Everett City Council Preliminary Agenda
6:30 p.m., Wednesday, October 23, 2024
City Council Chambers

Roll Call

Pledge Of Allegiance

Land Acknowledgment

Approval Of Minutes: October 16, 2024

Mayor's Comments: Swear In Of Police Officers: Jayland Roxas And Benjamin Weaver

Public Comment

Council Comments/Liaison Reports

Administration Update

City Attorney

CONSENT ITEMS:

(1) Adopt Resolution Authorizing Claims Against The City Of Everett In The Amount Of $4,714,342.82 For The Period Ending October 5, 2024 Through October 11, 2024.

Documents:

RES CLAIMS PAYABLE OCT 5, 2024 - OCT 11, 2024.PDF

(2) Adopt Resolution Authorizing Payroll Claims Against The City Of Everett In The Amount Of $5,571,936.46 For The Period Ending October 5, 2024.

Documents:

2024 RESOLUTION FOR PAYROLL PAY PERIOD 21.PDF

(3) Award Request For Proposal #2024-084 Job Order Contracting (JOC) For General Construction Services To Forma Construction Company, Burton Construction Inc., And CDK Construction Services For Two Years With One (1) Bilateral Option Term Of One Year.

Documents:

JOC AWARD.PDF

PROPOSED ACTION ITEMS:

(4) CB 2410-28 – 1st Reading - Adopt An Ordinance Relating To Changes In The City Of Everett's Procurement Policy Regarding Contractors And Service Providers Who Have Engaged In Wage Theft. (3rd & Final Reading 11/6/24)

Documents:

CB 2410-28.PDF

(5) CB 2410-29 – 1st Reading - Adopt The Amendment To Ordinance 3196-10 (International Property Maintenance Code) (EMC 16.09.010). (3rd & Final Reading 11/6/24)

Documents:

CB 2410-29.PDF

BRIEFING & PROPOSED ACTION ITEM:

(6) Adoption Of The Updated 2024 Hazard Mitigation Plan.

Documents:

HAZARD MITIGATION PLAN UPDATE.PDF
10 23 24 HAZARD MITIGATION PLAN PRES_V2.PDF

PUBLIC HEARING & PROPOSED ACTION ITEM:

(7) CB 2409-24 – 3rd & Final Reading - Adopt An Ordinance Amending The Zoning Map For 1301 Lombard Avenue.

Documents:

CB 2409-24.PDF

ACTION ITEMS:

(8) CB 2409-25 – 3rd & Final Reading - Adopt An Ordinance Creating A Special Improvement Project Entitled “Dorn Avenue Drainage Improvements” Fund 336, Program 043.

Documents:

CB 2409-25.PDF

(9) CB 2409-26 – 3rd & Final Reading - Adopt An Ordinance Creating A Special Improvement Project Entitled “Marilyn Avenue Drainage Improvements” Fund 336, Program 044.

Documents:

CB 2409-26.PDF

(10) CB 2409-27 – 3rd & Final Reading - Adopt An Ordinance Creating A Special Improvement Project Entitled “Olympic Boulevard Fish Barrier At Pigeon Creek No. 2” Fund 336, Program 045.

Documents:

CB 2409-27.PDF

Executive Session

Adjourn

PARTICIPATION IN REMOTE COUNCIL MEETINGS

- Call in to listen to the Council meetings: 425.616.3920, conference ID: 724 887 726#
- Participate remotely via Zoom by registering to speak at everettwa.gov/speakerform. You must register no later than 30 minutes prior to the meeting. Or contact Angela Ely at 425.257.8703 or aely@everettwa.gov and identify the topic you wish to address.
- Provide written public comments by email to Council@everettwa.gov or mail to 2930 Wetmore Avenue, Suite 9A, Everett, WA 98201. Emailing comments 24 hours prior to the meeting will ensure your comment is distributed to councilmembers and appropriate staff.
- Persons seeking to comment on non-agenda items may be asked to submit the comments in writing if the comment does not address an issue of broad public interest.

AGENDAS, BROADCAST AND RECORDINGS

- The Council agendas and meeting recordings can be found, in their entirety, at everettwa.gov/citycouncil.
- The Council meetings are broadcast on government-access cable Comcast Channel 21 and Frontier Channel 29. They are rebroadcast on Monday and Tuesday at noon; Thursday at 2 p.m. and 7 p.m.; Friday and Sunday at 7 p.m.; Saturday at 10 a.m.
- Watch live meetings and recordings at YouTube.com/EverettCity.

CONTACT THE COUNCIL

If you do not wish to participate in the meeting, we provide these other methods of contacting your elected officials: Email the Council at Council@everettwa.gov.

- Call the Council offices at 425.257.8703
- You may call in just to listen to the meeting: 425.616.3920, conference ID 724 887 726#

The City of Everett does not discriminate on the basis of disability in the admission or access to, or treatment in, its programs or activities. Requests for assistance or accommodations can be arranged by contacting the Everett City Council Office at 425.257.8703. For additional information, please visit our website at https://www.everettwa.gov/3129/American-Disabilities-Act-ADA-and-Title-.

RESOLUTION NO. _____

Be it Resolved by the City Council of the City of Everett:

Whereas the claims payable by check against the City of Everett for the period Oct 5, 2024 through Oct 11, 2024, having been audited and approved by the proper officers, have been paid and the disbursements made by the same, against the proper funds in payment thereof, as follows:

Fund	Department	Amount
002	General Government	441.60
003	Legal	11,943.92
004	Administration	6,250.00
005	Municipal Court	5,424.04
009	Misc Financial Funds	50,581.45
010	Finance	179.78
018	Communications, Mktg & Engag	17.50
024	Public Works-Engineering	18,314.14
031	Police	4,764.42
032	Fire	2,732.18
038	Facilities/Maintenance	98.50
	TOTAL GENERAL FUND	**$ 100,747.53**

Fund	Department	Amount
101	Parks & Recreation	20,859.89
110	Library	22,307.34
120	Public Works-Streets	17,371.91
130	Develop & Const Permit Fee	1,252.33
146	Property Management	28,957.66
152	Cum Reserve-Library	290.99
153	Emergency Medical Service:	161.91
155	Capital Reserve Fund	36,177.14
156	Criminal Justice	157.77
197	CHIP Loan Program	453.93
303	PW Improvement Projects	64,979.61
336	Water & Sewer Sys Improv I	4,207.74
342	City Facilities Construction	3,096,088.48
354	Parks Capital Construction	1,082.00
401	Public Works-Utilities	176,394.48
425	Public Works-Transit	515,340.30
430	Everpark Garage	322,234.19
440	Golf	43,352.60
501	MVD-Transportation Service	88,463.56
503	Self-Insurance	19,068.77
637	Police Pension	27,725.09
661	Claims	122,951.60
670	Custodial Funds	3,716.00
	TOTAL CLAIMS	**$ 4,714,342.82**

_____
Councilperson introducing Resolution

Passed and approved this _____day of _____ , 2024

_____
Council President

EVERETT
WASHINGTON

RESOLUTION NO. _____

Be it resolved by the City Council of the City of Everett:

That the payroll of the employees of the City of Everett as of October 05, and checks issued October 11, 2024, having been audited, be and the same is hereby approved and the proper officers are hereby authorized and directed to charge checks on the Payroll Fund in payment thereof:

Fund	Department	Gross Payroll	Employer Contributions
001	Legislative	13,178.37	7,521.05
003	Legal	93,820.76	26,123.14
004	Administration	52,780.57	10,307.49
005	Municipal Court	70,576.12	23,719.25
007	Personnel	54,361.69	17,493.92
010	Finance	111,092.69	34,542.87
015	Information Technology	155,585.95	39,246.98
018	Communications and Marketing	23,682.62	7,199.40
021	Planning & Community Dev	121,701.66	35,943.59
024	Public Works	226,512.16	72,177.15
026	Animal Shelter	59,378.21	23,642.18
030	Emergency Management	9,864.80	3,404.47
031	Police	1,210,156.38	309,765.40
032	Fire	731,364.74	200,470.58
038	Facilities/Maintenance	111,604.76	41,372.42
101	Parks & Recreation	147,181.83	56,358.25
110	Library	124,995.97	40,094.88
112	Community Theatre	8,654.23	2,096.23
120	Street	73,263.25	27,165.92
153	Emergency Medical Services	459,192.96	106,301.76
197	CHIP	25,474.35	3,311.62
198	Community Dev Block	3,839.52	1,261.28
401	Utilities	999,013.15	343,558.62
425	Transit	560,429.67	198,185.18
440	Golf	43,548.24	13,596.97
501	Equip Rental	80,681.81	29,302.88
		$5,571,936.46	$1,674,163.48

_____
Councilperson Introducing Resolution

Passed and approved this _____ day of _____ , 2024.

_____
Council President

EVERETT | City Council Agenda Item Cover Sheet

Project title: Award Request for Proposal #2024-084 Job Order Contracting (JOC) for General Construction Services to Forma Construction Company, Burton Construction Inc. and CDK Construction Services

Council Bill # *interoffice use*

Agenda dates requested:

Briefing
Proposed action
Consent 10/23/24
Action
Ordinance
Public hearing
Yes X No

Budget amendment:
Yes X No

PowerPoint presentation:
Yes X No

Attachments:
Contracts

Department(s) involved:
Procurement

Contact person:
Theresa Bauccio-Teschlog

Phone number:
(425) 257-8901

Email:
tbauccio@everettwa.gov

Initialed by:
HB

Department head

Administration

Council President

Project:	Request for Proposal #2024-084 Job Order Contracting for General Construction Services
Partner/Supplier:	Forma Construction Company, Burton Construction Inc., CDK Construction Services.
Location:	Various
Preceding action:	5/29/2024 Authorized release of Request for Proposal #2024-084 Job Order Contracting (JOC) for General Construction Services as substantially provided
Fund:	Various

Fiscal summary statement:

State statute limits job orders to no more than $500,000 per project, and contractors can receive no more than $4 million in job orders per year. Projects completed through Job Order Contracting are already budgeted and in the council-approved budget. The funding for each project is paid from various city accounts.

Project summary statement:

RCW 39.10.420 authorizes the City to establish Job Order Contracting (JOC) to reduce the total lead time and cost for the construction of public works projects for repair and renovation at public facilities. JOC uses a competitive process to select general contractors to oversee the completion of smaller projects at established unit pricing. In addition to cost, contractor selection is based on their experience with similar work, ability to manage multiple projects, and a plan to include local and diverse sub-contractors.

Procurement issued RFP #2024-084 on May 31, 2024. The solicitation was posted on the City's website and advertised in the Everett Herald. Three firms submitted proposals. RCW 39.10.420 allows the award to a maximum of three contractors. Staff is recommending awards to all three contractors. Scoring was as follows:

RFP# 2024-084 Job Order Contracting for General Construction Services

	Contractor Name	Total Score
1	FORMA Construction Company	297
2	Burton Construction, Inc	227
3	CDK Construction Services, Inc.	182

Recommendation (exact action requested of Council):

Award Request for Proposal #2024-084 Job Order Contracting (JOC) for General Construction Services to Forma Construction Company, Burton Construction Inc., and CDK Construction Services for two years with one (1) bilateral option term of one year.

CITY OF EVERETT, WASHINGTON

JOB ORDER CONTRACT

THIS JOB ORDER CONTRACT by and between the City of Everett (City) and Forma Construction Company (Contractor). This Contract was awarded pursuant to RFP 2024-084 Job Order Contracting for General Construction Services (RFP). City and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

SECTION 1 - WORK

Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

The Work of this Contract will be set forth in the Detailed Scopes of Work referenced in the individual Job Orders. The Contractor is required to complete each Detailed Scope of Work for the Job Order Price within the Job Order Completion Time.

The value of a Job Order Price Proposal shall be calculated by summing the total of the calculation for each Prepriced Task (Unit Price x quantity x Adjustment Factor) plus the value of all Non-Prepriced Tasks.

***SECTION* 2 – CITY REPRESENTATIVES**

2.1 **Project Manager**: The City will appoint a Project Manager for each Job Order, who shall be the City's representative and assume all duties and responsibilities and have the rights and authority assigned to the Project Manager in the Contract Documents in connection with the completion of the Work in accordance with the Job Order and the Contract Documents.

2.2 **Contract Administrator:** The JOC Contract Administrator is designated by the City to manage the Job Order Contracting program for the City. The Contract Administrator will oversee the execution of the program on behalf of the City and will provide overall guidance to the Project Managers and Contractor(s) in the execution of Job Orders. The Contract Administrator shall intervene in disputes or disagreements between the Project Manager and the Contractor. The Contract Administrator also may exercise any authority granted to Project Managers under the Contract Documents with respect to any Job Order at any time.

***SECTION* 3 - CONTRACT TIME**

3.1 The Base Term of the Contract is two (2) years.

3.2 There is one (1) bilateral Option Term. Both parties must agree to extend the Contract for the Option Term, which will be formalized as an amendment to this Contract. The duration of the Option Term is one year.

3.3 The City and the Contractor may agree to extend the Option Term, which will be formalized as an amendment to this Contract.

3.4 All Job Orders issued during the term of this Contract shall be valid and in effect notwithstanding that the Detailed Scope of Work may be performed, payments may be made, and the guarantee period may continue, after the Contract term has expired. All terms and conditions of the Contract apply to each Job Order.

3.5 The Contractor shall commence work upon issuance of a Job Order and shall complete the Detailed Scope of Work for the Job Order Price within the Job Order Completion Time.

***SECTION* 4 - CONTRACT PRICE**

4.1 City shall pay Contractor for completion of the Detailed Scopes of Work in accordance with the Contract Documents.

4.2 The Contract is an indefinite-quantity contract for general construction work and services. The Minimum Contract Value of Job Orders that the Contractor is guaranteed the opportunity to perform under this Contract is Twenty-Five Thousand Dollars ($25,000). The Estimated Annual Value is Four Million Dollars ($4,000,000) for the City's Job Order Contracting Program. The City reserves the right to issue up to the maximum amount specified in RCW 39.10.40 of Four Million Dollars ($4,000,000) per year or such greater amount that may be authorized by statute. The Maximum Contract Value shall not exceed the value set forth in the RCW.

4.3 The Contractor shall perform all work required, necessary, proper for or incidental to completing the Detailed Scope of Work called for in each individual Job Order issued pursuant to this Contract for the Unit Prices set forth in the Construction Task Catalog® and the following Adjustment Factors:

Normal Working Hours Adjustment Factor

7:00 am to 4:00 pm Monday through Friday, except for City Holidays:

1.3850.

Other Than Normal Working Hours Adjustment Factor

4:01 pm to 6:59 am Monday through Friday, and all day Saturday, Sunday and Owner Holidays:

1.3850.

Non-Prepriced Adjustment Factor:

1.15.

***SECTION* 5 - PAYMENT PROCEDURES**

Contractor shall submit Applications for Payment in accordance with Article 12 the General Conditions. Applications for Payment will be processed by the Contract Administrator with approval by the Project Manager as provided in the General Conditions.

5.1 Progress Payments. City shall make progress payments on account of the Job Order Price on the basis of Contractor's Invoices as recommended by Project Manager and Contract

Administrator in accordance with Article 12.1 of the General Conditions. All progress payments will be on the basis of the progress of the Work as established in the General Conditions (and in the case of Unit Price Work based on the number of units completed).

5.2.1 Final Payment: Upon final completion and acceptance of the work in accordance with the General Conditions, City shall pay the remainder of the Job Order Price as recommended by Project Manager and Contract Administrator. A Certificate of Completion signed by the Project Manager is required prior to payment of any final invoice(s).

5.2.2 As determined by the Project Manager, progress payments shall be made per the Project Payment Schedule.

5.2.3 In accordance with RCW 39.10.450, for purposes of chapters 39.08, 39.12, 39.76, and 60.28 RCW, each Job Order issued shall be treated as a separate contract. Contractor will provide the bonds as set forth in the RFP and in the General Conditions on the forms provided by the City. The alternate filing provisions of RCW 39.12.040(2) apply to each Job Order that otherwise meets the eligibility requirements of RCW 39.12.040(2).

***SECTION* 6 INDEMNIFICATION**

The indemnity and defense obligations in this Section 6 are in addition to any other indemnity and defense obligation elsewhere in the Contract Documents.

A. Contractor will defend and indemnify the City from any and all Claims arising out of, in connection with, or incident to any acts, errors, omissions, or conduct by Contractor relating to, or arising out of its performance of, this Contract. The Contractor will defend and indemnify the City whether a Claim is asserted directly against the City, or whether a Claim is asserted indirectly against the City, e.g., a Claim is asserted against someone else who then seeks contribution or indemnity from the City. The amount of insurance obtained by, obtainable by, or required of the Contractor does not in any way limit the Contractor's duty to defend and indemnify the City. The City retains the right to approve Claims investigation and counsel assigned to said Claim and all investigation and legal work regarding said Claim shall be performed under a fiduciary relationship to the City.

B. The Contractor's obligations under this Section shall not apply to Claims caused by the sole negligence of the City. If (1) RCW 4.24.115 applies to a particular Claim, and (2) such Claim is caused by or results from the concurrent negligence of (a) the Contractor, its employees, subcontractors/subconsultants or agents and (b) the City, then the Contractor's obligations under this Section 6 shall apply only to the extent allowed by RCW 4.24.115.

C. As used in this section: (1) "City" includes the City's officers, employees, agents, and representatives; (2) "Claims" include all losses, claims, demands, expenses (including, but not limited to, attorney's fees and litigation expenses), suits, judgments, or damage, whether threatened, asserted or filed against the City, whether such Claims sound in tort, contract, or any other legal theory, whether such Claims have been reduced to judgment or arbitration award, irrespective of the type of relief sought or demanded (such as money or injunctive relief), and irrespective of the type of damage alleged (such as bodily injury, damage to property, economic loss, general damages, special damages, or punitive damages); and (3) "Contractor" includes Contractor, its employees, agents, representatives and subcontractors.

D. Contractor waives any right of contribution against the City. It is agreed and mutually negotiated that in any and all claims against the City, its agents or employees, the Contractor, a subcontractor, anyone directly or indirectly employed by the Contractor or subcontractor, or anyone for whose acts any of them may be liable, the defense and indemnification obligations hereunder shall not be limited in any way by any limitation on the amount of damages, compensation, or benefits payable by or for the Contractor or any subcontractor under industrial worker's compensation acts, disability benefit acts, or other employees' benefit acts. Contractor's and City's signatures hereto indicate specific waiver of Contractor's industrial insurance immunity in order to fulfill this indemnity. SOLELY FOR THE PURPOSE OF INDEMNIFICATION AND DEFENSE AS PROVIDED IN THIS CONTRACT, THE CONTRACTOR SPECIFICALLY WAIVES ANY IMMUNITY UNDER THE STATE INDUSTRIAL INSURANCE LAW, TITLE 51 RCW. THE CONTRACTOR EXPRESSLY ACKNOWLEDGES THAT THIS WAIVER OF IMMUNITY UNDER TITLE 51 RCW WAS THE SUBJECT OF MUTUAL NEGOTIATION AND WAS SPECIFICALLY ENTERED INTO PURSUANT TO THE PROVISIONS OF RCW 4.24.115.

