's!

Climate Action Plan Strategy comparison - suggested starting strategies are indicated with *

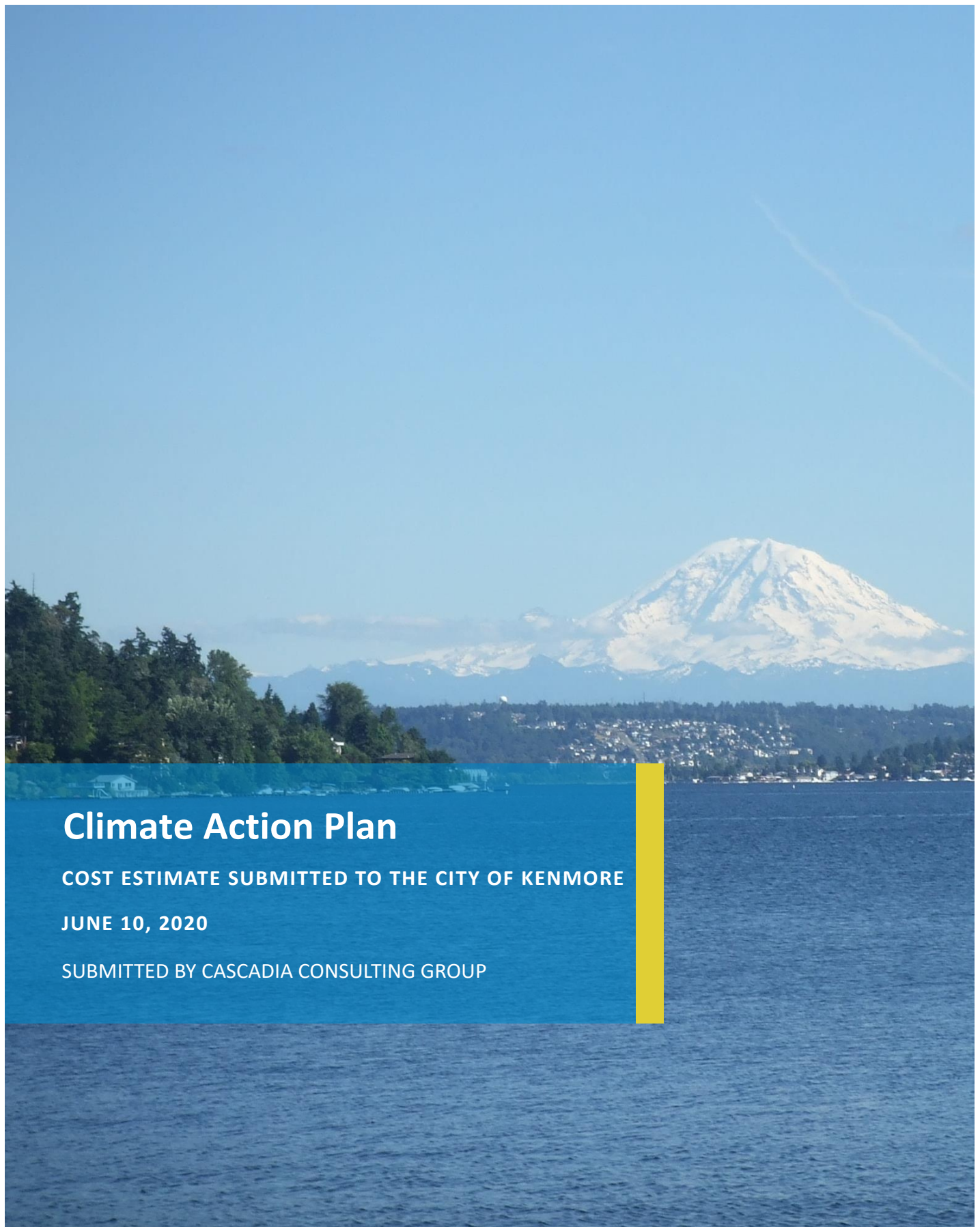
Topic	Subtopic	Strategy	Level	Shoreline	KC	K4C	Portland
Reducing GHG emissions	Reduce bldg. and facility energy use	Green buildings: Gov't buildings over Xsqft get EnergyStar certified — and are solar-ready	Govt	x	x	x	x
		*Adopt Environmentally Preferable Purchasing policies (KC's 2018 policy)	Govt	x	x	x	
		Train staff on energy efficient practices	Govt		x		
		*LED streetlights (this was over 1/3 of Shoreline emissions)	Govt	x	x	x	x
		Encourage Chamber's Green Business certification	Comm	x			
		*Offer free LED lights at events	Comm	x			
		*Implement building code changes to promote energy efficient buildings (part of RCC -see https://www.kingcounty.gov/depts/dnrp/solidwaste/programs/green-building/sustainable-cities/city-government/greenbuilding-land-use-codes.aspx)	Comm	x	x	x	
		Adopt building energy benchmarking and disclosure ordinances for nonresidential bldgs.; & resid energy disclosure at the point of sale (like Seattle)	Comm			x	x
		Energy efficiency retrofits — encourage/incent during permitting & in comms	Comm		x		

		Support Green Building Challenge; Built Green, LEED, and net-zero projects	Comm		x	x	x
		Promote use of KC DPER's Green Building Handbook —for green building dev	Comm		x		
		*Promote PSE energy efficiency incentives	Comm	x	x		
		*Promote home energy audit (Sustainable Works)	Comm	x	x		x
		*Promote installing programmable thermostat	Comm	x			
		*Promote sealing/insulating heating/cooling ducts	Comm	x			
		*Promote using EnergyStar ratings when replacing appliances	Comm	x			
		*Promote eco roofs	Comm				x
	Use clean electricity	Assure electricity supplied is GHG neutral —e.g., with PSE Green Direct — phase out fossil-fueled electricity	Govt	x	x	x	x
		Support a green power community challenge	Comm			x	
		Provide/promote renewable energy incentives	Comm			x	
		*Streamline permitting for solar (Kirkland and Bellevue)	Comm	x	x	x	x
		Community solar - bulk purchase solar via NW SEED (Mukilteo etc)	Comm	x		x	x
	Reduce water consumption	Promote installing solar on homes and businesses	Comm	x			x
		*Use and promote high efficiency irrigation and use of native plants	Govt/Comm	x			

		*Use and promote low flow toilets and high efficiency showerheads		X			
		Do and promote rainwater harvesting		X	X		
		Use and promote use of greywater (see DOH greywater)		X	X		
	Reduce fossil consumption	*Use a Green fleet (can join Evergreen Fleet for guidance and certification) if some are not EV, then use biodiesel	Govt	X	X	X	X
		*Install EV charging stations	Govt	X	X	X	X
		Incentives for installing EV stations in bldgs. and at developmt sites	Govt			X	
		Install smart water meters (we have this?) to not drive to them	Govt	X			
		*Promote driving high efficiency or EV cars (incentives suggested by K4C)	Comm	X		X	X
		*Promote maintaining full tire pressure	Comm	X			
	Reduce car use	*Create a Commute Trip Reduction program for employees	Govt	X	X	X	
		*Provide discounted ORCA cards to employees	Govt	X	X		
		*Have a Bike-to-Work challenge for employees	Govt	X	X		
		Work with employers to do the items above	Govt	X			
		Work with School Dist to reduce driving/increase bus riding	Govt	X			
		*Increase sidewalks, bikeways, Safe Routes — already doing items suggested	Govt	X	X	X	X
		Lead "Kenmore Walks" events... Shoreline has guided walks with 'difficulty' ratings — partnered with Feet First	Co mm	X			
		*Promote alternative to driving (e.g., RideShare, transit, bike, walk)	Comm	X	X		X
		*Promote starting an InMotion community social media program (KC)	Comm	X	X		

		*Promote participating in Walking Schoolbus	Co mm	x			
	Concentrate growth near transit	*Already doing this. Portland's goal: "connected neighborhoods" (stores, school, libraries, parks etc) accessible by foot (20 min/1mile) or bike (3 miles) — goal is 80% of residents can walk/bike to meet needs & get to transit	Govt	x	x	x	x
Increase carbon uptake	Protect and increase urban trees	*Implement development requirements to include/retain trees — already doing	Govt	x	x		x
		Improve tree health (use Silva cells, bioretention boxes)	Govt	x			
		*Consider being a Tree City USA (i.e., Board, \$44k/yr to trees, Arbor Day)	Govt	x			
		*Have a tree planting program/incentives (KC 1million/5 yrs; Kenmore's 2,687) and/or Seattle tree program for residential (up to 4 trees and help for them) — use Kenmore's tree canopy data to focus these efforts	Comm		x		x
		*Use Kenmore's tree canopy data and scenarios with Canopy Planner tool to help secure grants; work with partners (e.g., Inglewood that has sig. loss) and post to website to make public (down to census tract)	Comm				
		*Become a Forterra Green City partner... Kirkland, Redmond, Kent, Everett, Puyallup Tukwila etc have — volunteer hours planting and caring for trees	Comm				
		De-paving — reducing impervious surface	Comm				x
	Improve parks	Identify parkland/open space to preserve and restore - removing invasives (goats?), restoration projects; planting native plants	Govt	x			
Reduce waste	Increase Recycling	*Purchase recycled products	Govt	x	x	x	x
		*Reduce paper/go paperless — already do this	Govt		x	x	x
		*Have all recycling (inc organics) bins at City facilities, parks and busstops	Govt	x	x		
		*Offer food scrap buckets to residents	Govt	x			

		*Recycle maintenance yard debris	Govt	x	x		
		Require construction >1000sqft to divert 50% of debris (KC is 80%)	Govt	x	x		x
		*Require contractors/consultants to use recycled materials when possible	Govt		x		
		*Ensure multifamily have food waste and other types of recycling	Govt	x			
		Become EPEAT (electronic products environmental assessment tool) purchasing partner	Govt	x			
		Consider RAS (recycled asphalt shingles) for paving and alt to concrete	Govt	x	x		
		*Promotion of food waste recycling - resid and business (KC requires resid)	Comm	x	x		x
		*Promotion of Repair/Recycle/Reuse	Comm	x	x	x	x
Food and Agricult.	Lower carbon foods	Increase access to fresh fruits/vegs	Comm	x			x
		*Promote/educate re: lower carbon foods		x			x



Climate Action Plan

COST ESTIMATE SUBMITTED TO THE CITY OF KENMORE

JUNE 10, 2020

SUBMITTED BY CASCADIA CONSULTING GROUP

CITY OF KENMORE CLIMATE ACTION PLAN

Methodology & Estimated Costs

We are excited by the opportunity to work with the City of Kenmore to develop a comprehensive and effective climate action plan that meets the City's and community's needs. With climate change expected to have a range of potentially harmful impacts on human health, the economy, and the environment, the need for such a plan is urgent. We believe our ability to deliver an effective process at a range of price points—which we've demonstrated in similar climate planning projects nationwide—offers the City a balance of flexibility, customization, and cost efficiency. We will draw on our significant regional and national experience to hit the ground running, working with the City to confirm their desired approach and delivering that approach in a way that maximizes value for the available budget.

To successfully develop a thorough and effective CAP, the City must ask and answer key questions such as:

- **What are reasonable GHG reduction targets**, taking into account Kenmore's current GHG emissions profile, planning horizons, and political, social, and economic context?
- **What policies, programs, and actions should be taken to reduce emissions in each sector to achieve GHG reduction goals**, considering criteria such as cost-effectiveness, mitigation potential, feasibility, equity, inclusion, co-benefits, local compatibility, and economic impact? What resources will be needed?
- **What synergies and efficiencies are possible** by addressing climate change and other social, civic, economic, and/or public health needs simultaneously?
- **How can the CAP best be integrated with and leverage existing plans**, sustainability initiatives, economic development strategies, social and environmental programs, and other local goals and actions?
- **How can local residents and businesses best be engaged in this effort**, both in terms of developing the Plan and implementing it in the near and longer terms? What elements will be most successful in sharing best practices and spurring action?
- **What is the most effective way to monitor, measure, and report progress** over time, enabling successes to be celebrated and mid-course corrections to be made as needed?

These questions will help frame a climate mitigation and adaptation approach that is comprehensive, integrated with other City needs and goals, and broadly supported by the community.

With funding yet to be appropriated for a climate planning process, we understand that the City's needs, goals, and priorities will dictate the project's scope and scale. The table on the following pages illustrates two options—a streamlined, low-investment CAP and a more comprehensive "Cadillac" CAP—to clarify the level of effort, and resulting deliverables, the City can expect at two typical price points. (Of course, we can also work with the City to identify its priorities and weight the project more heavily in those areas; for example, if public engagement is a top priority, we could move budget away from some technical analysis tasks in order to fund additional engagement events or online communications.)



CITY OF KENMORE CLIMATE ACTION PLAN

COST ESTIMATE BREAKDOWN

CAP Element	Low Investment	High Investment
GHG Inventories (Municipal and Community)	\$12,000 - Limited training and reporting - High level of staff involvement <i>See GHG Menu of Options document—previously provided—for details.</i>	\$50,000 - Extensive training and reporting - Low level of staff involvement <i>See GHG Menu of Options document—previously provided—for details.</i>
Emissions Reduction Targets	\$4,000 - Business-as-usual forecasting - Review of results of engagement and peer city targets to identify targets - Brief memo documenting recommended targets and BAU forecast	\$10,000 - Business-as-usual forecasting - Scenario analysis of target options - Review of results of engagement and peer city targets to identify targets - Detailed memo documenting recommended targets, BAU forecast, and scenario analysis
Public/Stakeholder Engagement	\$20,000 - Simple public, stakeholder, and City staff engagement strategy, developed based on input during kick-off meeting and limited additional community research - Limited support for City Council and/or Commission meetings - Toolkit of basic outreach materials (factsheet, postcard, basic talking points, 1 online survey) - Lead initial engagement (e.g., one workshop or open house); support City to conduct remaining engagement - City summarizes public input	\$60,000 - Comprehensive public, stakeholder, and City staff engagement strategy, including additional community research, top-line and supporting outreach messages, tactics - Support/attend City Council and/or Commission meetings - Toolkit of outreach materials (factsheet, postcard, talking points, PPT, display boards) - Lead implementation of comprehensive engagement strategy (e.g., workshops, drop-ins, open houses, 3 online surveys, interviews) - Comprehensive summary of public input
Vulnerability Assessment	\$4,000 - Update previous assessment, based on available literature - Summarize in brief memo	\$12,000 - Update previous assessment, based on available literature and updated City staff/stakeholder/public engagement - Freshen graphics, including layout, colors, etc. to match full report
Strategy Development & Prioritization	\$10,000 Goal statements for each sector	\$40,000 Goal statements for each sector

CITY OF KENMORE CLIMATE ACTION PLAN

CAP Element	Low Investment	High Investment
	1-2 strategies per sector, with up to 3 actions per strategy - Excel spreadsheet of strategies and actions with instructions tab (City staff to coordinate review and input, and finalize with guidance from Cascadia) - Rough estimate of combined emissions reductions - Qualitative multi-criteria analysis (no detailed cost or impact assessment)	- Up to 4 strategies per sector, with as many associated actions as needed - Excel spreadsheet of strategies and actions with instructions tab (Cascadia coordinates review and input; finalizes) - Wedge analysis of combined emissions reductions from identified strategies and actions - Multi-criteria analysis, including some detailed cost and impact assessment
Report Development	\$10,000 - Brief report with accompanying implementation matrix (~15 pages; see Salt Lake City CAP, found embedded in this news article) - Minimal design treatment or City-designed - Microsoft Word layout	\$30,000 - Comprehensive report, including monitoring & evaluation plan and implementation framework (~50 pages plus appendices; see City of Albany CAAP) - Highly designed and reader-friendly (e.g., original infographics, custom templates) - Adobe InDesign layout
Dashboard	\$5,000 - Content and graphics, formatted for the City to easily add to their webpage and make future updates (1 page and 2 graphics per sector; see Sustainable Shoreline) - Static dashboard	\$30,000 - Interactive dashboard with content and graphics for each sector, with additional content for strategies (landing page, 10-15 pages of content, 20-30 graphics; see City of Columbia, MO or San Diego County) - Cascadia enters initial content and graphics into dashboard
Project Management	\$8,000 2-hour virtual kick-off meeting - Biweekly 30-min check-ins - Monthly invoice and progress report over 18 months	\$18,000 2-hour in-person kick-off meeting (or virtual if virus-related lockdown persists) - Weekly 1-hr check-ins - Monthly invoice and progress report over 18 months
Estimated Total Cost	\$73,000	\$250,000





City of Kenmore, Washington

Date: April 29, 2020

To: Rob Karlinsey, City Manager
From: Adam Nebenzahl, Graduate Intern

Re: Joining ICLEI

Introduction

During the January 2020 retreat, the City Council wished to make a Climate Action Plan a priority of the city for the calendar year. One of the steps in moving forward they wished to see was the city to become a member of ICLEI – Local Governments for Sustainability.

Who Is ICLEI and Why Join Them?

As stated on their website, ICLEI is “a global network of cities committed to sustainable urban development. They influence sustainability policy and drive local action for low emission, nature-based, equitable, resilient, and circular development. They work together through peer exchange, partnerships, and capacity building to create systemic change for urban sustainability.”

ICLEI believes in five interconnected “pathways” that are multisectoral and do not have jurisdictional boundaries. The pathways are as follows:

- Low Emission Development: Aims to curb climate change, creates new economic opportunities and improves the health of human and the local ecosystems.
- Nature-based Development: Aims to protect and enhance biodiversity and urban ecosystems, which are key to local economies and resilience of communities.
- Circular Development: Aims to build societies that use recyclable, sharable and replenishing resources to prevent the linear model of produce, consume, discard.
- Resilient Development: Aims to anticipate, prevent, absorb and recover from shocks and stresses brought on by environmental, technological, social, and demographic change.
- Equitable and People-Centered Development: Aims to build more just, livable and inclusive urban communities and addresses poverty.

These pathways align with what our Climate Action Plan would include once it has been planned out.

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Benefits of Becoming a Member

- Join a network of 1,750 cities and regional governments who have been producing up-to-date research and information and have experts on anything from global sustainability policy to practical technical solutions.
- Be part of the governing body and can have a say in the direction of ICLEI. Can host or go to regional events to showcase efforts to other members.
- Participate in conferences, workshops, and webinars.
- Access to software including ClearPath which help create greenhouse gas inventories, forecasts, climate action plans, and monitoring at the community-wide or government-operation scales; TEMPERATE, which helps create a climate vulnerability assessment plan, as well as GHG protocols that cities like Kirkland and Shoreline have used when developing their own Climate Action plans.
- Access to grant and travel funding for hands-on learning opportunities and networking.
- Access to other cities and governments webinars and publications posted to ICLEI.

Possible Trade-Offs

- In a time where we need to cut discretionary spending, although \$600 per year is not much, it may not be spending that the city can afford at this time.
- Materials and discussions from the organization may recommend making further investments to help improve the city, however, with the current economic situation, the city may not be able to and thus participating in a network that we may not be able to put to good use for a period of time may not be beneficial to involve the city in.

Recommendation

Although the current fiscal situation has changed for the city, it would still be beneficial to join this program for only \$600 per year. The opportunities it opens up for the city to explore more ways to adapt to the changing environment of the region by analyzing other cities is extremely beneficial not just in the environmental field, but also economically, demographically, and socially. It may also produce ways to work during the current Covid-19 situation and continue to work on improving the climate within a restricted budget. Finally, it will allow us to further our own testing for GHG emissions and will save us money from hiring a consultant. Overall, I think this is a program that Kenmore should be a part of in these changing times.



City of Kenmore, Washington

Date: June 2nd, 2020

To: Rob Karlinsey, City Manager
From: Adam Nebenzahl, City Management Intern

Re: Forterra Green Cities Program

On May 22nd, members of Kenmore staff met with Ali Yates Lakehart and Joanna Nelson de Flores, Forterra's Green Cities Program Manager and Green Cities Director of the Green Cities program. We discussed what the Green Cities Program is, why participate in it, what would it require of the Kenmore, and what the costs to join would be.

Background

Forterra's Green City Partnership program began in 2005 to improve and sustain urban forest health through community stewardship. Since 2005, 15 cities including Seattle, Kirkland, Redmond, Shoreline, and Snohomish County, among others, have established Green City Partnerships. To date, they have established a combined restoration goal of 13,000 acres which serves more than 1.6 million people. As of 2018 they have 2,500 acres in restoration, 1.2 million native forest plants, 1.33 million hours of volunteerism (valued at \$40 million) and 284 active stewards.

Steps to Establishing a New Green City Partnership

1. Secure start-up resources: Funding, staff resources, etc.
2. Identify partners
3. What areas to include?
4. Understanding your forest
5. Current capacity (city and community)
6. Make a Strategic Plan
 - Background
 - Assessment results
 - Structure of Green Kenmore Partnership
 - Roles and responsibilities
 - Goals, benchmarks, and timelines
 - Cost assessment
7. Implementation – community stewardship program
8. Support, Track, Report and Adapt

At the end of this memo is an attachment of a portion of the Green Tukwila Capacity assessment.

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What are the Costs and Benefits for the City of Kenmore?

While no hard quote was given during an initial meeting, the steps leading through the assessment was estimated to cost between \$50,000-70,000 paid directly to Forterra. Upon the completion of the assessment, Forterra also stated that the ongoing restoration costs were estimated to be about \$40,000 on a yearly basis, which do not necessarily have to be paid to Forterra and could either be run by the city or by hiring similar organizations like Forterra. Forterra did mention the opportunity for them to search for grants that could help lower the assessment costs and increase available startup resources. From there, Kenmore would have the option to continue work with Forterra to establish implementation and support, track, report, and adapt, or it could go into a bidding process with other local organizations that specialize in similar implementation like EarthCorps, or establishing implementation specifically through the “Green Kenmore” name. However, this memo focuses on the first six steps in establishing the Green City partnerships.

The benefits are wide ranging for the city of Kenmore. When establishing the city’s Climate Action Plan, this could be used as implementation for community engagement. It would also increase community involvement in general and would be an opportunity to bring more volunteering opportunities to Kenmore. Working with a well-established non-profit like Forterra would provide security that good work would be accomplished without adding more unneeded pressure and projects on staff.

GREEN TUKWILA PARTNERSHIP CAPACITY ASSESSMENT

This document is an explanation of the existing conditions relevant to the formation of the Green Tukwila Partnership (the Partnership). Note, that not all information collected through the capacity assessment is incorporated into the 20-Year Plan, but the information does inform aspects of the Partnership as a whole, including management structure, access to resources, and roles and responsibilities of partners. The capacity assessment is broken down into eight categories:

- I. Natural Area/Open Space;
- II. Existing Volunteer Stewardship;
- III. Tools and Resources;
- IV. Staffing;
- V. Outreach and Education;
- VI. Community.
- VII. Funding;
- VIII. Policies and Supporting Documents;

Each category is further divided based on the roles played by departments within the City or partnering organizations (i.e. Seattle City Light or Forterra). Recommendations related to the Partnership are included in the right-hand columns.

I. NATURAL AREA & OPEN SPACE (MEETING 1: BIG PICTURE)

What agencies hold public open space in the City? How many acres?

City of Tukwila

Is this all under the care of the Parks Department or are there other City Departments (like Public Works or Community Development) that hold or manage land?

Tukwila School District

Are there other nearby school districts with land in the City boundaries?

Seattle City Light

What other utilities?

WSDOT

Undeveloped right of ways? Who manages them?

Who manages street trees?

Are parks divided into categories (eg. resource parks, community parks, etc.) and are there rules for each?

What are any special areas of interest or concern?

Are there any anticipated acquisitions?

II. VOLUNTEER STEWARDSHIP (MEETING 2: COMMUNITY ENGAGEMENT)

What programs are led by the City?

Are there any regular City events?

MLK Day of Service, Earth Day, Arbor Day, Make-a-difference Day, National Public Lands Day, National Trails Day, etc.

Duwamish Alive!

Are there existing programs led by other agencies, organizations, etc?

Forterra (Duwamish Hill Preserve, Duwamish Shoreline)

EarthCorps Sound Stewards program

III. TOOLS AND RESOURCES (MEETING 3: FIELD WORK)

Are there tools available for volunteers or professional stewardship crews?

Where are they kept?

Who is responsible for maintaining them?

How are they accessed?

Can they be accessed by volunteers?

Has there been much of a problem with theft?

Are there facilities, like storage sheds or tool trailers?

Who manages them and who has access to them? Where are they located?

IV. AGENCY STAFFING (MEETING 1: BIG PICTURE)

What agencies have staff that deal with natural area management?

Are there divisions (eg. Planning and development, operations) within departments or agencies? Please outline.

What agencies have staff that deal with volunteer management?

Are there divisions (eg. Communications and outreach, youth programming) within departments or agencies? Please outline.

Does the Police department or other agencies not represented elsewhere in the Partnership have existing public outreach programs?

How many staff members, including part-time and seasonal employees?

Will any of these people be available to help with Green Tukwila?

To what extent do partners already work together?

Are there any outside crews that do work on City public space?

Private crews, WCC, EarthCorps?

What is the role of City Council committees, public commissions, or other governing bodies?

Parks Commission

Equity and Diversity Commission

TIB Commission

Tree and Environment Committee

V. OUTREACH AND EDUCATION (MEETING 2: COMMUNITY ENGAGEMENT)

Outreach and marketing: What resources exist within the City or other landholding agencies?

Are there any regular City events?

Website, newsletter, social media, events, connections with neighborhood groups

What is the potential for spreading the word and what is the protocol? Who manages these things?

Have there been any surveys or other public input processes done lately that we could reference?

Marketing: What resources exist?

Are there staff members charged with graphic design, marketing and outreach campaigns?

Are there City brand guidelines? What rules do we need to follow?

Are there City brand guidelines? What rules do we need to follow?

Education: What programs exist within the City or other agencies?

Are there staff members who do youth or adult education programming?

Is there existing curriculum being used or available?

VI. COMMUNITY (MEETING 2: COMMUNITY ENGAGEMENT)

What connections are there between the City, other agencies, and the community?

Are there any other known grassroots or non-profit operations working on public natural areas?

Are there any existing relationships with corporate volunteer groups? Schools or other youth programs?

Are there existing relationships with local businesses for in-kind donations?

Are there any regular public input protocols? Working with Community Liaison program? Any others?

Who would need to review liability waivers or other legal documents?

VII. FUNDING (MEETING 4: FUNDING)

What budgets will be involved in funding Green Tukwila work?

Interdepartmental

Capital improvement program

Office of the Mayor

Department/agency budgets

Tree City USA status

Is it active?

Where does the budget come from and what is it currently used for?

What opportunities exist for future funding?

Open space bonds, levies

Impact, usage, or utility fees?

Stormwater fund, tree fund, replacement, or mitigation fee funds?

Do any of these currently exist? If so, what are they used for? Of those that don't exist, do any seem feasible?

Neighborhood program grants or matching funds

State or County grants

Fundraising and donations

Is there an existing structure to accept donations? Can funds be restricted to a particular budget or program?

VIII. POLICIES AND SUPPORTING DOCUMENTS (MEETING 5: RELEVANT POLICY)

This section provides an overview of current policies that support or are conducive to stewardship activities in Tukwila. The underlined, bolded type introduces a plan, guide, or ordinance, and is followed by a summary of the policy and how the Partnership can help achieve identified goals.

What policies, laws, or guidelines will affect the work of the Partnership?

City Comprehensive Plan

City Municipal Code

State or larger – ex. Washington State Shoreline Master Program

Public tree policy

Views

Replacement or mitigation

Street Tree, USA status

Approved plant list – is there one? Does it include invasive species? Does it encourage native species?