***SECTION* 7 - CONTRACTOR'S REPRESENTATIONS**

Contractor, by submittal of a Proposal and entering into this Contract, makes the following representations:

7.1 Contractor has familiarized itself with the nature and extent of the Contract Documents, Work, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

7.2 Contractor is fully qualified to perform the Work to be performed hereunder in a competent and professional manner.

7.3 Contractor has given Project Manager written notice of all conflicts, errors or discrepancies that Contractor has discovered in the Contract Documents and the written resolution thereof by Project Manager is acceptable to Contractor.

***SECTION* 8 - CONTRACT DOCUMENTS**

The Contract Documents which comprise the entire agreement between City and Contractor concerning the work, consist of the following:

8.1 This Contract and its exhibits, if any. In a Federally Funded Job Order (as defined in the General Conditions) this Contract includes the applicable current Federal Contract Clauses, which the City will specifically designate in the Job Order. These Federal Contract Clauses are only applicable to that specific Federally Funded Job Order and have no force or effect with respect to any other Job Order. A Federally Funded Job Order may also include one-time changes to the Contract Documents specifically for that Job Order signed for the City by the Contract Administrator as necessary to coordinate the requirements of the applicable Federal Contract Clauses with the requirements of the Contract Documents.

8.2 General Conditions, attached hereto as Exhibit A, incorporated by reference.

8.3 Supplementary Conditions, incorporated by reference.

8.4 The RFP and all addenda, incorporated by reference.

8.5 Contractor's Proposal, incorporated by reference. If there is inconsistency between any provision of the Contractor's Proposal and any other Contract Document, then the provision imposing the more stringent requirement on the Contractor will control.

8.6 The Construction Task Catalog®, incorporated by reference.

8.7 All Job Orders and related documents, including but not limited to, the Detailed Scope of Work with Drawings and/or Specifications, Request for Proposal, Price Proposal, Job Order Proposal, Notice to Proceed, submittals, record documents, and all required close-out documentation and warranties, incorporated by reference. If there is inconsistency between any provision of the documents listed in this Section 8.7 and any other Contract Document, then the provision imposing the more stringent requirement on the Contractor will control.

There are no Contract Documents other than those listed above in this Section 8. The Contract Documents may only be amended, modified or supplemented as provided in the General Conditions or Supplementary Conditions.

All Contract Documents are essential parts of the Contract, and a requirement occurring in one is as binding as though occurring in all. In cases of conflict in the requirements and provisions as set out by the Contract Documents, the specifications, or the drawings, such conflict shall be reconciled by the order of precedence in the order the Contract Documents are set forth above.

Any modification of any Contract Document listed in sections 8.1 to 8.6 above requires an amendment executed by an authorized representative of the City and by an authorized representative of the Contractor. Changes to Contract Documents listed under Section 8.7 may executed by an authorized representative of the Contractor and by the Project Manager or the Contract Administrator for the City, as determined by Contract Administrator policy.

***SECTION* 9 – PREVAILING WAGE**

Contractor shall comply with all state and federal laws relating to the employment of labor and wage rates to be paid. The Contractor will be required to file prevailing wage intents and affidavits with Labor & Industries for each Job Order. A Federally Funded Job Order may specify the Davis-Bacon Act and Copeland Anti-Kickback Act, in which case Contractor shall comply with these requirements. The Contractor will pay state prevailing wage or Davis-Bacon wages, whichever is higher.

***SECTION* 10 - MISCELLANEOUS**

10.1 Terms used in this Contract which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

10.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in an written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.3 City and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect of all covenants, agreements, and obligations contained in the Contract Documents.

10.4 This Contract is governed by the laws of the State of Washington without regard to the principles of conflict of laws. Any action or suit brought in connection with this Contract shall be exclusively brought in the Superior Court of Snohomish County, Washington.

IN WITNESS WHEREOF, City and Contractor have signed this Contract. This Contract is effective as of the date of the last person to sign it, and may be executed in multiple counterparts, each of which shall be deemed an original. Signatures with AdobeSign are fully binding.

CITY OF EVERETT, WASHINGTON

By:_____
Cassie Franklin, Mayor

Attest:

_____
Office of the City Clerk

CONTRACTOR
Forma Construction Company

By:_____

Name: Eric Lindstrom
Title: Chief Operating Officer
Date:_____

CITY OF EVERETT, WASHINGTON

JOB ORDER CONTRACT

THIS JOB ORDER CONTRACT by and between the City of Everett (City) and Burton Construction, Inc. (Contractor). This Contract was awarded pursuant to RFP 2024-084 Job Order Contracting for General Construction Services (RFP). City and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

SECTION 1 - WORK

Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

The Work of this Contract will be set forth in the Detailed Scopes of Work referenced in the individual Job Orders. The Contractor is required to complete each Detailed Scope of Work for the Job Order Price within the Job Order Completion Time.

The value of a Job Order Price Proposal shall be calculated by summing the total of the calculation for each Prepriced Task (Unit Price x quantity x Adjustment Factor) plus the value of all Non-Prepriced Tasks.

***SECTION* 2 – CITY REPRESENTATIVES**

2.1 **Project Manager**: The City will appoint a Project Manager for each Job Order, who shall be the City's representative and assume all duties and responsibilities and have the rights and authority assigned to the Project Manager in the Contract Documents in connection with the completion of the Work in accordance with the Job Order and the Contract Documents.

2.2 **Contract Administrator:** The JOC Contract Administrator is designated by the City to manage the Job Order Contracting program for the City. The Contract Administrator will oversee the execution of the program on behalf of the City and will provide overall guidance to the Project Managers and Contractor(s) in the execution of Job Orders. The Contract Administrator shall intervene in disputes or disagreements between the Project Manager and the Contractor. The Contract Administrator also may exercise any authority granted to Project Managers under the Contract Documents with respect to any Job Order at any time.

***SECTION* 3 - CONTRACT TIME**

3.1 The Base Term of the Contract is two (2) years.

3.2 There is one (1) bilateral Option Term. Both parties must agree to extend the Contract for the Option Term, which will be formalized as an amendment to this Contract. The duration of the Option Term is one year.

3.3 The City and the Contractor may agree to extend the Option Term, which will be formalized as an amendment to this Contract.

3.4 All Job Orders issued during the term of this Contract shall be valid and in effect notwithstanding that the Detailed Scope of Work may be performed, payments may be made, and the guarantee period may continue, after the Contract term has expired. All terms and conditions of the Contract apply to each Job Order.

3.5 The Contractor shall commence work upon issuance of a Job Order and shall complete the Detailed Scope of Work for the Job Order Price within the Job Order Completion Time.

***SECTION* 4 - CONTRACT PRICE**

4.1 City shall pay Contractor for completion of the Detailed Scopes of Work in accordance with the Contract Documents.

4.2 The Contract is an indefinite-quantity contract for general construction work and services. The Minimum Contract Value of Job Orders that the Contractor is guaranteed the opportunity to perform under this Contract is Twenty-Five Thousand Dollars ($25,000). The Estimated Annual Value is Four Million Dollars ($4,000,000) for the City's Job Order Contracting Program. The City reserves the right to issue up to the maximum amount specified in RCW 39.10.40 of Four Million Dollars ($4,000,000) per year or such greater amount that may be authorized by statute. The Maximum Contract Value shall not exceed the value set forth in the RCW.

4.3 The Contractor shall perform all work required, necessary, proper for or incidental to completing the Detailed Scope of Work called for in each individual Job Order issued pursuant to this Contract for the Unit Prices set forth in the Construction Task Catalog® and the following Adjustment Factors:

Normal Working Hours Adjustment Factor

7:00 am to 4:00 pm Monday through Friday, except for City Holidays:

1.35.

Other Than Normal Working Hours Adjustment Factor

4:01 pm to 6:59 am Monday through Friday, and all day Saturday, Sunday and Owner Holidays:

1.35.

Non-Prepriced Adjustment Factor:

1.18.

***SECTION* 5 - PAYMENT PROCEDURES**

Contractor shall submit Applications for Payment in accordance with Article 12 the General Conditions. Applications for Payment will be processed by the Contract Administrator with approval by the Project Manager as provided in the General Conditions.

5.1 Progress Payments. City shall make progress payments on account of the Job Order Price on the basis of Contractor's Invoices as recommended by Project Manager and Contract

Administrator in accordance with Article 12.1 of the General Conditions. All progress payments will be on the basis of the progress of the Work as established in the General Conditions (and in the case of Unit Price Work based on the number of units completed).

5.2.1 Final Payment: Upon final completion and acceptance of the work in accordance with the General Conditions, City shall pay the remainder of the Job Order Price as recommended by Project Manager and Contract Administrator. A Certificate of Completion signed by the Project Manager is required prior to payment of any final invoice(s).

5.2.2 As determined by the Project Manager, progress payments shall be made per the Project Payment Schedule.

5.2.3 In accordance with RCW 39.10.450, for purposes of chapters 39.08, 39.12, 39.76, and 60.28 RCW, each Job Order issued shall be treated as a separate contract. Contractor will provide the bonds as set forth in the RFP and in the General Conditions on the forms provided by the City. The alternate filing provisions of RCW 39.12.040(2) apply to each Job Order that otherwise meets the eligibility requirements of RCW 39.12.040(2).

***SECTION* 6 INDEMNIFICATION**

The indemnity and defense obligations in this Section 6 are in addition to any other indemnity and defense obligation elsewhere in the Contract Documents.

A. Contractor will defend and indemnify the City from any and all Claims arising out of, in connection with, or incident to any acts, errors, omissions, or conduct by Contractor relating to, or arising out of its performance of, this Contract. The Contractor will defend and indemnify the City whether a Claim is asserted directly against the City, or whether a Claim is asserted indirectly against the City, e.g., a Claim is asserted against someone else who then seeks contribution or indemnity from the City. The amount of insurance obtained by, obtainable by, or required of the Contractor does not in any way limit the Contractor's duty to defend and indemnify the City. The City retains the right to approve Claims investigation and counsel assigned to said Claim and all investigation and legal work regarding said Claim shall be performed under a fiduciary relationship to the City.

B. The Contractor's obligations under this Section shall not apply to Claims caused by the sole negligence of the City. If (1) RCW 4.24.115 applies to a particular Claim, and (2) such Claim is caused by or results from the concurrent negligence of (a) the Contractor, its employees, subcontractors/subconsultants or agents and (b) the City, then the Contractor's obligations under this Section 6 shall apply only to the extent allowed by RCW 4.24.115.

C. As used in this section: (1) "City" includes the City's officers, employees, agents, and representatives; (2) "Claims" include all losses, claims, demands, expenses (including, but not limited to, attorney's fees and litigation expenses), suits, judgments, or damage, whether threatened, asserted or filed against the City, whether such Claims sound in tort, contract, or any other legal theory, whether such Claims have been reduced to judgment or arbitration award, irrespective of the type of relief sought or demanded (such as money or injunctive relief), and irrespective of the type of damage alleged (such as bodily injury, damage to property, economic loss, general damages, special damages, or punitive damages); and (3) "Contractor" includes Contractor, its employees, agents, representatives and subcontractors.

D. Contractor waives any right of contribution against the City. It is agreed and mutually negotiated that in any and all claims against the City, its agents or employees, the Contractor, a subcontractor, anyone directly or indirectly employed by the Contractor or subcontractor, or anyone for whose acts any of them may be liable, the defense and indemnification obligations hereunder shall not be limited in any way by any limitation on the amount of damages, compensation, or benefits payable by or for the Contractor or any subcontractor under industrial worker's compensation acts, disability benefit acts, or other employees' benefit acts. Contractor's and City's signatures hereto indicate specific waiver of Contractor's industrial insurance immunity in order to fulfill this indemnity. SOLELY FOR THE PURPOSE OF INDEMNIFICATION AND DEFENSE AS PROVIDED IN THIS CONTRACT, THE CONTRACTOR SPECIFICALLY WAIVES ANY IMMUNITY UNDER THE STATE INDUSTRIAL INSURANCE LAW, TITLE 51 RCW. THE CONTRACTOR EXPRESSLY ACKNOWLEDGES THAT THIS WAIVER OF IMMUNITY UNDER TITLE 51 RCW WAS THE SUBJECT OF MUTUAL NEGOTIATION AND WAS SPECIFICALLY ENTERED INTO PURSUANT TO THE PROVISIONS OF RCW 4.24.115.

***SECTION* 7 - CONTRACTOR'S REPRESENTATIONS**

Contractor, by submittal of a Proposal and entering into this Contract, makes the following representations:

7.1 Contractor has familiarized itself with the nature and extent of the Contract Documents, Work, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

7.2 Contractor is fully qualified to perform the Work to be performed hereunder in a competent and professional manner.

7.3 Contractor has given Project Manager written notice of all conflicts, errors or discrepancies that Contractor has discovered in the Contract Documents and the written resolution thereof by Project Manager is acceptable to Contractor.

***SECTION* 8 - CONTRACT DOCUMENTS**

The Contract Documents which comprise the entire agreement between City and Contractor concerning the work, consist of the following:

8.1 This Contract and its exhibits, if any. In a Federally Funded Job Order (as defined in the General Conditions) this Contract includes the applicable current Federal Contract Clauses, which the City will specifically designate in the Job Order. These Federal Contract Clauses are only applicable to that specific Federally Funded Job Order and have no force or effect with respect to any other Job Order. A Federally Funded Job Order may also include one-time changes to the Contract Documents specifically for that Job Order signed for the City by the Contract Administrator as necessary to coordinate the requirements of the applicable Federal Contract Clauses with the requirements of the Contract Documents.

8.2 General Conditions, attached hereto as Exhibit A, incorporated by reference.

8.3 Supplementary Conditions, incorporated by reference.

8.4 The RFP and all addenda, incorporated by reference.

8.5 Contractor's Proposal, incorporated by reference. If there is inconsistency between any provision of the Contractor's Proposal and any other Contract Document, then the provision imposing the more stringent requirement on the Contractor will control.

8.6 The Construction Task Catalog®, incorporated by reference.

8.7 All Job Orders and related documents, including but not limited to, the Detailed Scope of Work with Drawings and/or Specifications, Request for Proposal, Price Proposal, Job Order Proposal, Notice to Proceed, submittals, record documents, and all required close-out documentation and warranties, incorporated by reference. If there is inconsistency between any provision of the documents listed in this Section 8.7 and any other Contract Document, then the provision imposing the more stringent requirement on the Contractor will control.

There are no Contract Documents other than those listed above in this Section 8. The Contract Documents may only be amended, modified or supplemented as provided in the General Conditions or Supplementary Conditions.

All Contract Documents are essential parts of the Contract, and a requirement occurring in one is as binding as though occurring in all. In cases of conflict in the requirements and provisions as set out by the Contract Documents, the specifications, or the drawings, such conflict shall be reconciled by the order of precedence in the order the Contract Documents are set forth above.

Any modification of any Contract Document listed in sections 8.1 to 8.6 above requires an amendment executed by an authorized representative of the City and by an authorized representative of the Contractor. Changes to Contract Documents listed under Section 8.7 may executed by an authorized representative of the Contractor and by the Project Manager or the Contract Administrator for the City, as determined by Contract Administrator policy.

***SECTION* 9 – PREVAILING WAGE**

Contractor shall comply with all state and federal laws relating to the employment of labor and wage rates to be paid. The Contractor will be required to file prevailing wage intents and affidavits with Labor & Industries for each Job Order. A Federally Funded Job Order may specify the Davis-Bacon Act and Copeland Anti-Kickback Act, in which case Contractor shall comply with these requirements. The Contractor will pay state prevailing wage or Davis-Bacon wages, whichever is higher.

***SECTION* 10 - MISCELLANEOUS**

10.1 Terms used in this Contract which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

10.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in an written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.3 City and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect of all covenants, agreements, and obligations contained in the Contract Documents.

10.4 This Contract is governed by the laws of the State of Washington without regard to the principles of conflict of laws. Any action or suit brought in connection with this Contract shall be exclusively brought in the Superior Court of Snohomish County, Washington.

IN WITNESS WHEREOF, City and Contractor have signed this Contract. This Contract is effective as of the date of the last person to sign it, and may be executed in multiple counterparts, each of which shall be deemed an original. Signatures with AdobeSign are fully binding.

CITY OF EVERETT, WASHINGTON

By:_____
Cassie Franklin, Mayor

Attest:

_____
Office of the City Clerk

CONTRACTOR
Burton Construction, Inc.

By:_____

Name: Jennifer Burton
Title: Vice President
Date:_____

CITY OF EVERETT, WASHINGTON

JOB ORDER CONTRACT

THIS JOB ORDER CONTRACT by and between the City of Everett (City) and CDK Construction Services, Inc. (Contractor). This Contract was awarded pursuant to RFP 2024-084 Job Order Contracting for General Construction Services (RFP). City and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

SECTION 1 - WORK

Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

The Work of this Contract will be set forth in the Detailed Scopes of Work referenced in the individual Job Orders. The Contractor is required to complete each Detailed Scope of Work for the Job Order Price within the Job Order Completion Time.

The value of a Job Order Price Proposal shall be calculated by summing the total of the calculation for each Prepriced Task (Unit Price x quantity x Adjustment Factor) plus the value of all Non-Prepriced Tasks.

***SECTION* 2 – CITY REPRESENTATIVES**

2.1 **Project Manager**: The City will appoint a Project Manager for each Job Order, who shall be the City's representative and assume all duties and responsibilities and have the rights and authority assigned to the Project Manager in the Contract Documents in connection with the completion of the Work in accordance with the Job Order and the Contract Documents.

2.2 **Contract Administrator:** The JOC Contract Administrator is designated by the City to manage the Job Order Contracting program for the City. The Contract Administrator will oversee the execution of the program on behalf of the City and will provide overall guidance to the Project Managers and Contractor(s) in the execution of Job Orders. The Contract Administrator shall intervene in disputes or disagreements between the Project Manager and the Contractor. The Contract Administrator also may exercise any authority granted to Project Managers under the Contract Documents with respect to any Job Order at any time.

***SECTION* 3 - CONTRACT TIME**

3.1 The Base Term of the Contract is two (2) years.

3.2 There is one (1) bilateral Option Term. Both parties must agree to extend the Contract for the Option Term, which will be formalized as an amendment to this Contract. The duration of the Option Term is one year.

3.3 The City and the Contractor may agree to extend the Option Term, which will be formalized as an amendment to this Contract.

3.4 All Job Orders issued during the term of this Contract shall be valid and in effect notwithstanding that the Detailed Scope of Work may be performed, payments may be made, and the guarantee period may continue, after the Contract term has expired. All terms and conditions of the Contract apply to each Job Order.

3.5 The Contractor shall commence work upon issuance of a Job Order and shall complete the Detailed Scope of Work for the Job Order Price within the Job Order Completion Time.

***SECTION* 4 - CONTRACT PRICE**

4.1 City shall pay Contractor for completion of the Detailed Scopes of Work in accordance with the Contract Documents.

4.2 The Contract is an indefinite-quantity contract for general construction work and services. The Minimum Contract Value of Job Orders that the Contractor is guaranteed the opportunity to perform under this Contract is Twenty-Five Thousand Dollars ($25,000). The Estimated Annual Value is Four Million Dollars ($4,000,000) for the City's Job Order Contracting Program. The City reserves the right to issue up to the maximum amount specified in RCW 39.10.40 of Four Million Dollars ($4,000,000) per year or such greater amount that may be authorized by statute. The Maximum Contract Value shall not exceed the value set forth in the RCW.

4.3 The Contractor shall perform all work required, necessary, proper for or incidental to completing the Detailed Scope of Work called for in each individual Job Order issued pursuant to this Contract for the Unit Prices set forth in the Construction Task Catalog® and the following Adjustment Factors:

Normal Working Hours Adjustment Factor

7:00 am to 4:00 pm Monday through Friday, except for City Holidays:

1.412.

Other Than Normal Working Hours Adjustment Factor

4:01 pm to 6:59 am Monday through Friday, and all day Saturday, Sunday and Owner Holidays:

1.643.

Non-Prepriced Adjustment Factor:

1.412.

***SECTION* 5 - PAYMENT PROCEDURES**

Contractor shall submit Applications for Payment in accordance with Article 12 the General Conditions. Applications for Payment will be processed by the Contract Administrator with approval by the Project Manager as provided in the General Conditions.

5.1 Progress Payments. City shall make progress payments on account of the Job Order Price on the basis of Contractor's Invoices as recommended by Project Manager and Contract

Administrator in accordance with Article 12.1 of the General Conditions. All progress payments will be on the basis of the progress of the Work as established in the General Conditions (and in the case of Unit Price Work based on the number of units completed).

5.2.1 Final Payment: Upon final completion and acceptance of the work in accordance with the General Conditions, City shall pay the remainder of the Job Order Price as recommended by Project Manager and Contract Administrator. A Certificate of Completion signed by the Project Manager is required prior to payment of any final invoice(s).

5.2.2 As determined by the Project Manager, progress payments shall be made per the Project Payment Schedule.

5.2.3 In accordance with RCW 39.10.450, for purposes of chapters 39.08, 39.12, 39.76, and 60.28 RCW, each Job Order issued shall be treated as a separate contract. Contractor will provide the bonds as set forth in the RFP and in the General Conditions on the forms provided by the City. The alternate filing provisions of RCW 39.12.040(2) apply to each Job Order that otherwise meets the eligibility requirements of RCW 39.12.040(2).

***SECTION* 6 INDEMNIFICATION**

The indemnity and defense obligations in this Section 6 are in addition to any other indemnity and defense obligation elsewhere in the Contract Documents.

A. Contractor will defend and indemnify the City from any and all Claims arising out of, in connection with, or incident to any acts, errors, omissions, or conduct by Contractor relating to, or arising out of its performance of, this Contract. The Contractor will defend and indemnify the City whether a Claim is asserted directly against the City, or whether a Claim is asserted indirectly against the City, e.g., a Claim is asserted against someone else who then seeks contribution or indemnity from the City. The amount of insurance obtained by, obtainable by, or required of the Contractor does not in any way limit the Contractor's duty to defend and indemnify the City. The City retains the right to approve Claims investigation and counsel assigned to said Claim and all investigation and legal work regarding said Claim shall be performed under a fiduciary relationship to the City.

B. The Contractor's obligations under this Section shall not apply to Claims caused by the sole negligence of the City. If (1) RCW 4.24.115 applies to a particular Claim, and (2) such Claim is caused by or results from the concurrent negligence of (a) the Contractor, its employees, subcontractors/subconsultants or agents and (b) the City, then the Contractor's obligations under this Section 6 shall apply only to the extent allowed by RCW 4.24.115.

C. As used in this section: (1) "City" includes the City's officers, employees, agents, and representatives; (2) "Claims" include all losses, claims, demands, expenses (including, but not limited to, attorney's fees and litigation expenses), suits, judgments, or damage, whether threatened, asserted or filed against the City, whether such Claims sound in tort, contract, or any other legal theory, whether such Claims have been reduced to judgment or arbitration award, irrespective of the type of relief sought or demanded (such as money or injunctive relief), and irrespective of the type of damage alleged (such as bodily injury, damage to property, economic loss, general damages, special damages, or punitive damages); and (3) "Contractor" includes Contractor, its employees, agents, representatives and subcontractors.

D. Contractor waives any right of contribution against the City. It is agreed and mutually negotiated that in any and all claims against the City, its agents or employees, the Contractor, a subcontractor, anyone directly or indirectly employed by the Contractor or subcontractor, or anyone for whose acts any of them may be liable, the defense and indemnification obligations hereunder shall not be limited in any way by any limitation on the amount of damages, compensation, or benefits payable by or for the Contractor or any subcontractor under industrial worker's compensation acts, disability benefit acts, or other employees' benefit acts. Contractor's and City's signatures hereto indicate specific waiver of Contractor's industrial insurance immunity in order to fulfill this indemnity. SOLELY FOR THE PURPOSE OF INDEMNIFICATION AND DEFENSE AS PROVIDED IN THIS CONTRACT, THE CONTRACTOR SPECIFICALLY WAIVES ANY IMMUNITY UNDER THE STATE INDUSTRIAL INSURANCE LAW, TITLE 51 RCW. THE CONTRACTOR EXPRESSLY ACKNOWLEDGES THAT THIS WAIVER OF IMMUNITY UNDER TITLE 51 RCW WAS THE SUBJECT OF MUTUAL NEGOTIATION AND WAS SPECIFICALLY ENTERED INTO PURSUANT TO THE PROVISIONS OF RCW 4.24.115.

***SECTION* 7 - CONTRACTOR'S REPRESENTATIONS**

Contractor, by submittal of a Proposal and entering into this Contract, makes the following representations:

7.1 Contractor has familiarized itself with the nature and extent of the Contract Documents, Work, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the Work.

7.2 Contractor is fully qualified to perform the Work to be performed hereunder in a competent and professional manner.

7.3 Contractor has given Project Manager written notice of all conflicts, errors or discrepancies that Contractor has discovered in the Contract Documents and the written resolution thereof by Project Manager is acceptable to Contractor.

***SECTION* 8 - CONTRACT DOCUMENTS**

The Contract Documents which comprise the entire agreement between City and Contractor concerning the work, consist of the following:

8.1 This Contract and its exhibits, if any. In a Federally Funded Job Order (as defined in the General Conditions) this Contract includes the applicable current Federal Contract Clauses, which the City will specifically designate in the Job Order. These Federal Contract Clauses are only applicable to that specific Federally Funded Job Order and have no force or effect with respect to any other Job Order. A Federally Funded Job Order may also include one-time changes to the Contract Documents specifically for that Job Order signed for the City by the Contract Administrator as necessary to coordinate the requirements of the applicable Federal Contract Clauses with the requirements of the Contract Documents.

8.2 General Conditions, attached hereto as Exhibit A, incorporated by reference.

8.3 Supplementary Conditions, incorporated by reference.

8.4 The RFP and all addenda, incorporated by reference.

8.5 Contractor's Proposal, incorporated by reference. If there is inconsistency between any provision of the Contractor's Proposal and any other Contract Document, then the provision imposing the more stringent requirement on the Contractor will control.

8.6 The Construction Task Catalog®, incorporated by reference.

8.7 All Job Orders and related documents, including but not limited to, the Detailed Scope of Work with Drawings and/or Specifications, Request for Proposal, Price Proposal, Job Order Proposal, Notice to Proceed, submittals, record documents, and all required close-out documentation and warranties, incorporated by reference. If there is inconsistency between any provision of the documents listed in this Section 8.7 and any other Contract Document, then the provision imposing the more stringent requirement on the Contractor will control.

There are no Contract Documents other than those listed above in this Section 8. The Contract Documents may only be amended, modified or supplemented as provided in the General Conditions or Supplementary Conditions.

All Contract Documents are essential parts of the Contract, and a requirement occurring in one is as binding as though occurring in all. In cases of conflict in the requirements and provisions as set out by the Contract Documents, the specifications, or the drawings, such conflict shall be reconciled by the order of precedence in the order the Contract Documents are set forth above.

Any modification of any Contract Document listed in sections 8.1 to 8.6 above requires an amendment executed by an authorized representative of the City and by an authorized representative of the Contractor. Changes to Contract Documents listed under Section 8.7 may executed by an authorized representative of the Contractor and by the Project Manager or the Contract Administrator for the City, as determined by Contract Administrator policy.

***SECTION* 9 – PREVAILING WAGE**

Contractor shall comply with all state and federal laws relating to the employment of labor and wage rates to be paid. The Contractor will be required to file prevailing wage intents and affidavits with Labor & Industries for each Job Order. A Federally Funded Job Order may specify the Davis-Bacon Act and Copeland Anti-Kickback Act, in which case Contractor shall comply with these requirements. The Contractor will pay state prevailing wage or Davis-Bacon wages, whichever is higher.

***SECTION* 10 - MISCELLANEOUS**

10.1 Terms used in this Contract which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.

10.2 No assignment by a party hereto of any rights under or interests in the Contract Documents will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in an written consent to an assignment no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

10.3 City and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect of all covenants, agreements, and obligations contained in the Contract Documents.

10.4 This Contract is governed by the laws of the State of Washington without regard to the principles of conflict of laws. Any action or suit brought in connection with this Contract shall be exclusively brought in the Superior Court of Snohomish County, Washington.

IN WITNESS WHEREOF, City and Contractor have signed this Contract. This Contract is effective as of the date of the last person to sign it, and may be executed in multiple counterparts, each of which shall be deemed an original. Signatures with AdobeSign are fully binding.

CITY OF EVERETT, WASHINGTON

By:_____
Cassie Franklin, Mayor

Attest:

_____
Office of the City Clerk

CONTRACTOR
CDK Construction Services, Inc.

By:_____

Name: Chris Davies
Title: Chief Executive Officer
Date:_____

EVERETT City Council Agenda Item Cover Sheet

Project title: Adopt Ordinance Relating to Changes in the City of Everett's Procurement Policy Regarding Contractors and Service Providers Who Have Engaged in Wage Theft

Council Bill # *interoffice use*

Agenda dates requested:

Briefing & Action	
Proposed action	10/23/24
Proposed action	10/30/24
Consent	
Action	11/06/24
Ordinance	X
Public hearing	
Yes	x No

Budget amendment:
Yes x No

PowerPoint presentation:
Yes x No

Attachments:
Proposed Ordinance

Department(s) involved:
Legal (Drafting/Review)

Contact person:
Paula Rhyne

Phone number:
425-359-8134

Email:
prhyne@everettwa.gov

Initialed by:

Department head

Administration

Council President

Consideration:	Ordinance Relating to Changes in the City of Everett's Procurement Policy Regarding Contractors and Service Providers Who Have Engaged in Wage Theft
Project:	Ordinance
Preceding action:	N/A
Fund:	N/A

Fiscal summary statement: None

Project summary statement:

For public works contracts, state law (RCW 39.04.350(1)(g)) prohibits the City from awarding to contractors who, during the previous three years, have been found by Labor & Industries or a court to have willfully violated any provision of RCW chapters 49.46 (Minimum wage), 49.48 (Wage Payment), or 49.52 (Wage Deductions). The state law requires bidders to submit a certification to the City that they have no such violations during the past three years, and by state law the City is entitled to rely on those certifications in making an award.

The proposed ordinance adds a section to the City Procurement Policy to add additional protection above the state law "floor" as follows:

- For public works contracts, the state law three-year period is extended to five years. (Note: "public works contracts" refers to all contracts for construction, repair, maintenance, etc.)
- The ordinance says that the five-year period applicable public works contracts will also apply to all other services contracts (such as, for example, professional services agreements) that are in excess of $10,000.
- City staff will verify contractor/service provider certifications by using L&I online employer look-up tools as such tools are available.

Recommendation (exact action requested of Council): Adopt Ordinance Relating to Changes in the City of Everett's Procurement Policy Regarding Contractors and Service Providers Who Have Engaged in Wage Theft.

EVERETT
WASHINGTON

ORDINANCE NO. _____

An ORDINANCE Relating to Changes in the City of Everett's Procurement Policy Regarding Contractors and Service Providers Who Have Engaged in Wage Theft

WHEREAS,

A. The City of Everett is committed to ensuring the best quality of life possible for our residents.

B. The City of Everett is also committed to fiscal responsibility and prudent budgetary practices.

C. Wage theft is a crime and occurs when employers do not pay workers what they are legally entitled to according to the law or their work agreement. Wage theft can come in the form of paying workers less than minimum wage, failing to compensate for overtime, requiring workers to work uncompensated before or after their shifts, taking illegal deductions from wages, misclassifying employees to pay a lower wage, confiscating rightly earned tips, and other forms.

D. The prevalence of wage theft harms workers' quality of life, diminishes their ability to provide for their household, and inhibits their participation in the local economy. It also harms workers and businesses that do follow the law by placing them at a disadvantage if a competitor keeps their costs artificially low because they are withholding payments from their workers.

E. If a worker is subject to wage theft, they may file a complaint with the Department of Labor and Industries to ask for an investigation. In some cases, an employer is found to have willfully engaged in wage theft if they have engaged in, "a knowing and intentional action that is neither accidental nor the result of a bona fide dispute," (RCW 49.48.082(13)).

F. The City of Everett has identified the need to ensure that unscrupulous employers who are willful violators of wage laws are not rewarded with City contracts, and instead should be supporting fair, ethical, and legal business practices that sustain a thriving economy.

G. The City of Everett has determined that the City's Procurement Policy & Federal Emergency Contracting Policy (400-20-04) should be amended to provide additional protections regarding wage theft.

NOW, THEREFORE, THE CITY OF EVERETT DOES ORDAIN:

Section 1. A new Section is added to the City of Everett Procurement Policy entitled "Wage Theft Protections" as follows:

WAGE THEFT PROTECTIONS

The City recognizes that state law regarding public works contracts (RCW 39.04.350(1)(g) and (2)) provides certain wage theft protections as follows:

> RCW 39.04.350(1)(g): "Before award of a public works contract, a bidder must meet the following responsibility criteria to be considered a responsible bidder and qualified to be awarded a public works

project. The bidder must: . . . . Within the three-year period immediately preceding the date of the bid solicitation, not have been determined by a final and binding citation and notice of assessment issued by the department of labor and industries or through a civil judgment entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of chapter 49.46, 49.48, or 49.52 RCW."

RCW 39.04.350(2): "Before award of a public works contract, a bidder shall submit to the contracting agency a signed statement in accordance with chapter 5.50 RCW verifying under penalty of perjury that the bidder is in compliance with the responsible bidder criteria requirement of subsection (1)(g) of this section. A contracting agency may award a contract in reasonable reliance upon such a sworn statement."

The City has determined that, in addition to the state law requirements, it will implement the following wage theft protections:

Public Works Contracts. In its bid solicitations for public works contracts, the City will, unless the project funding source requires otherwise, include (by supplemental responsibility criterion under RCW 39.04.350(3) or other provision) a bidder responsibility requirement that is substantively the same as RCW 39.04.350(1)(g) and (2), except that the applicable time period shall be the five-year period immediately preceding the date of the bid solicitation.

Other Services Contracts. With respect to contracts or purchase orders for services other than public works (such as, for example, professional services agreements) in excess of $10,000, the City will as practical apply a responsibility/qualification requirement for willful wage violations substantively the same as RCW 39.04.350(1)(g) and (2). The procuring City department will as practical require that the City-service provider contract or the City-issued purchase order contain a provision stating that the service provider, by executing the contract or accepting the purchase order, certifies that it has not, within the preceding five-year period, been determined by a final and binding citation and notice of assessment issued by the department of labor and industries or through a civil judgment entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of chapter 49.46, 49.48, or 49.52 RCW. The City may reasonably rely on such certifications.

Substantially Identical Enitity. The bidder and service provider certification(s) will provide that the certification(s) cover any entity, however organized, with substantially identical operations, corporate, or management structure as bidder or service provider.

City Validation. To the extent practical, City staff will independently validate verifications and certifications from contractors and service providers by using online employer-lookup tools provided by the Washington Department of Labor and Industries. City staff is not required to maintain file records of validations.

Untrue Certifications. Submission of an untrue certification by a bidder or service provider is cause for contract termination.

Section 2. The City Clerk and the codifiers of this Ordinance are authorized to make necessary

corrections to this Ordinance including, but not limited to, the correction of scrivener's/clerical errors, references, ordinance numbering, section/subsection numbers, and any internal references.

Section 3. The City Council hereby declares that should any section, paragraph, sentence, clause or phrase of this ordinance be declared invalid for any reason, it is the intent of the City Council that it would have passed all portions of this ordinance independent of the elimination of any such portion as may be declared invalid.

Section 4. The enactment of this Ordinance shall not affect any case, proceeding, appeal or other matter currently pending in any court or in any way modify any right or liability, civil or criminal, which may be in existence on the effective date of this Ordinance.

Section 5. It is expressly the purpose of this Ordinance to provide for and promote the health, safety and welfare of the general public and not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefited by the terms of this Ordinance. It is the specific intent of this Ordinance that no provision or any term used in this Ordinance is intended to impose any duty whatsoever upon the City or any of its officers or employees. Nothing contained in this Ordinance is intended nor shall be construed to create or form the basis of any liability on the part of the City, or its officers, employees or agents, for any injury or damage resulting from any action or inaction on the part of the City related in any manner to the enforcement of this Ordinance by its officers, employees or agents.

_____
Cassie Franklin, Mayor

ATTEST:

_____
City Clerk

PASSED: _____

VALID: _____

PUBLISHED: _____

EFFECTIVE DATE: _____

EVERETT | City Council Agenda Item Cover Sheet

Project title: An ORDINANCE updating the City of Everett's Amendments to the International Property Maintenance Code, amending EMC 16.09.010

Council Bill #
CB 2410-29

Agenda dates requested:

Briefing	
1st Reading	10/23/24
Proposed action	10/30/24
Action	11/06/24
Ordinance	X
Public hearing	
Yes	x No

Budget amendment:
Yes x No

PowerPoint presentation:
Yes x No

Attachments:
Ordinance

Department(s) involved:
Public Works
Admin
Legal

Contact person:
Tony Lee

Phone number:
425-257-8812

Email:
tlee@everettwa.gov

Project:	Adoption of Amendments to 2021 International Property Maintenance Codes (IPMC)
Partner/Supplier:	N/A
Location:	Citywide
Preceding action:	Ordinance update of EMC 16.09.010 (3196-10, adopted 11/17/10)
Fund:	N/A

Fiscal summary statement:

The purpose of this Ordinance is to amend EMC 16.09.010, so that the Everett-specific amendments are updated with consideration of the 2021 IPMC.