Policy regarding wetlands, shorelines, steep slopes, or sensitive areas

Policy regarding volunteer work on public property (incl. tools, minors, court-mandated service)

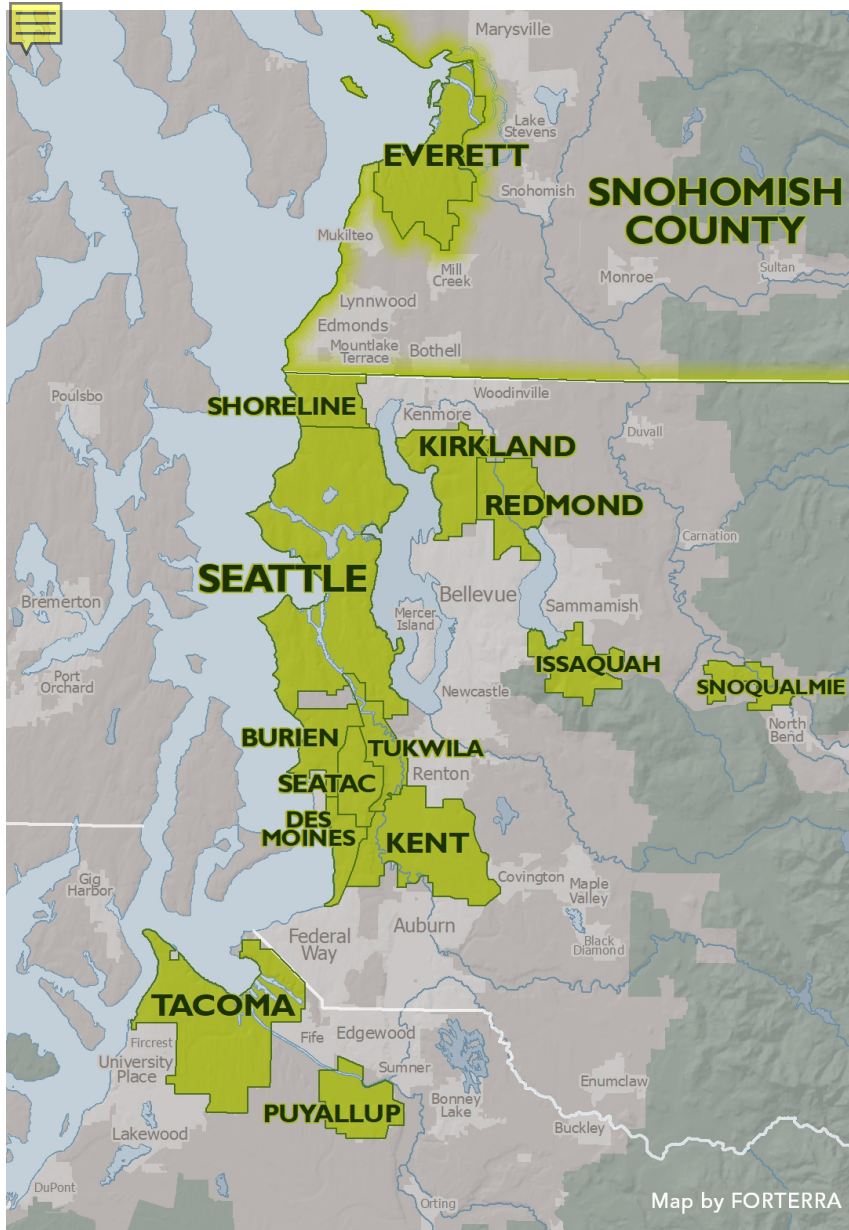
Approved vendor list, union regulations, or other restrictions for crews and contractors

Police, safety, sight lines

FORT&RRA







Growing a Regional Network of Healthy Urban Forest

Program to Date (2005-2019)

- 15 Green Cities/County
- Combined Restoration Goal:
~13,000 acres
- Serving more than 1.6 M people





Benefits to Healthy Urban Forests

- Greenhouse Gas Reduction
- Cooler Cities
- Clean Air and Water
- Habitat for Local Wildlife
- Recreational and Educational Opportunities
- Revitalized Neighborhoods
- Improved Property Values
- Carbon Sequestration
- Physical and Mental Wellness
- And more.....



Threats To Our Urban Forest



- Urban growth and fragmentation
- Loss of large canopy trees
- Invasive non-native plant species
- Aging canopy
- Invasive non-native insects and disease
- Improper tree care
- Lack of understanding about the value and benefits of urban trees
- Climate Change
- Inadequate urban forest planning, management, and funding



If We Do Nothing....

If forested natural areas are not restored

Aggressive non-native vegetation will dominate the urban forest unless removed. In 100 years, the trees will be gone. City officials estimate that potentially billions of dollars in services such as stormwater control will be lost.



PRESENT



IN 20 YEARS



IN 50 YEARS

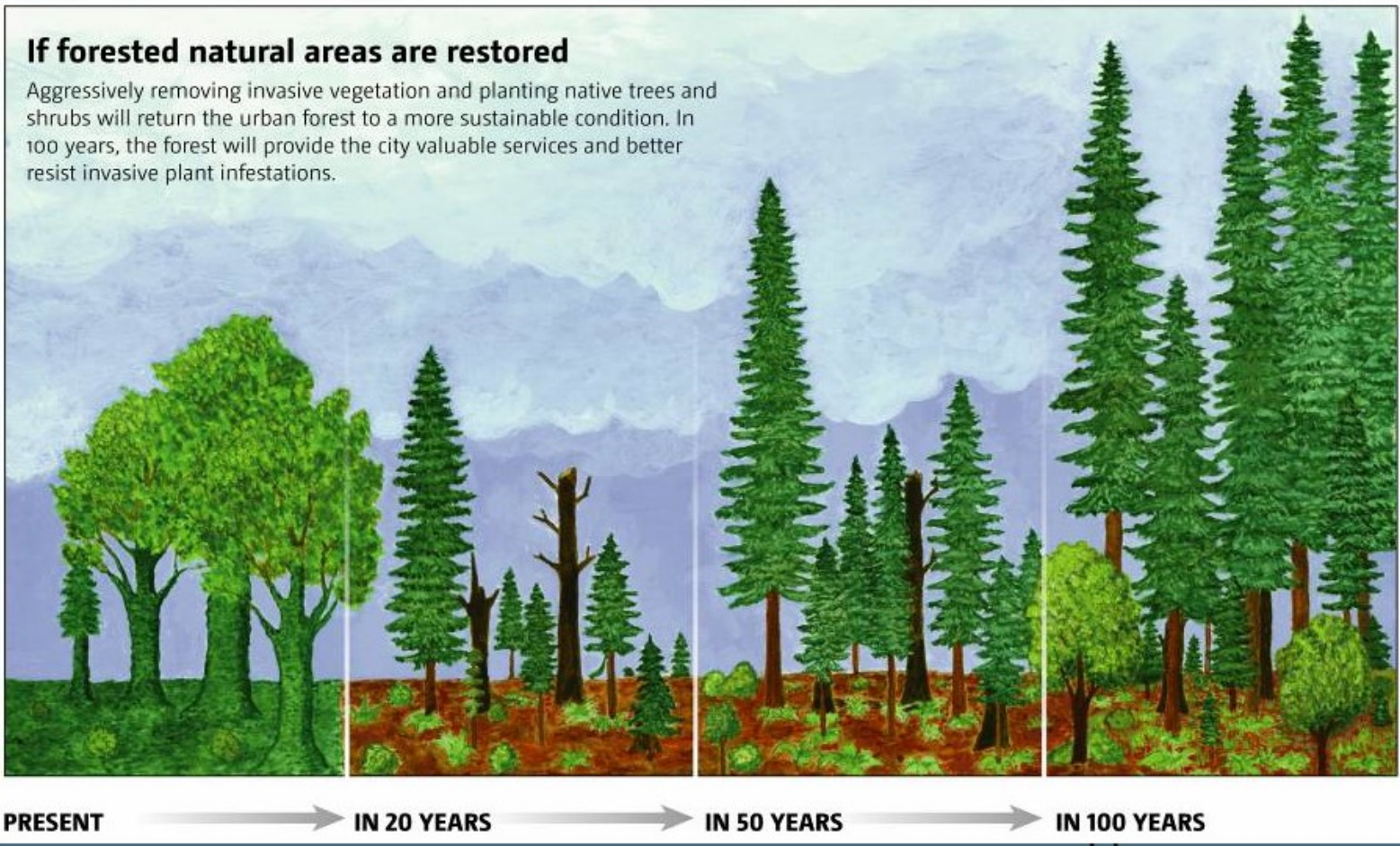


IN 100 YEARS

If We Restore the Forest

If forested natural areas are restored

Aggressively removing invasive vegetation and planting native trees and shrubs will return the urban forest to a more sustainable condition. In 100 years, the forest will provide the city valuable services and better resist invasive plant infestations.





Green City Partnerships Goals

1. Connect the community to their urban forest and galvanize support for this precious resource.
2. Improve urban forest health and ecological resilience allowing an increase in the forest's benefits to increase quality of life.
3. Through planning and wholistic community support, ensure long-term sustainability of this work.

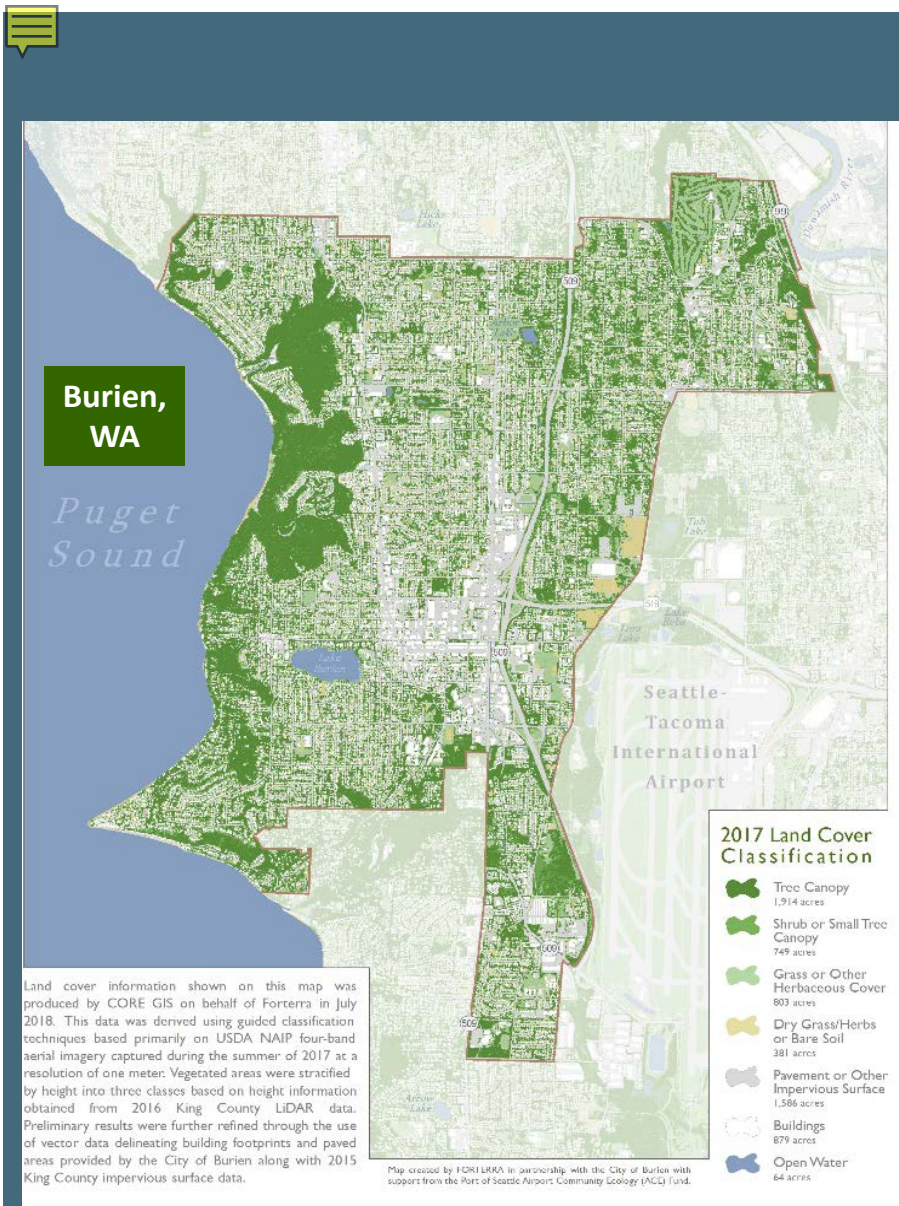


Assessment and Planning

Elements of a 20-year plan

1. Statement of vision, objectives, and intended outcomes
2. Forest assessment results and maps
3. Capacity assessment of City resources and community input
4. Cost estimate
5. Structure of the Green City Partnership
6. Roles and responsibilities
7. Benchmarks and timelines



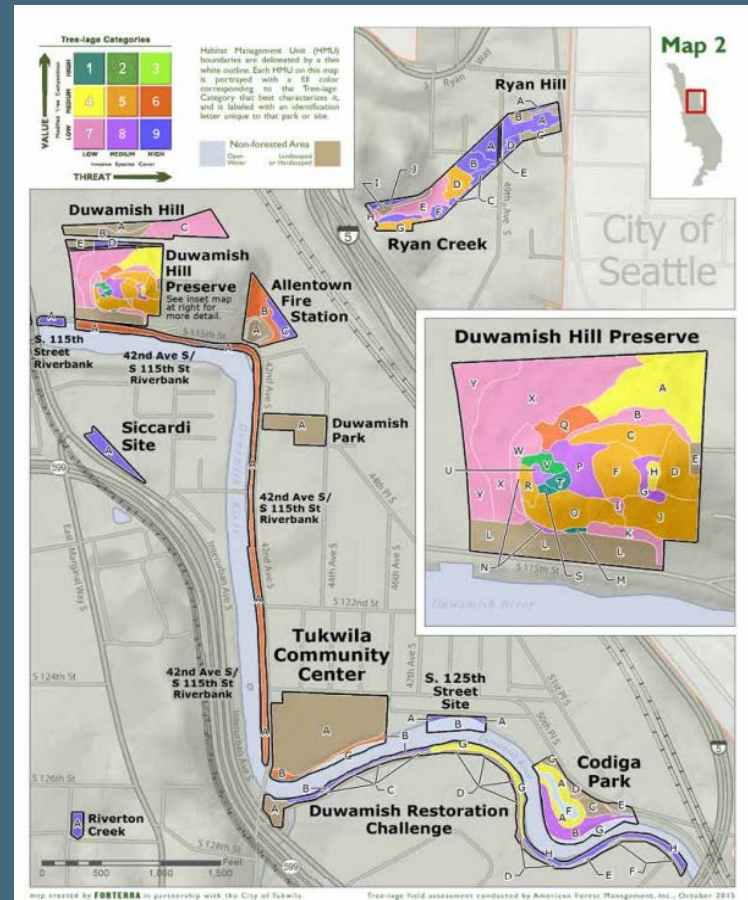


Canopy Cover Enhancement

- Determine location of existing canopy
- Create goals and recommendations that support the **equitable** distribution of canopy in Kenmore
- Provide metrics and implementation programs to support the above goals.

Forest Landscape Assessment

- Determine the health of existing forested public land
- Provide metrics and implementation programs to restore Kenmore's urban forest to good health.
- Create goals and recommendations that support **equitable** investment of this work



Community-based Stewardship



Green City Partnership Impacts

Program to Date (2005-2018)

- 2,500 acres in restoration (27%)
- 1.2 M native forest plants
- 1.33 M hours of volunteerism (valued at \$40 million)
- 284 active Stewards

*Highest performing programs are at ~ 0.11
volunteer hours per capita*



GREEN CITY
PARTNERSHIPS

Questions?

Ali Lakehart

Green Cities Program Manager

alakehart@forterra.org

206-905-6909



City of Kenmore, Washington

Date: June 3rd, 2020

To: Rob Karlinsey, City Manager
From: Adam Nebenzahl, City Management Intern

Re: Tree City USA

Background

The Tree City USA program has existed since 1976. It is a nationwide movement that provides the framework necessary for communities to manage and expand their public trees. Currently, more than 3,400 communities making up 140 million people are Tree City USA members.

Requirements to Becoming a Tree City Member

Below are the four standards for Tree City USA Recognition:

1. A Tree Board of Department: Someone must be legally responsible for the care of all trees on city-owned property. This can be a professional forester, arborist, city department, citizen-led tree board of some combination.
2. A Tree Care Ordinance: A key section of a qualifying ordinance is one that establish the tree board or forestry department and gives them responsibility of tree care.
3. A Community Forestry Program with an Annual Budget of at Least \$2 per capita
4. An Arbor Day Observance and Proclamation

Benefits of Being a Tree City Member

Tree City USA states that their “program provides direction, assistance and national recognition for your community. It’s the framework for a healthy, sustainable forestry program in your town.” Below is a list of some of the benefits that Tree City USA promotes:

- *Reduce costs for energy, stormwater management, and erosion control.* Trees yield 3-5 times their cost in overall benefits to the city.
- *Cut energy consumption by up to 25%.* Studies indicate that as few as three additional trees planted around each building in the U.S. could save \$2 billion annually in energy costs.
- *Boost property values across you community.* Properly placed trees can increase property values from 7-20%.
- *Build stronger ties to your neighborhood and community.* Trees and green space directly correlate to greater connections in the community
- *Educate people living in your city about the value of trees and the importance of sustainable tree management.*

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City of Kenmore, Washington

Date: May 29th, 2020

To: Rob Karlinsey, City Manager
From: Adam Nebenzahl, City Management Intern

Re: Salmon-Safe Certification

On May 14th, members of Kenmore staff met with Dan Kent and Molly Ray, the Executive Director and Puget Sound Director of the Salmon-Safe Certification program. We discussed what the Salmon-Safe Certification is, why participate in it, and how much it would cost to participate.

Background of Salmon-Safe Certification

Salmon-Safe has been working in the Puget Sound since 1998 promoting ecologically sustainable land management practices that protect water quality and aquatic biodiversity. Salmon-Safe is the first certification program linking municipal land management practices and the protection of downstream water quality.

Organizations achieve certification after a rigorous assessment and independent verification of operations by experts in stormwater and landscape management and fish biology. Salmon-Safe has worked with public institutions ranging from the University of Washington to the cities of Seattle, Portland, Eugene, Shoreline, Tumwater, and others. High visibility media outreach and recognition campaigns deliver citizen engagement and public visibility to certified cities, building a reputation for excellence in environmental innovation.

Finally, certification is a 5-year period with annual review and entitles Kenmore to display the Salmon-Safe logo and incorporate Salmon-Safe messaging in internal and external communications.

Requirements to Becoming Salmon-Safe Certified

Below is an 8-step assessment process that the city will take part in during certification process:

1. Scope and Planning:
 - Salmon-Safe Responsibilities: Develop scope and timeline for each task
 - Kenmore Responsibilities: Develop and route contracting documents, schedule consent item on Council Agenda planner to authorize City Manager to sign contract

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2. Water Quality Protection Gap Analysis: Expert review of current practices and infrastructure.
 - Salmon-Safe Responsibilities: Coordinate document review with Salmon-Safe science team; conduct interviews
 - Kenmore Responsibilities: Supply documents; participate in interviews.
3. Key Operational Site Assessments:
 - Salmon-Safe Responsibilities: Coordinate scheduling with the City staff; assess City sites
 - Kenmore Responsibilities: Assist consultant with scheduling coordination; tour sites with consultant team.
4. Science Team Certification Decision/Report Development:
 - Salmon-Safe Responsibilities: Generate certification report, route internally amongst science team for review, and incorporate feedback
 - Kenmore Responsibilities: N/A
5. Certification Finalization/City Review of Certification Report:
 - Salmon-Safe Responsibilities: Incorporate City feedback into the certification report and provide certification letters, as well as certification upon formalization of certification.
 - Kenmore Responsibilities: Review final certification report, circulate internally, and solicit feedback.
6. City Adoption
 - Salmon-Safe Responsibilities: Provide certification certificate upon formalization of certification.
 - Kenmore Responsibilities: Coordinate sign-off on the certification letter and creation of pre-condition statement(s), as needed.
7. Certification Implementation Support
 - Salmon-Safe Responsibilities: Present to City and provide technical assistance as needed. Condition verification will be ongoing throughout the 5-year certification cycle and starting upon formalization of certification.
 - Kenmore Responsibilities: Assist consultant with scheduling coordination.
8. Public Education and Awareness Support
 - Salmon-Safe Responsibilities: Collaborate with City communications staff and develop a public outreach campaign.
 - Kenmore Responsibilities: Collaborate with consultant to develop a public outreach campaign.

Cost and Benefits to Becoming Salmon-Safe Certified

18120 68th Ave NE · Kenmore, WA 98028

Office: (425) 398-8900 · Fax: (425) 481-3236 · cityhall@kenmorewa.gov · www.kenmorewa.gov

Salmon-Safe determined that the cost of assessment and annual verification will be performed at a *total cost not to exceed \$34,800 for a five-year certification*. After those five years, recertification costs typically be around 50-60% of the original cost. In addition, staff time, mainly in the Surface Water Management Utility, would be needed to help achieve the certification and run the program on an ongoing basis. To pay for this program, the Surface Water Management (SWM) budget could cover the cost, but SWM fees would either need to be increased or cuts would need to be made to other SWM programs. The City Management Intern could be utilized to help gather the required documents in the early certification process which could accelerate the certification timeline.

Participating in this program aligns with Kenmore's Comprehensive Plan vision, compliance with the City's NPDES Phase II Municipal Stormwater Permit, regional WRIA 8 salmon recovery efforts, goals for environmental protection and stewardship and also the Council's 2020-2021 Priority #3 "Develop a Kenmore Climate and Environment Action Plan including water, air, forest, and habitat restoration".

The benefit of salmon safe certification are ecologically sustainable land management practices that protect water quality and aquatic biodiversity. These benefits also support the goal of a climate action plan to reduce greenhouse gas production.

Also, as stated above, it can be used for public outreach and citizen engagement to help promote the beauty and innovation of Kenmore. The decision on whether to participate in this program should be made in the context of the other environmental stewardship programs being considered, as well as the overall workplan of the Environmental Services Division and other affected departments.

Subject/Topic: Walkways & Waterways Public Art Design Approvals (19-C2099) & Fabrication Contract Authorization(20-C2159). Proposed Council Action/Motion: Motion approving the Ad-Hoc Public Art Committee's recommendation to accept Jennifer Dixon's final artwork designs for three Walkways and Waterways projects at: Log Boom, Squire's Landing and Rhododendron Parks. Motion giving authorization to the City Manager to enter into a fabrication and installation contract (Contract 20-C2159) with the artist (Jennifer Dixon) in an amount not to exceed \$123,473.00.	For Council Meeting Agenda of: 6/22/2020 Department: Community Development Prepared by Maureen Colaizzi, Parks Project Manager <u>Initial & Date</u> Approved by Department Head: <u>via email 6/5/20</u> Approved by City Attorney: <u>via email 4/17/20</u> Approved by Finance Director: via email n/a Approved by City Manager: via email RK 6/11/20 Attachments: 1) Artwork Descriptions/Fabrication Budget 2) Artist Design Contract 19-C2099 & RFQ 19-2099 3) Draft Fabrication Contract 20-C2159
<u>INFORMATION/BACKGROUND:</u> Staff is seeking Council approval of final public artwork designs by Jennifer Dixon (Artist) that are recommended by the Ad-Hoc Public Art Committee (Committee) for the three Walkways and Waterways projects at Log Boom, Squire's Landing and Rhododendron Parks. Attachment 1 includes the artwork design descriptions, site plan location and fabrication budget for artworks at all three park projects. Staff will present the Committee's recommendation to Council and the Committee and Artist will be present to answer questions. Staff is also recommending that Council pass a motion authorizing the City Manager to enter into a fabrication contract (Contract 20-C2159) with Jennifer Dixon in the amount not to exceed \$123,473.00 for fabrication and installation of the final designs. <u>Background:</u> KMC Chapter 3.50 sets out the procedures for using the One Percent for the Arts funds on public projects. These funds may be used for selection, acquisition, and installation or display of visual art. City Council reviewed and approved the art selection criteria and process, and the draft Ad-Hoc Public Art Committee charter on November 18, 2019. On January 27, Council authorized the City Manager to enter into a design contract with Jennifer Dixon, Public Artist for up to \$21,567. The design contract (19-C2099, Attachment 2) has not exceeded \$20,000.00 which leaves 123,473.00 available for a fabrication contract. See Attachment 3, Draft Fabrication Contract 20-C2159.	
<u>The Artist Design Process and Committee Review:</u> After design contract authorization, the Artist worked directly with the projects' design team to collaborate on ways to integrate public artworks into the park construction designs for Log Boom and Squire's Landing Parks. After receiving preliminary design feedback from	

the Committee, the Artist continued to refine her artwork designs with both the design team and the City's maintenance staff through final design.

The Committee, comprised of the following members: David Francis, Sara Solum Hayashi, Staci Adman, Nancy Ousley and Drew Coombs, met on Friday, March 13th to review the Artist's preliminary design ideas. The Committee used the Art Project Goals on page 3 of the RFQ (RFQ 19-C2099, Attachment 2) to review the artist design ideas and provide valuable feedback for the Artist to help bring her early ideas to a final design. The Committee met on April 27th and on May 18th to review the Artist's final designs. See Attachment 1 for the artworks' descriptions, site maps and fabrication budget.

The Committee recommends approval of the Artist's final designs with the following comments about the artworks:

Artworks Design Concept:

Jennifer Dixon's design approached the three parks through imagery and concept, inspired by water, trees and topography, but also creating artworks specifically fitted to each site. The artworks are a marriage of organic and built with each providing different experiences for different viewers. Artworks show the flow (of the concept) and draws you into the environment with an element of surprise.

Log Boom Park Artwork Design:

The Artist's use of etchings of wood and water in the concrete paving and seat walls draw visitors to the centerpiece flume sculpture. The Artist weaves together aspects of history and environment to create the flume sculpture, a dynamic sculpture that will change with the seasons and allow for an interactive place for people to connect with Kenmore's past.

Rhododendron Park Artwork Design:

The Artist's cedar tree "snag" sculptures help tie the site together and lure visitors toward the water creating cadence and rhythm that is cumulative and tells a story that help connect visitors with their surrounding natural environment. The texture and embedded words reinforce the overall effect that the environment is created from many different smaller components.

Squire's Landing Park Artwork Design:

From the scrolled gate to the colors along the boardwalk and occasional text messages, the Artist's themed artworks bring visitors into the natural world in a gradual process culminating at the boardwalk's destination, a series of three large architectural "bird blind" sculptures at the viewing platforms. These sculptures are a treasure at the end enveloping visitors in scrolled shapes, providing a context for their experience. Framing visitors' view, the sculptures cast shadows that convey a sense of the cedar grove nearby creating a memorable experience with a more intimate environment to observe nature and contemplation.

Draft Final Design & Fabrication Schedule: The Artist's final designs will be incorporated into the 90% design through the 100% Construction Bid Documents for Log Boom Park and Squires Landing Park projects. The Artist will coordinate fabrication and installation for the artwork at Rhododendron Park as well as some elements of the Log Boom and Squire's Landing Park artworks that are not being constructed by the contractor.

The following draft schedule assumes Council approves the Committee's recommendation for the artwork designs and authorizes the City Manager to enter into the fabrication contract:

- June 2020: Fabrication contract signed.
- Summer 2020: Final fabrications drawings & specifications of artwork elements to be constructed by the project contractor will be incorporated in the bid documents.
- Fall 2020: Final fabrication drawings & specifications for artwork elements being installed by the artist.
- 2021-2022 Fabrication
- 2022-2023 Installation

Artist Fabrication Contract: The artist's fabrication contract (Attachment 2) is in a form approved by the City Attorney and addresses the following project needs:

- Meeting the project's fabrication/installation schedule as described above.
- Ensuring the fabrication/installation is within the allotted budget described in Attachment 2.
- Ensuring the fabrication/installation for the artworks considers the site-specific opportunities in the RFQ 19-2099 (Attachment 1).
- Ensuring the fabrication/installation meets the Art Project Goals as described in on page 3 of the RFQ (Attachment 1).

FISCAL CONSIDERATION: The total estimated 1% for public art (design/fabrication/installation) available for all three park Walkways & Waterways projects is \$143,474.30. The design contract was limited to \$20,000 leaving a balance for fabrication/installation of \$123,473.30 which includes funding the artist's services during that phase of the work. As presented to Council on November 18, 2019, the budget is comprised of funding from these sources:

- 1% for Art estimated for the Rhododendron Park Boardwalk and Float Project: \$17,214.30
- 1% for Art estimated for the Squires Landing Park Waterfront Improvement Project: \$39,260.00
- 1% for Art estimated for the Log Boom Park Waterfront Improvement Project: \$13,000
- Funds allocated from Public Art Fund: \$9,000 (Council direction 9/23/19)
- 1% for Art estimated for the 68th Ave Pedestrian "Walkways" Improvement Project: \$65,000 (Council direction 9/23/19 to allocate these funds to the park Walkways & Waterways projects)

COUNCIL PRIORITIES: Council 2020-2021 Priorities: #4 Implement the Walkways & Waterways Projects.

Attachment 1 Artworks Design Description, Site Plans & Fabrication Budget

WALKWAYS AND WATERWAYS PARK PROJECTS

ARTWORKS DESIGN DESCRIPTION

The artworks are a celebration of water and its conveyance, seen and unseen through the natural processes of the water cycle that transports water from the sky to the trees and back to the sky, the culturally historic conveyance of timber on the waters of Lake Washington, and the geologically historic movement of water that formed the topography of current day Kenmore.

LOG BOOM PARK

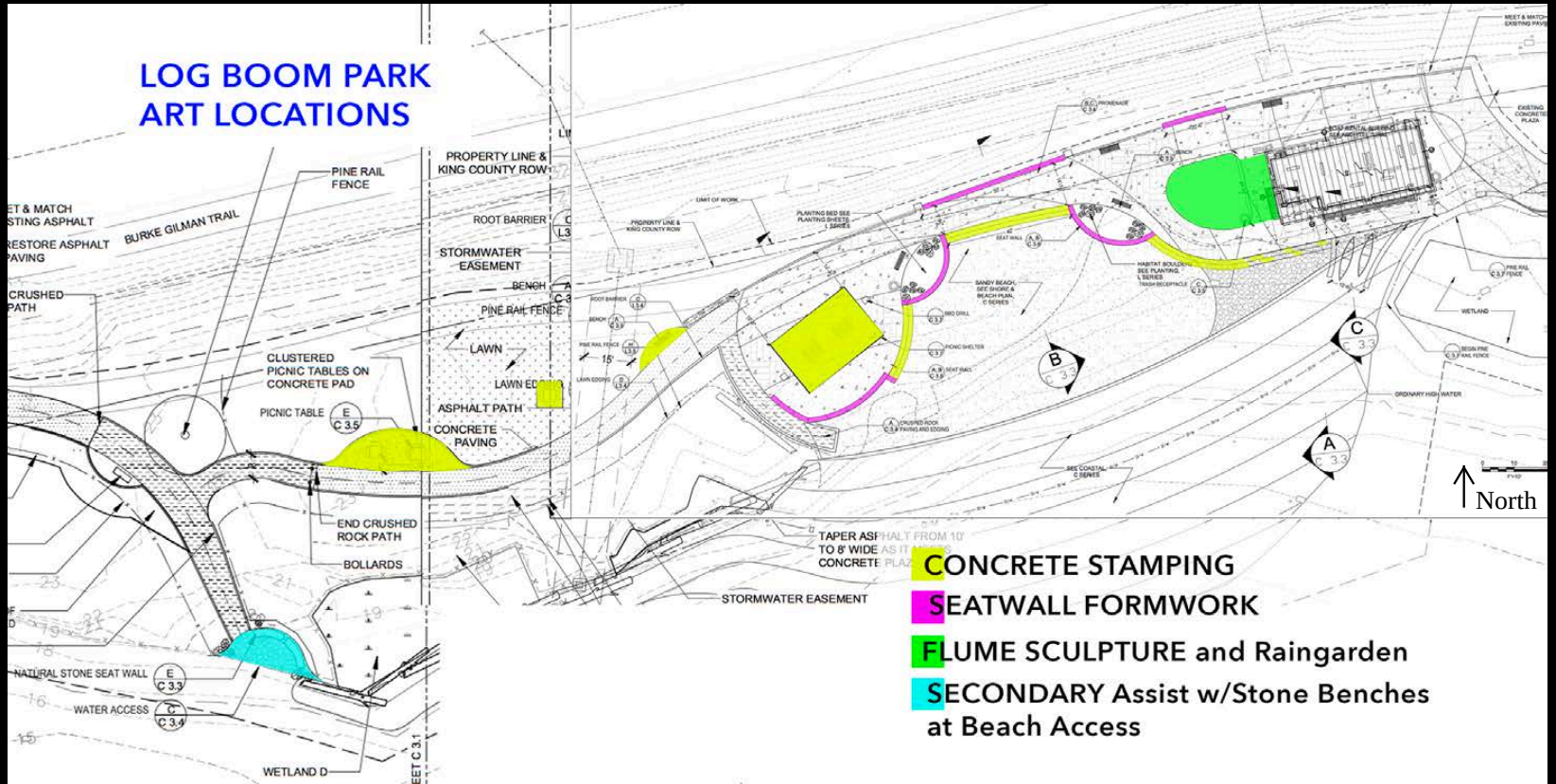
Etchings of wood and water in the concrete paving and seat walls draw you to the centerpiece flume sculpture. Inspired by historic log booms, the sculpture creates an interactive place for people to connect with Kenmore's past while enjoying a lively expression of water conveyance by channeling storm water into its adjacent rain garden.

RHODODENDRON PARK

Three cedar tree sculptures serve as markers along the pathway to the Sammamish River. Each cedar log tells the story of water, land, and trees and connects the viewer to the surrounding natural environment.

SQUIRE'S LANDING PARK

The artist's theme is expressed through metal screens, brightly colored grating, and engraved handrails along the boardwalk that leads visitors to three viewpoints, each with a unique "bird blind" sculpture on the waters' edge. The open design of the roofs and the guardrails frame the view as well as cast shadows that allude to the forest canopy.





Kenmore Walkways and Waterways
FINAL Budget
May 2020

Total Fabrication Budget \$123,473

LOG BOOM PARK \$ 50,000

Concrete Stamps	\$ 5,000
Storm water Sculpture	\$35,000
Delivery, Install, Equipment	\$ 5,000
Contingency	\$ 5,000

RHODODENDRON PARK \$ 18,473

3 Cedar Posts	\$ 1,500
Carving, Burning, Inlay	\$ 8,500
Sealant/Graffiti Coating	\$ 1,600
Welded steel joinery	\$ 1,250
Delivery, Install, Storage	\$ 3,400
Contingency	\$ 2,223

SQUIRES LANDING \$ 55,000

Laser cut screens for boat house	
3@ \$450	\$ 1,350
4- 4"x4" posts @\$275/ea	\$ 1,100
Laser cut guardrail panels	
4 ea/3 Birdblinds @\$250	\$ 3,000
Bird Blinds	\$30,000
CNC routed text for top rails	
36 planks @ \$30/ea	\$ 1,080
Delivery, Install, Equipment	\$13,000
Contingency	\$ 5,470

Attachment 2 Artist Design Contract and RFQ 19-2099

**CONTRACT FOR DESIGN OF ARTWORKS AT LOG BOOM
PARK, RHODODENDRON PARK AND SQUIRE'S LANDING
PARK
Contract No. 19-C2099**

This Agreement is entered into by and between the City of Kenmore, Washington, a municipal corporation ("City") and Jennifer Dixon ("Artist"), whose address is, 325 30th Avenue, Seattle WA 98122.

WHEREAS, the City Council has authorized the appropriation of one percent for art on qualifying capital improvement projects that are undertaken by the City ("1% for Art") for the selection, acquisition and installation of original works of art in the City; and

WHEREAS, the citizens of Kenmore approved Proposition 1 Walkways & Waterways Improvements bond measure, which in part, funds capital improvements and public access to waterfront parks; and

WHEREAS, the City Council has authorized the use of funds from 1% for Art for the design and fabrication of artworks in the following Kenmore parks: Log Boom Park, 17415 61st Avenue NE, Rhododendron Park, 6910 NE 170th Street, and Squire's Landing Park, 7353 NE 175th Street (collectively, the "Parks"); and

WHEREAS, the City published a Request for Qualifications ("RFQ") with the primary goal of selecting an artist to design and fabricate a set of linked public artworks that are genuinely integrated into the natural environment and physical conditions of the Parks, and that will uniquely highlight the special relationship Kenmore land has to water and the varied shoreline edge (the "Artworks"); and

WHEREAS, after completion of the RFQ process, the City selected the Artist to design and fabricate the Artworks in the Parks; and

WHEREAS, the City Council desires to authorize the Artist to design Artworks for the Parks, subject to the terms and conditions in this Agreement, and then upon approval of said design, the Council desires the parties to enter into a fabrication contract to install the Artworks in the Parks;

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 Artist.**
 - A. The Artist shall design Artworks for the Parks and perform the Scope of Services described in Exhibit "A" of this Agreement, attached hereto and incorporated by reference ("Services"). In performing the Services, the Artist shall comply with all federal, state and local laws and regulations applicable to the services. The Artist shall diligently perform the Services in accordance with professional standards of conduct and in strict compliance with all terms and conditions of this Agreement. Should the Artist engage any subcontractors in the performance of the Services, the Artist agrees to require all such subcontractors to be bound by the terms and conditions of this Agreement.

Notwithstanding the foregoing, Artist shall not assign the creative or artistic portion of the Services to another party without the prior written consent of the City.

- B. Notwithstanding the foregoing, the City is not obligated by this Agreement to proceed to implementation of the Artworks or design proposal. The City reserves the right to reject the Artist's conceptual design of the Artworks.
 - C. The City shall have the sole responsibility for determining stages of completion of the Services. The Services and design of the Artwork shall, at all times, be subject to the City's general review and approval. The Artist shall confer with the City periodically during the progress of the Services, and shall prepare and present such information and materials (e.g., a detailed outline of completed work) as may be pertinent, necessary or requested by the City to determine the adequacy of the Services performed and the Artist's progress.
2. **Compensation and Method of Payment.** The Artist shall request payment for work performed using the billing invoice form at Exhibit "C."

The City shall pay Artist:

[Check applicable method of payment]

☒ According to the rates set forth in Exhibit "A" Scope of Services in a sum not to exceed \$20,000.00. All amounts paid under this Agreement are inclusive of all applicable state and federal taxes including Washington State Sales Tax.

☐ A sum not to exceed \$ ___

☐ Other (describe):

Artist shall complete and return to the City Exhibit "D," Tax Identification Number," prior to or along with the first billing invoice.

The Artist understands that there is no guarantee of a minimum amount of work or compensation under this Agreement, and the Artist shall only submit invoices based on performing the tasks described in Exhibit A. The City shall pay the Artist for Services rendered within thirty (30) days after the Billing Voucher approval.

- 3. **Duration of Agreement.** This Agreement shall be in full force and effect for a period commencing upon execution and ending June 30, 2020, unless sooner terminated under the provisions of this Agreement. Time is of the essence of this Agreement in each and all of its provisions in which performance is required.
- 4. **Copyright; City's Right to Reproduce Images and Ownership.**

U.S. The Artist shall retain the copyright and all other intellectual property rights to the Artworks, provided that the City is hereby granted an irrevocable, non-exclusive, royalty free license to use, reproduce and distribute the Artworks, in perpetuity, including, but not limited to, the Artworks and all preliminary studies, models, and maquettes thereof

that have been delivered to and accepted by the City, and to authorize third parties to graphically reproduce (through photography or otherwise) any and all of the same, as are desired by the City for municipal (e.g., education, public information, etc.) purposes and not for financial gain. On each such municipal reproduction, the City shall assure that all reproductions by the City contain a credit to the Artist and a copyright notice substantially in the following form: "Copyright, Artist's name, all rights reserved, date" in such a manner and location as shall comply with the U.S. Copyright Laws.

- A. Upon the City's acceptance of the fabricated Artworks, the City shall acquire good title to, and own the physical embodiment of the Artworks, including, but not limited to, the Artworks proposal and all preliminary studies, models, and samples and maquettes, free and clear from any and all claims, liens, and charges by any person or entity, including but not limited to, any employee or supplier.
- B. The City is not responsible for any third-party infringement of Artist's copyright and not responsible for protecting the intellectual property of Artist.
- C. The rights granted by this provision shall survive the expiration or early termination of this Agreement.

5. Warranties of Title.

- A. The Artist represents and warrants that:
 - i. The Artworks are solely the result of the artistic efforts of the Artist;
 - ii. The Artworks are unique and original and do not infringe or violate any copyright, trade secret, trademark, patent, or other proprietary or personal right held by any third party;
 - iii. The Artworks (or duplicates thereof) have not been accepted for sale elsewhere;
 - iv. The Artist has not sold, assigned, transferred, licensed, granted, encumbered or utilized the Artworks or any element thereof or any copyright related thereto which may affect or impair the rights granted pursuant to this Agreement;
 - v. All Artworks created by the Artist under this Agreement, whether created by the Artist alone or in collaboration with others, shall be wholly original with the Artist and shall not infringe upon or violate the rights of any third party;
 - vi. The Artist has the full power to enter and perform this Agreement and to make the grant of rights contained in this Agreement;
 - vii. The Artist warrants that the Artworks are designed to last for at least thirty (30) years unless otherwise state elsewhere in this Agreement or attachments thereto; and
 - viii. These representations and warranties shall survive the termination or expiration of this Agreement.

6. Independent Contractor.

The Artist and the City agree that the Artist is an independent contractor with respect to the services provided pursuant to this Agreement. The Artist will be solely responsible for its acts and for the acts of its agents, employees, sub-Contractors 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. No employee of the Artist or other persons engaged to perform any work or service required of or by the Artist under this Agreement shall be considered an employee of the City. No claim of any such employee or other person, whether for industrial insurance, unemployment compensation, or any other benefit or entitlement whatsoever, shall be an obligation of the City.

7. Indemnification.

A. The Artist shall protect, defend, indemnify and save 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 and/or wrongful conduct of the Artist, his/her officers, employees and agents in performing this Agreement. The Artist agrees that his/her obligations under this subsection shall extend to any claim, demand, and cause of action brought by or on behalf of any employees or agents. For this purpose, the Artist, by mutual negotiation, hereby waives, as respects to the City only, any immunity that would otherwise be available against such claims under the Industrial Insurance provisions of Title 51 RCW. In the event the City incurs any judgement, award or cost arising therefrom including reasonable attorneys' fees to enforce the provisions of this subsection, all such fees, expenses, and costs shall be recoverable from the Artist.

B. The City shall protect, defend, indemnify and save harmless the Artist, 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 and/or wrongful conduct of the City, its officers, employees and agents in performing this Agreement. The City agrees that its obligations under this subsection shall extend to any claim, demand, and cause of action brought by or on behalf of any employees or agents. For this purpose, the City, by mutual negotiation, hereby waives, as respects to the Artist only, any immunity that would otherwise be available against such claims under the Industrial Insurance provisions of Title 51 RCW. In the event the Artist incurs any judgement, award or cost arising therefrom including reasonable attorneys' fees to enforce the provisions of this subsection, all such fees, expenses, and costs shall be recoverable from the City.

C. For purposes of this Agreement, "claims" shall include, but not be limited to, an allegation, claim or assertion that distribution, transfer, or use of any kind of the Artworks, software, books, documents, reports, films, tapes, or sound reproductions of materials of any kind, delivered hereunder, constitutes an infringement of any third party's intellectual property rights including copyright, patent, trademark, or trade name infringement, or otherwise results in an unfair trade practice under state or federal law. If the Artworks are in any action held to constitute an infringement of any third party's rights and its use is enjoined, the Artist shall immediately and at his/her expense (a) procure for

the City the right to continue its use of the Artworks in accordance with this Agreement, (b) alter the Artworks to eliminate infringement portions, subject to the City's approval, or (c) replace the artwork with a version acceptable to the City that is non-infringing.

D. The City shall not be liable to the Artist for any unauthorized use of the Artworks by third parties.

8. Insurance.

The Artist 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 Artist, its agents, representatives or employees.

A. Minimum Scope of Insurance.

Artist 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. Visual Artists do NOT require professional liability insurance however, in the event that services delivered as a part of this Contract require professional services, Professional Liability, Errors and Omissions coverage shall be provided. "Professional Services", for the purpose of this Contract section shall mean any services provided by a licensed professional, such as structural review or engineering.

B. Minimum Amounts of Insurance.

Artist shall maintain the following insurance limits:

1. Automobile Liability insurance shall be written with limits no less than the minimum coverage as required by the State of Washington.

2. Commercial General Liability insurance shall be written with limits no less than \$1,000,000 each occurrence, \$2,000,000 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 Artist'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 Artist's insurance and shall not contribute with it.

2. The Artist'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.

Artist 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 Artist before commencement of the work.

9. **Artwork Changes.**

The Artist acknowledges that time is of the essence, and that delay may impact fabrication of the Artworks in the Parks. The parties agree that material changes may be made to an Artworks' design by the Artist prior to the City's acceptance of said Artworks (such as changes in the Artworks' material, color, size, relative scale as compared to the preliminary design therefor that was most recently accepted or approved by the City, etc.), but only after the Artist has given written notice of such desired changes to the City and has received written approval by the City for each such change.

10. **Record Keeping and Reporting.**

A. The Artist shall maintain accounts and records, including personnel, property, financial, and programmatic records, which sufficiently and properly reflect all direct and indirect costs of any nature expended and services performed pursuant to this Agreement. The Artist 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. 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.

11. **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.

12. **Termination.**

A. The City reserves the right to terminate or suspend this Agreement at any time, with or without cause, upon seven (7) days prior written notice.

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

C. This Agreement may be canceled immediately if the Artist's insurance coverage is canceled for any reason, or if the Artist is unable to perform the services called for by this Agreement.

D. The Artist reserves the right to terminate this Agreement with not less than fourteen (14) days written notice, or in the event that outstanding invoices are not paid within sixty (60) days.

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

13. **Discrimination Prohibited.** The Artist shall not discriminate against any employee, applicant for employment, or any person seeking the services of the Artist under this Agreement, on the basis of race, color, religion, creed, sex, sexual orientation, age, national origin, marital status, presence of any sensory, mental or physical disability, or other circumstance prohibited by federal, State or local law or ordinance, except for a bona fide occupational qualification.

14. **Assignment and Subcontract.** The work and services required of the Artist by this Agreement are personal, and the Artist shall not assign, delegate, or transfer any portion of the services contemplated by this Agreement without the prior written consent of the City. This provision shall not prohibit Artist from employing qualified personnel for work under the Artist's direct supervision regarding the artwork except the Artist shall not permit any such person to acquire any copyright, ownership interest, lien right, or other property interest in the Artworks.

15. **Conflict of Interest.** The Artist 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 Artist is asked to perform services for a project with which it may have a conflict, Artist will immediately disclose such conflict to the City.

16. **Confidentiality.** All information regarding the City obtained by the Artist in performance of this Agreement shall be considered confidential. Breach of confidentiality by the Artist shall be grounds for immediate termination.

17. **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 Artist 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.

18. **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. If there is a conflict between the terms and conditions of this Agreement and the attached exhibits, then the terms and conditions of this Agreement shall prevail over the exhibits. Changes which are mutually agreed upon shall be incorporated by written amendments to this Agreement.

19. **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 Artist shall be sent to the following address:

Jennifer Dixon
325 30th Avenue
Seattle WA 98122
jenleedix@gmail.com
Phone No.: (206) 909-5978

20. **Applicable Law; Venue; Attorneys' Fees.** This Agreement shall be governed by and construed in accordance with the laws of the State of Washington. In the event any suit, arbitration or other proceeding is instituted to enforce any term of this Agreement, 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.
21. **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 Artist, 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.

ARTIST

By: 
Jennifer Dixon
Title: Artist
Date: 2/3/20

CITY OF KENMORE

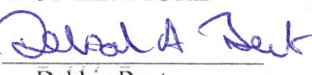
By: 
Debbie Bent
Title: Community Development
Date: 2/3/20

EXHIBIT A - SCOPE OF SERVICES

**CONTRACT FOR DESIGN OF ARTWORKS AT LOG BOOM PARK,
RHODODENDRON PARK AND SQUIRE'S LANDING PARK
Contract No. 19-C2099**

Scope of Services to be Provided by Artist. The Artist shall furnish services including, but not limited to, the following:

Design Services

The Artist has been selected to develop artistic designs for the fabrication and installation of artworks in three Kenmore waterfront parks:

- Log Boom Park, 17415 61st Avenue NE
- Rhododendron Park, 6910 NE 170th Street
- Squire's Landing Park, 7353 NE 175th Street

The Artist agrees that an essential element of this Agreement is the skill and creativity of the Artist. The Artist, therefore, shall not assign the creative or artistic portions of the work to another party without the consent of the City.

Scope of Services

The Attached Scope of Services includes task, schedule for deliverables and fee associated with the tasks/deliverables. The Scope of Services shall meet the Art Project Goals set forth in RFQ 19-C2099 (Attached to the Exhibit A Scope of Services).

Exhibit A SCOPE OF SERVICES
Contract No. 19-C2099

TASK #1

- a) Meet with Designers
- b) Deliver work plan and schedule to City of Kenmore
- c) Begin historical research
- d) Submit report of work performed to date, including meetings attended

Deliverable: Work Plan completed by February 15

\$2,000

TASK #2

- a) Meetings with Design Team in person or remotely
- b) Site visits (one with Design Team member if possible)
- c) Meet with community representatives
- d) Research materials, talk to fabricators/vendors
- e) Attend Community Open House February 26
- f) Submit preliminary drawings and reports illustrating preliminary design
- g) Present Preliminary Design to the Ad-Hoc Public Art committee to receive feedback for the final design March 9-13
- h) Submit report of work performed to date, including meetings attended, preliminary concepts, etc.

**Deliverable: Concept (Preliminary) Design for All Three Parks
completed by March 9-13**

\$6,500

TASK #3

- a) Continue to coordinate with Design team and City of Kenmore regarding concepts, materials, locations, etc.
- b) Present Final Designs to Ad-Hoc Public Art Committee for approval April 6-10
- c) Coordinate with Design Team to prepare and complete construction documents for Log Boom Park
- d) Attend City Council Meeting on April 27 when Ad-Hoc Public Art Committee Recommends the final designs for City Council approval
- e) Submit finalized construction documents for Log Boom Park to the Design Team including engineering and technical specifications, materials fabrication and attachment methods
- f) Submit report of work performed to date, including meetings attended preliminary concepts, etc.

**Deliverable: Final Design/Construction Documents Log Boom
completed by April 6-10**

\$6,500

**Exhibit A SCOPE OF SERVICES
Contract No. 19-C2099**

TASK #4

- a) Coordinate with Design Team to prepare and complete Construction Documents for Squire's Landing Park
- b) Submit finalized construction documents for Squire's Landing Park to the Design Team that include engineering and technical specifications, fabrication and attachment methods, and all materials to be included in construction documents
- c) Finalize Rhododendron Park for fabrication phase
- d) Submit report of work performed to date, including meetings attended, etc.

Deliverable: Construction Documents Squire's Landing Park and Fabrication Ready Design for Rhododendron Park completed by May 18 \$5,000

FEE FOR SERVICES

Task 1: Work Plan	\$2000.00
Task 2: Preliminary Design	\$6,500.00
Task 3: Final Design	\$6,500.00
Task 4: Construction Docs	<u>\$5,000.00</u>
TOTAL	\$20,000.00

SCHEDULE FOR DELIVERABLES

Task 1: Work Plan	February 15, 2020
Task 2: Prelim Design	March 9-13, 2020
Task 3: Final Design	April 6-10, 2020
Task 4: Construction Docs	May 18, 2020

SCOPE OF SERVICES ATTACHMENTS

Attachment 1: RFQ 19-C2099 Art Project Goals: Task 2 and 3 Deliverables shall meet the Art Project Goals set forth in RFQ 19-C2099.

EXHIBIT A Scope of Services
ATTACHMENT 1



CITY OF KENMORE, WASHINGTON

**A CALL FOR ARTISTS
REQUEST FOR QUALIFICATIONS (RFQ)
RFQ 19-C2099**

**ARTIST FOR THREE WATERFRONT PARKS:
Log Boom, Rhododendron and Squire's Landing**

Date Issued: November 29, 2019
Proposals Due: December 20, 2019 4:00 PM Pacific Time

Budget: \$143,473 (Design/Fabricate/Install)

The City of Kenmore is seeking an artist or artist team to develop artworks for three Kenmore waterfront parks:

- Log Boom Park: 17415 61st Avenue NE
- Squire's Landing Park: 7353 NE 175th Street
- Rhododendron Park: 6910 NE 170th Street



Description

Waterfront access improvements are planned at all three parks as part of the Walkways and Waterways bond levy that passed in 2016. Construction is expected between 2020-2023.

The three Kenmore parks, bordering on the intertwined natural waterways ecosystem of river, stream and lake that define the City, will be grouped together for this public art opportunity. This approach gives an artist the prospect of creating stimulating, responsive artworks that showcase the interconnected waterway systems at work in Kenmore's natural environment. This enhances the community's understanding and appreciation of a wonderful part of their City's environment. It is important to take full advantage of the uniqueness of Kenmore's water tied to open spaces to give the community places of respite that contrast with the surrounding built and infrastructure environment.

The process for these linked public art projects is to select an artist in a timely manner so that they are able to work in a limited collaboration with the park design team (Mott McDonald, JA Brennan Landscape Architecture and Confluence) to develop artworks underlying and complementing the design of each park and impacting the experiences people will have within the parks. Beyond its familiarity with the sites as designers, the

team has extensive experience working with artists on previous projects, making this a good opportunity to implement some exciting integrated artwork components.

Art Project Goals

The primary goal is to have an artist create a set of linked public artworks that are genuinely integrated into the natural environment and physical conditions of the three parks. All artworks in each of the parks will uniquely highlight the special relationship Kenmore land has to water and the varied shoreline edge.

Other goals:

- Encourage a range of artwork types to address and weave into the specific environment and designs of each park.
 - Artworks could have diverse conceptual underpinnings and cultural references, and could be of a variety of scales, materials, and how they engage the natural elements.
- Artworks are woven into the parks in ways that creatively expand and deepen the range of momentary experiences all park users will have each time they visit.
- Developed artworks are integral to the community's understanding and sense of each park, as well as how people experience it - whether regular or one-time visitors.
- Artworks impact each park in a special, iconic way emphasizing the specialness of Kenmore's relationship to its varied, rich shoreline.
- Artworks interact with and reveal the notable qualities of the land and water, daily shifting natural elements, park design and uses.
 - Artworks would explore and potentially respond to natural elements such as rainwater, water conditions of the river, stream or lake, light and shadows, wind, seasonal and time of day changes, etc. -- revealing these fundamental natural elements and forces to people in imaginative ways. This approach becomes a signature of the artworks in these parks.
- Artworks are engaging and meaningful for all by paying deliberate attention to diversity of ages of those who will be visiting and using these parks.
- Artworks may also provide elements of playfulness and fun, continuing the "love of Kenmore" theme where artwork projects have been implemented by community members to foster beauty and art and connect people together.

Background

The City of Kenmore is unique in the abundance of natural systems that weave in and around the city, connecting the different neighborhoods through stream corridors, sensitive areas, and ravines to the Sammamish River and Lake Washington. These natural elements have defined and continue to affect Kenmore's community setting. The natural environment provides habitat for fish and wildlife, enhances water, air and soil quality, and provides areas for passive recreation. Many of the city's existing parks are located beside or contain a creek, river, or freshwater shoreline, wetlands or significant forested areas.

Kenmore is approximately 6.15 square miles in area, with roughly 39,000 lineal feet of shoreline on Lake Washington (21,000 lineal feet) and along the Sammamish River (18,000 lineal feet). Improving public access to Kenmore's waterfront is a priority. The City has over seven miles of shoreline on Lake Washington and the Sammamish River but limited opportunities for public access.

Urban Parks

Urban parks are an essential component of a healthy, meaningfully balanced life when we live within the built environment of a city. Parks provide a place for people to shift from their daily responsibilities to a more relaxed, open experience of time and place. Parks provide a spectrum of experiences that contribute to personal and family wellbeing, while at the same time strengthening community through shared, interactive use.

Parks are very much about a range of experiences framed by what is happening. There are active and passive activities, differences based on time of day, weather and natural cycles, whether alone or with others, and more. Parks are places that provide the full experiential spectrum - from quiet solace to energetic activities. As such, they offer a fantastic, ever-shifting array of various conditions and unexpected circumstances. These conditions in turn offer park visitors on-going experiences that are unique from visit to visit, even if for example, the same trail is walked again and again.

Cultural Expression and Parks

Each park is wonderfully unique – the setting, the activities, the land, the vistas, the design. Yet the addition of art in a park can energize, enliven and enrich a particular park even further. Using art to further expand on a park's particular uniqueness elevates that park to a place with the potential to provide even more memorable connections to place and people.

Adding a cultural, artful voice unfurling in unexpected ways expands the experiences of the environment of the park. Artworks encourage a spirit of creativity among visitors as they engage with imaginative, unexpected additions to a park's environment. This engagement enhances the potential for remembering each visit by changing how

people are engaged physically, mentally, and emotionally from moment-to-moment while in the park.

Therefore, an art intervention in a park should generate unexpected experiences paired with the more typical park experiences of the weather, light, time of day, planned and unplanned activities, time spent alone or with friends and family, unexpected conditions or friendly meetings that shift one's planned uses of the park.

Opportunities for Artwork at the Three Parks

The park design for Log Boom Park and Squires Landing Park are both reaching 60%. The selected artist can work with the design team during the last part of the design process to propose artworks that integrate deeply into the parks. The following framework of integrated artwork opportunities for each park gives the chosen artist ample opportunities to select from the range of highlighted locations listed within each park. That said, they will have to be strategic in determining the most effective way to use the art budget over the three parks.