Project summary statement:

In 2021, an updated version of the International Property Maintenance Code ("IPMC") was published by the International Code Council, Inc. The 2021 IPMC has some different code chapters than the 2018 IPMC.

Under Chapter 16.005 EMC, the 2021 IPMC was automatically adopted by Everett when the 2021 IMPC became effective.

EMC 16.09.010 contains the Everett-specific amendments to the IPMC. The purpose of this Ordinance is to amend EMC 16.09.010, so that the Everett-specific amendments are incorporated into the 2021 IPMC.

Recommendation (exact action requested of Council):

Adopt the amendment to Ordinance 3196-10 (International Property Maintenance Code) (EMC 16.09.010).

Initialed by:
RLS
Department head

Administration

Council President

EVERETT
WASHINGTON

ORDINANCE NO. _____

An ORDINANCE updating the City of Everett's amendments to the International Property Maintenance Code, amending EMC 16.09.010

WHEREAS,

A. In 2021, an updated version of the International Property Maintenance Code ("IPMC") was published by the International Code Council, Inc. and contained differences from the 2018 IPMC.

B. Under Chapter 16.005 of the Everett Municipal Code, the 2021 IPMC was automatically adopted by Everett when it became effective.

C. Section 16.09.010 of the Everett Municipal Code contains Everett-specific amendments to the IPMC. The purpose of this Ordinance is to repeal and replace EMC 16.09.010, making Everett-specific amendments consistent with the 2021 IPMC.

NOW, THEREFORE, THE CITY OF EVERETT DOES ORDAIN:

Section 1. Section 16.09.010 of the Everett Municipal Code, as currently written, is repealed in its entirety.

Section 2. A new Section 16.09.010 of the Everett Municipal Code is adopted as follows:

A. Section 101.1 of the IPMC is hereby replaced with the following:

> These regulations shall be known as the International Property Maintenance Code of the City of Everett, hereinafter referred to as "this code."

B. Sections 103.1, 103.2, and 103.3 of the IPMC are hereby replaced with the following:

> 103.1 Enforcement Procedures. The provisions of this chapter are enforced as provided in Chapter 1.20 of the Everett Municipal Code ("EMC").
>
> 103.2 Enforcement Personnel.

103.2.1 Code Official. Consistent with Chapter 16.005, EMC, the City's "code official," as used by this code, is the City's Building Official. For the purposes of Chapter 1.20, EMC, the City's Building Official is also a "code enforcement officer."

103.2.2 Code Enforcement Unit Supervisor. The Code Enforcement Unit Supervisor shall be the City Building Official's designated agent and shall hold, in common with the Building Official, all authorities, powers, and responsibilities under this code. The Code Enforcement Unit Supervisor is both a code official for the purposes of this code and a code enforcement officer for the purposes of Chapter 1.20, EMC. Notwithstanding any language in this code, the Building Official is authorized to enforce the provisions of this code, and the Code Enforcement Unit Supervisor exercises authority and responsibility under the direction of the Building Official.

103.2.3 Code Enforcement Officers. Day-to-day implementation, administration, and enforcement of this code shall be by the City's Code Enforcement Unit under the oversight and direction of the Code Enforcement Unit Supervisor. Individuals hired to serve as the unit's Code Enforcement Officers shall have the powers delegated to them by the City's Building Official or Code Enforcement Unit Supervisor.

C. Section 105.5 of the IPMC is hereby deleted in its entirety and replaced with the following:

All notices and orders issued under this code shall be in issued as set forth in Chapter 1.20, EMC.

D. Sections 107 and 108 of the IPMC are hereby replaced with the following:

SECTION 107 MEANS OF APPEAL

107.1 Means of Appeal. Appeals are governed by the provisions of Chapter 1.20, EMC.

E. Sections 109.2 through 109.5 of the IPMC are hereby deleted in their entirety.

F. Section 111.4 of the IPMC, including Sections 111.4.1 and 111.4.2, is hereby deleted in its entirety.

G. Sections 112.5 and 112.6 of the IPMC are hereby deleted in their entirety.

H. Section 113.1 of the IPMC is hereby replaced with the following:

> When, after review of a structure, the code official's judgment is that the structure is vacant, unsecured, and creating a public nuisance or so deteriorated or dilapidated or has become so out of repair as to be dangerous, unsafe, insanitary, or otherwise unfit for human habitation or occupancy, the code official shall order the owner of the premises upon which the structure is located, or the owner's authorized agent, as follows:
>
> > If the code official's judgment is that it is unreasonable to repair the structure; to demolish and remove such structure; or
> >
> > If the code official's judgment is that the structure is capable of being made safe by repairs; to repair and make safe and sanitary or to board up and hold for future repair or to demolish and remove at the owner's option; or
> >
> > If the code official's judgment is that there has been a cessation of normal construction of any structure for a period of more than two years; to demolish and remove such structure, or board up until future use.
>
> Boarding the building up for future repair shall not extend beyond one year, unless approved by the code official.

I. Section 113.2 is hereby deleted in its entirety.

J. The following definition is added to Section 202, "General Definitions," of the IPMC:

> **"PUBLIC NUISANCE."** Any condition which annoys, injures, interferes with or endangers the comfort, repose, health or safety of others and affects the rights of a community or neighborhood although the extent of the damage may be unequal.

K. Sections 302.4, 302.6, 302.8, and 302.9 of the IPMC are hereby deleted in their entirety.

L. Section 304.2 of the IPMC is hereby replaced with the following:

> When it is discovered that the lack of protective treatment is causing or has caused deterioration to exterior wood or metal surfaces, the code official has the authority to

determine the level of deterioration of the exterior wood or metal surfaces.

M. Section 304.14 of the IPMC is hereby deleted in its entirety.

N. Section 304.17 of the IPMC is hereby deleted in its entirety.

O. Section 404.3 of the IPMC is hereby replaced with the following:

Habitable spaces, hallways, corridors, laundry areas, bathrooms, toilet rooms and habitable basement areas shall have a minimum clear ceiling height of 6 feet 8 inches (2033 mm).

Exceptions:

1. In one- and two-family dwellings, beams or girders spaced not less than 4 feet (1219 mm) on center and projecting not greater than 6 inches (152 mm) below the required ceiling height.

2. Attic and basement rooms in one- and two-family dwellings having a minimum finished ceiling height of 6 feet 8 inches (2033 mm) with a minimum clear height of 6 feet 4 inches (1932 mm) under beams, girders, ducts, and similar obstructions.

3. Rooms occupied exclusively for sleeping, study or similar purposes and having a sloped ceiling over all or part of the room, with a minimum clear ceiling height of 6 feet 8 inches (2033 mm) over not less than one-third of the required minimum floor area. In calculating the floor area of such rooms, only those portions of the floor area with a minimum clear ceiling height of 5 feet (1524 mm) shall be included.

P. Section 606.2 of the IPMC is hereby updated with the following:

606.2 Elevators. In buildings equipped with passenger elevators, not less than one elevator shall be maintained in operation at all times when the building is occupied.

Exception: Buildings equipped with only one elevator shall be permitted to have the elevator temporarily out of service for testing or servicing.

Exception: If it can be shown that the building could be constructed under the currently adopted building codes, without requiring an elevator, then an existing elevator would

be allowed to be removed.

Q. Appendix A of the IPMC is adopted in its entirety.

R. Appendix B of the IPMC is not adopted.

Section 3. The following is provided for reference and may not be complete:

EMC Amended by this Ordinance	Ordinance History of EMC Amended by this Ordinance
EMC 16.09.010	Part 8, Section 1 of Ordinance 3196-10

Section 4. The City Clerk and the codifiers of this Ordinance are authorized to make necessary corrections to this Ordinance including, but not limited to, the correction of scrivener's/clerical errors, references, ordinance numbering, section/subsection numbers, and any internal references.

Section 5. The City Council hereby declares that should any section, paragraph, sentence, clause or phrase of this ordinance be declared invalid for any reason, it is the intent of the City Council that it would have passed all portions of this ordinance independent of the elimination of any such portion as may be declared invalid.

Section 6. The enactment of this Ordinance shall not affect any case, proceeding, appeal or other matter currently pending in any court or in any way modify any right or liability, civil or criminal, which may be in existence on the effective date of this Ordinance.

Section 7. It is expressly the purpose of this Ordinance to provide for and promote the health, safety and welfare of the general public and not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefited by the terms of this Ordinance. It is the specific intent of this Ordinance that no provision or any term used in this Ordinance is intended to impose any duty whatsoever upon the City or any of its officers or employees. Nothing contained in this Ordinance is intended nor shall be construed to create or form the basis of any liability on the part of the City, or its officers, employees or agents, for any injury or damage resulting from any action or inaction on the part of the City related in any manner to the enforcement of this Ordinance by its officers, employees or agents.

_____

Cassie Franklin, Mayor

ATTEST:

_____
Marista Jorve, City Clerk

PASSED: _____

VALID: _____

PUBLISHED: _____

EFFECTIVE DATE: _____

EVERETT City Council Agenda Item Cover Sheet

Project title: Adoption Of 2024 Hazard Mitigation Plan Update

Council Bill # *interoffice use*

Agenda dates requested:

Briefing 10/23/24
Proposed action
Consent
Action X
Ordinance
Public hearing
Yes X No

Budget amendment:
Yes X No

PowerPoint presentation:
X Yes No

Attachments:
1. Proposed Resolution
2. 2024 Hazard Mitigation Plan
3. FEMA Approval Pending Adoption letter

Department(s) involved:
Office of Emergency Management

Contact person:
Jim Sande

Phone number:
425-257-8109

Email:
jsande@everetttwa.gov

Initialed by:
JS
Department head

Administration

Council President

Project:	2024 Hazard Mitigation Plan Update
Partner/Supplier:	N/A
Location:	N/A
Preceding action:	
Fund:	Fund 030

Fiscal summary statement:

None

Project summary statement:

In June 2023, City staff and service provider Bridgeview Consulting, LLC began work to update the City's Hazard Mitigation Plan. The plan update describes the City's long-term strategy for reducing the risk and impact of natural disasters. The plan update focused on identifying natural hazards and areas of vulnerability and developing strategies to mitigate potential impacts. The overall purpose of the plan update is to strategically guide actions in such a way as to reduce the impacts of natural disasters on life and property.

In April 2024, the completed draft plan update was submitted for state and FEMA review. The state finished its review in May. In September, FEMA completed its review and determined the plan complied with all required regulatory elements. FEMA issued an Approval Pending Adoption letter. The letter serves as FEMA's commitment to formally approve the plan upon receiving documentation of its adoption by the City.

An approved and adopted Hazard Mitigation Plan is required for the City to be eligible to receive certain types of disaster assistance, including Stafford Act and mitigation project grants.

Recommendation (exact action requested of Council):

Adoption of the updated 2024 Hazard Mitigation Plan.

EVERETT
WASHINGTON

RESOLUTION NO. _____

A RESOLUTION Adopting the Everett Hazard Mitigation Plan

WHEREAS,

A. The City of Everett has exposure to natural hazards that increase the risk to life, property, environment and the City's economy.

B. Pro-active mitigation of known hazards before a disaster event can reduce or eliminate long-term risk to life and property.

C. The Disaster Mitigation Act of 2000 (Public Law 106-390) established requirements for pre and post disaster hazard mitigation programs requiring that "local and tribal government applicants for sub-grants must have an approved local mitigation plan in accordance with 44 CFR 201.6 prior to receipt of a Hazard Mitigation Grant Program sub-grant funding." The purpose of such local mitigation plan is to represent the City's commitment to reduce risks from natural hazards.

D. Pursuant to 44 CFR 201.6, a planning team and stakeholders with like planning objectives was formed to create consistent mitigation strategies to be implemented within the identified planning area.

E. The planning team 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.

F. Pursuant to 44 CFR 201.6, the City of Everett's Hazard Mitigation Plan has been reviewed and found to meet regulatory criteria requirements, and following adoption by the City, will be approved by FEMA, making it eligible for Stafford Act and other mitigation project grants.

NOW, THEREFORE, BE IT RESOLVED THAT:

The City of Everett hereby adopts the updated 2024 Hazard Mitigation Plan.

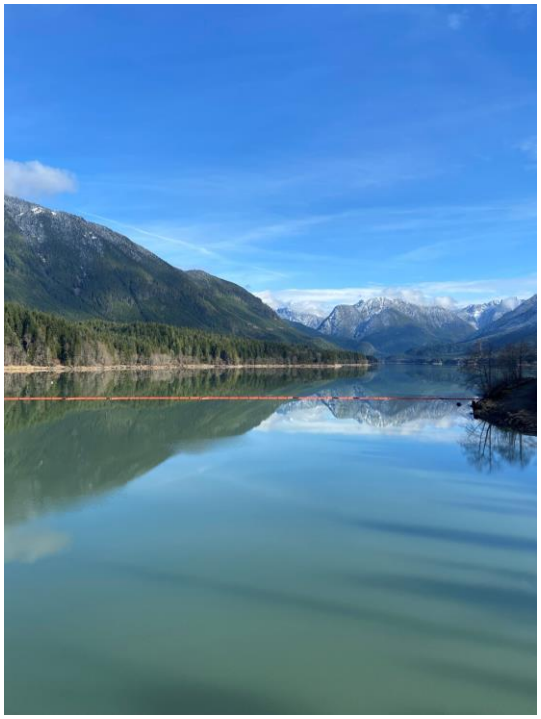
_____
Councilmember introducing resolution

Passed and approved this _____ day of _____, 2024.

_____
Council President

OCTOBER 2024

CITY OF EVERETT 2024 HAZARD MITIGATION PLAN



Bridgeview Consulting, LLC.
915 N. Laurel Lane | Tacoma, WA 98406 | 253.380.5736

CITY OF EVERETT

2024 HAZARD MITIGATION PLAN

FINAL

OCTOBER 2024

Prepared for:

City of Everett
Office of Emergency Management
2930 Wetmore Avenue
Everett, WA 98201

Prepared by:

Bridgeview Consulting LLC
1708 155th St. NW
Gig Harbor, WA 98332
(253) 380-5736

Cover photos: #1 Courtesy of *MyEverettNews* November 2022 Storm; #2 Courtesy of Erika Spencer, Spada Lake

City of Everett 2024 Hazard Mitigation Plan
TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

No. Title *Page No.*

EXECUTIVE SUMMARY

The federal Disaster Mitigation Act (DMA) promotes proactive pre-disaster planning by making it a condition of receiving financial assistance under the Robert T. Stafford Act. The DMA established a Pre-Disaster Mitigation Program and new requirements for the national post-disaster Hazard Mitigation Grant Program.

The DMA encourages state and local authorities to work together on pre-disaster planning, promoting sustainability as a strategy for disaster resistance. Sustainable hazard mitigation addresses the sound management of natural resources and local economic and social resiliency, and it recognizes that hazards and mitigation must be understood in a broad social and economic context. The planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk-reduction projects.

Disaster incidents will continue to occur, and with climate change, are expected to become more severe. Knowing this provides us with unique opportunities. Opportunities which, when implemented, help to reduce the impacts from those disaster incidents. While we cannot control nature, the impact from those disasters are within our ability to influence and change, at least to some degree. By targeting proactive measure in those vulnerable or critical areas in ways which will positively influence the most vulnerable areas in our community, we can make a difference and lessen the burden of impact on our citizens, government, and nature itself.

The City of Everett Hazard Mitigation Plan promotes programs and projects that partner with communities, building a foundation of resilience before, during, and after disasters. The planning team made up of City of Everett departments and other surrounding local governments and stakeholders worked together to create this Hazard Mitigation Plan not only to fulfill the DMA requirements, but also to identify positive measures which, when implemented, will reduce the negative impact of disaster incidents.

PLAN UPDATE

Federal regulations require hazard mitigation plans include a system for monitoring, evaluating, and updating of the document. The update provides an opportunity to reevaluate recommendations, monitor the impacts of actions that have been accomplished, and determine if there is a need to change the focus of mitigation strategies. A jurisdiction covered by a plan that has expired is not able to pursue funding under the Robert T. Stafford Act for which a current hazard mitigation plan is a prerequisite.

INITIAL RESPONSE TO DMA IN THE CITY OF EVERETT

The inevitability of natural hazards and the growing population and activities within the planning region created a need to develop information, concepts, strategies, and a coordination of resources to increase public awareness of the hazards of concern and the risk associated with those hazards.

In an effort to reduce the impact of the hazards and assist in protecting life, property and the economy, City of Everett leadership determined that it was in the best interests of its citizenry to develop the first Hazard Mitigation Plan in 2006, with updates occurring regularly as required since that time in 2011, 2018 and this 2024 update.

These plans have also provided information for several other efforts throughout the City, including land use development and zoning regulations, hazard-specific plans, and various other emergency management plans, such as the City's Hazard Identification and Vulnerability Analysis (HIVA) contained within the City's Comprehensive Emergency Management Plan, which helps guide all disaster response citywide.

Since completion of the various editions, new technologies, information and increased awareness have brought about a wealth of information to enhance the validity of the initial plan, providing the opportunity, through development of the 2024 update to the Hazard Mitigation Plan, to continue to increase the resilience of the planning region as a whole.

2024 CITY OF EVERETT PLAN UPDATE—WHAT HAS CHANGED?

The City of Everett is using the five-year update process to enhance the existing plan based on availability of new hazard data, including more detailed analysis of existing hazards of concern, and a better understanding of the Federal Emergency Management Agency's (FEMA's) guidance to develop mitigation plans, which was revised in 2021 and became effective April 19, 2023.

The following changes have been incorporated in the 2024 plan:

- The layout of the plan varies in formatting but maintains the required general information and hazard profile data.
- Hazards of concern were modified slightly for this 2024 update, with only the natural hazards addressed in the Hazard Mitigation Plan (HMP), relying on the Hazard Identification and Vulnerability Assessment (HIVA) or Threat Hazard Identification and Threat Assessment (THIRA) to address non-natural hazards. Climate change was expanded slightly from what had previously been addressed, with additional data identified within each hazard impacted by climate change.
- Dam inundation data was again identified to the degree possible based on available data provided by the dam owners. Data which was available was included.
- The risk assessment was expanded to use additional methodologies and new studies to define risk and determine vulnerability. This edition is again based on analysis using both GIS and Hazus outputs, and focuses on determining impacts on people, property, environment, and the economy. This edition also utilizes FEMA's 2020 Flood Insurance Study data.
- Critical infrastructure data was updated to include new structures within the planning area as identified throughout the process to ensure community lifelines were included to the extent possible.
- The risk assessment has been prepared to better support future grant applications by providing risk and vulnerability information that will directly support the measurement of "cost-effectiveness" required under FEMA mitigation grant programs.
- The method of risk ranking was modified, utilizing the Calculated Priority Risk Index (CPRI) ranking method. This will allow for use of the CPRI for the non-natural hazards as well when the city expands its non-natural hazards. This edition also includes an expanded social vulnerability assessment.