1. Log Boom Park

The public will have access to Lake Washington at the park's westside through an existing beach expansion, new trails and viewpoints, picnic areas, waterfront pavilion, environmental enhancements, and access for hand-powered watercraft. This park is bounded to the north by the Burke Gilman Trail.

The primary new construction in this park begins west of the existing restroom and continues westward past a new hand-carry watercraft rental building, the new beach with gathering plaza, into a more natural area with a connection to the shoreline that is more secluded. It ends with a connection to the Burke Gilman Trail. There are select locations in the park an artist can integrate art into that have the potential to overlap with the design construction documents and construction budget.

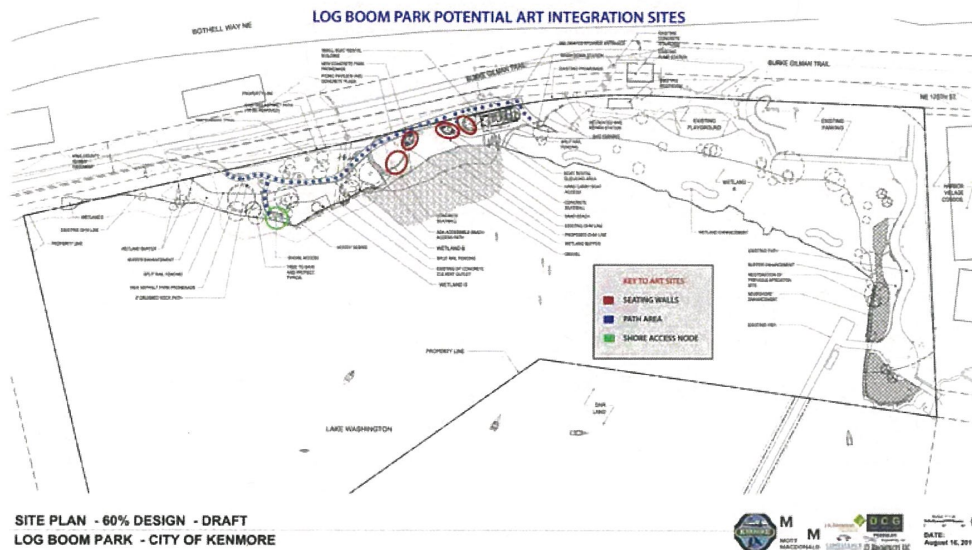
There are numerous components and areas of the park that an artist can work to integrate art into, and potential to overlap with the design construction documents and construction budget:

- Consider a sequential, selectively placed set of artworks relating to the new section of the park's linear western half of the park's pathway system
- Place art at particular points of interest along the path, carrying people along
- Place art in the more natural, wooded area to create an evocative, special environment within the larger park environment

Functionally, also available to consider are:

- Several seating walls in the gathering plaza

- Surfaces of the concrete portions of the new pathway



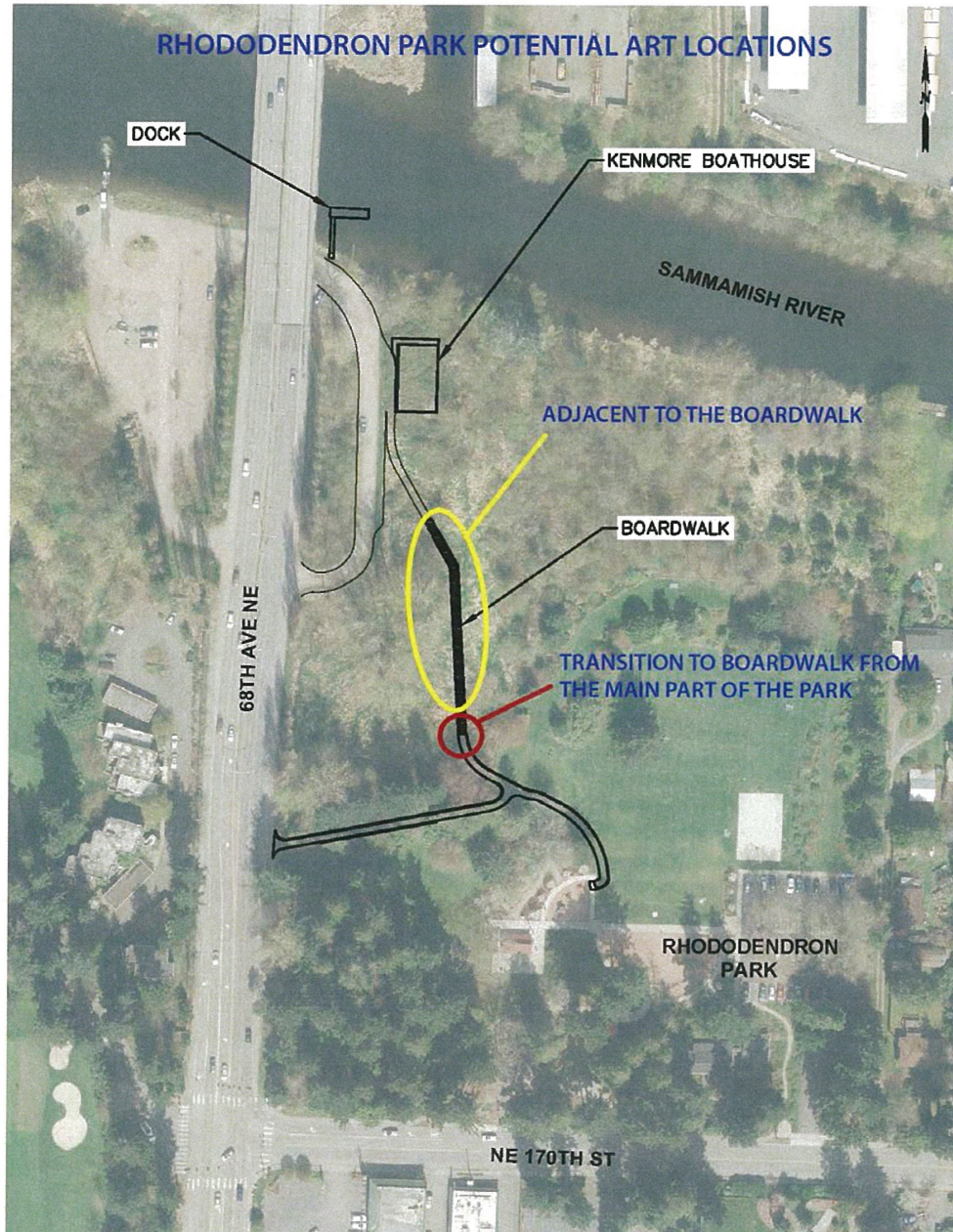
2. Rhododendron Park

This is an established park with new access to the Sammamish River created by a boardwalk and trail through an enhanced natural open space leading to the riverfront, completed in 2018. The trail ultimately provides access to the river shoreline and a float for hand-carry watercraft access. There are also environmental enhancements to the shoreline and wetlands. The boardwalk is an important addition to the park as it gives people water access – either directly for boats or for the pure enjoyment of being at the river. Within the main part of the park there are no views of the river.

The boardwalk leaves the main part of the park at the northwest corner of the large open area of the park. The entrance to the boardwalk is not particularly visible, so not readily apparent. For some, the river access remains a hidden gem in the park.

There is an opportunity to:

- Highlight the boardwalk where it connects with the main part of the park
- Gesture towards the river and the float



3. Squire's Landing Park

This is a new 6.5-acre park improvement project that enhances public access to the Sammamish River and Swamp Creek. Major natural open space restoration, trails, boardwalks, and water viewing points will connect the park to the river and creek and will allow visitors to gain a better understanding of the connection to Lake Washington. The project will also add functional elements - new floating docks, parking, picnic shelter, and a restroom.

The natural and functional environments of this larger park will be highly varied. People can enter the park from the street on foot on a forested pathway or through the parking area similar to those who arrive by car. Park users will be there for many reasons -- passive time in the forested area on paths and near the water at the shoreline edges, bringing many types of watercraft to launch, picnicking and more.

There are numerous components and areas of the park that an artist can work to integrate art into, and potential to overlap with the design construction documents and construction budget:

- A central plaza area with links to paths and watercraft launching access. A key path/boardwalk continues from the plaza towards the water - passing through wetlands and adjacent to a stunning row of old, second growth cedar trees.
- At the end of the boardwalk is a turnaround node at the water's edge.
- Two pre-fab pedestrian bridges cross over water: one across the lagoon to a picnic area; the other over Swamp Creek to paths leading to the Sammamish River.
- Three water view nodes on boardwalks ending at both waterways.

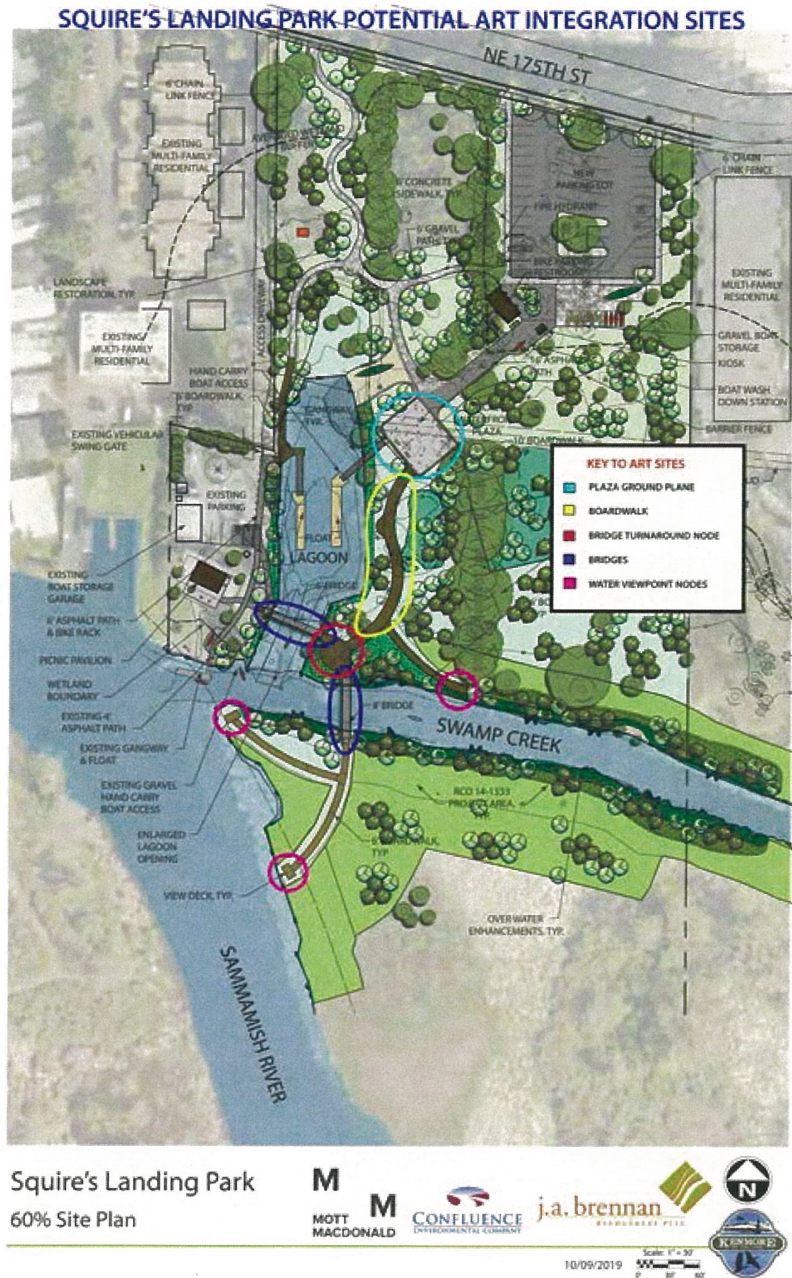


EXHIBIT C
City of Kenmore
Billing Invoice

To: City of Kenmore
18120 68th Ave. NE
Kenmore, Washington 98028
Phone: (425) 398-8900
Fax: (425) 481-3236

Contract Number: 19-C2099

Invoice Number: _____ Date of Invoice: _____

Consultant: Jennifer Dixon, Artist
Mailing Address: 325 30th Avenue, Seattle WA 98122
Telephone: (206) 909-5978

Contract Period: January 27-May 31, 2020 Reporting Period: _____

Amount requested this invoice: \$ _____

Attach itemized description of services provided.

Specific Program: Public Art for Three Waterfront Access Projects at Log Boom, Squire's Landing and Rhododendron Parks.

BUDGET SUMMARY

Total contract amount	\$ 20,000.00
Previous payments	\$ _____
Current request	\$ _____
Balance remaining	\$ _____

Authorized Signature (Required)

Authorized signature

City of Kenmore Use Only

Approved for Payment by: _____ Date: _____

Exhibit D

Form W-9 (Rev. October 2018) Department of the Treasury Internal Revenue Service	Request for Taxpayer Identification Number and Certification ▶ Go to www.irs.gov/FormW9 for instructions and the latest information.	Give Form to the requester. Do not send to the IRS.
1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank. Jennifer Leigh Dixon		
2 Business name/disregarded entity name, if different from above		
Print or type. See Specific Instructions on page 3.	3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only one of the following seven boxes.	
	☒ Individual/sole proprietor or single-member LLC ☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____ ☐ Other (see instructions) ▶ _____ ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate	
	4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) _____ Exemption from FATCA reporting code (if any) _____ (Applies to accounts maintained outside the U.S.)	
	5 Address (number, street, and apt. or suite no.) See instructions. 325 30th Avenue	
6 City, state, and ZIP code Seattle WA 98122		Requester's name and address (optional)
7 List account number(s) here (optional)		
Part I Taxpayer Identification Number (TIN) Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see <i>How to get a TIN</i> , later. Note: If the account is in more than one name, see the instructions for line 1. Also see <i>What Name and Number To Give the Requester</i> for guidelines on whose number to enter.		
Social security number Employer identification number 60		
Part II Certification Under penalties of perjury, I certify that:		
1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and 2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and 3. I am a U.S. citizen or other U.S. person (defined below); and 4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.		
Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.		
Sign Here	Signature of U.S. person ▶	Date ▶ 1/32/20
General Instructions Section references are to the Internal Revenue Code unless otherwise noted. Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to www.irs.gov/FormW9 . Purpose of Form An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.		
• Form 1099-DIV (dividends, including those from stocks or mutual funds) • Form 1099-MISC (various types of income, prizes, awards, or gross proceeds) • Form 1099-B (stock or mutual fund sales and certain other transactions by brokers) • Form 1099-S (proceeds from real estate transactions) • Form 1099-K (merchant card and third party network transactions) • Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition) • Form 1099-C (canceled debt) • Form 1099-A (acquisition or abandonment of secured property) Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN. <i>If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.</i>		



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
1/23/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER C Don Filer Agency 4201 Roosevelt Way NE Suite 200 Seattle WA 98105-6608		CONTACT NAME: Shari Lofquist PHONE (A/C, No, Ext): (206) 545-4800 FAX (A/C, No): (206) 545-4849 E-MAIL ADDRESS: slofquist@filerinsurance.com	
INSURED Jennifer Dixon 325 30th Ave Seattle WA 98122		INSURER(S) AFFORDING COVERAGE INSURER A: Ohio Security Ins Co NAIC # 24082 INSURER B: INSURER C: INSURER D: INSURER E: INSURER F:	

COVERAGES		CERTIFICATE NUMBER: City of Kenmore		REVISION NUMBER:			
THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATION MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.							
INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	☒ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☒ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☒ POLICY ☐ PRO-JECT ☐ LOC OTHER:			BL557953349	1/22/2020	1/22/2021	EACH OCCURRENCE \$ 1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 1,000,000 MED EXP (Any one person) \$ 15,000 PERSONAL & ADV INJURY \$ 1,000,000 GENERAL AGGREGATE \$ 2,000,000 PRODUCTS - COMP/OP AGG \$ 2,000,000
	AUTOMOBILE LIABILITY ☐ ANY AUTO ☐ ALL OWNED AUTOS ☐ HIRED AUTOS ☐ SCHEDULED AUTOS ☐ NON-OWNED AUTOS						COMBINED SINGLE LIMIT (Ea accident) \$ BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
	UMBRELLA LIAB ☐ OCCUR EXCESS LIAB ☐ CLAIMS-MADE DED ☐ RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$ \$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	Y/N	N/A				PER STATUTE ☐ OTH-ER ☐ E.L. EACH ACCIDENT \$ E.L. DISEASE - EA EMPLOYEE \$ E.L. DISEASE - POLICY LIMIT \$
DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required) Certificate holder is additional insured. Re: Contract # 20-C2135							

CERTIFICATE HOLDER	CANCELLATION
City of Kenmore Maureen Colaizzi, Parks Proj Mgr 18120 68th Ave NE Kenmore, WA 98028	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE Shari Lofquist/SHARI <i>Shari Lofquist</i>

ACORD 25 (2014/01)
INS025 (201401)

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CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)
01/23/2020

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Evan Silvers Agency 2213 E Madison St Seattle, WA 98112	CONTACT NAME: Evan Silvers PHONE (A/C, No, Ext): 2064857464 FAX (A/C, No): E-MAIL ADDRESS: Evan@EvanSilversIns.org																					
INSURED Jennifer L Dixon 325 20th Ave Seattle, WA 98122	<table border="1"> <tr> <th colspan="2">INSURER(S) AFFORDING COVERAGE</th><th>NAIC #</th></tr> <tr> <td>INSURER A :</td><td>State Farm Mutual Automobile Insurance Company</td><td>25178</td></tr> <tr> <td>INSURER B :</td><td></td><td></td></tr> <tr> <td>INSURER C :</td><td></td><td></td></tr> <tr> <td>INSURER D :</td><td></td><td></td></tr> <tr> <td>INSURER E :</td><td></td><td></td></tr> <tr> <td>INSURER F :</td><td></td><td></td></tr> </table>	INSURER(S) AFFORDING COVERAGE		NAIC #	INSURER A :	State Farm Mutual Automobile Insurance Company	25178	INSURER B :			INSURER C :			INSURER D :			INSURER E :			INSURER F :		
INSURER(S) AFFORDING COVERAGE		NAIC #																				
INSURER A :	State Farm Mutual Automobile Insurance Company	25178																				
INSURER B :																						
INSURER C :																						
INSURER D :																						
INSURER E :																						
INSURER F :																						

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATION MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
	COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☐ OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PRO-JECT ☐ LOC OTHER:						EACH OCCURRENCE \$ DAMAGE TO RENTED PREMISES (Ea occurrence) \$ MED EXP (Any one person) \$ PERSONAL & ADV INJURY \$ GENERAL AGGREGATE \$ PRODUCTS - COMP/OP AGG \$ \$
	AUTOMOBILE LIABILITY ☒ ANY AUTO ☐ OWNED AUTOS ONLY ☐ HIRED AUTOS ONLY ☐ SCHEDULED AUTOS ☐ NON-OWNED AUTOS ONLY			344 6195-A11-471	01/11/2020	07/11/2020	COMBINED SINGLE LIMIT (Ea accident) \$ BODILY INJURY (Per person) \$ 100,000 BODILY INJURY (Per accident) \$ 300,000 PROPERTY DAMAGE (Per accident) \$ 100,000 \$
	UMBRELLA LIAB ☐ OCCUR EXCESS LIAB ☐ CLAIMS-MADE DED RETENTIONS \$						EACH OCCURRENCE \$ AGGREGATE \$ \$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) ☐ Y/N If yes, describe under DESCRIPTION OF OPERATIONS below		N/A				PER STATUTE ☐ OTH-ER ☐ E.L. EACH ACCIDENT \$ E.L. DISEASE - EA EMPLOYEE \$ E.L. DISEASE - POLICY LIMIT \$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)
 2013 Volkswagen Jetta VIN # 3VWPP7AJ2DM643752

CERTIFICATE HOLDER

CANCELLATION

Jennifer L Dixon & David A Shapiro 325 30th Ave Seattle, WA 98122	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE

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ACORD 25 (2016/03)

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1001486 132849.12 03-16-2016

Attachment 3 Draft Fabrication Contract

CONTRACT
FABRICATION AND INSTALLATION OF ARTWORKS AT
LOG BOOM PARK, RHODODENDRON PARK AND SQUIRE'S
LANDING PARK
Contract No. 20-C2159

This Agreement is entered into by and between the City of Kenmore, Washington, a municipal corporation ("City") and Jennifer Dixon ("Artist") whose address is 325 30th Avenue, Seattle, Washington 98122.

WHEREAS, the City Council has authorized the appropriation of one percent for art on qualifying capital improvement projects that are undertaken by the City ("1% for Art") for the selection, acquisition and installation of original works of art in the City; and

WHEREAS, the citizens of Kenmore approved Proposition 1 Walkways & Waterways Improvements bond measure, which in part, funds capital improvements and public access to waterfront parks; and

WHEREAS, the City Council has authorized the use of funds from 1% for Art for the design and fabrication of artworks in the following Kenmore parks: Log Boom Park, 17415 61st Avenue NE, Rhododendron Park, 6910 NE 170th Street, and Squire's Landing Park, 7353 NE 175th Street (collectively, the "Parks"); and

WHEREAS, the City published a Request for Qualifications ("RFQ") with the primary goal of selecting an artist to design and fabricate a set of linked public artworks that are genuinely integrated into the natural environment and physical conditions of the Parks, and that will uniquely highlight the special relationship Kenmore land has to water and the varied shoreline edge (the "Artworks"); and

WHEREAS, after completion of the RFQ process, the City selected the Artist to design the Artworks in the Parks; and

WHEREAS, the City Council desires to retain Artist to perform the artistic services described in this Agreement, including the fabrication and installation of the Artworks in the Parks, as further described in Exhibit "A", subject to the terms and conditions in this Agreement;

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 Artist.

A. The Artist shall fabricate and install the Artworks for the Parks pursuant to the approved designs, and perform the Scope of Services described in Exhibit "A" of this Agreement, attached hereto and incorporated by reference ("Services"). In performing the Services, the Artist shall comply with all federal, state and local laws and regulations

applicable to the services. The Artist shall diligently perform the Services in accordance with professional standards of conduct and in strict compliance with all terms and conditions of this Agreement. Should the Artist engage any subcontractors in the performance of the Services, the Artist agrees to require all such subcontractors to be bound by the terms and conditions of this Agreement. Notwithstanding the foregoing, Artist shall not assign the creative or artistic portion of the Services to another party without the prior written consent of the City.

B. The City shall have the sole responsibility for determining stages of completion of the Services. The Services shall, at all times, be subject to the City's general review and approval. The Artist shall confer with the City periodically during the progress of the Services, and shall prepare and present such information and materials (e.g., a detailed outline of completed work) as may be pertinent, necessary or requested by the City to determine the adequacy of the Services performed and the Artist's progress.

C. Upon reasonable prior notice to Artist, the City and its officers, employees and agents shall have the right to make reasonable inspections and reviews of the Artist's progress with respect to the Services.

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

The City shall pay Artist:

[Check applicable method of payment]

 X For satisfactory completion of the scope of work described in Exhibit A in an amount not to exceed \$123,473, payable in the specified amounts upon the completion of deliverable milestones described in Exhibit A. The amount of compensation is inclusive of all applicable state and federal taxes, including any Washington State Sales/Use Tax owed by the City or the Artist as a result of this Contract. It shall be the responsibility of the Artist to remit all such taxes to the Washington State Department of Revenue and/or any other applicable taxing authorities.

 A sum not to exceed \$ ___

 Other (describe):

Artist shall complete and return to the City Exhibit "D," Tax Identification Number," prior to or along with the first billing invoice. The Artist shall only submit invoices based on performing the Services described in Exhibit A. The City shall pay the Artist for Services rendered within ten (10) days after City Council voucher approval.

3 Duration of Agreement. This Agreement shall be in full force and effect for a period commencing upon execution of this Agreement, and shall terminate upon completion of Services, unless extended by agreement of the parties, or unless sooner terminated under the

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

4 Copyright; City's Right to Reproduce Images; City's Ownership of Artworks.

A. The Artist shall retain the copyright and all other intellectual property rights to the Artworks, provided that the City is hereby granted an irrevocable, non-exclusive, royalty free license to use and to authorize third parties to graphically reproduce (through photography or otherwise), in perpetuity, the image of the Artworks, including but not limited to, the artwork proposal and all preliminary studies, models and maquettes thereof that have been delivered to and accepted by the City, and to authorize third parties to graphically reproduce (through photography or otherwise) any and all of the same, as are desired by the City for municipal (e.g., education, public information, etc.) purposes and not for financial gain. On each such municipal reproduction, the reproductions by the City will contain a credit to the Artist and a copyright notice substantially in the following form: "Copyright, Artist's name, all rights reserved, date" in such a manner and location as shall comply with the U.S. Copyright Laws.

B. Upon the City's acceptance of the fabricated and installed Artworks, the City shall acquire good title to, and own the physical embodiment of the Artworks, including, but not limited to, the Artworks proposals and all preliminary studies, models, and samples and maquettes, free and clear from any and all claims, liens, and charges by any person or entity, including but not limited to, any employee or supplier.

C. The City is not responsible for any third-party infringement of Artist's copyright and not responsible for protecting the intellectual property of Artist.

D. The rights granted by this provision shall survive the expiration or early termination of this Agreement.

5 Warranties.

A. The Artist represents and warrants that:

- i. The Artworks are solely the result of the artistic efforts of the Artist;
- ii. The Artworks are unique and original and do not infringe or violate any copyright, trade secret, trademark, patent, or other proprietary or personal right held by any third party;
- iii. The Artworks (or duplicates thereof) have not been accepted for sale elsewhere;
- iv. The Artist has not sold, assigned, transferred, licensed, granted, encumbered or utilized the Artworks or any element thereof or any

copyright related thereto which may affect or impair the rights granted pursuant to this Agreement;

- v. All Artworks created by the Artist under this Agreement, whether created by the Artist alone or in collaboration with others, shall be wholly original with the Artist and shall not infringe upon or violate the rights of any third party;
- vi. The Artist has the full power to enter and perform this Agreement and to make the grant of rights contained in this Agreement;
- vii. The Artworks are designed to last for at least thirty (30) years unless otherwise stated elsewhere in this Agreement or attachments thereto, whichever is less, and guarantees the Artworks against any faulty material or workmanship. The Artist shall, at the City's option, remedy and/or pay for any loss or damage resulting therefrom that occurs or appears within a period of one (1) year after the date the City accepts each Artwork. The City shall give written notice with reasonable promptness to the Artist regarding observed defects in any Artworks. Nothing contained herein nor any action whatsoever by the City shall constitute an acceptance of work not done in accordance with the provisions of this Agreement or relieve the Artist of liability or responsibility for faulty material or workmanship; and
- viii. These representations and warranties shall survive the termination or expiration of this Agreement.

6. Independent Contractor. The Artist and the City agree that the Artist is an independent contractor with respect to the services provided pursuant to this Agreement. The Artist will be solely responsible for its acts and for the acts of its agents, employees, sub-contractors 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. No employee of the Artist or other persons engaged to perform any work or service required of or by the Artist under this Agreement shall be considered an employee of the City. No claim of any such employee or other person, whether for compensation, wages, industrial insurance, unemployment compensation, or any other benefit or entitlement whatsoever, shall be an obligation of the City.

7. Indemnification.

A. The Artist shall protect, defend, indemnify and save 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 and/or wrongful conduct of the Artist, and/or her officers, employees, sub-contractors, and agents in performing this Agreement. The Artist agrees that her obligations under this subsection shall extend to any claim, demand, and cause of action brought by or

on behalf of any employees or agents. For this purpose, the Artist, by mutual negotiation, hereby waives, as respects to the City only, any immunity that would otherwise be available against such claims under the Industrial Insurance provisions of Title 51 RCW. In the event the City incurs any judgement, award or cost arising therefrom including reasonable attorneys' fees to enforce the provisions of this subsection, all such fees, expenses, and costs shall be recoverable from the Artist.

B. The City shall protect, defend, indemnify and save harmless the Artist, 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 and/or wrongful conduct of the City, its officers, employees and agents in performing this Agreement. The City agrees that its obligations under this subsection shall extend to any claim, demand, and cause of action brought by or on behalf of any employees or agents. For this purpose, the City, by mutual negotiation, hereby waives, as respects to the Artist only, any immunity that would otherwise be available against such claims under the Industrial Insurance provisions of Title 51 RCW. In the event the Artist incurs any judgement, award or cost arising therefrom including reasonable attorneys' fees to enforce the provisions of this subsection, all such fees, expenses, and costs shall be recoverable from the City.

C. For purposes of this Agreement, "claims" shall include, but not be limited to, an allegation, claim or assertion that distribution, transfer, or use of any kind of the Artworks, software, books, documents, reports, films, tapes, or sound reproductions of materials of any kind, delivered hereunder, constitutes an infringement of any third party's intellectual property rights including copyright, patent, trademark, or trade name infringement, or otherwise results in an unfair trade practice under state or federal law. If the Artworks are in any action held to constitute an infringement of any third party's rights and its use is enjoined, the Artist shall immediately and at her expense (a) procure for the City the right to continue its use of the Artworks in accordance with this Agreement, (b) alter the Artworks to eliminate infringement portions, subject to the City's approval, or (c) replace the artwork with a version acceptable to the City that is non-infringing.

D. The City shall not be liable to the Artist for any unauthorized use of the Artworks by third parties.

8 Insurance. The Artist 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 Artist, its agents, representatives or employees.

A. Minimum Scope of Insurance. Artist 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. Visual Artists do NOT require professional liability insurance however, in the event that services delivered as a part of this Contract require professional services, Professional Liability, Errors and Omissions coverage shall be provided. "Professional Services", for the purpose of this Contract section shall mean any services provided by a licensed professional, such as structural review or engineering.

B. Minimum Amounts of Insurance. Artist shall maintain the following insurance limits:

1. Automobile Liability insurance shall be written with limits no less than the minimum coverage as required by the State of Washington.

2. Commercial General Liability insurance shall be written with limits no less than \$1,000,000 each occurrence, \$2,000,000 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 Artist'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 Artist's insurance and shall not contribute with it.

2. The Artist'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. Artist 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 Artist before commencement of the work.

9. **Artwork Changes.** The Artist acknowledges that time is of the essence, and that delay may impact fabrication and installation of the Artworks.

A. Material changes prior to acceptance: The parties agree that material changes may be made to the Artworks by Artist prior to the City's acceptance of said Artworks (such as changes in the Artworks' material, color, size, relative scale as compared to the preliminary design therefor that was most recently accepted or approved by the City, etc.), but only after the Artist has given written notice of such desired changes to the City and has received written approval by the City for each such change. The City reserves the right to reject proposed material changes to the Artworks.

B. Material changes after acceptance. If any material change occurs to the Artworks after they been finally accepted by the City (whether such change is an intentional action of a third party, an accident, or an act of nature), including but not limited to a change to the exterior surface of the artwork or interrelationship or relative locations of the parts of the Artworks, the City reserves the right to determine, after consultation with an independent, professional art conservator, if, when and how any repairs and restoration to the Artworks can be made, and the nature, scope and anticipated cost of any such repair or restoration. The City reserves the right to contract with a conservator, rather than the Artist, to implement any such repairs or restoration.

1. In the event the City determines such repair or restoration should be undertaken, the City will attempt to provide written notice to Artist. Such notice shall: a) explain, in detail, the nature of the change; b) include one or more drawings, photographs, maps, plans, and other documentation to accurately illustrate such change for the information of the Artist; c) outline in detail the recommendations of the conservator, and the proposed repair or restoration means and methods; and d) request the Artist to respond to such recommendations and propose repair, within thirty (30) days after the date of such notice.

2. Within thirty (30) days after the Artist's receipt of the City's notice specified above, the Artist shall provide a written notice to the City specifying, in detail, the Artist's objections, if any, to such proposed repair or restoration work and the reasons for such objection(s). The failure of the Artist to provide such notice to the City within the thirty (30) days after the Artist's receipt of the City's notice shall constitute the Artist's waiver of all objections to repair or restoration of the Artworks (including means and methods) described in the City's notice.

3. The Artist shall not unreasonably withhold approval for any reasonable repair or restoration of the Artworks outline by the City in said notice.

C. The City reserves the right to maintain its facilities and public sites for public purposes, and in so doing, may determine that it is necessary to relocate or remove the Artworks and/or modify the site in/on which the Artworks are located. The City will not relocate or remove the Artworks and/or substantially modify the site in/on which they are located without attempting to notify the Artist of the proposed change and attempting to reach agreement with the Artist regarding the future appearance or locations of the Artworks.

The Artists shall not unreasonably withhold approval of the relocation or removal of Artworks from the sites they are located or the modifications of such locations, as proposed by the City in its notice to the Artist pursuant to this subsection.

i. In the event the City decides to deaccession any of the Artworks, the Artist shall have the first right of refusal to purchase her work, providing it is not integrated into a larger piece of a structure.

ii. If a modification of any of the Artworks occurs without the Artist's written permission and the Artist gives written notice to the City requesting that her name and said artwork be disassociated, the Artwork will no longer be designated as the work of the Artist.

iii. Except as provided herein, the City will not modify the Artworks without written authorization from the Artist regarding the modification. The Artist will not unreasonably withhold such authorization. For purposes of this Agreement, no modification of Artworks that results from the passage of time or the inherent nature of the materials used in the Artworks shall constitute a modification for which the Artist may claim relief or any remedy from the City. In addition, no modification of Artworks that is the result of conservation or of its public presentation (including but not limited to lighting and placement) shall constitute a modification that is prejudicial to the Artist's honor or reputation or for which Artist may claim relief or remedy from the City unless such modification is the direct result of gross negligence.

D. By executing this Agreement the Artist consents to the installation of Artworks in the park facilities identified in this Agreement. The Artist acknowledges that such installation may subject the Artworks to destruction, distortion, mutilation, or other modification by reason of its installation in said location.

10. Repairs and Maintenance. Contingent upon the necessary funds being appropriated for such action, the City shall make a good faith effort to maintain the Artworks as instructed by the Artist, and to secure the Artist's recommendations with regard to repair, maintenance, conservation, and restoration of the Artworks. All repair, maintenance, conservation and restoration shall be performed consistent with accepted principles of professional conservation, to the extent practicable. The City reserves the right to have repair, maintenance, conservation and restoration performed by a professional or contractor other than Artist.

11. Record Keeping and Reporting.

A. The Artist shall maintain accounts and records, including personnel, property, financial, and programmatic records, which sufficiently and properly reflect all direct and indirect costs of any nature expended and services performed pursuant to this Agreement. The Artist 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. 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.

12. 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.

13. Termination.

A. The City reserves the right to terminate or suspend this Agreement at any time, with or without cause, upon seven (7) days prior written notice.

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

C. This Agreement may be canceled immediately if the Artist's insurance coverage is canceled for any reason, or if the Artist is unable to perform the services called for by this Agreement.

D. The Artist reserves the right to terminate this Agreement with not less than fourteen (14) days written notice, or in the event that outstanding invoices are not paid within sixty (60) days.

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

14. Discrimination Prohibited. The Artist shall not discriminate against any employee, applicant for employment, or any person seeking the services of the Artist under this Agreement, on the basis of race, color, religion, creed, sex, sexual orientation, age, national origin, marital status, presence of any sensory, mental or physical disability, or other circumstance prohibited by federal, State or local law or ordinance, except for a bona fide occupational qualification.

15. Assignment and Subcontract. The work and Services required of the Artist by this Agreement are personal, and the Artist shall not assign, delegate, or transfer any portion of the services contemplated by this Agreement without the prior written consent of the City. This provision shall not prohibit Artist from employing qualified personnel for work under the Artist's direct supervision regarding the artwork except the Artist shall not permit any such person to acquire any copyright, ownership interest, lien right, or other property interest in the Artworks.

16. Conflict of Interest. The Artist 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 Artist is asked to perform services for a project with which it may have a conflict, Artist will immediately disclose such conflict to the City.

17. Confidentiality. All information regarding the City obtained by the Artist in performance of this Agreement shall be considered confidential. Breach of confidentiality by the Artist shall be grounds for immediate termination.

18. 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 Artist 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.

19. 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. If there is a conflict between the terms and conditions of this Agreement and the attached exhibits, then the terms and conditions of this Agreement shall prevail over the exhibits. Changes which are mutually agreed upon shall be incorporated by written amendments to this Agreement.

20. 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:

Phone No.: _____

21. Applicable Law; Venue; Attorneys' Fees. This Agreement shall be governed by and construed in accordance with the laws of the State of Washington. In the event any suit, arbitration or other proceeding is instituted to enforce any term of this Agreement, 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.

22. 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 Artist, 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.

ARTIST

By: _____

Title: _____

Date: _____

CITY OF KENMORE

By: _____

Title: _____

Date: _____

EXHIBIT A - SCOPE OF WORK

CONTRACT FOR FABRICATION AND INSTALLATION OF ARTWORKS AT LOG BOOM PARK, RHODODENDRON PARK AND SQUIRE'S LANDING PARK

Contract No. 20-C2159

FABRICATION SCOPE OF WORK

As part of Kenmore's Walkways and Waterways, Jennifer Dixon will complete a series of artworks at three Kenmore parks: Log Boom Park, Rhododendron Park, and Squires Landing. The artworks are a celebration of water and its conveyance, seen and unseen through the natural processes of the water cycle that transport water from the sky to the trees and back to the sky, the culturally historic conveyance of trees/logs/timber on the waters of Lake Washington at Log Boom Park, and the geologically historic movement of water that formed the topography of current day Kenmore.

LOG BOOM PARK: The Artwork consists of a series of integrated works throughout the park.

Flume Sculpture: The main artwork is a steel sculpture "flume" that channels all storm water from the Boat House building to an adjacent rain garden. The sculpture will be attached to the building to receive storm water from two rain gutters: one along the northwest corner of the building and the other beside the northwest corner of the building's canopy.

The overall sculpture will be fabricated of weathering steel and measure: 12' high by 13' wide by 22' long. The flume itself will have 4" sides to channel the storm water into the rain garden. In addition to the attachments to the building, the sculpture will also be attached to two tripod "trestles" constructed of steel tubing in the rain garden.

The artist will work with the project contractors to install the appropriate footings included in the construction documents. City of Kenmore has agreed to cover the costs of the footings that are integrated into the construction documents. The artist will install the attachments to the building, the sculpture and trestles.

Concrete Stamping: In addition to aforementioned sculpture, Dixon will integrate patterns stamped into the concrete ground plane at six areas in the park: The three sets of stairs leading to the beach area and picnic pavilion located at the plaza and the bench bump out and picnic area to the west of the main plaza. The artist will pay for and manage the fabrication of the concrete stamps, in collaboration with the project team. The project's contractor will be given possession of the stamps, test, and execute the stamping as part of the project's contract. There will be no additional cost to the artist.

RHODODENDRON PARK: The artwork consists of three works along a pathway to the water.

Three Cedar Trees: The artwork at Rhododendron Park consists of three cedar logs set vertically at three locations in the park to mark the pathway to the Sammamish River. The logs will each measure 18" in diameter but vary in size: 1- 6', 1- 7', 1- 8'. The logs will have thematic imagery related to the two other parks (Log Boom Park and Squires Landing.) Images will be carved and burned into the logs' fronts with text on their backsides creating an unfolding story poem. Each will be installed with metal knife brackets attached to concrete footings.

SQUIRE'S LANDING PARK: The Artwork consists of a series of integrated works throughout the park.

Laser Cut Art Screen: Three laser cut steel screens will be installed at the northern upper plaza at the northwestern corner of the Boat Storage. The screen serves as a visual anchor for visitors arriving from the parking lot. The imagery will be a modified version of patterns incorporated at Log Boom Park and Rhododendron Park. These screens and the support uprights will be fabricated from weathering steel and be installed by the artist.

Boardwalk: On the extensive boardwalk, Dixon will incorporate a different color of grating to highlight the areas of interest at the site. The artist will work with the manufacturer to specify the color at no extra charge to the artist or the project. The project's contractor will install along with the main boardwalk. Where guardrails are employed along the boardwalk, Dixon will incorporate artwork intermittently along the 6" ipe' top rail. The artist will pay solely for the artwork rendering and will coordinate with the manufacturer the pickup and delivery of the rails.

"Bird Blind" Viewpoints: At the three viewpoints incorporated into the design, artworks inspired by bird blinds will be incorporated at all viewpoints. Using the projects thematic imagery, each "bird blind" will have a unique characteristic and serve to direct visitors' view to the natural surroundings at the park. The artwork will consist of laser cut weathered steel roofs and guardrails and are meant to frame the view as well as cast shadows that convey a sense of being under a forest canopy. In addition, the sloped roofline will channel and direct a minimal amount of storm water to each location and visually and conceptually connect it to the flume sculpture at Log Boom Park.

Concrete Stamping: The artist will integrate patterns stamped into the concrete ground plane at three sites in the park: north upper plaza, waterfront plaza on the east side of the lagoon, and the picnic pavilion on the west side. The stamps will be the same imagery as used at Log Boom Park. Dixon will pay for and manage the fabrication of any additional stamps. The project's contractor will be given possession of the stamps, test and execute the stamping as part of the project's contract. There will be no additional cost to the artist.

DELIVERABLES

LOG BOOM PARK:

Task #1 Delivery of the following to the City of Kenmore:

- Submittal of any changes, revisions (if applicable.)
- Submittal of subcontractor invoice for 50% deposit for fabrication of flume
- Fabrication of stamps

Deliverable: Submittal of documentation to begin fabrication. To be completed
(in accordance with the construction schedule) \$25,000

Task #2 Delivery of the following to the City of Kenmore:

- Delivery of stamps to contractor for testing.
- Meet with contractor regarding stamping and formwork
- Photographic or other documentation of 50% completion of fabrication and/or proof of purchase of materials towards completion.

Deliverable: Submittal of documentation of 50% completion. To be completed
(in accordance with the construction schedule) \$15,000

Task #3 Delivery of the following to the City of Kenmore:

- Final completion and installation of artwork
- Photos of stamping
- Maintenance report submitted

Deliverable: Submittal of documentation to begin fabrication. To be completed
(in accordance with the construction schedule) \$10,000

Fee Subtotal: \$50,000

RHODODENDRON PARK:

Task #1 Delivery of the following to the City of Kenmore:

- Proof of General Liability Insurance
- Engineered footing specifications and revised locations (if applicable) for each Cedar Pole
- Submittal of subcontractor invoice for 50% deposit for fabrication/storage

Deliverable: Submittal of all documentation to begin fabrication. \$8,473

Task #2 Delivery of the following to the City of Kenmore:

- Photographic or other documentation of 50% completion of the fabrication and/or proof of purchase of materials towards completion.

Deliverable: Submittal of documentation 50% completion of fabrication. \$5,000

Task #3 Delivery of the following to the City of Kenmore:

- Final completion and installation of artwork
- Maintenance report

Deliverable: Completion of 100% of work and acceptance thereof by the City of Kenmore
\$5,000

Fee Subtotal: \$18,473

SQUIRE’S LANDING PARK:**Task #1** Delivery of the following to the City of Kenmore:

- Submittal of any changes, revisions (if applicable.)
- Submittal of Invoice for 50% deposit for fabrication

Deliverable: Completion of 100% of work and acceptance thereof by the City of Kenmore. To be completed *(in accordance with the construction schedule)* \$25,000

Task #2 Delivery of the following to the City of Kenmore:

- Delivery of stamps to contractor for testing.
- Meet with contractor regarding stamping and formwork
- Photographic or other documentation of 50% completion of fabrication and/or proof of purchase of materials towards completion.

Deliverable: Submittal of documentation of 50% completion. To be completed *(in accordance with the construction schedule)* \$17,500

Task #3 Delivery of the following to the City of Kenmore:

- Final completion of 100% of work and acceptance thereof by the City of Kenmore
- Final completion and installation of artwork
- Maintenance report submitted

Deliverable: Completion of 100% of work and acceptance thereof by the City of Kenmore. To be completed *(in accordance with the construction schedule)* \$12,500

Subtotal: \$55,000**MILESTONE AND FEE SCHEDULE****Fall 2020: Design Drawings & Specifications***

Artwork elements being installed by the artist:

Rhododendron Park Deliverables: Tasks 1,2, 3 \$18,473

**Design Drawings & Specifications for artworks installed by the contractor are in artist’s design contract 19-C2099*

2021-2022: Fabrication

Log Boom Park Deliverables: Task 1,2,3 \$50,000

Squire’s Landing Park Deliverables: Task 1 \$25,000

2022-2023: Installation

Squire’s Landing Park Deliverables: Task2, 3 \$30,000

Total Fee \$123,473

EXHIBIT B

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

Compensation

1. The Artist shall be paid an amount not to exceed One Hundred Twenty Three Thousand Four Hundred and Seventy Three Dollars (\$123,473), payable in the amounts and upon satisfactory completion of the milestones specified in Exhibit "A" ("Compensation").
2. The amount of compensation is inclusive of all applicable state and federal taxes, including any Washington State Sales/Use Tax owed by the City or the Artist as a result of this Contract. It shall be the responsibility of the Artist to remit all such taxes to the Washington State Department of Revenue and/or any other applicable taxing authorities.

EXHIBIT C

City of Kenmore
Billing Invoice

To: City of Kenmore
18120 68th Ave. NE
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: _____

BUDGET SUMMARY

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

Authorized signature

For Department Use Only

Approved for Payment by: _____ Date: _____

Authorized Signature (Required)

EXHIBIT D

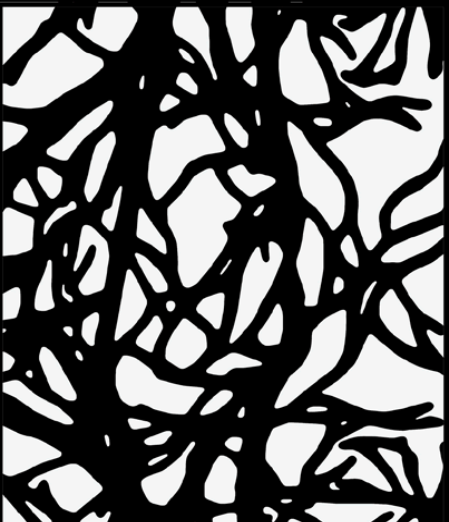
Form W-9 (Rev. December 2014) Department of the Treasury Internal Revenue Service	Request for Taxpayer Identification Number and Certification		Give Form to the requester. Do not send to the IRS.
Print or type See Specific Instructions on page 2.	1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.		
	2 Business name/disregarded entity name, if different from above		
	3 Check appropriate box for federal tax classification; check only one of the following seven boxes: Individual/sole proprietor or single-member LLC C Corporation S Corporation Partnership Trust/estate Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ Note. For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner. Other (see instructions) ▶	4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3): Exempt payee code (if any) Exemption from FATCA reporting code (if any) <i>(Applies to accounts maintained outside the U.S.)</i>	
	5 Address (number, street, and apt. or suite no.)	Requester's name and address (optional)	
	6 City, state, and ZIP code		
7 List account number(s) here (optional)			
Part I Taxpayer Identification Number (TIN)			
Social security number			



**Kenmore Walkways and Waterways
Log Boom Park, Rhododendron Park, and Squire's Landing Park
Public Art Presentation
Jennifer Dixon**