- All charts, graphs and maps have been updated with the most current data. In those cases where data was no longer available and the previous graphic was utilized, it was so noted.
- All Census and Census-related data has been updated with the most current data available.
- Goals were reviewed. The Planning Team felt they remained consistent with the intent of the city with respect to its mitigation strategy. Objectives were developed for the 2024 update.
- Additional analysis was completed concerning the impact of land use development trends on the hazards of concern.
- Community Lifelines were discussed, and the concept integrated in the on-going effort to support basic services on which a community relies. New information was added with respect to FEMA's development (and definition) of the lifelines, as well as an additional analysis indicating potential positive impact from the city's identified mitigation action items as they relate to the specific identified lifeline.
- Strategies from the 2018 edition were updated, and new strategies identified. The method of prioritizing strategies was modified as identified in Chapter 12, and includes a form of benefit cost analysis.
- Emergency Management Director Jim Sande conducted outreach to gain participation from city departments, including one-on-one meetings. For some departments, due to limited staffing throughout the city, only a limited number of departments participated. Those departments are identified in Chapter 2.
- The plan maintenance strategy was reviewed and updated. The City of Everett's Emergency Management Director is new to the position (starting February 2023). As such, the maintenance strategy developed for the 2018 plan was not completed by him, or by his predecessor. For the 2024 plan, an annual report card contained within the plan maintenance section will be utilized annually by the planning team to capture relevant information to be incorporated in the 2029 update.

THE MITIGATION PLANNING TEAM

The Mitigation Planning Team (MPT or Planning Team) includes members from various city departments and key stakeholders and convenes regularly to monitor, evaluate, and implement the city's mitigation program. One of the MPT's main purposes of the group is to serve as the primary mechanism for city participation in updating the Everett HMP. As such, the city intends its role to continue throughout the planning cycle, and to serve as the driver for the program's success. Key roles of the MPT include:

- Support the ongoing implementation of the city's hazard mitigation program through plan development and ensuring department-level involvement.
- Provide input and technical support for the update and maintenance of the Everett HMP.

The City of Everett Emergency Management Department serves as the coordinating agency for the City of Everett's mitigation program. Under the direction of the Emergency Management Director, the office facilitates mitigation activities, including updates to the City's HMP, and provides technical

assistance to other city departments. Under the Director, key roles of emergency management include:

- Keeping the Mayor and City Council apprised of the city's hazard mitigation program;
- Providing technical support to city departments concerning the integration of mitigation into other programs and department-level activities; and
- Facilitating the city's hazard mitigation program.

The success of the city's mitigation program is dependent on all city departments. It is dependent on mitigation viewed as shared responsibility, crossing all organizational elements of the city. All city departments are encouraged to incorporate hazard mitigation into their various plans, ordinances, policies and programs, and be active participants in the city's effort to increase resilience throughout the City of Everett. This is accomplished through:

- Implementation of actions identified during the planning process and within the City of Everett's HMP;
- Incorporating hazard mitigation into other departmental planning efforts, described by FEMA as the integration of planning; and
- Identify representatives to serve as a member of the MPT.

PLAN DEVELOPMENT METHODOLOGY

Update of the City of Everett hazard mitigation plan included seven phases:

- **Phase 1, Organize resources**—–Under this phase, grant funding was secured to fund the effort, the Hazard Mitigation Planning Team was formed, and other stakeholders were assembled to oversee development of the plan. Also under this phase were coordination with local, state, and federal agencies and a comprehensive review of existing programs that may support or enhance hazard mitigation.
- **Phase 2, Assess risk**—Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards. Phase 2 occurred simultaneously with Phase 1, with the two efforts using information generated by one another. This process focuses on the following parameters:
  - Identification of new hazards and updating hazard profiles
  - The impact of hazards on physical, social, and economic assets
  - Vulnerability identification
  - Estimates of the cost of damage or costs that can be avoided through mitigation.

  Phase 3, Involve the public—Under this phase, a public involvement strategy was developed that used multiple media sources to give the public multiple opportunities to provide comment on the plan. The strategy focused on three primary objectives:
  - Assess the public's perception of risk
  - Assess the public's perception of vulnerability to those risks
  - Identify mitigation strategies that will be supported by the public

- **Phase 4, Identify goals, objectives, and actions**—Under this phase, the goals and objectives were reviewed and updated, as well as a range of potential mitigation actions for each natural hazard identified. A "mitigation catalog" was used to guide the selection of recommended mitigation initiatives to reduce the effects of hazards on new development and existing inventory and infrastructure. A process similar to the one created for the last edition was utilized for prioritizing, implementing, and administering action items based in part on a review of project benefits versus project costs.
- **Phase 5, Develop a plan maintenance strategy**—Under this phase, a strategy for long-term mitigation plan maintenance was created, with the following components:
  - A method for monitoring, evaluating, and updating the plan on a five-year cycle
  - A protocol for a progress report to be completed annually on the plan's accomplishments
  - A process for incorporating requirements of the mitigation plan into other planning mechanisms
  - Ongoing public participation in the mitigation plan maintenance process
- **Phase 6, Develop the plan**—The MPT for this effort assembled key information into a document to meet DMA requirements.
- **Phase 7, Implement and adopt the plan**—Once pre-adoption approval has been granted by the Washington Emergency Management Division and FEMA, the final adoption phase will begin wherein the city will adopt the plan.

MITIGATION GOALS

The 2018 goals were reviewed and confirmed for the 2024 update during the initial kick-off meeting on September 28, 2023. The goals were utilized to allow further assessment of mitigation strategies. Strategies were assessed to determine association with several general categories related not only to emergency management as a whole, but also inclusive of the seven Community Lifelines:

- Safety and Security
- Food, Water, Shelter
- Health and Medical
- Energy
- Communications
- Transportation
- Hazardous Materials

In addition, the strategies were also assessed to determine association for the Community Rating System, as follows:

- Prevention
- Public Information and Education
- Property Protection
- Emergency Services / Response
- Natural resources

- Structural projects
- Recovery

PROGRESS REPORT OF 2018 HAZARD MITIGATION PLAN

Since the 2018 Hazard Mitigation Plan (HMP) was approved, the city has completed many initiatives identified throughout this document in an attempt to serve the population and increase economic growth. Chapter 12 identifies the current status of the strategies contained in the previous plan. The 2018 plan maintenance strategy identified an annual meeting with all planning team members as its method of tracking project completion and identification of hazard impact. Such meetings did not occur due to staffing levels and workloads, as well as COVID response and operations. The MPT, however, does feel that a similar maintenance and report strategy remains effective as it relates to them, and has developed a similar process for their use as discussed in Plan Maintenance portion of this document. The City of Everett's Emergency Management Director will continue to work with the MPT in the continued quest to reduce the risk and vulnerability to the city and its residents.

In addition to implementation of some of the 2018 mitigation strategies, the city has developed a number of different efforts which have enhanced its ability to support mitigation-friendly infrastructure development. During development of these various efforts, data from the previous Hazard Mitigation Plan was integrated to the greatest extent possible, with the HMP data serving as a starting point. A detailed list of the various efforts which support mitigation is contained within the Capability Matrix (Chapter 13).

Integrating mitigation efforts into the daily practices has become commonplace to a large extent. A number of daily practices utilized by the various departments and agencies support mitigation, including the Community, Planning & Economic Development, Parks, and Public Works Departments, among others. These entities, as well as others, have continued to incorporate mitigation activities into various day-to-day functions. A few examples of those efforts include:

- Land use development projects emphasizing smart planning by utilizing the risk data to assist in selecting site locations outside of high hazard areas;
- Maintaining and enhancing natural habitats to create space which reduces the negative impact of flooding;
- Utilizing building materials and standards based on recommended codes and their ability to reduce risk;
- Implementing program management for shoreline management, wildlife and cultural resource protection, and air and water quality monitoring;
- Overall assessment of the communities' usage of new construction to determine if multiple purposes exist, which, when fully operational, can be used for multiple purposes (e.g., a shelter or community resilience center which can also serve as a gym); and
- During planning stages, projected development includes prioritizing mitigation efforts based on impact (positive and negative), such as the project's proximity to the 100- and 500-year floodplain and landslide risk, among others.

The updated version of the hazard mitigation action plan is a key element of this plan. For the purpose of this document, mitigation action items are defined as: *activities designed to reduce or eliminate the long-term losses resulting from the impacts of natural hazards of concern*. It is through the

implementation of the action plan that the city can strive to become disaster-resilient through sustainable hazard mitigation.

Although one of the driving influences for preparing this plan was grant funding eligibility, that is not the focus of this plan. It was important to the MPT that they examine initiatives that would work through all phases of emergency management and that contribute to, rather than remove from, the environment. It is significant that the mitigation efforts include mainstreaming adaptive, 'no-regrets' strategies which improve the ability to live with the hazards of concern. As such, some of the initiatives outlined in this plan are not grant-eligible, and grant eligibility was not the focus of the selection. Rather, the focus was the initiatives' effectiveness in achieving the goals of the plan and whether they are within the city's capabilities, while also supporting FEMA's Community Lifelines and the established Core Capabilities. As established, the lifelines enable the continuous operation of critical government and business functions to help ensure human health and safety, and economic security of the community.

This planning process resulted in the identification of mitigation actions to be targeted for implementation both collectively, and by individual departments. Those initiatives are identified in Chapter 12.

CONCLUSION

Full implementation of the recommendations of this plan will take time and resources. The measure of the plan's success will be the coordination and integration of efforts. Keeping this coordination and communication intact will be the key to successful implementation of the plan. Teaming together to seek financial assistance at the state and federal level will be a priority to initiate projects that are dependent on alternative funding sources. These funding sources may be non-traditional sources and include partnering with private industry where feasible. This plan was built upon the effective leadership of a multi-disciplined planning team and a process that relied heavily on public input and support. The plan will succeed for the same reasons.

CHAPTER 1.
INTRODUCTION

Hazard mitigation is defined as the use of long- and short-term strategies to reduce or alleviate the loss of life, personal injury, and property damage that can result from a disaster. It involves strategies such as planning, policy changes, programs, projects, and other activities that can mitigate the impacts of hazards. The responsibility for hazard mitigation lies with many, including private property owners; business and industry; and local, state, and federal government.

1.1 AUTHORITY

The federal Disaster Mitigation Act (DMA) (Public Law 106-390) required state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. Prior to 2000, federal disaster funding focused on disaster relief and recovery, with limited funding for hazard mitigation planning. The DMA increased the emphasis on planning for disasters before they occur. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Act) by repealing and replacing sections which emphasized the need for state and local entities to closely coordinate mitigation planning and implementation efforts.

The DMA encourages state and local authorities to work together on pre-disaster planning, and it promotes sustainability for disaster resistance. Sustainable hazard mitigation includes the sound management of natural resources and the recognition that hazards and mitigation must be understood in the largest possible social and economic context. The enhanced planning network called for by the DMA helps local governments articulate accurate needs for mitigation, resulting in faster allocation of funding and more cost-effective risk reduction projects.

The City of Everett 2024 Hazard Mitigation Plan has been developed pursuant to the requirements of 44 CFR 201.6. The plan meets FEMA's guidance for a single jurisdiction mitigation plan.

1.2 ACKNOWLEDGEMENTS

The City of Everett 2024 Hazard Mitigation Plan is an ongoing effort of the Everett Office of Emergency Management to ensure the city's comprehensive approach to preparing for, mitigating the impacts of, responding to, and recovering from a disaster. Preparation of this document, and its continued improvement, requires participation and support from many individuals, agencies, organizations, and businesses. City departments, other agencies, and employees deserve recognition for their efforts to develop this plan. Those agencies, individuals, and departments involved in this process are identified in Table 2-1.

The City of Everett Office of Emergency Management provided support for all aspects of plan development. Everett GIS also provided assistance by providing critical facility data, building stock data, and other general GIS information. The MPT met on a regular basis to guide the project, identify the hazards most threatening, develop and prioritize mitigation projects, review draft deliverables, and facilitate public outreach efforts.

Various MPT members participated in the planning process by attending or facilitating public meetings and contributed to plan development by reviewing and commenting on the draft plan.

Several stakeholders provided assistance and guidance to support the effort by providing data and information. The participation by citizens was exceptionally good during the plan's development, with citizens attending various public outreach sessions and training, and providing invaluable information with respect to concerns, strategy ideas, and hazard information. Input was incorporated as appropriate throughout the document.

1.3 PURPOSE OF PLANNING

The local mitigation plan is the representation of a jurisdiction's commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. Local plans also serve as the basis for the State of Washington to provide technical assistance and to prioritize project funding. This hazard mitigation plan identifies resources, information, and strategies for reducing risk.

The Everett HMP assesses the potential impact of the natural hazards to the City of Everett's communities and provides mitigation goals and strategies to reduce impacts. The HMP prioritizes the city's mitigation strategies and includes a comprehensive implementation plan. The overall purpose of the HMP is to strategically guide actions and investments in such a way as to reduce the impacts of natural hazards on human life and property. The efforts that have contributed to the development of the HMP will lead to a safer, stronger, more survivable and resilient city.

The 2024 HMP is the required five-year update to the City of Everett's Hazard Mitigation Plan prepared and adopted in 2018. Keeping the Everett HMP current is a good emergency management practice for the people of Everett and allows the city to maintain its eligibility for state and federal mitigation funds that support the city's mitigation activities

All citizens and businesses of the City of Everett are the ultimate beneficiaries of this hazard mitigation plan. When implemented, the plan helps reduce risk for those who live in, work in, and visit the city. It provides a viable planning framework for all known natural hazards that may impact the area. Participation in development of the plan by key stakeholders helped ensure that outcomes will be mutually beneficial. The resources and background information in the plan are applicable not only citywide, but in some instances, countywide. The plan's goals and recommendations can lay groundwork for the development and implementation of local mitigation activities and partnerships. During this 2024 update, the city worked in coordination with the county to ensure its mitigation goals aligned with those of the county to help ensure a consistent level of effort. The City of Everett's Public Works Department was also a planning team member of Snohomish County's HMP process, helping to ensure interagency coordination and collaboration.

1.4 PLAN ADOPTION

44 CFR 201.6(c)(5) requires documentation that a hazard mitigation plan has been formally adopted by the governing body of the jurisdiction requesting federal approval of the plan. This plan will be submitted for a pre-adoption review to the Washington State Division of Emergency Management and FEMA prior to adoption. Once pre-adoption approval has been provided, the city will formally adopt the plan. The city understands that DMA compliance and its benefits cannot be achieved until the plan is adopted. The resolution adopting the plan and FEMA's approval letter can be found in Appendix B of this volume.

1.5 SCOPE AND PLAN ORGANIZATION

The process followed to update the 2024 City of Everett 2024 Hazard Mitigation Plan included the following:

- Review and prioritize disaster events that are most probable and destructive.
- Update and identify new critical facilities.
- Review and update areas within the community that are most vulnerable.
- Review (and update as appropriate) goals for reducing the effects of a disaster event.
- Review old and identify new projects to be implemented for each goal.
- Review procedures for monitoring progress and updating future hazard mitigation plans.
- Review the draft hazard mitigation plan.
- Adopt the updated hazard mitigation plan.

The plan as written includes all federally required elements of a disaster mitigation plan. This includes the description of the planning process, public involvement strategy, goals and objectives, hazard risk assessment, mitigation initiatives, and a plan maintenance strategy.

The following appendices include information or explanations to support the main content of the plan:

- Appendix A—A glossary of acronyms and definitions;
- Appendix B—City Adoption Resolution and Final FEMA Plan Approval; and
- Appendix C—A template for progress reports to be completed as this plan is implemented.

CHAPTER 2.
PLANNING PROCESS

To develop the City of Everett hazard mitigation plan, the city applied the following primary objectives:

- Identify funding for the project through allocation of the City's General Funds
- Form an internal Mitigation Planning Team (MPT)
- Coordinate with individual and agency stakeholders
- Review existing plans and studies
- Engage the public:
  - Conduct a hazard survey
  - Hold public meetings
  - Review the draft hazard mitigation plan.

These objectives are discussed in the following sections.

2.1 MITIGATION PLANNING TEAM FORMATION

The City of Everett hired Bridgeview Consulting, LLC to assist with development and implementation of the plan. The Bridgeview Consulting project manager assumed the role of the lead planner, reporting directly to the city's designated project manager, Jim Sande, Everett Emergency Management Director. A smaller internal planning group was formed to help lead the planning effort, made up of the following members:

- Jim Sande, Emergency Management Director and Project Manager
- Vickie Fontaine, Emergency Management Planning & Operations Coordinator
- Erika Spencer, GIS Analyst, Public Works
- Engagement and Communications Department (various individuals depending on context)
- Beverly O'Dea, Bridgeview Consulting (Lead Project Planner)

2.2 KICK-OFF MEETING

The kick-off planning workshop for this effort took place on September 28, 2023. Key workshop objectives were as follows:

- Provide an overview of the Disaster Mitigation Act
- Describe the reasons for a plan
- Outline the city's work plan
- Outline adoption requirement

- Confirm hazards of concern
- Review and update, as appropriate, the Goals and Objectives
- Establish the definition of Critical Facilities
- Establish a Public Outreach Strategy for use during this update cycle

After the kick-off meeting, various meetings were held with the Mitigation Planning Team while the plan was being drafted. In advance of each meeting, an agenda and materials to be discussed (i.e. example mitigation strategies, examples of projects eligible for FEMA funding, etc.) were sent to meeting participants.

2.3 COORDINATION WITH AGENCIES AND OTHER STAKEHOLDERS

Hazard mitigation planning enhances collaboration and support among diverse parties whose interests can be affected by hazard losses. 44 CFR requires that opportunities for involvement in the planning process be provided to neighboring communities, local and regional agencies involved in hazard mitigation, agencies with authority to regulate development, businesses, academia, and other private and nonprofit interests (Section 201(6)(b)(2)). The following were identified and invited to participate in this effort:

- Representatives from Snohomish County, local PUDs, hospital, port districts, and others. When engaged, their participation included providing data, meeting attendance, and review of the risk assessment and draft hazard mitigation plan.
- Washington State stakeholders included data and representatives from the Department of Natural Resources, Department of Health, Department of Ecology, Department of Transportation, and Washington State Division of Emergency Management, among others. Their participation included providing data, attending meetings, and reviewing the draft hazard mitigation plan.
- Federal agency stakeholders and information included the FEMA Region X, Naval Station Everett, National Weather Service (NWS), U.S. Army Corps of Engineers, U.S. Geologic Survey, U.S. Forest Service, and NOAA, among others. These agencies provided information on plan development, were invited to public meetings, and were invited to review the draft hazard mitigation plan.
- Non-government stakeholders included the American Red Cross and the Chamber of Commerce, among others.