Visual Vocabulary





trees



land

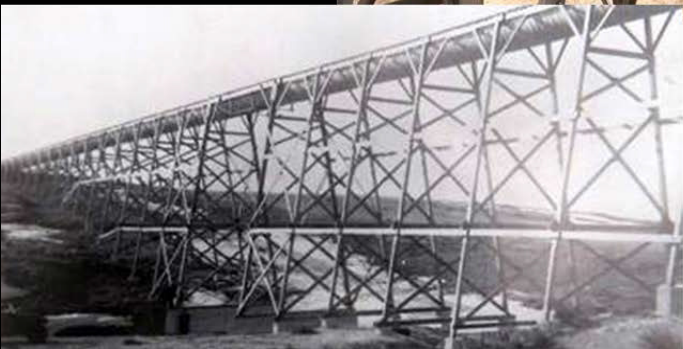


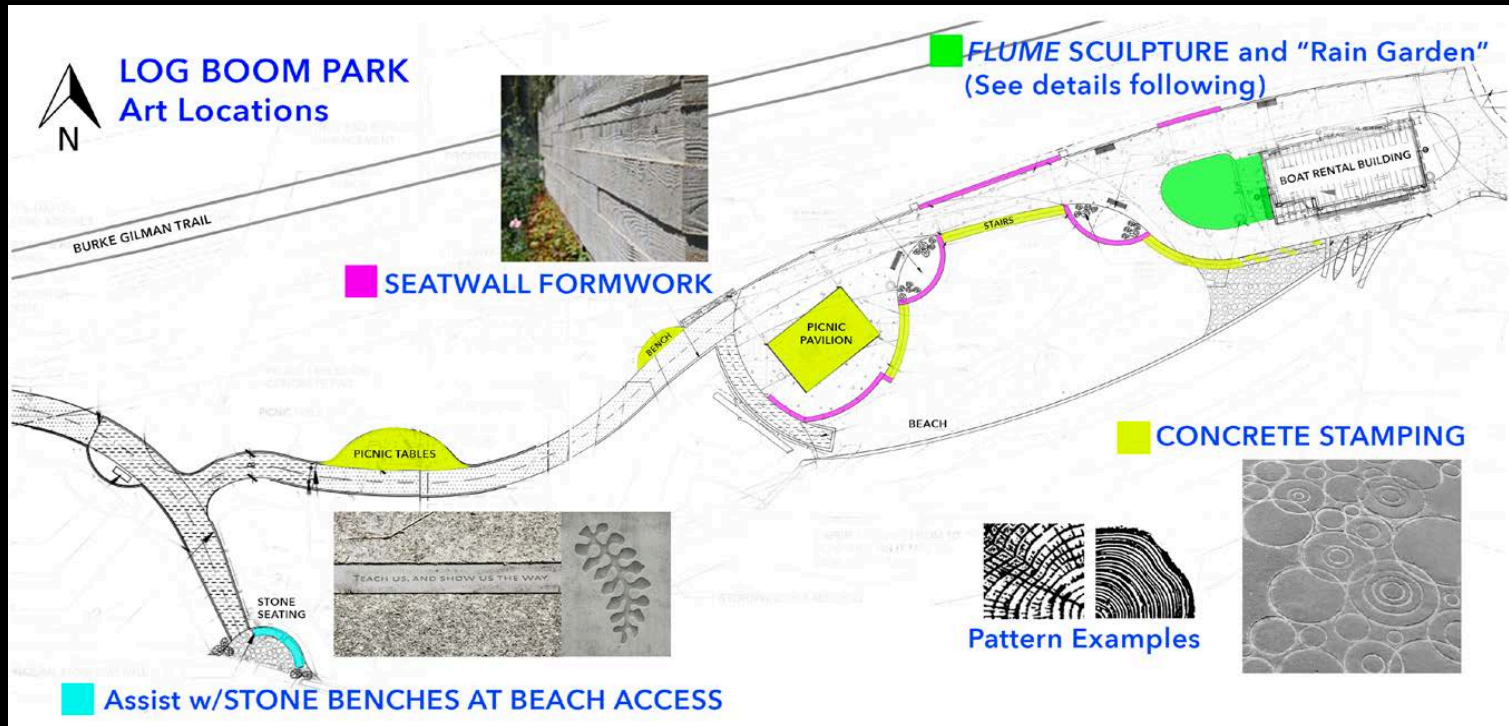
water

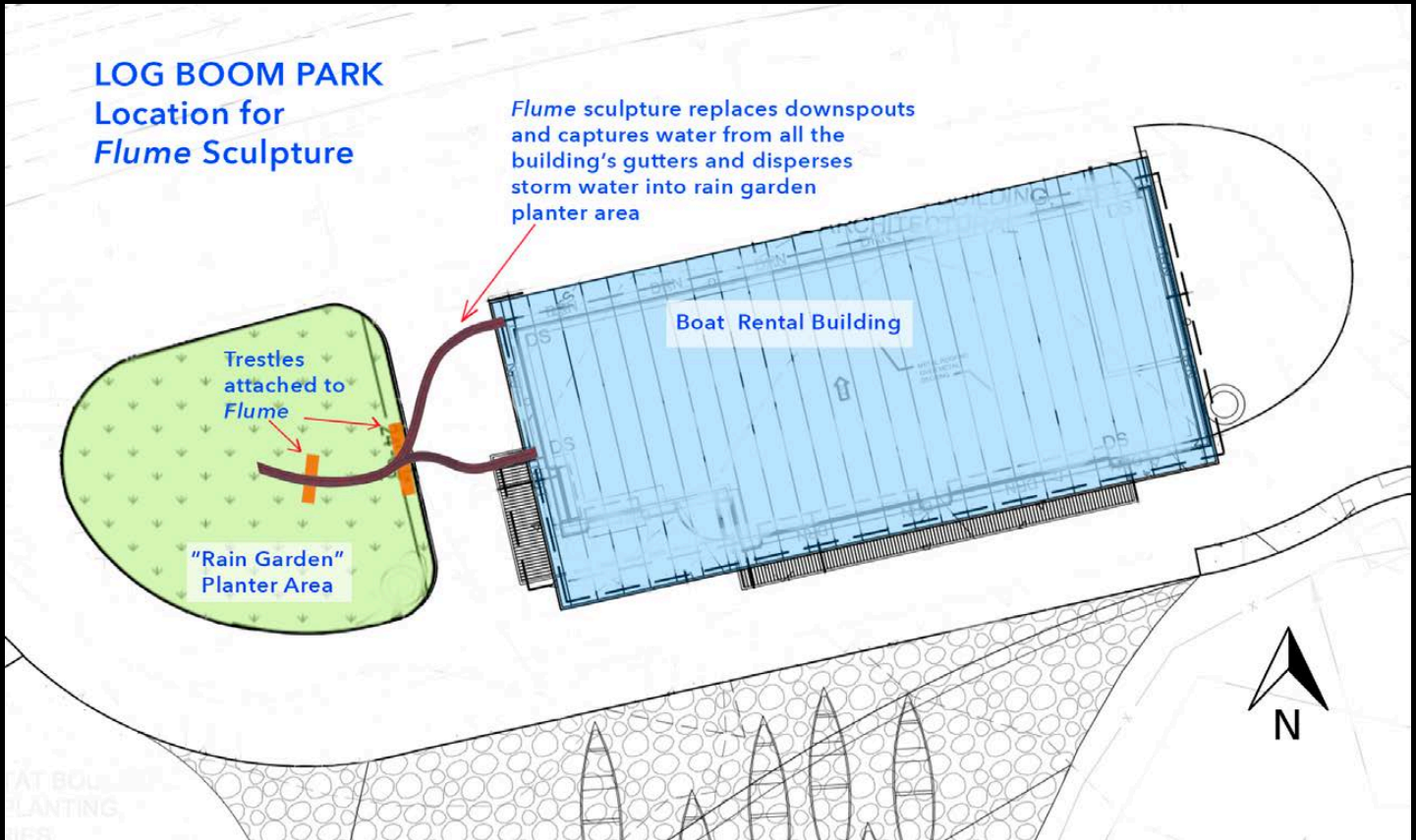


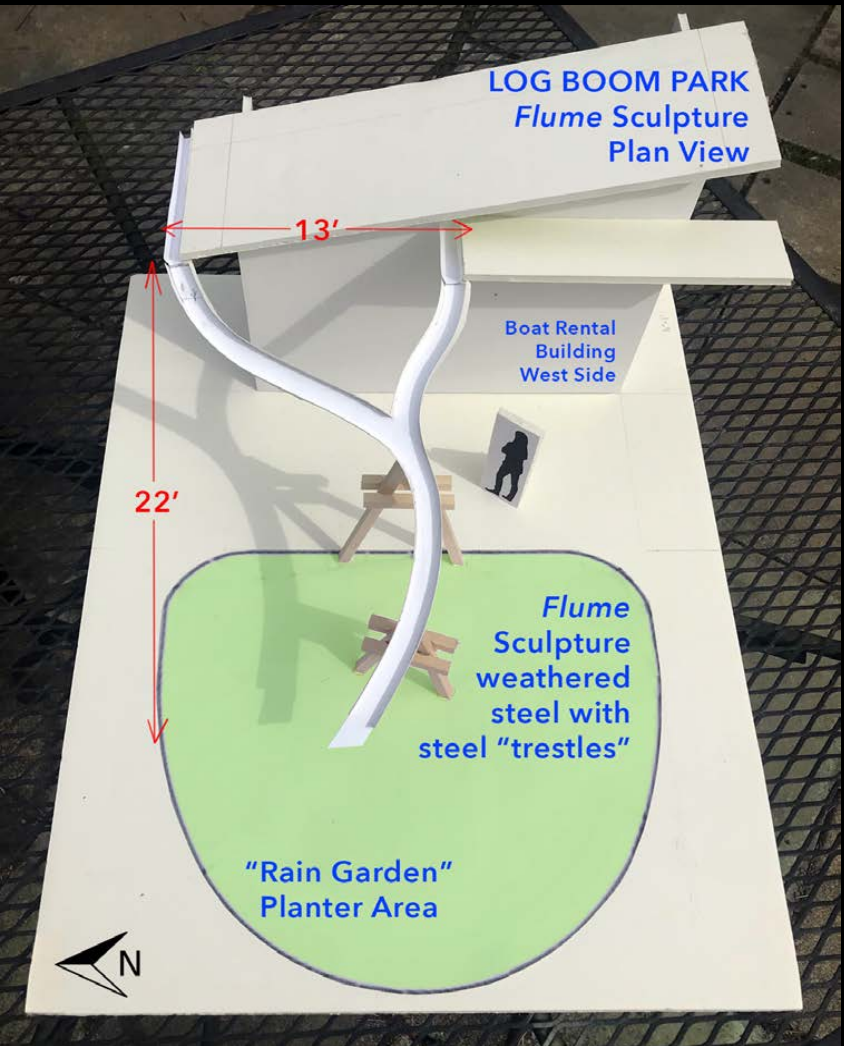


Log Flumes





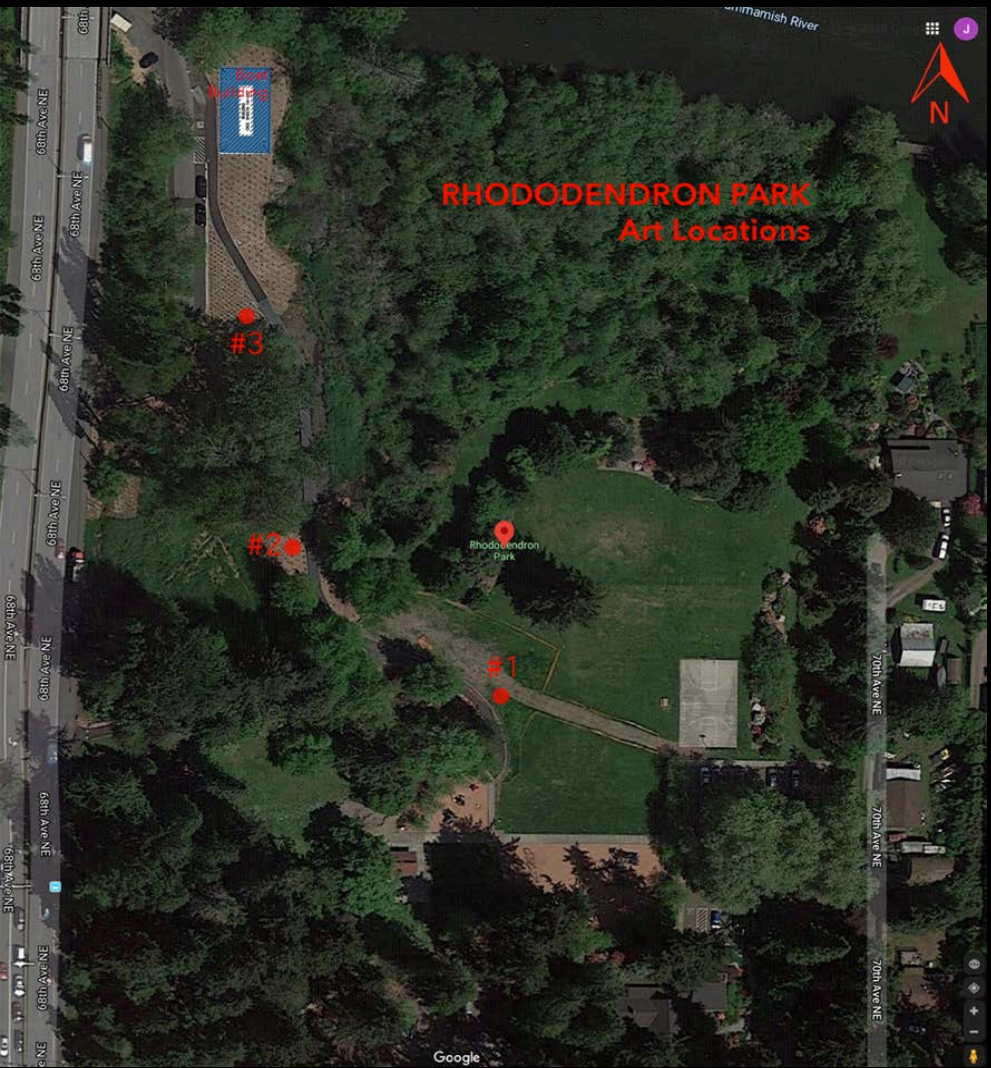






Rhododendron Park



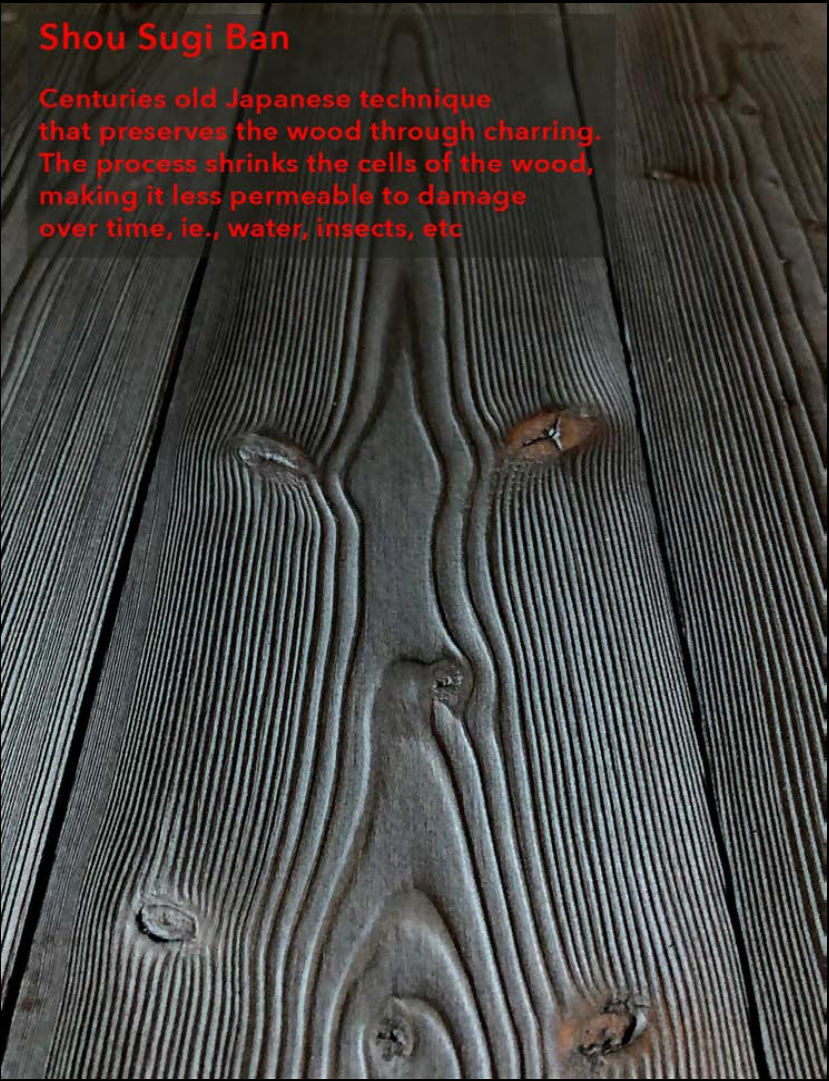




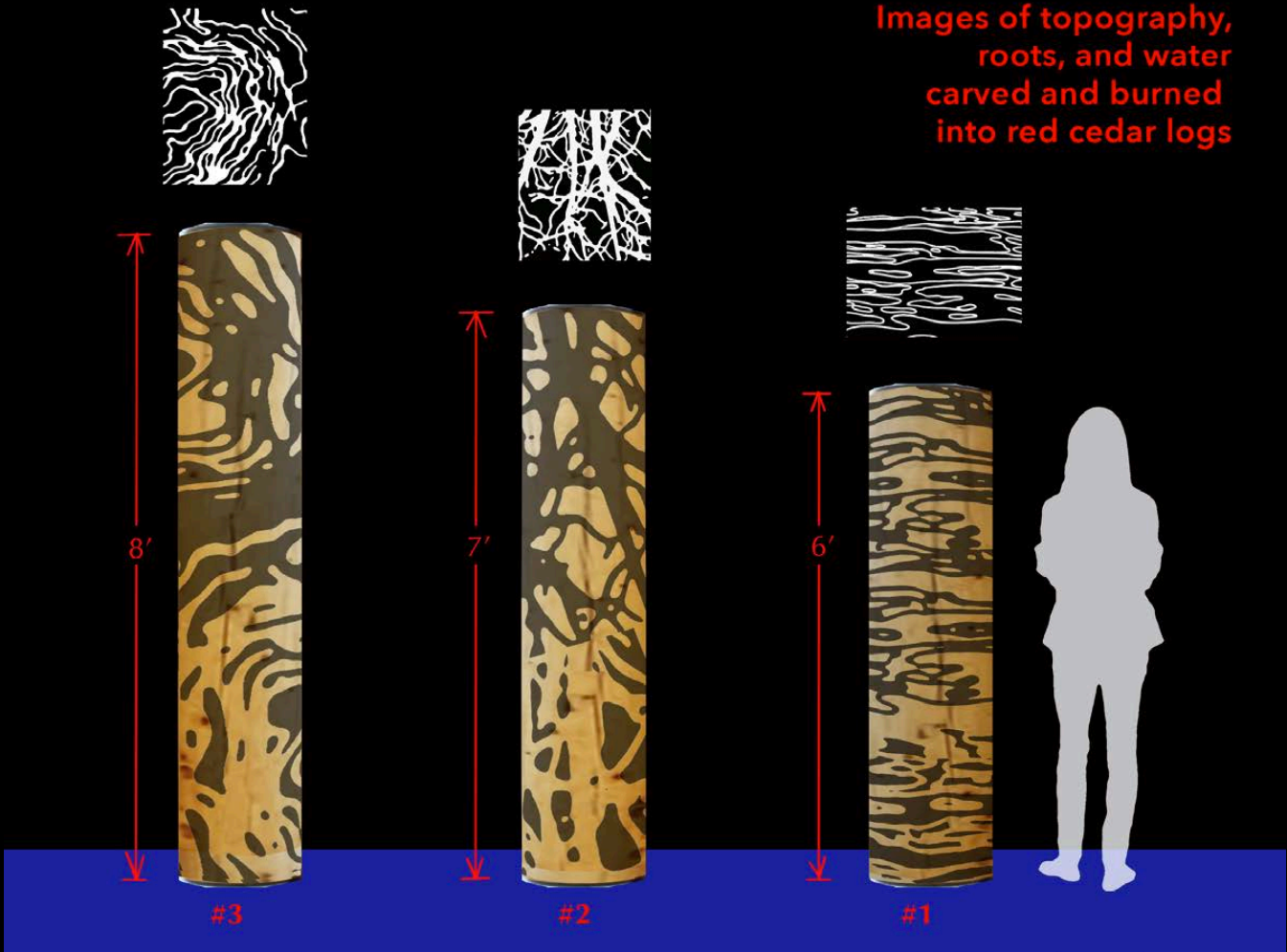
The existing snag located at the pedestrian entrance at 68th provided inspiration for *Three Cedar Logs*

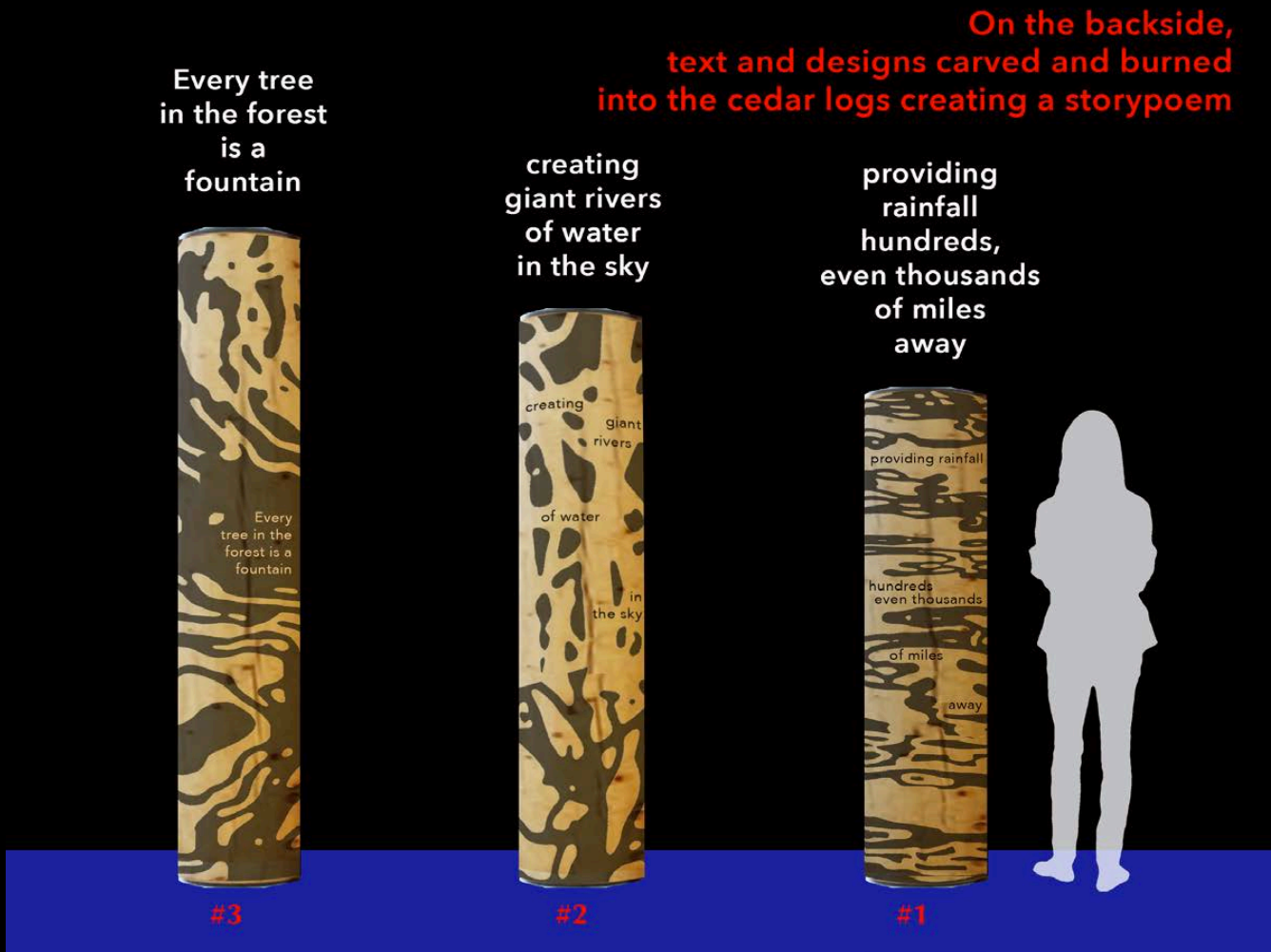
Shou Sugi Ban

Centuries old Japanese technique that preserves the wood through charring. The process shrinks the cells of the wood, making it less permeable to damage over time, ie., water, insects, etc



Images of topography,
roots, and water
carved and burned
into red cedar logs





THREE CEDAR LOGS, Front



THREE CEDAR LOGS, Back



**Every tree in the forest
is a fountain**



**creating giant rivers
of water in the sky**

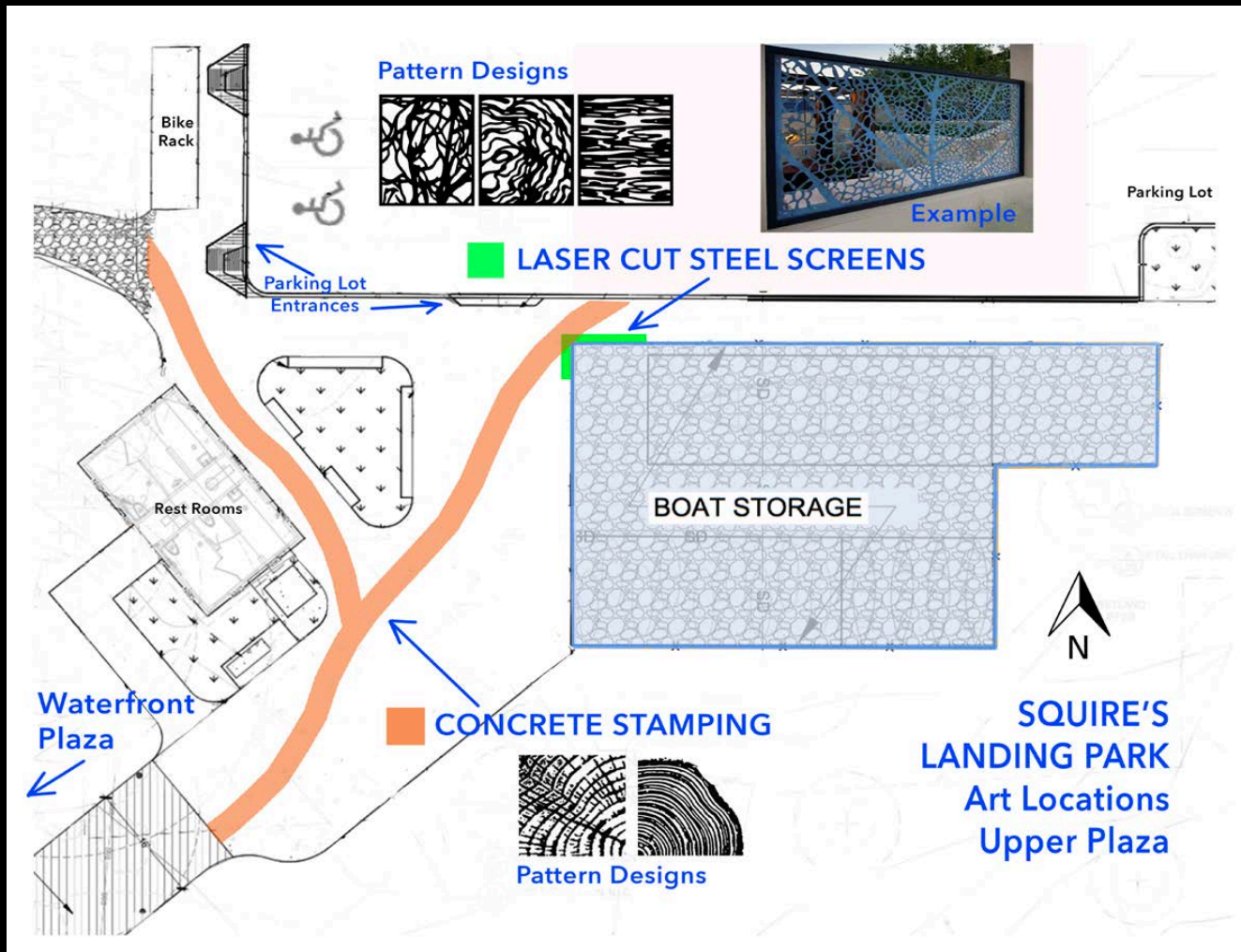


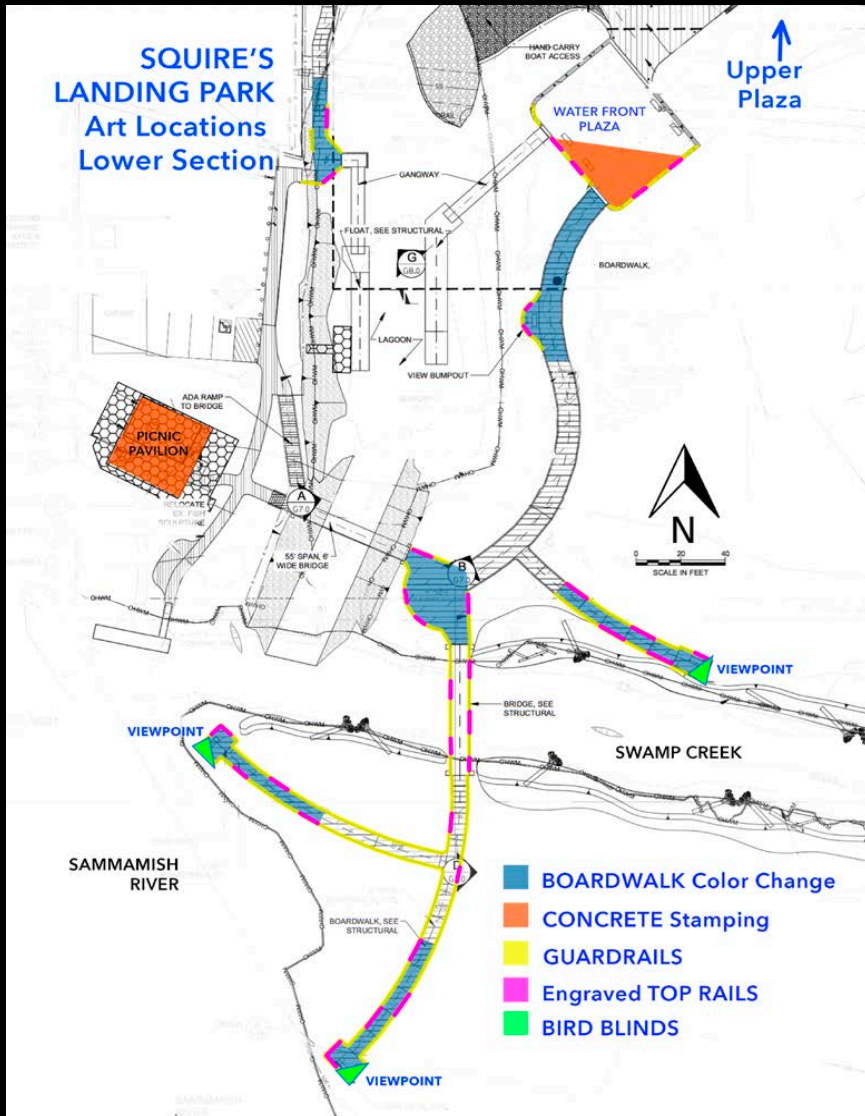
**providing rainfall hundreds
even thousands of miles away**











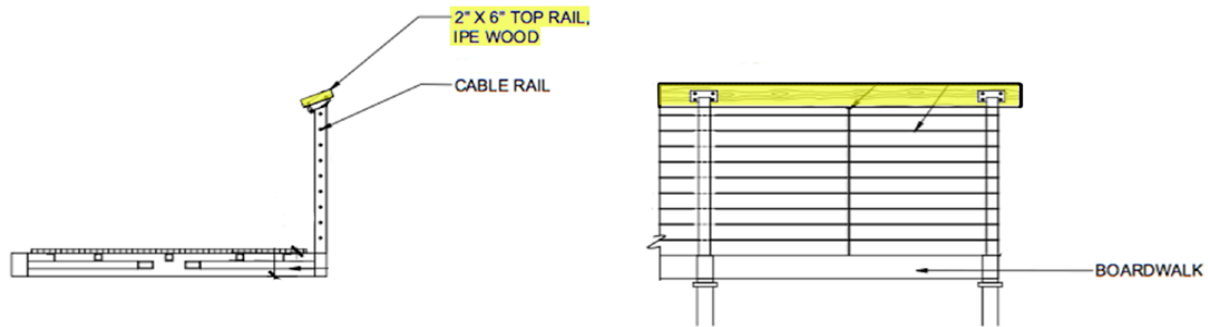
SQUIRE'S LANDING PARK

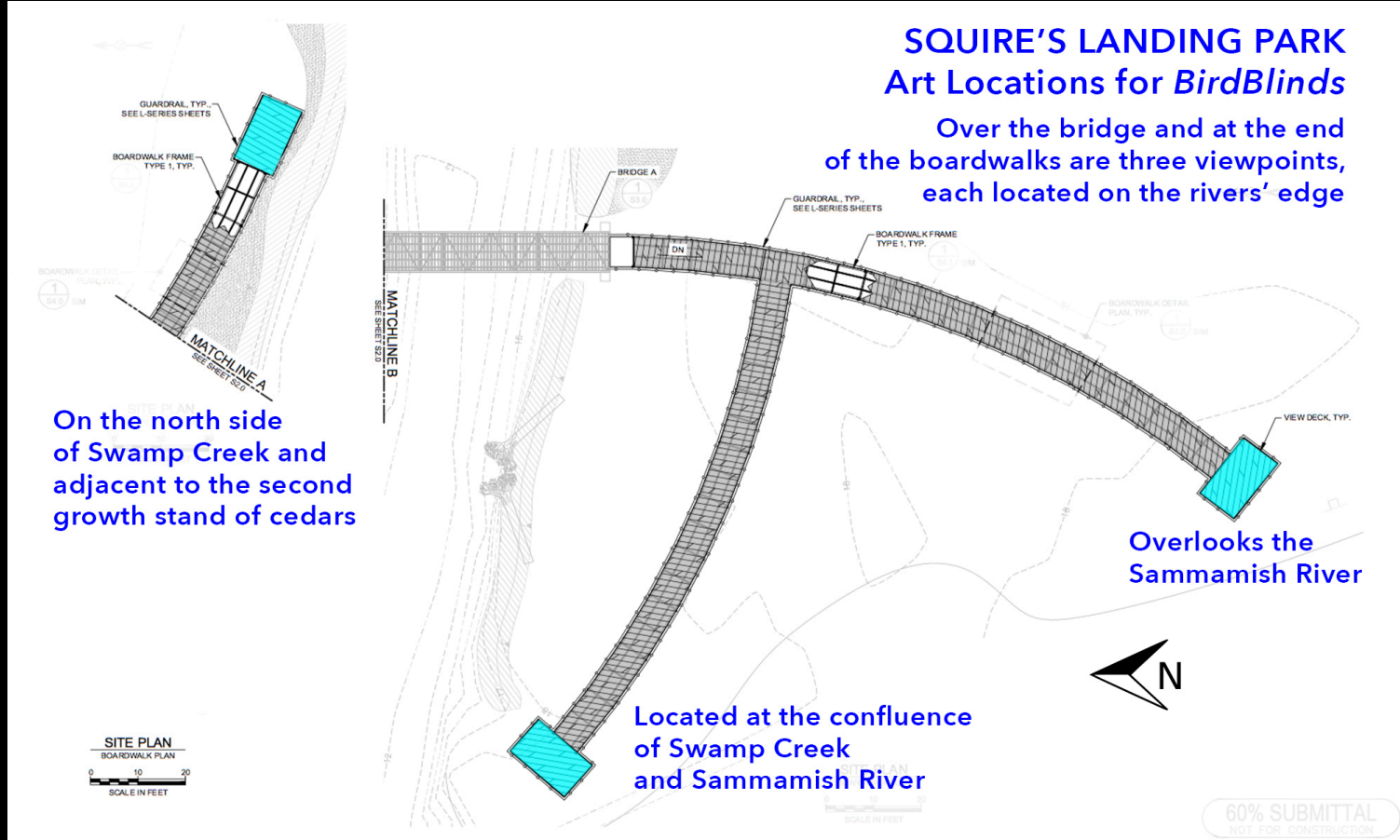
Guardrail Ipe' Top Rail

36 top rails with text

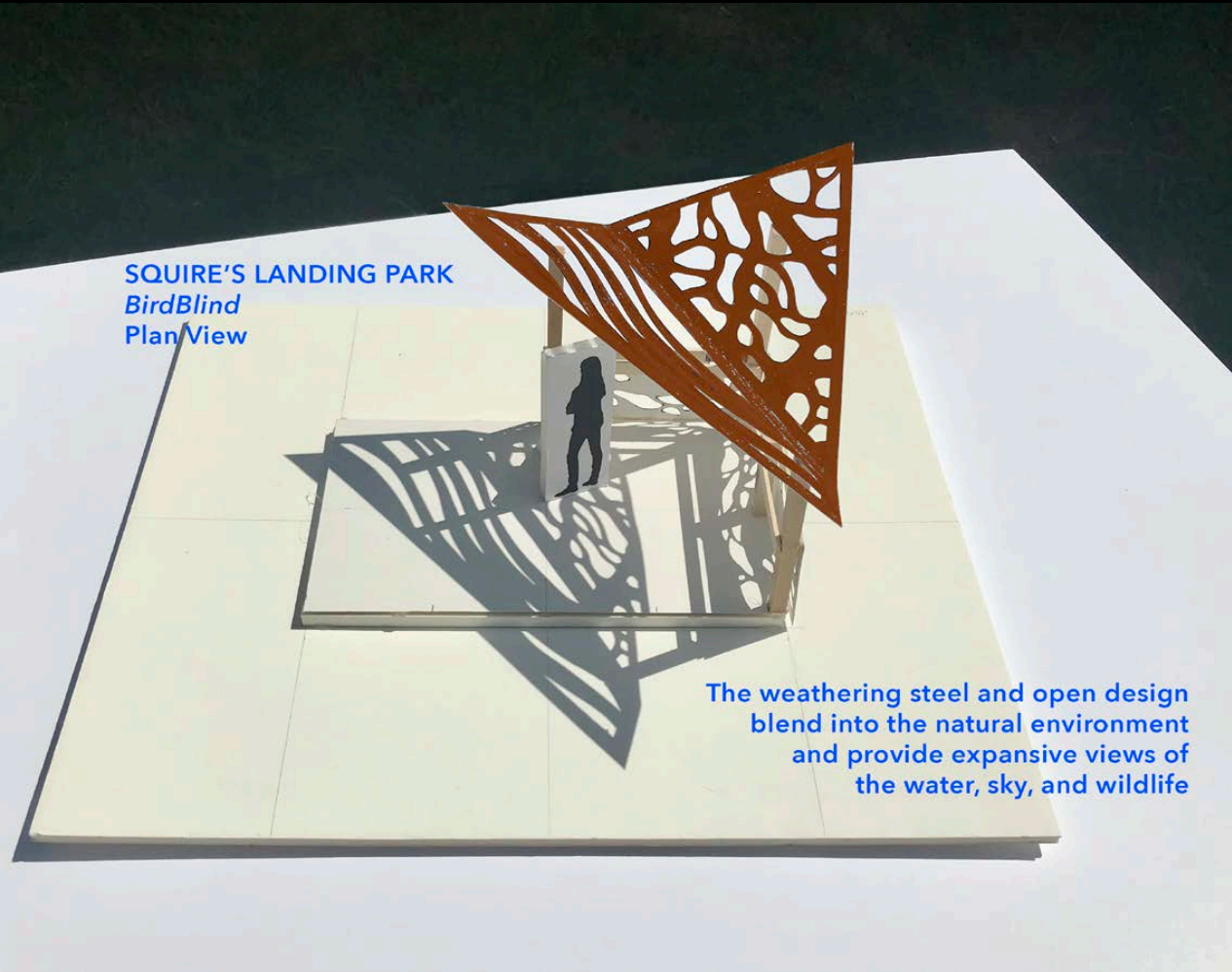


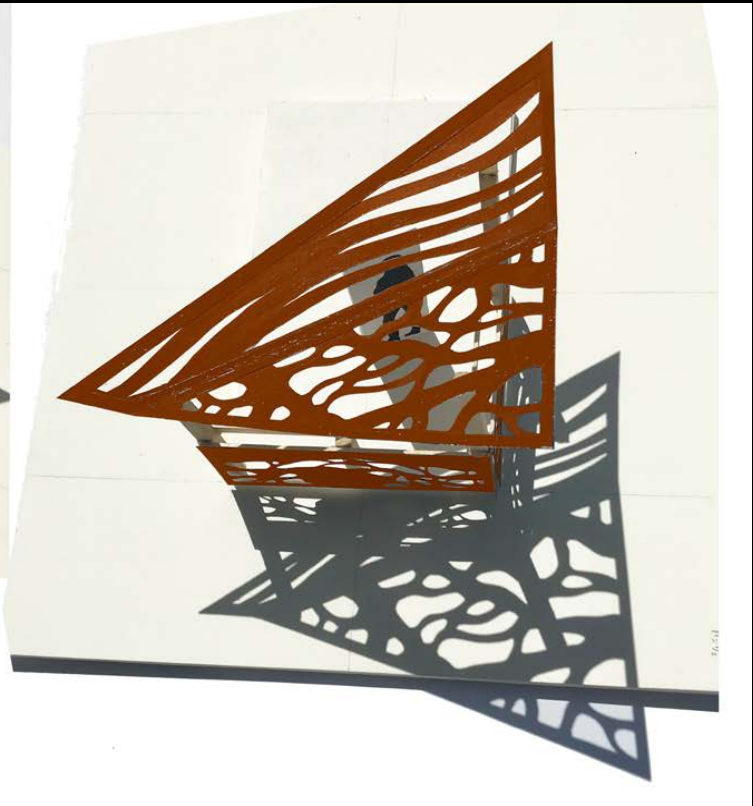
← 10' →
Text etched into ipe' top rail and set intermittently along boardwalk to create a rhythm and backward/forward storypoem