Multiple city email distribution lists were utilized, which reached individuals from various departments and organizations. Many of these entities provided information for plan development, assisted with strategy update and development, attended the public meetings, and/or reviewed the draft hazard mitigation plan update. The local LEPC distribution list was also utilized during the process to increase outreach.

Stakeholders received a variety of information during the project, including (but not limited to) meeting notices, documents for review, the draft mitigation strategy, and when completed the draft hazard profiles and plan. Stakeholders also provided input on the plan, particularly for the risk assessment. Table 2-1 lists some of the planning team members involved in the update. A total of 26 individuals attended the kickoff meeting (not all are listed in the below table). Table 2-

2 identifies various stakeholders who were contacted, or from which agencies data was captured. The city attempted to include community lifeline representatives, various public-private entities, and major employers within the City of Everett to gain their perspectives during the planning effort.

Table 2-1
Planning Team Membership and Tasks

Name and Jurisdiction	Tasks
Jim Sande Project Manager Director of Emergency Management Everett Emergency Management	Meeting attendance; provided briefings to council members and department heads on process and events occurring; provided historic county information; assisted with development of MPT; conducted plan reviews at various stages; led strategy update from 2018 strategies; conducted department level outreach for 2024 strategy development; conducted public outreach efforts, including email distributions, map distribution, etc.
Vickie Fontaine Emergency Planning & Operations Coordinator Everett Emergency Management	Assisted with data capture from various departments; provided data capture and assimilation of information as needed; coordinated and attended meetings with various departments for information gathering; conducted plan review at various stages; assisted with department level outreach for 2024 strategy development; assisted with public outreach efforts, distribution of survey, website development and posting, email distributions, posting of maps, assimilation of outreach data for presentation to public; attended all meetings and completed all reviews.
Dan Good Day Laborer Everett Emergency Management	Reviewed and provided comment on drat plan and hazard profiles.
Erika Spencer, GIS Programmer and Analyst Community, Planning and Economic Development	Attended kickoff meeting; provided GIS layers at various stages; developed CIKR list based on established definition; provided hazard data; provided land use information; assisted with the distribution of maps and information for the risk assessment; conducted risk assessment on behalf of the City of Everett; review hazard profiles and draft plan.
Simone Tarver, Project Manager Everett Engagement and Communications	Attended meetings; assisted with preparation of and distribution of various public announcements; provided assistance with content and distribution on all citywide platforms, including website, distribution lists, and social media. This included all phases of plan development, including Press Release, Survey, Distribution of information from Risk Assessment, and when the Draft HMP was ready for public review.

Table 2-1 Planning Team Membership and Tasks	
Name and Jurisdiction	**Tasks**
Henry Flanagan GIS/Programmer Analyst Everett Public Works	Assisted with development of GIS data for risk assessment.
Nick Shekeryk Engagement & Communications Specialist Everett Engagement and Communications	Assisted with preparation and distribution of public announcements to include website, social media, and newsletter updates.
Ben Breeden Homeless Response Coordinator Everett Community Development	Attended meetings with planning team members; provided information on available risk data as appropriate; assisted with review of draft plan; provided information on department overview and information on social vulnerability as it relates to homelessness.
Katrina Newport Permit System Business Analyst Everett Public Works	Assisted with plan development; provided permitting data identified within the land use portion of the plan.
Souheil Nasr Utilities Engineering Manager Evertt Public Works	Meeting attendance; involved in previous HMP update; provided information relevant to the changes occurring within the City. Provided input on risk assessment and capabilities assessment. Provided information on Water Supply Risk Assessment Study and city waterline and reservoir planning and development.
Karen Stewart Environmental Planner Community, Planning and Economic Development	Meeting attendance; conducted review of the HMP; conducted review of the risk assessment portion of the plan prior to distribution and provided information concerning impact and mitigation initiatives.
Chris Muth-Schulz Risk Manager Office of the City of Attorney	Provided City of Everett statement of value information utilized in the risk assessment portion of the planning process.
Michael Schmieder Operations Manager Everett Transit	Attended kickoff meeting; received emailed information and notices; invited to review and comment on plan.
Colin Olivers Assistant City Attorney Office of the City Attorney	Meeting attendance; received emailed information and notices; invited to review and comment on plan.
Cory Rettenmier Parks Business Program Manager Everett Parks & Facilities	Attended kickoff meeting; received emailed information and notices; invited to review and comment on plan.

Table 2-1 Planning Team Membership and Tasks	
Name and Jurisdiction	**Tasks**
Mark Wamsley Utilities GIS Program Manager Everett Public Works	Attended kickoff meeting; assisted with providing historic information on previous plan editions and risk assessment; assisted with data update for 2024 plan update; received information notices; invited to review and comment on draft plan.
Yorik Stevens-Wajda Planning Director Community, Planning and Economic Development	Meeting attendance; provided review and comment throughout process; provided input on 2018 strategies and Comp plan/land use background.
Rachael Doniger PIO & Public Education Coordinator Everett Fire Department	Provided input on status of 2018 strategies and 2024 strategy development; provided hazard profile information; invited to review hazard profiles and draft plan.
Sierra Magnuson Administrative Assistant Everett Public Works	Researched and provided hazard profile information; facilitated Public Works coordination during the plan update.
Tony Cademarti Fleet Program Manager Everett Motor Vehicle Division	Provided input on 2018 strategies and 2024 strategy development.
Becky Ableman McCrary Long Range Planning Manager Community, Planning and Economic Development	Provided input on 2018 strategies and 2024 strategy development; invited to review and comment on hazard profiles and draft plan.
Euan Robertson Parks and Facilities Program Coordinator Everett Parks & Facilities	Provided input on 2018 strategies and 2024 strategy development.
Chris Fadden IT Director Everett IT	Provided input on 2018 strategies and 2024 strategy development.
Jennifer Bailey Water Resource Specialist Everett Public Works	Provided input on update status of 2018 strategies.
Tom Hood City Engineer/ Assistant Public Works Director Everett Public Works	Attended kickoff meeting; invited to provide profile and draft plan review and comment.
Megan Munro Human Resources Safety Official	Attended kickoff meeting; provided input on 2018 strategies and 2024 strategy development; invited to review and comment on risk assessment and draft plan.

Table 2-1 Planning Team Membership and Tasks	
Name and Jurisdiction	**Tasks**
Brian Senyitko Operations Supervisor Everett Transit	Received meeting and information notices; invited to review and comment on hazard profiles/risk assessment and draft plan.
Capt. Robert Goetz Everett Police Department	Attended kickoff meetings; received information notices; invited to review risk assessment and draft plan and provide comments and input.
Kimberly Moore Assistant Director Everett Parks & Facilities	Received meeting data and information; invited to provide comments and input on hazard profiles and draft plan review.
Paul Gagnon Assistant Fire Chief Everett Fire Department	Received meeting invitation; emailed information; invited to review hazard profiles and draft plan.
Matt Sorenson Division Chief Everett Fire Department	Received meeting invitation; emailed information; invited to review hazard profiles and draft plan.
Geoffrey Albright Lieutenant Everett Police Department	Received meeting notices; emailed information; invited to review hazard profiles and draft plan.
Julie Willie Community Development Director Everett Community Development	Received meeting notices; emailed information; invited to review hazard profiles and draft plan.
Jeff Harris Assistant Director of Facilities Everett Parks & Facilities	Provided input on 2018 strategies and 2024 strategy development.
Beverly O'Dea, Consultant/Lead Planner Bridgeview Consulting, LLC bevodea@bridgeviewconsulting.org (253) 301-1330	Project Manager and Author of Plan. Facilitated all meetings; captured data and information for all elements of the plan; prepared public review data for presentation of risk assessment findings; prepared drafts of plan for citizen review; completed survey analysis, etc.

Table 2-2
Stakeholders and Areas of Participation

Stakeholders	Name	Data/Information Provided or Invited to Participate
US Forest Service		Wildfire Data LandFire Data
FEMA Region X	Ted Perkins Josha Crowley, PE Starr II – Region 10 Service Center Marshall Rivers FEMA Risk Analyst	Flood hazard information Risk Report FEMA Risk Report Data and Depth Grid Data (Sea Level Rise) Floodplain Specialist
Snohomish County Emergency Management	Dara Salmon, Deputy Director Rebecca Carpenter Jayme Haselow Lucia Schmit (Director)	Received updates and notice of various draft reviews. Provided information as necessary. Attended kickoff meeting.
Snohomish County	Ed Whitford, GIS Director	Received notices of various draft reviews; data request for Snohomish County GIS data supporting the City's effort.
Red Cross	Martha Read, Sr. Disaster Program Manager	Invitation extended, did not attend kickoff meeting; received hazard profile data and invitation to comment on profiles and draft plan.
Everett Senior Center – Volunteers of America	Cory Armstrong-Hoss Director Gul Subaykan Operations Manager	Received meeting invitation; provided notice of availability of risk assessment for review and comment and draft plan review.
Providence Hospital	Chad Lisenby Manager for Security & Emergency Preparedness	Invited to attended kickoff meeting; received notices for review of risk assessment and draft plan.
Boeing	Anna Gochnour, Emergency Manager Joshua Baker, Emergency Manager Emergency Management Security and Fire	Received notices of meetings; attended kickoff meeting; invited to review risk assessment and draft plans.
City of Marysville	Sarah LaVelle Emergency Preparedness Manager	Received notices of meetings; invited to review risk assessment and draft plan.

Table 2-2 Stakeholders and Areas of Participation		
Everett Housing Authority	Travis Arrington, Maintenance Manager & Safety Officer	Received notices of meetings; provided necessary information; invited to review risk assessment and draft plan. Also assisted with distribution of information concerning HMP update and risk assessment.
Northwest Healthcare Response Network	Kelly Sunagel North District Coordinator	Attended kick-off meeting; Received notices of meetings; invited to review and comment on risk assessment and draft plan.
Everett Community College	Lacey Shoemaker, Asst. Director Emergency Management – Environmental Health and Safety	Invitation extended to attend kickoff meeting; did not attend; provided opportunity to review hazard profiles and draft plan.
Snohomish County 911	Kurt Mills Executive Director	Kickoff invitation extended, did not attend; provided opportunity to review hazard profiles/risk assessment and provide comment on draft plan.
Port of Everett	Ed Madura Security Director	Kickoff invitation extended, did not attend; provided opportunity to review hazard profiles and comment on draft plan.
Snohomish County PUD	Scott Parker Manager, Security & Emergency Management	Kickoff invitation extended, did not attend; received information notices and invitations to review plan at various stages.
Everett School District	Mike Gunn Executive Director Facilities and Operations Darcy Walker Director of Facilities & Planning	Attended kickoff meeting; received information notices and invitations to review plan.
Naval Station Everett	Steve Paschal Emergency Management Officer	Invited to review and provide input into various elements of the plan, including risk assessment and draft plan.
Tulalip Tribes	Angel Cortez Emergency Preparedness Manager	Invited to review and provide input into various elements of the plan, including risk assessment and draft plan.
WA-DNR		Landslide and Tsunami Data

Table 2-2 Stakeholders and Areas of Participation		
	Various Data	Wildfire Data Wildfire History
WA-DOE	Diane Fowler, Community Right to Know Coordinator Jerry Franklin	Reporting Hazmat sites in Snohomish County RiskMap Coordinator
WA EMD	Kevin Zerbe, HM Strategist Tim Cook, SHMO	NFIP Data; Plan Review
WA DOH	Various Data	Social Vulnerability Data
USGS	Various Data	Earthquake Data

2.4 REVIEW OF PLANS AND STUDIES

44 CFR states that hazard mitigation planning must include review and incorporation as appropriate of existing plans, studies, reports, and technical information (Section 201.6.b(3)). Laws and ordinances in effect in the planning area that can affect hazard mitigation initiatives are reviewed in Chapter 13. The list of references at the end of this volume presents sources used to capture information necessary to complete this planning effort. Plans, studies, and reports used for this process include, but are not limited to:

- City of Everett Hazard Mitigation Plan (2018)
- Snohomish County Hazard Mitigation Plan (2020)
- City of Everett Comprehensive Emergency Management Plan (CEMP)
- City of Everett Shoreline Master Program (2019)
- City of Everett Debris Management Plan (July 2022)
- City of Everett Parks, Recreation and Open Space Plan (February 2022)
- City of Everett Water Supply Study (2012; under update with 2024 completion)
- Regional Catastrophic Plan
- Flood Insurance Study; Snohomish County and Incorporated Areas (2020)
- Washington State Enhanced Hazard Mitigation Plans (2010, 2013, 2018, 2023)
- Washington Department of Natural Resources (WA-DNR) Landslide Reports (various)
- Snohomish County PUD Annual Report (various years)
- Coastal erosion data (various)
- Climate change data (various)
- Washington State Department of Ecology Drought Studies/Data (various)
- Washington Department of Ecology Hazardous Materials Annual Report for Snohomish County (2018, 2022)

Data obtained from the plan and regulation review was incorporated into various sections of the hazard mitigation plan. The risk analysis beginning in Chapter 4 through Chapter 11 (hazard ranking) refer to plans and ordinances that affect the management of each hazard. Section 14.2 describes how mitigation can be implemented through existing programs. An assessment of regulatory, technical, and financial capabilities to implement hazard mitigation initiatives is presented in Chapter 13. Many of these relevant plans, studies and regulations are cited in the capability assessment.

2.5 PUBLIC INVOLVEMENT

Broad public participation in the planning process helps ensure that diverse points of view about the planning area's needs are considered and addressed. The public must have opportunities to comment on disaster mitigation plans during the drafting stages and prior to plan approval (44 CFR Section 201.6(b), 201.6(c)(1)(i) and 201.6(c)(1)(ii)).

The City of Everett did conduct extensive outreach using different methods to increase engagement. This included utilizing existing meetings to gain greater involvement, holding web-based meetings, utilize websites and social media, and scheduling conference calls that allowed participation by agencies and individuals. Interviews with individuals and specialists from outside organizations identified common concerns related to natural and manmade hazards, and key long- and short-term activities to reduce risk. Interviews included public safety personnel, planning department personnel, natural resources personnel, cultural resource personnel, and representatives from other government agencies from surrounding jurisdictions. The public outreach strategy for involving the public in this plan emphasized the following elements:

- Invite members of the public on the planning team.
- Use a questionnaire to determine general perceptions of risk and support for hazard mitigation and to solicit direction on alternatives. The questionnaire was available to anyone wishing to respond via the website and was distributed by hard copy during meetings. Distribution of the email included employee lists, agency distribution lists, and notices through social media and website platforms maintained by the City.
- Provide a news release to local papers and identified the survey on the hazard mitigation website (published September 8, 2023) as well as when the risk assessment was completed to invite review and comment, and when the draft plan is completed to provide notice of the review period commencing.
- Utilize Facebook and Twitter accounts to also post information on the HMP process at various stages on their Facebook and Twitter accounts.
- Attempt to reach as many citizens as possible using multiple formats.
- Identify and involve planning area stakeholders.
- Include training or other events and utilize existing email distribution lists to announce planning milestones.

Some of the outreach sessions and planning milestones are identified in Table 2-3. This list is not all-inclusive, but rather demonstrative of the various efforts of the planning team.

2.5.1 News Releases

A news release was issued on September 8, 2023 to draw attention to the City's update process and the survey (see Figure 2-1).

When the draft plan was available for public review, notice was published in an effort to draw in as many comments as possible. The city also provides news flash information, which also included the initial news release, as well as additional information at various times throughout the process.[1]

EVERETT WASHINGTON

NEWS RELEASE

FOR IMMEDIATE RELEASE
Sept. 8, 2023

CONTACT
Simone Tarver, project manager, administration, 425-535-5301
Jim Sande, director, emergency management, 425-257-8109

Everett to start update process for its Hazard Mitigation Plan

The process will include opportunities for the community to learn more and provide input.

EVERETT, WA – The City of Everett has started the process of updating its Hazard Mitigation Plan (HMP), which is its long-term strategy for reducing the risk and impact of natural disasters. Community involvement will be an important component of this update.

The HMP focuses on community resilience by identifying hazards and areas of vulnerability and developing strategies to mitigate the potential impacts. The purpose of the HMP update is to identify natural disasters that may impact the City and identify actions to reduce losses from those hazards. This planning process helps the City and whole community understand the importance of mitigation and develop actions based on current and future risks and capabilities.

Throughout the plan update process, there will be opportunities for community members to provide input and the City of Everett highly encourages all those who live, work, and play in the greater Everett area to participate. In the coming months, there will be public meetings and other chances to learn more and share feedback. More information, including maps and updates on the plan's progress, will be available at everettwa.gov/HMP.

The planning process and the update to the HMP will be led by Jim Sande, director of emergency management, with support from Bridgeview Consulting, LLC, and directed by the Hazard Mitigation Planning Team. This team is made up of representatives from the City and other key stakeholders from within the planning area as well as from county, state, and federal agencies.

It is anticipated the plan process will take approximately nine to twelve months to complete.

Figure 2-1 City of Everett Press Release

2.5.2 Internet

At the beginning of the plan development process, a website was created to keep the public posted on plan development milestones and to solicit input (see Figure 2-2).

This site was also utilized to present risk maps and risk findings when completed, as well as distribution of the draft plan for citizen review. The plan was provided via a file-transfer site, which allowed for the plan downloading for review. The city intends to keep a website active after the plan's completion to keep the public informed about successful mitigation projects and future plan updates.

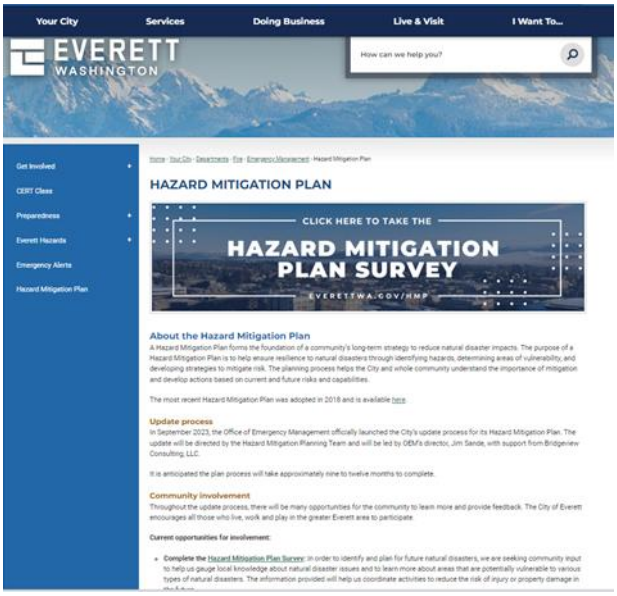


Figure 2-2 Hazard Mitigation Plan Website

[1] News Flash • Everett, WA • CivicEngage (everettwa.gov)

The City's website address was publicized in all press releases, distributions, questionnaires, and public meetings.[2] Information on the plan development process, the planning team, the questionnaire, and phased drafts of the plan was made available to the public on the site throughout the process. Hazard maps were published and were available for download. The city also utilized its Facebook page to distribute information (see Figure 2-3), which has in excess of 4,100 followers.

Census data indicates that of the population within the city, 94% owned a computer, with approximately 90% having broadband internet subscriptions, making the use of the computer and internet a viable option for public outreach. This data is also supported by the Survey completed for this 2024 HMP update.

2.5.3 Newsletter

In addition to published News Releases, the city also utilized the Everett Newsletter (October 2023 newsletter (everettwa.gov), identifying the various stages of the planning process, data, information, risk assessment data, and the draft (and final) plan review periods. Once available, the city also utilized this means of community to launch the survey (see Figure 2-4).

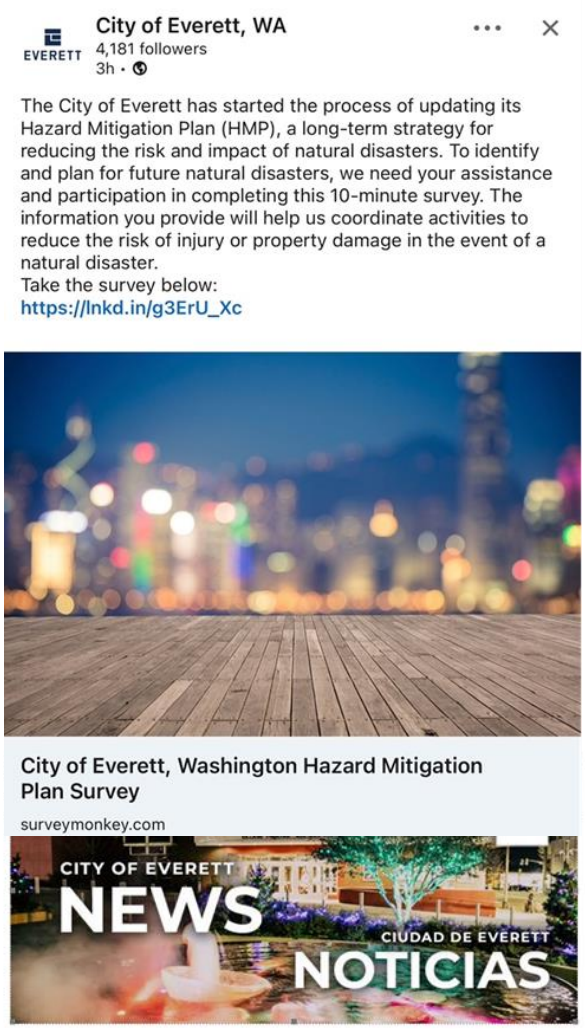


Figure 2-3 City of Everett Facebook

Figure 2-4 Newsletter Notice of Survey

[2] Hazard Mitigation Plan | Everett, WA - Official Website (everettwa.gov)

2.5.4 Plan Development Milestones

Several public meetings and events which were open to the public were held during this effort. All planning meetings were also open to the public, and citizens did attend, providing information and input. The MPT also utilized existing meetings of various types as a planning resource, including the city's concurrent update of its Comprehensive Land Use Plan meetings. Once completed, the hazard maps were presented and available for review at meetings, via the city's webpage, posted on the city's Facebook page and Twitter. Email notifications and press releases were distributed at various stages announcing the availability of the information, as well as distributed via various social media tools. Each citizen attending meetings or outreach efforts were also asked to complete a questionnaire, and each was given an opportunity to provide written comments to planning team members.

Most members of the planning team live or work in the planning area. Planning team participation by individuals with varied backgrounds and from varied organizations added details and information that were valuable in identifying direction for the plan development process.

As indicated, the city created a new webpage, which hosted a mitigation section, wherein all notices and survey links were posted. During meetings within the planning area or attended elsewhere by planning team members, individuals were directed to the website to gain better insight of the city's endeavors and to solicit input. The planning team identified stakeholders to target through the public involvement strategy. Members of the planning team attending conferences or meetings provided updates to those in attendance, asking for input and review of the plan. Occurring simultaneously with this effort was the update of the City of Evett's Comprehensive Land Use Plan (COMP). During those public outreach events, planning team members on both the HMP and COMP plan discussed both efforts and provided data appropriate to the meeting topic.

Presentation of Risk

Once the risk assessment portion of the planning process was completed, the risk maps were posted to the city's website beginning March 4, 2024, with blast distributions made to the city's residents and employees on Facebook. The city intends to maintain the maps on its website once this planning process is completed. A risk packet consisting of maps, hazard ranking, and other information was developed and provided as handouts during various community meetings, such as the Council of Neighborhoods meeting which occurred on February 26, 2024 (Figure 2-5), which included 25 attendees. Information was distributed during several CERT classes. Packets were made available either via request to the Director of Emergency Management, but also available for download from the City's website. The newsletter was also again utilized to distribute information on the availability of the risk maps,

Figure 2-5 Council of Neighborhoods Meeting February 26, 2024

hazard profiles, and risk results, as was social media utilized to provide notification and links to the data. The *City of Everett Newsletter* was also distributed on March 4, 2024.

Draft Plan Review

Once the draft plan was completed, the public was invited to provide comments on the hazard mitigation plan. The final public review period began March 18, 2024 through April 5, 2024. The city completed the following outreach activities:

- A news release was issued by the city to customary local medica sources, announcing the plans' availability. The news release was posted on the city website.
- The draft plan was posted on the project website and stakeholders were notified through e-mail messages of its availability, including Twitter and Facebook (reaching several thousand people).
- Distribution lists were utilized announcing plan availability on two separate occasions, which included various stakeholders invited to participate, as well as local citizens in the area, businesses, and representatives from various service organizations providing support to the City of Everett's community lifelines.
- During CERT events (multiple), the availability of the draft plan was announced.
- The Snohomish County LEPC distribution list was utilized to announce availability of the HMP Draft Plan, incorporating the link to the plan, reaching in excess of 200 people.
- Announcement of the draft plan availability was provided to Everett City Council on March 18, 2023.
- During the Region 1 meeting on March 28, 2023 planning team members discussed the HMP update, and the availability of the draft plan for review and comment (~23 individuals).

Once the review period closed, final comments and edits were addressed, and the plan was submitted to the State and FEMA for review. Once pre-adoption approval was received from FEMA, the plan was provided to the Everett City Council for adoption. After adoption, final copies of the plan were submitted to the Washington State Emergency Management Division and FEMA.

The city received a few comments back from citizens on the draft plan review. One comment in particular discussed the landslide hazard and made recommendations with respect to the availability of landslide information to homeowners at a more local level rather than Washington State Department of Natural Resources, who is the statewide agency tasked with tracking landslides. The commenter felt citizens should be able to enter landslide hazard information directly into a database, which other homeowners could then review. The city does currently track landslide incidents which occur, but the data is managed by city employees and does not allow for citizens to input the data. The citizen comment was forwarded to the appropriate department for response.

The final plan will remain on the city's website over the next five years. The Emergency Management Director will maintain responsibility for updating future editions of the plan. Comments on the plan should be addressed to:

Jim Sande, Director
Everett Emergency Management
JSande@everettwa.gov
Office: 425-257-8109

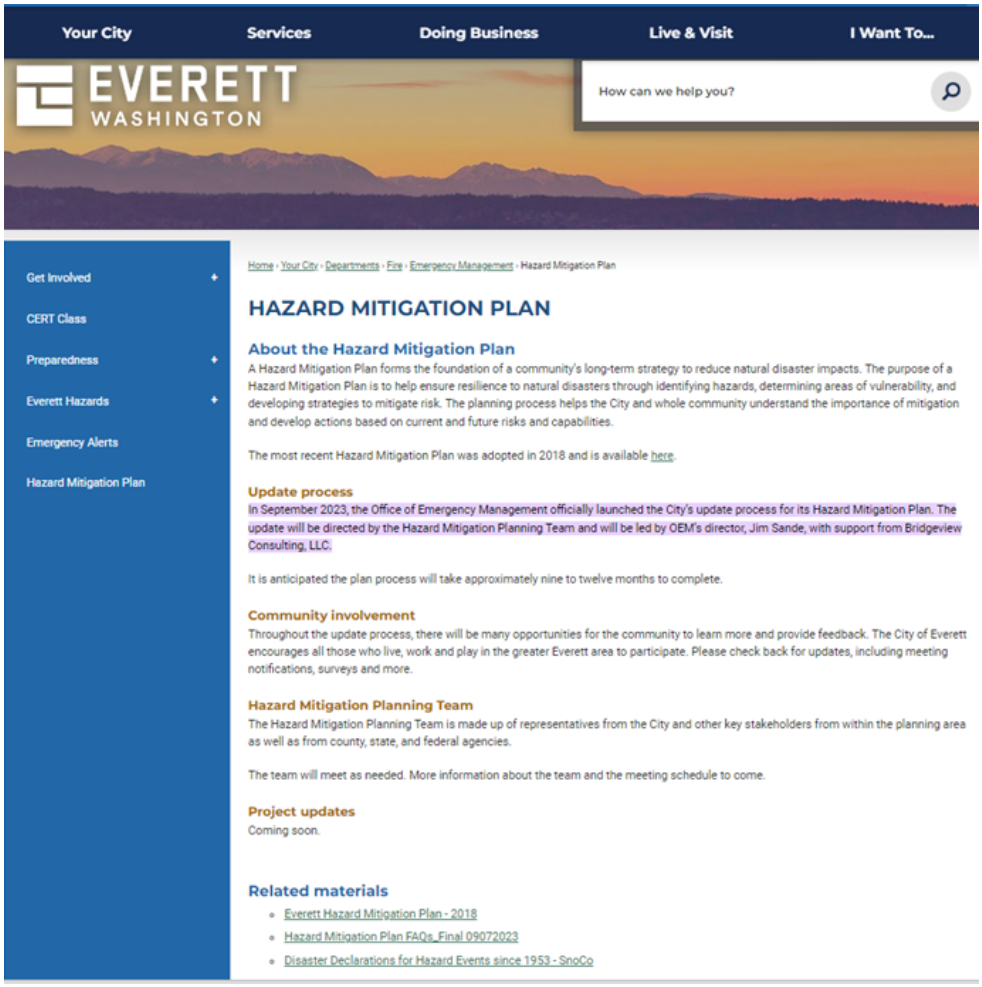


Figure 2-6 City of Everett HMP Website

Table 2-3
Plan Milestones and Public Outreach Events

Date	Jurisdiction	Description
2023		
April/May	City	City of Everett initiated consultant procurement through an open solicitation. Several responses and inquiries were received from vendors nationwide. Letters of Qualifications submitted by vendors were reviewed, screened, and rated.
June	City	Council presentation was made identifying the Hazard Mitigation Project; vendor selection was identified and the Council approved execution of contract with consultant

Table 2-3
Plan Milestones and Public Outreach Events

Date	Jurisdiction	Description
July	City	Begin formation of the planning team; core project management team identified to lead effort from various city departments; Consultant begins review of various documentation and assimilating data, reports, studies, etc.
September	City	Press release announcing the up-coming project, published in local newspaper. Hazard mitigation plan website established; Frequently Asked Questions posted; Press Release posted.
September 28	City	Kick-off meeting held, including planning team members, volunteers, stakeholders and citizens. Kick-Off Meeting audio recording were available for review.
October	City	Survey deployed
October	City	Link for survey was posted, as well as on social media platforms, flyer produced with survey link and QR Code for distribution at public meetings and posting throughout City.
October/ November	City	Continued update of critical facilities list by planning team members. List updated and Team began determining impact data to City structures.
January 16	City / CERT Teams	Vickie Fontaine provided a briefing during two CERT meetings (36 local residents in attendance), during which she announced the HMP project, providing an overview of the process and hazards to be addressed in the plan, as well as the potential benefits for mitigation strategies. During the meeting, Vickie also provided information concerning the available HM survey, providing the link and QR code, which was made available throughout the process.
February 8-16	City Planning Team	Completed review of the risk assessment, hazard profiles, and risk ranking. Changes incorporated.
February 16	City Planning Team Meeting	Risk ranking exercise completed and confirmed; strategy/action items reviewed and discussed; incorporation of risk data into other planning mechanisms discussed (e.g., land use, CEMP, evacuation plans, etc.)
February 26	Council of Neighborhoods	Planning Team Member Vickie Fontaine made a presentation of the risk findings and the risk ranking as completed during the regularly scheduled Council of Neighborhoods meeting. This meeting included representatives and citizens from various local communities. Handouts of the maps, FAQs, risk ranking findings (including a comparison from previous plan editions) was made available, inviting citizen comment. The meeting was open to the public and is regularly advertised. A full list of participants is available from EM Director.
Various Dates	Citywide	Planning Team and one-on-one meetings with all planners from all disciplines were presented with an update on the HMP, provided another overview of the risk maps, and provided the hazard ranking as defined by the city. The strategies were also again identified and discussed with the intent of seeking additional input and data. Team members were asked to further disseminate information concerning the risk assessment and the availability of risk maps on the city's website.

Table 2-3
Plan Milestones and Public Outreach Events

Date	Jurisdiction	Description
March 4	Citywide and Newsletter Release	Risk findings, including hazard maps and risk ranking were made available via the City's website, with distribution of their availability also made via social media (reaching over 4,000 people). Email announcement was also made to stakeholders and planning team members concerning the availability of risk data and maps open for review and comment.
March 18-April 5, 2024	City of Everett	Press release announcing draft plan availability for review on Website and hard copy available for review at Emergency Management on request. Email notification to all city employees, LEPC planning team email notice provided which includes +50 planning team members from outside agencies and jurisdictions. Planning team members distributed press release as well as posting on Facebook and Twitter accounts. Various CERT events were also utilized to distribute notice of the draft plan's availability for review and comment, with copies of the City of Everett's press release distributed (19 people in attendance). Northwest Healthcare Coalition Meeting (3/22), EM personnel distributed the link to the plan, asking individuals to review and comment (39 people in attendance); Region 1 Meeting (3/28) planning process and draft plan's availability was discussed, inviting public comments (~23 people in attendance).
September 2024	City of Everett	FEMA Approval Pending Adoption Received

2.6 HAZARD QUESTIONNAIRE RESULTS

A hazard mitigation plan questionnaire developed by the planning team was used to gauge household preparedness for natural hazards and the level of knowledge of tools and techniques for reducing risk and loss from natural hazards. This questionnaire was designed to help identify areas vulnerable to one or more natural hazards. The answers to its questions helped guide the MPT in selecting goals, objectives, and mitigation strategies, as well as helping to identify potential vulnerability with respect to social inequalities as they relate to respondents. Hard copies were disseminated throughout the planning area, and a web-based version was made available on the hazard mitigation plan website which was distributed and announced during meetings. A flyer was also developed and distributed with the website address and a QR code. The flyer was posted in various locations throughout the planning area and distributed during meetings.

Survey Results

Over 45 questionnaires were completed. Figure 2-7 shows a sample from the web-based questionnaire. Of those responding, 36 percent have lived or worked within the City of Everett for 20 years or longer.

In review of the survey results, responses indicate a close match between respondents' hazards of greatest concern and hazards identified through the Planning Team's risk ranking - again confirming the hazards of greatest concern within the City of Everett, as follows:

- Earthquake
- Severe weather
- Climate change
- Flood
- Hazardous Materials (included within each hazard profile for the city's risk ranking)
- Dam failure (flood profile), landslide, tsunami, and volcanic eruption were the hazards of lesser concern.

Additional points of interest from the survey results include:

- Of those responding, 58 percent of respondents have experienced an earthquake in the last 20 years, with 82 percent have experienced a severe weather event. Severe weather and flood events are the majority of hazards that have impacted the city in the last 20 years. Approximately 36 percent of respondents have also experienced a flood (separate from a severe weather event), with 29 percent indicating they have been impacted by a wildfire (including smoke from distant fires).
- Slightly over 48 percent of respondents indicated that the impact of disaster incidents played a role in their decision to purchase their residence; 30 percent of respondents indicated they have earthquake insurance, 3 percent have landslide insurance, and none of the respondents have flood insurance. Only 6 percent of respondents have renter's insurance. Review of flood insurance data illustrates that the city has only 57 flood insurance policies in force for a total of $22 million in coverage. This may provide a potential mitigation initiative for the city to increase the number of insured residents.
- When queried about their level of preparedness, 67 percent indicated they are somewhat prepared, while 13 percent indicated they are adequately prepared, and 5 percent are well prepared. Of those responding, 80 percent maintain a surplus of extra medical supplies, 74 percent have stored food and water, and 33 percent have developed emergency response plans addressing a variety of hazards, with 49 percent developing a fire escape plan, and 41 percent having pre-identified a family meeting location. These numbers are relatively high (for the sample of responses), demonstrating positive impact from emergency management preparedness campaigns promoting the necessity of basic needs.
- Demographic data indicates that over 60 percent of respondents were 51 years or older, followed by 20 percent between the ages of 41-50, and 18 percent between 18 and 40.
- General comments include positive feedback for the city's use of social media during times of incidents as television and radio stations may not be accessible; some voiced concern over ongoing political issues and unrest; some comments provided positive endorsement for the CERT programs in place, requesting continued use and involvement by these teams.
- Approximately 49 percent of respondents felt the City of Everett's Newsletters were excellent methods for distributing information to residents; 72 percent felt public awareness campaigns were effective methods; 56 percent indicated that the internet and social media are the preferred methods for distributing information to citizens in the city,

with 85 percent (combined) indicating those sources to be their preference for information exchange. These methods were the primary tools of information exchange utilized for this HMP update.

- The majority of respondents indicated that data concerning potential hazards and risk information is readily available. The HMP's plan maintenance section does provide for continued distribution of the hazard data over the lifecycle of this plan, with the city maintaining the HMP website to continue distribution of the information.

Figure 2-7 illustrates one of the public outreach events that occurred during the planning process.