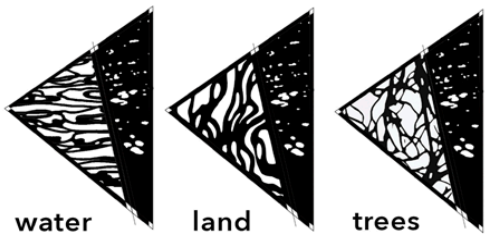


Inspired by the play of sunlight and shadow in the adjacent cedar stand, the laser cut roof and guardrail panels allow for an ongoing change in light and shadow.



SQUIRE'S LANDING PARK *BirdBlind* Rooflines

The roof of each *BirdBlind* is the same triangular shape but folded in different ways to create a unique roofline for each blind



Each *BirdBlind* has its own design based on the three themes: Water, Land, Trees



Thank you!

Subject/Topic: King County-Cities Climate Collaboration (K4C) Letter of Joint Commitment Proposed Council Action/Motion: Include the City of Kenmore on the K4C Joint Letter of Commitment: Climate Change Actions in King County, originally published in 2014 and updated in 2019.	For Council Meeting Agenda of: June 22, 2020 Department:_Public Works, Env Services Division Prepared by: Richard Sawyer, Env Services Manager <u>Initial & Date</u> Approved by Department Head: RS Approved by City Attorney: _____ Approved by Finance Director: _____ Approved by City Manager: RK 6/11/20 Exhibits/Attachments: K4C Joint Letter of Commitment (clean version) K4C Joint Letter of Commitment (with 2019 updates highlighted in yellow)
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King County-Cities Climate Collaboration (K4C) is a partnership, established through interlocal agreement, between King County and seventeen local governments to coordinate and enhance the effectiveness of local government climate and sustainability action. The City of Kenmore joined the partnership in December 2018 and as of April 2019, the partnership represents approximately 80% of King County's population.

Letter of Joint Commitment

The Letter of Joint Commitment is comprised of an introduction (Principles for Collaboration) and 11 commitments, summarized as follows:

VIII. C. King County-Cities Climate Collaboration (K4C) Letter of Joint ...

- Establishes the importance and need to address climate change and reduce greenhouse gas (GHG) emissions
- Establishes the need to work as partners towards a shared vision
- Recognizes that each partner may not pursue all actions, and will act where it has the most impact and influence given unique characteristics of jurisdiction
- Identify need to engage communities vulnerable to the impacts of climate change

Commitment 1 - Shared Goals

- Achieve shared countywide GHG reduction targets, which were updated in 2019 to reduce direct countywide sources of GHG emissions by at least 50% by 2030, and 80% by 2050, compared to a 2007 baseline.

Commitment 2 - Climate Policy

- Support strong federal, regional, state, countywide, and local climate policy

Commitment 3 - Transportation and Land Use

- Align planning for employment, affordable housing, and mobility taking into consideration impacts of GHG emissions.
- Increase transit service and mobility with a goal of reducing countywide driving per capita by 20% by 2030 and 50% by 2050, compared to 2017 levels, understanding that different areas of the county have varying levels of transit service.
- Update and implement Vision 2050
- Increase mobility and accessibility options for biking, rolling, and walking so more people have fast, convenient, and low GHG emissions ways to travel.

Commitment 4 - Clean Fuels and Electric Vehicles

- Protect federal vehicle efficiency standards
- Adopt clean fuel standards
- Increase use of electric vehicles
- Require and increase access to electric vehicle charging stations

Commitment 5 - Energy Supply

- Implement the Washington State Clean Energy Transformation Act, which provides for 100% clean electricity supply by 2045
- Establish a more resilient energy system and phase out fossil fuels

Commitment 6 - Green Building and Energy Efficiency

- Reduce energy use in all existing buildings 25% by 2030 and 45% by 2050 compared to 2017
- Implement Washington State Energy Code
- Strengthen conservation, and use of renewable natural gas, and support the transition to electrical systems to reduce natural gas and other fossil fuel use in existing buildings by at least 20% by 2030 and 80% by 2050
- Support state legislation that advances conversion to clean energy sources in the built environment

Commitment 7 - Consumption and Materials Management

- Achieve a 70% recycling rate countywide
- Achieve zero waste of resources for materials that have economic value for reuse, resale and recycling by 2030

Commitment 8 - Forests and Farming

- Reduce sprawl and associated transportation related GHG emissions and sequester biological carbon by focusing growth in urban centers and protecting and restoring forests and farms.

Commitment 9 - Operations

- Develop operational GHG reduction targets that support shared countywide goals and implement actions that reduce each partners' GHG footprint.

Commitment 10 - Climate Preparedness

- Increase community resilience by planning and preparing for the impacts of climate change on K4C communities and the King County region.

Commitment 11 - Collaboration

- Participate in or join the King County-Cities Climate Collaboration (K4C) – focused on efforts to coordinate and enhance local government climate and sustainability efforts – to share case studies, subject matter experts, resources, tools, and to collaborate on grant and funding opportunities.

The City is also in the early stages of developing a Climate Action Plan (CAP), which will incorporate these commitments into the City's climate change management strategies moving forward. Options on how to develop the CAP are being presented to Council at the June 22, 2020 meeting.

FISCAL CONSIDERATION:

Implementation of the Letter of Joint Commitment, and addressing climate change in general, will have ongoing costs to the City. These costs will be better understood as the City develops its Climate Action Plan, which is also being presented to Council at the June 22, 2020 meeting.

COUNCIL GOAL/BUDGET OBJECTIVE BEING ADDRESSED:

Council's 2020-2021 Priority #3 "Develop a Kenmore Climate and Environment Action Plan including water, air, forest, and habitat restoration



Joint Letter of Commitment: Climate Change Actions in King County

Climate change is a paramount challenge of this generation and has far-reaching and fundamental consequences for our economy, environment, public health, and safety.

Across King County and its cities, we are already experiencing the impacts of climate change: warming temperatures, acidifying marine waters, rising seas, decreasing mountain snowpack, and less water in streams during the summer.



These changes have the potential for significant impacts to public and private property, resource based economies like agriculture and forestry, and to residents' health and quality of life.

The decisions we make locally and regionally, such as where our communities will grow and how they will be served by transportation, will set the stage for success or failure in reducing carbon pollution, making sound long-term investments, and ensuring our communities are livable and resilient to climate change impacts.

The Intergovernmental Panel on Climate Change, the United Nations body responsible for assessing the science related to climate change, implications, and adaptation and mitigation efforts, released a report in 2018 calling for rapid reductions in carbon emissions to reduce the impacts of global warming. The King County Growth Management Planning Council – a formal body of elected officials from across King County – voted in 2014 to adopt a shared target to reduce countywide sources of greenhouse gas (GHG) emissions, compared to a 2007 baseline, by 25% by 2020, 50% by 2030, and 80% by 2050. In 2019, the Washington State Legislature passed, and the Governor signed into law, bills that will transition the electricity sector to clean sources by 2045, accelerate efficiency in the built environment, and reduce transportation related emissions.

Based on our shared assessment of emissions in King County, and review of potential strategies to reduce emissions, we believe that these targets are ambitious but achievable.

Building on the work of the King County-Cities Climate Collaboration (K4C) – a partnership between the County and partners to coordinate and enhance local government climate and sustainability efforts – more than a dozen cities and the County came together in the first half of 2014 to chart opportunities for joint actions to reduce GHG emissions and accelerate progress towards a clean and sustainable future. In 2019, K4C partners seek to refresh these commitments to reflect changes in the regulatory landscape, technical developments, and updated emissions information.



The attached Principles for Collaboration and Joint County-City Climate Commitments are focused on practical, near-term, collaborative opportunities between partners and King County. These shared commitments build on the significant work that many of our partners and County are already taking. By signing this letter, we pledge our support for the shared vision that these principles and actions represent. All partners commit to actively pursue those strategies, policies, and actions to make the most impact given the size, location, and development patterns of their jurisdictions.

Through focused, coordinated action, we will maximize the impact of our individual and shared efforts.



Principles for Collaboration

1. Climate change is the paramount challenge of our generation, and has fundamental and far-reaching consequences for our economy, environment, and public health and safety.
2. Strong action to reduce GHG emissions is needed, and the time is now.
3. Local governments can reduce greenhouse gas (GHG) emissions through many decisions related to transportation and land use, energy and green building, forests and farms, and consumption and materials management.
4. All partners support the shared vision that the Joint County-City Climate Commitments represent, but it is not the intention that each partner will pursue every action. Each partner will actively pursue strategies where action, investment, and policy will have the most impact and influence.
5. Many cities in King County have set individual climate goals and are taking steps to reduce local GHG emissions, and we need to build on this leadership.
6. Local solutions need to be implemented in ways that build a cleaner, stronger, and more resilient regional economy, and support the health of communities and our natural environment.
7. Reaching our goals will require collaboration, and trust between the County, cities, utilities, businesses, nonprofit organizations, and other public sector agencies.
8. Building an equitable clean energy economy will require deeper engagement with communities of color and low income, immigrant, and youth populations. These communities are more vulnerable to the impacts of climate change – from increasing flood risks to rising costs of fossil fuels – and historically less likely to be included in community-scale solutions or as leaders. We are committed to work in ways that are fair, equitable, empowering, and inclusive, and will seek solutions in concert with highly impacted communities. Solutions should prioritize low- and no-income people, people of color and indigenous people, immigrants and refugees, people with disabilities, and limited-English speaking communities. Solutions should include provisions for a just transition for workers.



9. Solutions to reduce carbon emissions require action at local, state, and federal government levels. We have the responsibility to lead at the local level, and we have the power to influence and advocate for change at the state and federal level that supports and advances the work we undertake at the local level.
10. We can accomplish more with a shared vision and coordinated action; collaboration will increase the efficiency of our efforts and magnify the impact of our strategies beyond what each of us could achieve on our own.
11. As of 2019, King County and 17 partners are members of the King County-Cities Climate Collaboration, and we will work to build on this membership, in both increased action and participation from additional partners.
12. Elected and staff representatives will reconvene at least twice a year to share our individual and collective successes, and develop plans for continued action and investment in carbon emission reduction solutions. Elected officials have the opportunity at their discretion to engage more actively in advancing the shared goals, such as through joint comment letters, with support by King County staff. All partners also dedicate a staff member to coordinate implementation of the following Joint County-City Climate Commitments, and to serve as a representative to the K4C. Staff will meet regularly to share best practices and develop tools and strategies for implementing shared goals.

Joint County-City Climate Commitments



I. Shared Goals

Pathway: Achieve shared countywide GHG reduction targets that reduce direct countywide sources of greenhouse gas (GHG) emissions by at least 50% by 2030, and 80% by 2050, compared to a 2007 baseline. Pursue additional goals and actions to sequester carbon and reduce emissions from consumption of goods and services.

Policy Commitment: Adopt GHG reduction targets that are consistent with those established by the Growth Management Planning Council and that support countywide emission reduction goals.

Project or Program: Build on King County's commitment to measure and report on countywide GHG emissions by sharing data between partners, informing the public of our individual and collective progress, and using the information to inform regional climate action.



II. Climate Policy

Pathway: Support strong federal, regional, state, countywide, and local climate policy.

Policy Commitment: Advocate for comprehensive federal, regional, and state science-based limits and a market-based price on carbon pollution and other greenhouse gas (GHG) emissions. A portion of revenue from these policies should support local GHG reduction efforts that align with these Joint County-City Climate Commitments, such as funding for transit service, renewable energy and energy efficiency projects, green building, and forest protection and restoration initiatives.



III. Transportation and Land Use

Pathway: Align planning for employment, affordable housing, and mobility taking into consideration impacts to GHG emissions. Increase transit service and mobility with a goal of reducing countywide driving per capita by 20% by 2030 and 50% by 2050, compared to 2017 levels, understanding that different areas of the county have varying levels of transit access.

Policy Commitment: Partner to secure state authority for funding to sustain and grow transit service and support travel by walking and biking through development of dedicated trails and bike lanes in King County. Support increased mobility through land use and street planning that provides for faster travel times, easier connections, and broader reach of transit services. Work to ensure new mobility services supplement transit services and prioritize outcomes for communities where mobility needs are greatest.

Policy Commitment: Update and implement Vision 2050, the region's growth strategy, to focus growth inside the Urban Growth Area cities and centers served by high capacity transit and create vibrant urban centers, protect natural resource lands and rural areas, and direct public investments in support of efficient land use. Implement land use strategies in ways that help us achieve shared climate goals, more closely link housing and jobs, and encourage dense, healthy, sustainably developed mixed-use neighborhoods near transit that minimize displacement. Increase mobility and accessibility options for biking, rolling, and walking so more people have fast, convenient, and low GHG emissions ways to travel.

Project or Program: As practical, for King County and cities developing equitable transit-oriented communities around high capacity light rail and transit projects, adopt the Puget Sound Regional Council's Growing Transit Communities Compact.



IV. Clean Fuels and Electric Vehicles

Pathways: (1) Protect Federal Vehicle Efficiency Standards. (2) Adopt a regional or statewide Clean Fuels Standard that reduces transportation fuel emissions intensities by at least 20% by 2030, compared to 2017 levels. (3) Increase use of electric vehicles such that 100% of light duty vehicles, and at least 60% of medium duty, and 40% of heavy-duty vehicles are electric by 2050.

Policy Commitment: Reduce climate pollution, build our renewable energy economy, and lessen our dependence on imported fossil fuels by supporting the adoption of a statewide or regional low carbon fuel standard that gradually lowers pollution from transportation fuels.

Policy Commitment: Support engagement and partnerships with utilities and organizations to develop regional pilots to incent the transition to electric vehicle ownership for all sectors, through development of infrastructure, education, and grants and incentives.

Policy Commitment: Enact local code and programs to incent or require electric vehicle charging within buildings or on development sites.



V. Energy Supply

Pathway: Implement the Washington State Clean Energy Transformation Act, which phases out coal-fired electricity sources by 2025 and requires 80% carbon neutral electricity by 2030, and 100% clean electricity by 2045; limit construction of new natural gas based electricity power plants, and seek to establish a more resilient energy system.

Policy Commitment: Build on existing state renewable energy commitments including the Washington State Renewable Portfolio Standard (RPS) and the Clean Energy Transformation Act that provide for 100% Clean electricity supply by 2045 by partnering with local utilities, state regulators, and other stakeholders on a countywide commitment to clean energy resources. This includes meeting future energy needs through deep energy efficiency improvements and improved management of peak demands, and supporting renewable generation and fuel resources while phasing-out fossil fuels.

Project or Program: In partnership with utilities, develop a package of local jurisdictional commitments and initiatives that support renewable and distributed energy sources that direct the region toward a robust and resilient utility system. Actions include supporting community solar development, green power community challenges, streamlined local renewable energy installation permitting, district energy, code development, and renewable energy incentives.



Project or Program: Participate in utility Integrated Resource Plan and Energy Plan development processes, and emphasize interests for acceleration of transition and equitable distribution of benefits through regulatory and rulemaking forums.



VI. Green Building and Energy Efficiency

Pathways: (1) Reduce energy use in all existing buildings 25% by 2030 and 45% by 2050 compared to 2017; (2) Implement Washington State Energy Code which requires new buildings constructed to move incrementally towards stronger efficiency performance including a 70% energy reduction and net-zero GHG emissions in new buildings by 2031; (3) Strengthen conservation, and use of renewable natural gas, and support the transition to electrical systems to reduce natural gas and other fossil fuel use in existing buildings by at least 20% by 2030 and 80% by 2050.

Policy Commitment: Participate in the Regional Code Collaboration and adopt code pathways that build on the Washington State Energy Code, leading the way to “net-zero carbon” buildings, reduced water consumption, and the use of building materials with low carbon emissions. Support efforts at state and national level to develop stronger residential energy codes that save energy and money and take supporting actions such as to adopt building energy benchmarking and disclosure ordinances for non-residential and multi-family buildings within local jurisdiction, and residential energy disclosure at point of sale.

Project or Program: Develop a multi-city partnership to build a regional energy efficiency retrofit economy, including tactics such as: collaborating with energy efficiency and green building businesses, partnering with utilities, working with community partners, and expanding on existing retrofit programs. Foster opportunities for economic development, job creation, community-based representations, and pro-equity strategies.

Policy Commitment: Support state legislation that advances conversion to clean energy sources in the built environment. Collaborate with stakeholders, including labor and utilities, to develop energy codes that support the transition to highly efficient and low carbon non-residential and multifamily buildings through the conservation of fossil fuels, use of renewable natural gas, and electrification.



VII. Consumption and Materials Management

Pathway: Achieve a 70% recycling rate countywide; by 2030, achieve zero waste of resources for materials that have economic value for reuse, resale, and recycling.



Policy Commitment: Partner through the Metropolitan Solid Waste Management Advisory Committee on policy, projects, and programs focused on (1) waste prevention and reuse, (2) product stewardship, recycling, and composting, and (3) beneficial use.

Project or Program: Develop a regional strategy through the adopted 2019 Comprehensive Solid Waste Management Plan to reach zero waste of resources by 2030 through a combination of education, incentives, and regulatory tools aimed at single-family, multi-family residents, businesses, and construction projects in King County.



VIII. Forests and Farming

Pathway: Reduce sprawl and associated transportation related GHG emissions, and sequester biological carbon by focusing growth in urban centers and protecting and restoring forests and farms.

Policy Commitment: Partner on Transfer of Development Rights (TDR) initiatives to focus development within the Urban Growth Area, reduce development pressure on rural lands, and protect our most valuable and important resource lands as part of the Land Conservation Initiative.

Project or Program: Protect and restore the health of urban and community trees and forests. Collaborate on the development and implementation of goals and strategies that improve urban tree canopy, forest health, and carbon sequestration informed by the King County Land Conservation Initiative and the countywide 30-year forest plan. Collaborate with private and community efforts such as Forterra's Green Cities Partnerships.

Project or Program: Partner on collaborative efforts to expand forest and farm stewardship and protection, for example through King Conservation District's farm management planning, landowner incentive, and grant programs.

Project or Program: Expand our local food economy, for example by supporting urban and community farming, buying locally produced food, and participating in the Local Food Initiative.



IX. Operations

Pathway: Reduce GHG emissions from operations in support of countywide goals.

Policy Commitment: Develop operational GHG reduction targets that support shared countywide goals and implement actions that reduce each partners' GHG footprint.

Project or Program: Demonstrate commitment and contribute to countywide goals through operational actions to: implement energy efficiency projects and initiatives at existing facilities; measure existing



building performance through EPA's Energy Star or equivalent program; implement high-efficiency street and traffic light replacement projects; construct new buildings to LEED, Living Building Challenge or other high performance standards and infrastructure to equivalent carbon – neutral and sustainability standards; reduce waste and purchase sustainable materials and services; and electrify municipal vehicles.



X. Climate Preparedness

Pathway: Increase community resilience by planning and preparing for the impacts of climate change on K4C communities and the King County region.

Policy commitment: Expand the K4C model for collaboration to include climate preparedness topics and issues.

Project or Program: Identify shared climate impact concerns and related needs, and opportunities for addressing those concerns. Engage elected officials and the public on local climate impacts and priorities for action. Consider participating in the Puget Sound Climate Preparedness Collaborative to advance climate preparedness work in the region.



XI. Collaboration

Policy Commitment: Participate in or join the King County-Cities Climate Collaboration (K4C) – focused on efforts to coordinate and enhance local government climate and sustainability efforts – to share case studies, subject matter experts, resources, tools, and to collaborate on grant and funding opportunities.

Project or Program: Engage and lead public-private collaborative action through relationships developed with business, not for profit organizations, other local government agencies and coalitions, and citizen advocacy groups.



Elected Officials of the King County – Cities Climate Collaboration

A black ink signature of Dow Constantine.

Dow Constantine
King County Executive

A black ink signature of Jimmy Matta.

Jimmy Matta
Mayor, City of Burien

A blue ink signature of Mary Lou Pauly.

Mary Lou Pauly
Mayor, City of Issaquah

A blue ink signature of Penny Sweet.

Penny Sweet
Mayor, City of Kirkland

A black ink signature of Debbie Bertlin.

Debbie Bertlin
Mayor, City of Mercer Island

A black ink signature of Angela Birney.

Angela Birney
Mayor, City of Redmond

A black ink signature of Karen Moran.

Karen Moran
Mayor, City of Sammamish

A black ink signature of Will Hall.

Will Hall
Mayor, City of Shoreline

A blue ink signature of Matthew Larson.

Matthew Larson
Mayor, City of Snoqualmie



Joint Letter of Commitment: Climate Change Actions in King County

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Across King County and its cities, we are already experiencing the impacts of climate change: warming temperatures, acidifying marine waters, rising seas, decreasing mountain snowpack, and less water in streams during the summer.



These changes have the potential for significant impacts to public and private property, resource based economies like agriculture and forestry, and to residents' health and quality of life.

The decisions we make locally and regionally, such as where our communities will grow and how they will be served by transportation, will set the stage for success or failure in reducing carbon pollution, making sound long-term investments, and ensuring our communities are livable and resilient to climate change impacts.

The Intergovernmental Panel on Climate Change, the United Nations body responsible for assessing the science related to climate change, implications, and adaptation and mitigation efforts, released a report in 2018 calling for rapid reductions in carbon emissions to reduce the impacts of global warming. The King County Growth Management Planning Council – a formal body of elected officials from across King County – voted in 2014 to adopt a shared target to reduce countywide sources of greenhouse gas (GHG) emissions, compared to a 2007 baseline, by 25% by 2020, 50% by 2030, and 80% by 2050. In 2019, the Washington State Legislature passed, and the Governor signed into law, bills that will transition the electricity sector to clean sources by 2045, accelerate efficiency in the built environment, and reduce transportation related emissions.

Based on our shared assessment of emissions in King County, and review of potential strategies to reduce emissions, we believe that these targets are ambitious but achievable.

Building on the work of the King County-Cities Climate Collaboration (K4C) – a partnership between the County and partners to coordinate and enhance local government climate and sustainability efforts – more than a dozen cities and the County came together in the first half of 2014 to chart opportunities for joint actions to reduce GHG emissions and accelerate progress towards a clean and sustainable future. In 2019, K4C partners seek to refresh these commitments to reflect changes in the regulatory landscape, technical developments, and updated emissions information.



The attached Principles for Collaboration and Joint County-City Climate Commitments are focused on practical, near-term, collaborative opportunities between partners and King County. These shared commitments build on the significant work that many of our partners and County are already taking. By signing this letter, we pledge our support for the shared vision that these principles and actions represent. All partners commit to actively pursue those strategies, policies, and actions to make the most impact given the size, location, and development patterns of their jurisdictions.

Through focused, coordinated action, we will maximize the impact of our individual and shared efforts.



Principles for Collaboration

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3. Local governments can reduce greenhouse gas (GHG) emissions through many decisions related to transportation and land use, energy and green building, forests and farms, and consumption and materials management.
4. All partners support the shared vision that the Joint County-City Climate Commitments represent, but it is not the intention that each partner will pursue every action. Each partner will actively pursue strategies where action, investment, and policy will have the most impact and influence.
5. Many cities in King County have set individual climate goals and are taking steps to reduce local GHG emissions, and we need to build on this leadership.
6. Local solutions need to be implemented in ways that build a cleaner, stronger, and more resilient regional economy, and support the health of communities and our natural environment.
7. Reaching our goals will require collaboration, and trust between the County, cities, utilities, businesses, nonprofit organizations, and other public sector agencies.
8. Building an equitable clean energy economy will require deeper engagement with communities of color and low income, immigrant, and youth populations. These communities are more vulnerable to the impacts of climate change – from increasing flood risks to rising costs of fossil fuels – and historically less likely to be included in community-scale solutions or as leaders. We are committed to work in ways that are fair, equitable, empowering, and inclusive, and will seek solutions in concert with highly impacted communities. Solutions should prioritize low- and no-income people, people of color and indigenous people, immigrants and refugees, people with disabilities, and limited-English speaking communities. Solutions should include provisions for a just transition for workers.



9. Solutions to reduce carbon emissions require action at local, state, and federal government levels. We have the responsibility to lead at the local level, and we **have the power to influence and advocate** for change at the state and federal level that supports and advances the work we undertake at the local level.
10. We can accomplish more with a shared vision and coordinated action; collaboration will increase the efficiency of our efforts and magnify the impact of our strategies beyond what each of us could achieve on our own.
11. As of 2019, King County and 17 partners are members of the King County-Cities Climate Collaboration, and we will work to build on this membership, in both increased action and participation from additional partners.
12. Elected and staff representatives will reconvene at least **twice a year** to share our individual and collective successes, and develop plans for continued action and investment in carbon emission reduction solutions. Elected officials have the opportunity at their discretion to engage more actively in advancing the shared goals, such as through joint comment letters, with support by King County staff. All partners also dedicate a staff member to coordinate implementation of the following Joint County-City Climate Commitments, and to serve as a representative to the K4C. **Staff will meet regularly to share best practices and develop tools and strategies for implementing shared goals.**

Joint County-City Climate Commitments



I. Shared Goals

Pathway: Achieve shared countywide GHG reduction targets **that reduce direct countywide sources of greenhouse gas (GHG) emissions by at least 50% by 2030, and 80% by 2050**, compared to a 2007 baseline. Pursue additional goals and actions to **sequester carbon** and reduce emissions from consumption of goods and services.

Policy Commitment: **Adopt GHG reduction targets that are consistent with those established by the Growth Management Planning Council and that support countywide emission reduction goals.**

Project or Program: Build on King County's commitment to measure and report on countywide GHG emissions by sharing data between partners, informing the public of our individual and collective progress, and using the information to inform regional climate action.



II. Climate Policy

Pathway: Support strong federal, regional, state, countywide, and local climate policy.

Policy Commitment: Advocate for comprehensive federal, regional, and state science-based limits and a market-based price on carbon pollution and other greenhouse gas (GHG) emissions. A portion of revenue from these policies should support local GHG reduction efforts that align with these Joint County-City Climate Commitments, such as funding for transit service, renewable energy and energy efficiency projects, green building, and forest protection and restoration initiatives.



III. Transportation and Land Use

Pathway: Align planning for employment, affordable housing, and mobility taking into consideration impacts to GHG emissions. Increase transit service and mobility with a goal of reducing countywide driving per capita by 20% by 2030 and 50% by 2050, compared to 2017 levels, understanding that different areas of the county have varying levels of transit access.

Policy Commitment: Partner to secure state authority for funding to sustain and grow transit service and support travel by walking and biking through development of dedicated trails and bike lanes in King County. Support increased mobility through land use and street planning that provides for faster travel times, easier connections, and broader reach of transit services. Work to ensure new mobility services supplement transit services and prioritize outcomes for communities where mobility needs are greatest.

Policy Commitment: Update and implement Vision 2050, the region's growth strategy, to focus growth inside the Urban Growth Area cities and centers served by high capacity transit and create vibrant urban centers, protect natural resource lands and rural areas, and direct public investments in support of efficient land use. Implement land use strategies in ways that help us achieve shared climate goals, more closely link housing and jobs, and encourage dense, healthy, sustainably developed mixed-use neighborhoods near transit that minimize displacement. Increase mobility and accessibility options for biking, rolling, and walking so more people have fast, convenient, and low GHG emissions ways to travel.

Project or Program: As practical, for King County and cities developing equitable transit-oriented communities around high capacity light rail and transit projects, adopt the Puget Sound Regional Council's Growing Transit Communities Compact.



IV. Clean Fuels and Electric Vehicles

Pathways: (1) Protect Federal Vehicle Efficiency Standards. (2) Adopt a regional or statewide Clean Fuels Standard that reduces transportation fuel emissions intensities by at least 20% by 2030, compared to 2017 levels. (3) Increase use of electric vehicles such that 100% of light duty vehicles, and at least 60% of medium duty, and 40% of heavy-duty vehicles are electric by 2050.

Policy Commitment: Reduce climate pollution, build our renewable energy economy, and lessen our dependence on imported fossil fuels by supporting the adoption of a statewide or regional low carbon fuel standard that gradually lowers pollution from transportation fuels.

Policy Commitment: Support engagement and partnerships with utilities and organizations to develop regional pilots to incent the transition to electric vehicle ownership for all sectors, through development of infrastructure, education, and grants and incentives.

Policy Commitment: Enact local code and programs to incent or require electric vehicle charging within buildings or on development sites.



V. Energy Supply

Pathway: Implement the Washington State Clean Energy Transformation Act, which phases out coal-fired electricity sources by 2025 and requires 80% carbon neutral electricity by 2030, and 100% clean electricity by 2045; limit construction of new natural gas based electricity power plants, and seek to establish a more resilient energy system.

Policy Commitment: Build on existing state renewable energy commitments including the Washington State Renewable Portfolio Standard (RPS) and the Clean Energy Transformation Act that provide for 100% Clean electricity supply by 2045 by partnering with local utilities, state regulators, and other stakeholders on a countywide commitment to clean energy resources. This includes meeting future energy needs through deep energy efficiency improvements and improved management of peak demands, and supporting renewable generation and fuel resources while phasing-out fossil fuels.

Project or Program: In partnership with utilities, develop a package of local jurisdictional commitments and initiatives that support renewable and distributed energy sources that direct the region toward a robust and resilient utility system. Actions include supporting community solar development, green power community challenges, streamlined local renewable energy installation permitting, district energy, code development, and renewable energy incentives.



Project or Program: Participate in utility Integrated Resource Plan and Energy Plan development processes, and emphasize interests for acceleration of transition and equitable distribution of benefits through regulatory and rulemaking forums.



VI. Green Building and Energy Efficiency

Pathways: (1) Reduce energy use in all existing buildings 25% by 2030 and 45% by 2050 compared to 2017; (2) Implement Washington State Energy Code which requires new buildings constructed to move incrementally towards stronger efficiency performance including a 70% energy reduction and net-zero GHG emissions in new buildings by 2031; (3) Strengthen conservation, and use of renewable natural gas, and support the transition to electrical systems to reduce natural gas and other fossil fuel use in existing buildings by at least 20% by 2030 and 80% by 2050.

Policy Commitment: Participate in the Regional Code Collaboration and adopt code pathways that build on the Washington State Energy Code, leading the way to “net-zero carbon” buildings, reduced water consumption, and the use of building materials with low carbon emissions. Support efforts at state and national level to develop stronger residential energy codes that save energy and money and take supporting actions such as to adopt building energy benchmarking and disclosure ordinances for non-residential and multi-family buildings within local jurisdiction, and residential energy disclosure at point of sale.

Project or Program: Develop a multi-city partnership to build a regional energy efficiency retrofit economy, including tactics such as: collaborating with energy efficiency and green building businesses, partnering with utilities, working with community partners, and expanding on existing retrofit programs. Foster opportunities for economic development, job creation, community-based representations, and pro-equity strategies.

Policy Commitment: Support state legislation that advances conversion to clean energy sources in the built environment. Collaborate with stakeholders, including labor and utilities, to develop energy codes that support the transition to highly efficient and low carbon non-residential and multifamily buildings through the conservation of fossil fuels, use of renewable natural gas, and electrification.



VII. Consumption and Materials Management

Pathway: Achieve a 70% recycling rate countywide; by 2030, achieve zero waste of resources for materials that have economic value for reuse, resale, and recycling.



Policy Commitment: Partner through the Metropolitan Solid Waste Management Advisory Committee on policy, projects, and programs focused on (1) waste prevention and reuse, (2) product stewardship, recycling, and composting, and (3) beneficial use.

Project or Program: Develop a regional strategy through the adopted 2019 Comprehensive Solid Waste Management Plan to reach zero waste of resources by 2030 through a combination of education, incentives, and regulatory tools aimed at single-family, multi-family residents, businesses, and construction projects in King County.



VIII. Forests and Farming

Pathway: Reduce sprawl and associated transportation related GHG emissions, and sequester biological carbon by focusing growth in urban centers and protecting and restoring forests and farms.

Policy Commitment: Partner on Transfer of Development Rights (TDR) initiatives to focus development within the Urban Growth Area, reduce development pressure on rural lands, and protect our most valuable and important resource lands as part of the [Land Conservation Initiative](#).

Project or Program: Protect and restore the health of urban and community trees and forests. Collaborate on the development and implementation of goals and strategies that improve urban tree canopy, forest health, and carbon sequestration informed by the King County Land Conservation Initiative and the [countywide 30-year forest plan](#). Collaborate with private and community efforts such as Forterra's Green Cities Partnerships.

Project or Program: Partner on collaborative efforts to expand forest and farm stewardship and protection, for example through King Conservation District's farm management planning, landowner incentive, and grant programs.

Project or Program: [Expand our local food economy, for example by supporting urban and community farming, buying locally produced food, and participating in the Local Food Initiative.](#)



IX. Operations

Pathway: Reduce GHG emissions from operations in support of countywide goals.

Policy Commitment: [Develop operational GHG reduction targets that support shared countywide goals and implement actions that reduce each partners' GHG footprint.](#)

Project or Program: Demonstrate commitment and contribute to countywide goals through operational actions to: implement energy efficiency projects and initiatives at existing facilities; measure existing



building performance through EPA's Energy Star or equivalent program; implement high-efficiency street and traffic light replacement projects; construct new buildings to LEED, Living Building Challenge or other high performance standards and infrastructure to equivalent carbon – neutral and sustainability standards; reduce waste and purchase sustainable materials and services; and **electrify municipal vehicles**.



X. Climate Preparedness

Pathway: Increase community resilience by planning and preparing for the impacts of climate change on K4C communities and the King County region.

Policy commitment: Expand the K4C model for collaboration to include climate preparedness topics and issues.

Project or Program: Identify shared climate impact concerns and related needs, and opportunities for addressing those concerns. Engage elected officials and the public on local climate impacts and priorities for action. Consider participating in the Puget Sound Climate Preparedness Collaborative to advance climate preparedness work in the region.



XI. Collaboration

Policy Commitment: Participate in or join the King County-Cities Climate Collaboration (K4C) – focused on efforts to coordinate and enhance local government climate and sustainability efforts – to share case studies, subject matter experts, resources, tools, and to collaborate on grant and funding opportunities.

Project or Program: Engage and lead public-private collaborative action through relationships developed with business, not for profit organizations, other local government agencies and coalitions, and citizen advocacy groups.



City of Kenmore, Washington

Memorandum

Date: 6/11/20
To: Councilmembers
From: Rob Karlinsey, City Manager
Subject: Coronavirus Relief Funds (CRF) and Eligible Reimbursement Costs

- A. Purpose:** At the 6/22/20 Council meeting, staff is seeking Council policy direction related to the use of the \$699,600 of Coronavirus Relief Funds (CRF) under the Coronavirus Aid Relief and Economic Security (CARES) Act. The City can receive reimbursement of eligible costs related to the Covid-19 health emergency for the period between March 1, 2020 and October 31, 2020.
- B. Policy Questions:** Staff is estimating \$595,719 of eligible city costs through October 31, 2020 (see Table Below) for CRF reimbursement. Staff is seeking Council direction for how to use the remaining estimated \$103,881 of available CRF funds.

1. Does Council want to consider CRF funds for reimbursement to human service agencies and/or to agencies who provide rental assistance for housing?

Human Services:

\$70,500 of City funds have already been allocated to human service agencies for Covid-19 related expenses. These funds are in addition to the \$172,545 allocated to human service agencies in 2020 approved by Council. The \$70,500 includes: Hopelink (\$10,000), Mary's Place (\$5,000), the Northshore Schools Foundation (\$3,000), \$2,500 Center for Human Services, and council approved \$50,000 additional funds to the human services budget for non-specified human services needs.

If Council considers additional funds for reimbursement, staff recommends providing funds to agencies based on agency need to respond to Covid-19. Subcontracts may be necessary to comply with the fund reimbursement requirements.

Rental Assistance:

Through the CARES Act, Housing and Urban Development (HUD) received \$5 billion for Community Development Block Grants (CDBG), \$2 billion of which is a direct allocation based on regular program formula to states and local governments. From this, King County is expected to receive roughly \$3.3 million in CDBG-CV funds to prevent, prepare for, or respond to coronavirus.

The Joint Agreement Cities (Burien, Kirkland, Redmond, Renton, Shoreline) which are cities who qualify for their own CDBG funds but choose to partner in a regional housing & community development program, will receive roughly \$1.3 million of this funding.



City of Kenmore, Washington

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This means there will be an allocation of roughly \$2 million in CDBG that can go to Covid-19 response in CDBG consortium cities. The Joint Recommendations Committee (JRC) provides guidance and dictates the use of King County CDBG funds and they approved use of these funds (with minor exceptions) for rental assistance. For the northeast subregion (includes Kenmore), it will be about \$600,000. The County is likely to give this money to nonprofits (such as United Way or others) for disbursement. Kenmore does not have its own rental assistance program, so residents would need to work with the non-profits directly to apply for CDBG funds.

If Council considers additional CRF funds for rental assistance, staff recommends providing the funds to a non-profit who have a rental assistance program, such as Hopelink. Subcontracting may apply to comply with the fund reimbursement requirements.

2. Does Council want to consider CRF funds for reimbursement to businesses for eligible expenses related to Covid-19?

Economic support is an eligible cost reimbursement category, including small business grants for business interruptions, payroll support programs or other assistance.

The Working Washington grants for small businesses is administered through the Department of Commerce, who worked with economic development organizations in each county to coordinate initial review of applications that would be considered by Commerce. For King County, the Greater Seattle Chamber was the clearing house. Maximum \$10,000 per grant. Criteria included jobs that could be saved/women and minority owned/ etc. There were 25 applications in total from Kenmore businesses, and we were requested to recommend 6-11 of those businesses for further consideration. We recommended 11 businesses. The grant awards for King County are expected to be announced by mid-June.

An option for Council to consider is having the City provide funds to any of the 25 applicants who were not awarded grant funds from the State. The amount could be equal to the business' original request (up to \$10,000); or provide funds that are equally divided among the businesses not receiving the grant.

C. Estimate of Eligible City Costs March 1, 2020 through October 31, 2020:

Eligible Expense Category	Type of Cost	March-April Cost	May-October Estimate	Total
Public Health	Legal assistance, supplies (sanitizers, gloves etc.), signage, hand washing stations, facial scanners, sneeze guards, opening kits for local businesses,	\$23,756	\$70,500	\$94,256



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	supplies for the business incubator			
Payroll	premium pay, closure pay, and staff time and meetings related to Covid-19 response	\$68,361	\$225,707	\$294,068
Compliance with Covid-19 Measures	Equipment/training/IT help to support employees teleworking, city truck*	\$6,895	\$110,000	\$116,895
Other	Support to human service agencies, Covid community survey	\$ 70,500	\$20,000	\$90,500
Total		\$ \$169,512	\$426,207	\$595,719
Amount Remaining				\$103,881

*City truck to accommodate one person (employee or seasonal worker) per vehicle to meet social distancing requirements

D. Background: On April 27, 2020 Governor Inslee announced the award of nearly \$300m to local governments in Coronavirus Relief Funds (CRF) from the State's allocation of the Coronavirus Aid Relief and Economic Security (CARES) Act. The allocation of \$699,600 is based on Kenmore's 2019 population estimate.

E. Cost Eligibility and Eligibility Test: The City entered into a contract with the Department of Commerce (Contract 20-6541C-209) who are administering eligible reimbursement requests.

Commerce developed an eligibility cost test. It is the City's responsibility to define "necessary" or "substantially different" and to make their own determination. No receipts or proof of payment for costs incurred are required to be submitted to Commerce. However, the City is still required to maintain sufficient accounting records in accordance with state and federal laws and monitoring visits may be scheduled.

If all responses for the incurred cost are "true" for all five statements below, then the City can feel confident the cost is eligible:

1. The expense is connected to the COVID-19 emergency.
2. The expense is "necessary".
3. The expense is not filling a short fall in government revenues.
4. The expense is not funded thru another budget line item, allotment or allocation, as of March 27, 2020.



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5. The expense wouldn't exist without COVID-19 OR would be for a "substantially different" purpose.

An additional consideration is whether the funds are used to address immediate impacts.

F. Eligibility Cost Categories: There are six (6) primary eligible cost categories.

1. Medical Expenses

- Public hospitals, clinics, and similar facilities
- Temporary public medical facilities & increased capacity
- COVID-19 testing, including serological testing
- Emergency medical response expenses
- Telemedicine capabilities
- Other

2. Public Health Expenses

- Communication and enforcement of public health measures
- Medical and protective supplies, including sanitation and PPE
- Disinfecting public areas and other facilities
- Technical assistance on COVID-19 threat mitigation
- Public safety measures undertaken
- Quarantining individuals
- Other

3. Payroll Expenses for Public Employees Dedicated to COVID-19

- Public Safety
- Public Health
- Health Care
- Human Services
- Economic Development
- Other

4. Expenses to Facilitate Compliance with COVID-19 Measures

- Food access and delivery to residents
- Distance learning tied to school closings
- Telework capabilities of public employees
- Paid sick and paid family and medical leave to public employees
- COVID-19-related expenses in county jails
- Care and mitigation services for homeless populations
- Other

5. Economic Supports

- Small Business Grants for business interruptions
- Payroll Support Programs



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- Other

6. Other COVID-19 Expenses



City Of Kenmore, Washington

Memorandum

Date: 6/9/20

To: Rob Karlinsey, City Manager

From: Debbie Bent, Community Development Director

Subject: Status Update for Parks Capital Improvement Projects

At the 6/22/20 Council Meeting, staff will be available to answer questions about the status of Park Capital Improvement Projects. Any adjustments to the six-year (2019-2025) capital improvement program budgets (revenues/expenditures) will be brought forward for Council consideration and action later this year.

1. Rhododendron Boathouse Project:

- **Budget:** \$1,185,019 allocated in the Capital Improvement Program (CIP) including: \$46,094 park impact fees, \$611k King County grant, \$242,500 state appropriation, \$250k Northshore School District funds, \$12,800 REET, and \$22,625 ALEA grant plus expenditures from prior years of \$56,800. Total project budget \$1,245,018.
- **Project Description:** 40' x 70' steel boathouse to serve the school district rowing program and community rowing. Provides enclosed storage for 24-36 rowing shells. Small second story area for exercise machines, meeting and coaching space.
- **Construction Schedule:** GenCap Construction Corp. was awarded the construction contract of \$1,195,826. Construction start is estimated to begin the second week of June with completion by year-end. Staff are working with the contractor to maintain public access to the float in the "construction downtime" between July and October when awaiting building delivery. Access during some weekends and/or evenings during construction allowed as feasible, also depending on the bridge construction activities.
- **Northshore School District (NSD) Interlocal Agreement:** The Council authorized the agreement in January outlining the terms and conditions related to the contribution of \$250k NSD funds. The City and school district attorneys are still working on the legalize, but there are no sticking points.
- **Fundraising:** There is a budget shortfall of approximately \$340k. Council direction was for a private/non-profit fundraising committee to raise the shortfall. The committee has secured \$50k but fundraising has significantly slowed due to COVID19 and additional time may be needed to raise the full amount.

2. Log Boom Park Walkways & Waterways Project

- **Budget:** \$3,122,535 allocated in the CIP including: \$2.43m bond funds, \$316,112 ALEA grant, \$80k REET, and \$193,888 park impact fees. Plus, expenditures from prior years of \$447,227 and plus \$340k allocated in future CIP 2025-2032 for monitoring required mitigation plantings. Total

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project budget \$3.9m. The project cost estimated at 60% design, presented to Council February 10th was \$3.6m. Project cost estimates at 90% design will be presented to Council in July.

- **Project Description:** This project will improve public access to Lake Washington including beach expansion, new trails and viewpoints, picnic areas, waterfront pavilion, environmental and ecological enhancements, kayak concession building, and access for hand-powered watercraft.
- **Schedule:** Continuing to work through permit review for the different agencies, with a goal to obtain all permits by November this year which could potentially lead to construction in 2021, assuming all permits received and a successful bid process. During construction the park would be closed but the pier and east entrance would remain open with minor closures. Temporary portable restrooms would be provided. Staff anticipates presenting 90% design plans, updated costs, and schedule to the City Council in July. If construction begins in 2021, completion would likely be by the end of 2023.
- **Public Art:** Council will be asked to approve the final art design and fabrication contract for public art at the June 22nd meeting.

3. Squires Landing Walkways & Waterways Project

- **Budget:** \$6,985,533 allocated in the CIP including: \$500k RCO grant, \$5,005,464 bond funds, \$185k KCD funds (unsecured, application later this year), \$651,968 Swamp Creek Basin funds, \$393,101 park impact fee funds, and \$250k state appropriation (unsecured) plus prior years expenditures of \$538,287 and plus \$382,500 allocated in future 2025-2034 CIP for monitoring required mitigation plantings. Total Project budget is \$7.9m. The project cost estimated at 60% design, presented to Council February 10th was \$8.2m. Project cost estimates at 90% design will be presented to the City Council in July.
- **Project Description:** Seven-acre project to improve public water access to the Sammamish River. Improvements will include new elevated walkways, trails, and viewpoints, as well as natural open space and other environmental enhancements. The project will also add new boating facilities including docks, ramps, and staging areas for hand-powered watercraft; parking; and a restroom.
- **Schedule:** Continuing to work through permit review for the different agencies. Estimate receiving all permits in 2021. Construction phased over two years to accommodate in-water work with completion in 2023. Staff anticipates presenting 90% design plans, updated costs, and schedule to Council in July.
- **Public Art:** Council will be asked to approve the final art design and fabrication contract for public art at the June 22nd meeting.

4. Squire's Landing Park - Land Acquisition Project

- **Budget:** \$1,154,731 allocated in the CIP including: \$850k King County conservation funds, and \$400k Swamp Creek Basin funds plus prior year expenditures of \$50,959. Total project cost \$1,205,690.

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- **Project Description:** In order to meet the State Recreation and Conservation Office (RCO) requirements, the City purchased replacement property in the vicinity of NE 192nd Street to be retained as open space to allow part of the Squires Landing Park property to “convert” to more active use to accommodate the proposed Squires Landing Walkways & Waterways park project.
- **Schedule:** The Deed for the replacement property is in the recording process. Later this year the Council is required to hold a public hearing related to removal of the restrictive covenants on the “converted” portion of the Squires Landing Park property. Estimate completing the RCO land conversion process in the fall.
- **Building Demolition NE 192nd Property:** A vacant house on the purchased NE 192nd Street property is required to be demolished to meet RCO requirements. Quotes came in at \$30k, which was 50% below the engineers estimate. Demolition is estimated to be completed by the end of July.
- 5. **Twin Springs Park Project:**
 - **Budget:** \$251,900 allocated in the CIP including: \$100k park impact fees, and \$151,900 state appropriation plus prior year expenditures of \$53,269. Total project budget \$305,169.
 - **Project Description:** Very minor improvements to do the bare minimums to open the park to the public, including construction of a maintenance path, refurbishing the existing parking lot and access at the entrance of 80th Ave/192nd and constructing a small parking pad off the entrance of 80th Ave/195th.
 - **Schedule:** The park is closed to the public, pending completion of minor improvements. The project is on hold likely through 2020. Final design work should be complete in 2021. Park opening 2022.
- 6. **Rhododendron Park Float Project**
 - **Budget:** \$8k allocated in the CIP including: \$2k park impact fees allocated each year (2019-222) for monitoring/maintenance.
 - **Project Description/Schedule:** A boarding float for hand-carry watercraft was completed at the end of 2017. Five years of monitoring and maintaining are required for mitigation plantings (2018-2022). The City has contracted with EarthCorps for monitoring/maintenance.
- 7. **Squires Landing Park - Replacement Float Project:**
 - **Budget:** \$16k allocated in the CIP including: \$4k park impact fees allocated each year (2019-2022) for monitoring/maintenance.
 - **Project Description/Schedule:** Float replacement completed at the end of 2017. Five years of monitoring and maintaining are required for mitigation plantings (2018-2022). The City has contracted with EarthCorps for monitoring/maintenance.

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8. Rhododendron Park Boardwalk Walkways & Waterways Project:

- **Budget:** \$32k allocated in the CIP including: \$8k allocated each year (2019-2022) for monitoring/maintenance including in-lieu fees and bond funds.
- **Project Description/Schedule:** New boardwalk connecting the interior of the park to the Sammamish River, parking/access road improvements and environmental enhancements. Improvements completed at the end of 2017. Five years of monitoring and maintaining are required for mitigation plantings (2018-2022). The City has contracted with EarthCorps for monitoring/maintenance.
- **Public Art:** Council will be asked to approve the final art design and fabrication contract for public art at the June 22nd meeting.



City Of Kenmore, Washington

Memorandum

Date: 06/22/2020

To: Rob Karlinsey, City Manager

From: John Vicente, City Engineer

Regarding: Transportation CIP Update

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W Sammamish River Bridge:

Construction is underway and a lot of great progress has been made so far. Site preparation work such as silt fencing, berms, equipment delivery along with removal of the sidewalk on the bridge has been completed. Several of the bridge piers (not in water) have been drilled on the north and south side of the bridge with several having been poured. Work has also started on the new waterline north and south of the bridge.

Summer is on its way and with that in-water work will begin on July 1st and extend to August 31st. The contractor will start with constructing the in-water work platforms. The Contractor will be using cranes from both sides of the river and using the platform for drilling in-water piers this summer. There will also be regular inspections of the river to verify permit conditions are being met. While in-water work is being conducted, work will also occur on the storm drainage and the undergrounding of the utilities. During the summer, it is anticipated that the contractor will be working up to 7-days a week and between 16 and 24 hours per day. This is necessary given the limited in-water window period established for the project.

The project is currently within budget (with little contingency utilized) and on schedule but it is unknown at this time the full impact that Covid-19 will have on the project. The City has been put on notice that delays in the bridge girders is likely. We are waiting for the manufacturer to provide specific delivery dates before we assess impacts, if any, to budget and schedule.

Contractor: Ceccanti Construction Inc.
Contract Working Days: 640 Contract Days
Current Construction Cost : \$30.3M

Iuanita Dr. Pedestrian/Bicycle Safety Project:

Pre-construction utility relocation work continues and is scheduled to be completed in mid-July 2020 in coordination with the City's contractor. Construction of the official city contract work is scheduled to begin July 6, 2020 and be completed by the end of

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Transportation CIP Update
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2021. Public notifications of construction have been delivered. It is anticipated that the contractor will start work on the east side of the street at the north end of the project limits and work south.

Contractor: Thomco Construction Inc.
Contract Working Days: 350 Contract Days
Estimated Construction Cost (Engineer's Estimate): \$12.04M
Actual Low Bid / Construction Contract: \$10.99M

68th Ave NE Pedestrian/Bicycle Safety Project:

Pre-construction utility relocation work continues and is anticipated that it will be completed before the start of construction. Design for the 68th Ave NE project is now complete, however, the project is currently on hold until the City receives its final permit from the Corps of Engineers. The bidding phase for this project has been delayed until the early fall of 2020. Construction will not begin until the first quarter of 2021 and will be completed by the fall of 2022.

Contract Working Days: 240 Contract Days
Estimated Construction Cost (Engineer's Estimate): \$9,550,000.

2020 Pavement Preservation Project:

The 2020 Pavement Sealing Project advertised on June 3rd and contract award is on the City Council agenda for the June 22 council meeting. The project is separated into three areas: Arrowhead neighborhood, Northeast Kenmore (north of 192nd St and between 75th Av and 80th Av), and Northwest Kenmore (Kenlake Pl north of 62nd Av, and several small road sections north of SR 522 and west of 68th Av). The Arrowhead neighborhood area will be recommended for award but the other two areas will be pending bids received and available budget. Public outreach for the project is being prepared and information regarding the project will be available on the website soon after the project is awarded. Outreach by mail and door hangers to affected residents will take place soon after award. The construction schedule will be developed with the contractor once the project is awarded, but work is expected to begin in late July or early-to-mid August and substantially complete in approximately two weeks or less after it begins.

Contract Working Days: 40 Contract Days
Estimated Construction Cost (Engineer's Estimate): \$625,000

Simonds Overlay Project:

The Simonds Road Overlay Project includes the overlay of Simonds Road from 163rd Pl to 92nd St. and improvements at the intersection of 84th Ave NE which include Rectangular Rapid Flashing Beacon (RRFB), new curb ramps, narrowing the crossing of 84th Ave NE on the northside of the intersection, and some minor landscaping. The project also includes replacing curb ramps to meet Americans with Disabilities Act (ADA) and rechannelization of Simonds Road adding bike lanes on both sides. The added bike lanes will connect to the existing bike lanes to the north/west on Simonds Road/170th St.

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Transportation CIP Update
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Work started June 1st with removal of curb ramps and construction of new curb ramps. Once curb ramps have been poured, removal of the top 2" of the asphalt surface will start. Pavement removal is expected to start the first week of June 22nd. Weather permitting, paving will start thereafter and continue into July. After paving, work at the 84th intersection will be finished.

Contractor: Lakeside Industries
Contract Working Days: 40 Contract Days
Estimated Construction Cost (Engineer's Estimate): \$899,000
Actual Low Bid / Construction Contract: \$881,481

61st Sidewalk Replacement Project:

We are currently applying for grant funds for replacing sidewalk panels along the 61st Ave Corridor. A project of this nature does not typically compete well for grant funding but we are hopeful that we will secure some funding assistance in replacing the damaged sidewalk. Options for replacing the sidewalks panels will be reviewed by staff and brought to Council for discussion early next year.