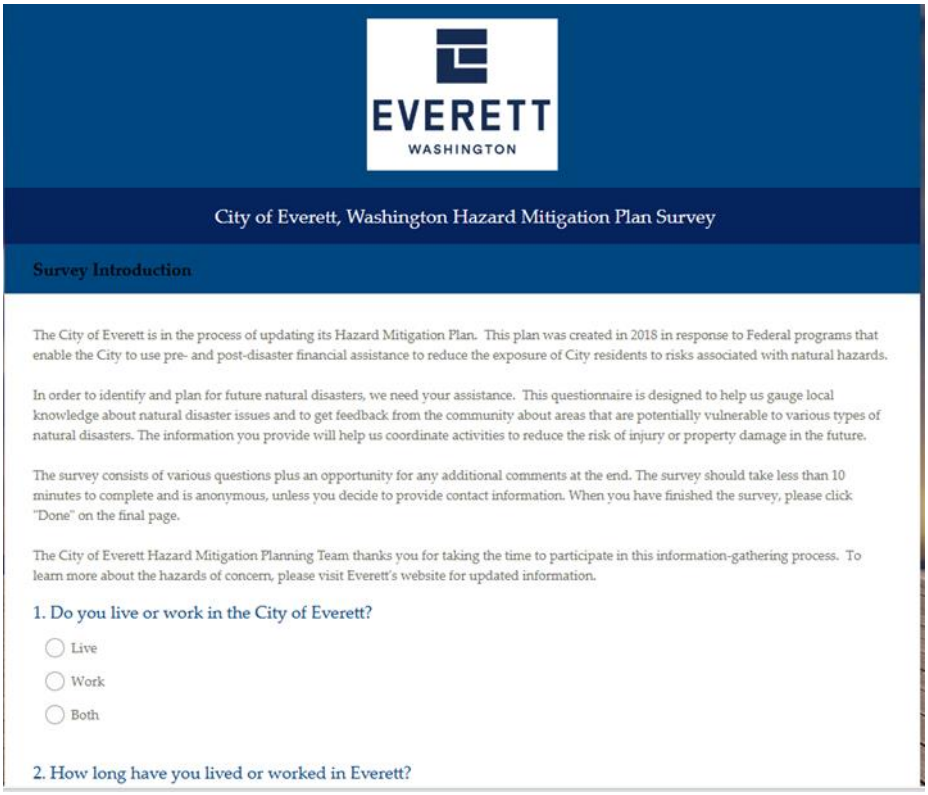


Figure 2-7 Introduction to City of Everett Survey

CHAPTER 3.
COMMUNITY PROFILE

Originally called Port Gardner Bay by European settlers, the peninsula now known as Everett, Washington had previously been the home of the Snohomish Tribe. (The tribe was later "restructured" as part of the Tulalip Tribe Confederation with their reservation located north of the city.) In the late 18th and early 19th centuries, with government-granted homesteads and the lure of the region's vast natural resources, European and American settlers began immigrating here from the east.

Named after the son of investor Charles Colby, Everett incorporated as a city in 1893. It began its industrial growth during the late 1890s, containing amongst other industry, a paper mill, smelters, and a nail factory. By the 1900s, the city began growing exponentially. New expansion coincided with the arrival of immigrants, and the city's population tripled over the next decade, from around 8,000 in 1900 to 24,000 in 1910.

By design, Everett set aside most of its waterfront for industry that, by then, included lumber and shingle mills, wood products manufacturers, iron works, shipbuilders, fisheries, and canneries. By 1920, the city had established itself as an international port dominated by the lumber-shingle trade. Then, as the timber economy began to wane regionally, the city welcomed a shift to aerospace with the arrival of Boeing in the 1960s.

Today Everett enjoys a diverse economy that still has strong roots in its industrial past. In the 1990s, the location of the Navy on Everett's waterfront helped, along with the aerospace, technology, manufacturing and government businesses, to make Everett a prominent city in the Puget Sound.

3.1 PHYSICAL SETTING

Geography

Everett is the seat of Snohomish County and is its largest city (see Figure 3-1). The city is located at the delta of the Snohomish River in the west central portion of Snohomish County. Within its 47.7 square miles, the city borders Port Gardner Bay and includes approximately 15 percent of tidal water.

Rivers and Streams

The City of Everett is located at the delta of the Snohomish River, which flows from the east and is fed by the Snoqualmie and Skykomish Rivers. Everett is predominantly located within Water Resource Inventory Area (WRIA) 07, otherwise referred to as Snohomish. Most of Everett south of Casino Road is in Lake Washington Water Resource Inventory Area (WRIA) 08.

Mountains and Volcanoes

The Cascade Mountains border the eastern portion of Snohomish County. The nearest volcanically active mountain is Glacier Peak, fifty miles to the east and slightly north.

Forest Resources

The City of Everett has forest resource lands within its watershed in the Sultan River Basin. Much of the county agricultural and forestlands are located in the central and eastern portions of the county.

Soils and Geology

The area surrounding Everett, in the southwest portion of Snohomish County is rich in alluvial and glacial deposits. The physiography of the county includes:

- Nearly level alluvial deposits along the major river valleys
- Glacial till plains, outwash plains, and terraces in the middle of the county
- Mountainous areas in the eastern part of the county

The basic drainage flow is from the Cascade Mountains in the east to the Puget Sound in the west. The North Fork of the Stillaguamish River, along the northern edge of the county, begins at the town of Darrington and drains into the Puget Sound. The South Fork, which is in the center of the county, begins at Granite Falls and joins the North Fork at the town of Arlington. The Skykomish River begins at the town of Index in the southern part of the county, flows westerly through the towns of Sultan and Monroe, and joins the Snoqualmie River near the town of Snohomish to form the Snohomish River. The Snohomish River flows northwesterly through Everett to the Puget Sound.

The types of soils found in western Snohomish County and under Everett are primarily Alderwood-Urban Land Complex Soils, at 2%-8% slopes. Alderwood Gravelly Sandy Loam Soils at 15%-25% slopes make up the second most common soil type in the area. Other soils present in and around Everett include Indianola loamy sand, Kitsap silt loam, Norma loam, and Tokuls gravelly loam at various slopes.

Figure 3-1 Contextual Map for Everett and Snohomish County

3.2 CLIMATE

The annual precipitation around Everett averages 36.1 inches per year. November, December and January are generally the rainiest months of the year while July and August are the driest. Snowfall, which is a rare occurrence, is generally heaviest in the months of December, January, and February. The average temperature in Everett is 51.15 degrees Fahrenheit. Annual high temperature is 57.6

degrees Fahrenheit and annual low temperature is 44.7 degrees Fahrenheit. Average monthly highs in the summer reach low seventies and average monthly lows in the winter reach mid-thirties but Everett may experience even greater extremes during severe weather incidents.[3]

Figure 3-2 12-month Average Temperature 1900-2022

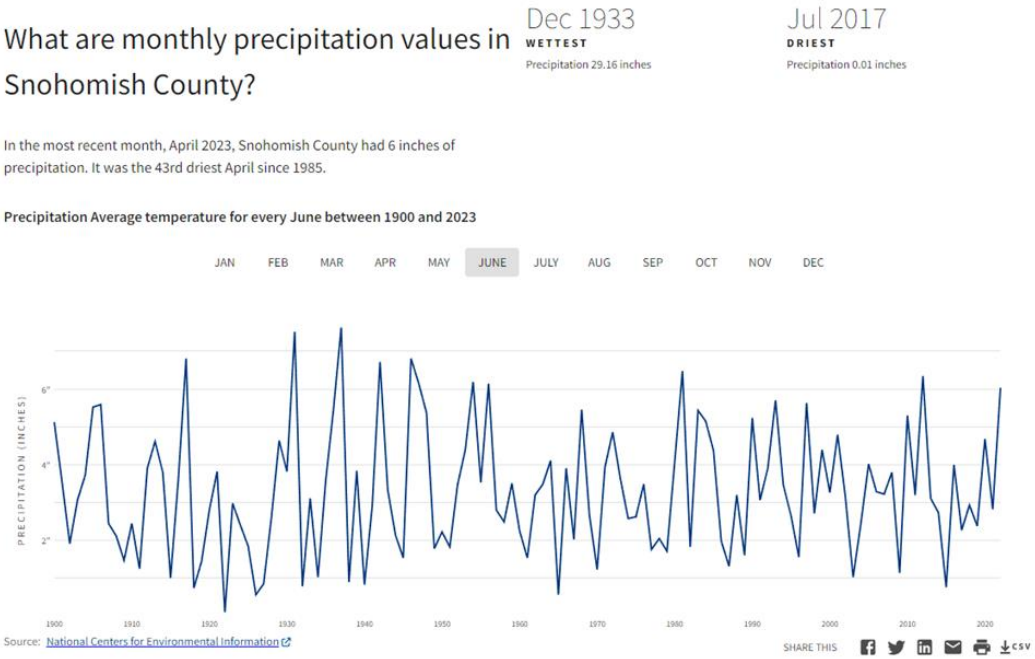


Figure 3-3 12-month Precipitation Totals 1900-2022

[3] Climate in Snohomish County, Washington | USAFacts

3.3 MAJOR PAST HAZARD EVENTS

Presidential disaster declarations are typically issued for hazard events that cause more damage than state or local governments can handle without assistance from the federal government, although no specific dollar loss threshold has been established for these declarations. A presidential disaster declaration puts federal recovery programs into motion to help disaster victims, businesses, tribal, and public entities. In some instances, grant funding from disaster declarations are also matched by state programs and funds, for which the city may be eligible. FEMA categorizes disaster declarations as one of three types:

- **Presidential major disaster declaration**—Major disasters are hurricanes, earthquakes, floods, tornados, or major fires that the President determines warrant supplemental federal aid. The event must be clearly more than state or local governments can handle alone. Funding comes from the President's Disaster Relief Fund, managed by FEMA and disaster aid programs of other participating federal agencies. A presidential major disaster declaration puts into motion long-term federal recovery programs, some of which are matched by state programs (Hazard Mitigation Grant Program), to help disaster victims (Individual Assistance, National Flood Insurance Program), businesses (Small Business Administration), and public entities (Public Assistance). These are the various types of funding which the city has received most often after disaster events.
- **Emergency declaration**—An emergency declaration is more limited in scope and without the long-term federal recovery programs of a presidential major disaster declaration. Generally, federal assistance and funding are provided to meet a specific emergency need or to help prevent a major disaster from occurring.
- **Fire management assistance declaration** (44 CFR 204.21)—FEMA approves declarations for fire management assistance when a fire constitutes a major disaster, based on the following criteria:
  - Threat to lives and improved property, including threats to critical facilities and critical watershed areas
  - Availability of state and local firefighting resources
  - High fire danger conditions, as indicated by nationally accepted indices such as the National Fire Danger Ratings System
  - Potential major economic impact

Since 1953, 34 federal disaster declarations have affected Snohomish County, as listed in Table 3-1 (FEMA, 2023). Also identified in Table 3-1 are 12 Proclamations and Emergency Proclamations issued by the Governor's Office for incidents occurring within the State of Washington which include Snohomish County, and which are related to the natural hazards of concern. In some instances, the Governor's Proclamations may have also led to a Federal Disaster Declaration. No data specific to the City of Everett is identified in either dataset as impact is identified only at the County level. Review of these events does help identify targets for risk reduction and ways to increase a community's capability to avoid large-scale events in the future.

Unfortunately, in some instances, natural hazard events do not trigger federal disaster declaration protocol but have significant impacts on communities. These events are also important to consider in establishing recurrence intervals for hazards of concern. For purposes of this mitigation plan,

some of the events of significance which have not risen to the level of a disaster declaration are discussed within the hazard profiles.

Table 3-1
Disaster Declarations for Hazard Events in Snohomish County
1953-2023

Disaster	Type of Event	Date of Declaration
137	Severe Storms	10/20/1962
185	Heavy Rains and Flooding	12/29/1964
196	Earthquake	5/11/1965
492	Severe Storms, Flooding	12/13/1975
545	Severe Storms, Mudslides, Flooding	12/10/1977
612	Storms, High Tides, Mudslides, Flooding	12/31/1979
623	Mt. St. Helens Volcanic Eruption	5/21/1980
784	Severe Storms, Flooding	12/15/1986
852	Flooding, Severe Storms	1/18/1990
883	Flooding, Severe Storms	11/26/1990
896	High Tides, Severe Storms	3/8/1991
981	Severe Storms, High Winds	3/4/1993
1079	Storms, High Winds, Flooding	1/3/1996
1100	Severe Storms, Flooding	2/9/1996
1159	Severe Winter Storms, Flooding	1/17/1997
1172	Severe Storms, Flooding, Landslides, Mudslides	4/2/1997
1361	Earthquake	3/1/2001
1499	Severe Storms, Flooding	11/7/2003
1641	Severe Storms, Flooding, Tidal Surge, Landslides, Mudslides	5/17/2006
1671	Severe Storms, Flooding, Landslides, Mudslides	12/12/2006
1682	Severe Winter Storms, Landslides, Mudslides	2/14/2007
1734	Severe Storms, Flooding, Landslides, Mudslides	12/8/2007
1817	Severe Winter Storms, Landslides, Mudslides, Flooding	1/30/2009
1825	Severe Winter Storms, Record and Near Record Snow	3/2/2009
4056	Severe Winter Storms, Flooding, Landslides, Mudslides	3/5/2012
4168	Flooding, Mudslides	4/2/2014
4242	Severe Windstorm	10/15/2015
4249	Severe Storms, Straight-Line Winds, Flooding, Landslides, Mudslides	1/15/2016

Table 3-1 Disaster Declarations for Hazard Events in Snohomish County 1953-2023		
Disaster	**Type of Event**	**Date of Declaration**
4418	Severe Storm	3/4/2019
4481	Biological	3/22/2020
4539	Severe Storm, Flood, Landslide, Mudslide	4/23/2020
4593	Severe Storm, Winds, Flooding, Landslide and Mudslides	4/8/2021
5455	Fire (PA Category B and H only)	9/10/2022
4682	Severe Storm	1/12/2023
State Proclamations and Emergency Proclamations for Weather-Related Disaster Events Impacting Snohomish County (2018-2023)		
Proclamation / Emergency Proclamation Number	**Type of Event**	**Date(s) of Incident or Proclamation**
24-01	Atmospheric River Event (Flooding)	December 3, 2023
23-01	Extreme Weather and Flooding	December 18-28, 2022
22-06	Autumn Storm	November 3-8, 2022
21-18	Severe Weather (Wind and Rain)	November 12, 2021
21-10 (amended)	Wildfires (Burn Ban and Fuel Delivery)	July 6, 2021
21-03	Winter Weather (winds, snow, ice, rain, landslides)	December 17, 2020-February, 2021
20-72 (amended)	Wildfires (Temporary Assistance to Families	August 19, 2020
20-01 (amended)	Severe Winter Weather	January 4, 2020 (Inactive)
20-02	Severe Winter Storm (winds, snow, ice, flooding, landslides, erosion)	January 20, 2020 – February 8, 2020
19-02 (amended)	Snowfall and Ice	February 8, 2019 (Inactive)
19-06	Severe Winter Storm (winds, Tornado, flooding, land- and mud-slides)	December 10 – 25, 2018 (Inactive)
18-05	Wildfires (fuels and weather conditions)	July 2018 (Inactive)

The most common disasters to occur are severe storms and flooding. Those hazards are further broken down by month, year, recurrence intervals (not based on order of magnitude), probability of occurrence, and FEMA ranking as illustrated in Table 3-2. These are based on FEMA event typing. For these generalized purposes, recurrence intervals are determined by the number of events divided by the number of years to obtain an average. In some instances, recurrence intervals based on magnitude are contained within the hazard profiles. The recurrence intervals are not based on the order of magnitude (e.g., a 100-year storm), but rather on the fact that the event occurred, no matter what the magnitude. The Percent Probability of Occurrence is calculated by the dividing the number of events by years, and then multiplying that sum by 100 to create the percent probability of an event occurring in any given year.

Table 3-2
Storm Disaster History by Month, Recurrence, and Probability of Occurrence

Hazard Type	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total	Years of Occurrence	FEMA Rank	Recurrence / Years (No Order of Magnitude)	Probability/ (Percent risk that an event may occur)
Flood	1	1	1	2	0	0	0	0	0	0	1	5	**11**	64, 75, 77, 79, 86, 90, 91, 96, 97, 09, 20	2	6.36	15.71
Severe Storm (all types)	4	1	4	1	1	0	0	0	0	1	1	2	**15**	93, 96, 97, 03, 06 (x2), 07 (x2), 09, 12, 15, 16, 19, 21, 23	1	4.67	21.43
TOTAL	**5**	**2**	**5**	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**7**	**26**				
Based on FEMA designation and dates.																	

3.4 CRITICAL FACILITIES AND INFRASTRUCTURE

3.4.1 Definition

Critical facilities and infrastructure are those that are essential to the health and welfare of the population. Loss of a critical facility could also result in a severe economic or catastrophic impact and have a cascading impact on the various community lifelines. These facilities become especially important after a hazard event. Critical facilities typically include police and fire stations, schools, and emergency operations centers. Critical infrastructure can include the roads and bridges that provide ingress and egress and allow emergency vehicles access to those in need, and the utilities that provide water, electricity, and communication services to the community. Also included are "Tier II" facilities and railroads, which hold or carry significant amounts of hazardous materials with a potential to impact public health and welfare in a hazard event.

For purposes of this planning effort, the Planning Team identified the definition of critical facilities based on that which has historically been utilized throughout the city during various planning efforts as identified below. The previously developed critical facilities list was reviewed and updated during this 2023-2024 process, and encompasses the following:

- Police stations, fire stations, vehicle and equipment storage facilities, communication centers and towers, and emergency operations centers needed for disaster response before, during, and after hazard events.
- Public and private utilities, facilities, and infrastructure vital to maintaining or restoring normal services to areas damaged by hazard events.
- Hospitals, including large medical facilities that provide critical medical services.
- Structures or facilities that produce, use, or store highly volatile, flammable, explosive, toxic, and/or water-reactive materials (e.g., hazmat facilities).
- Public gathering places that could be used as evacuation or feeding centers during large-scale disasters.
- Governmental facilities central to governance and quality of life along with response and recovery actions taken as a result of a hazard event.

3.4.2 Critical Facilities Update

This process included an update of the critical facilities identified during the 2024 plan development. The data utilized for identification of those structures which met the definition of critical facility were captured from Everett's Schedule of Value established for insurance purposes. A total of ~151 structures were identified for this update process, as well as valuation of some of the various transmission lines (single point data used to identify potential dollar losses). The total value of those critical facilities identified was approximately $1.034 billion in structure value, and $47 million in content value (rounded figures). When combined, total assets exceed $1.106 billion included within this risk assessment.

While all critical facilities identified are incorporated into this planning process, due to the sensitivity of this information, a detailed list of facilities is not provided. Table 3-3 provides a summary of the general types of critical facilities and infrastructure owned and operated by the City of Everett. Deficiencies in this list has been identified as a task by the planning team to continue improving the data for use in future plan updates. All critical facilities/infrastructure identified in the plan were analyzed in the GIS platform to help rank risk and identify mitigation actions. The risk assessment for each hazard qualitatively discusses critical facilities with regard to that hazard.

Figure 3-4 illustrates the general location of facilities and parcels throughout the City of Everett. Figure 3-5 illustrates the critical facilities and infrastructure assessed during this 2024 HMP update.

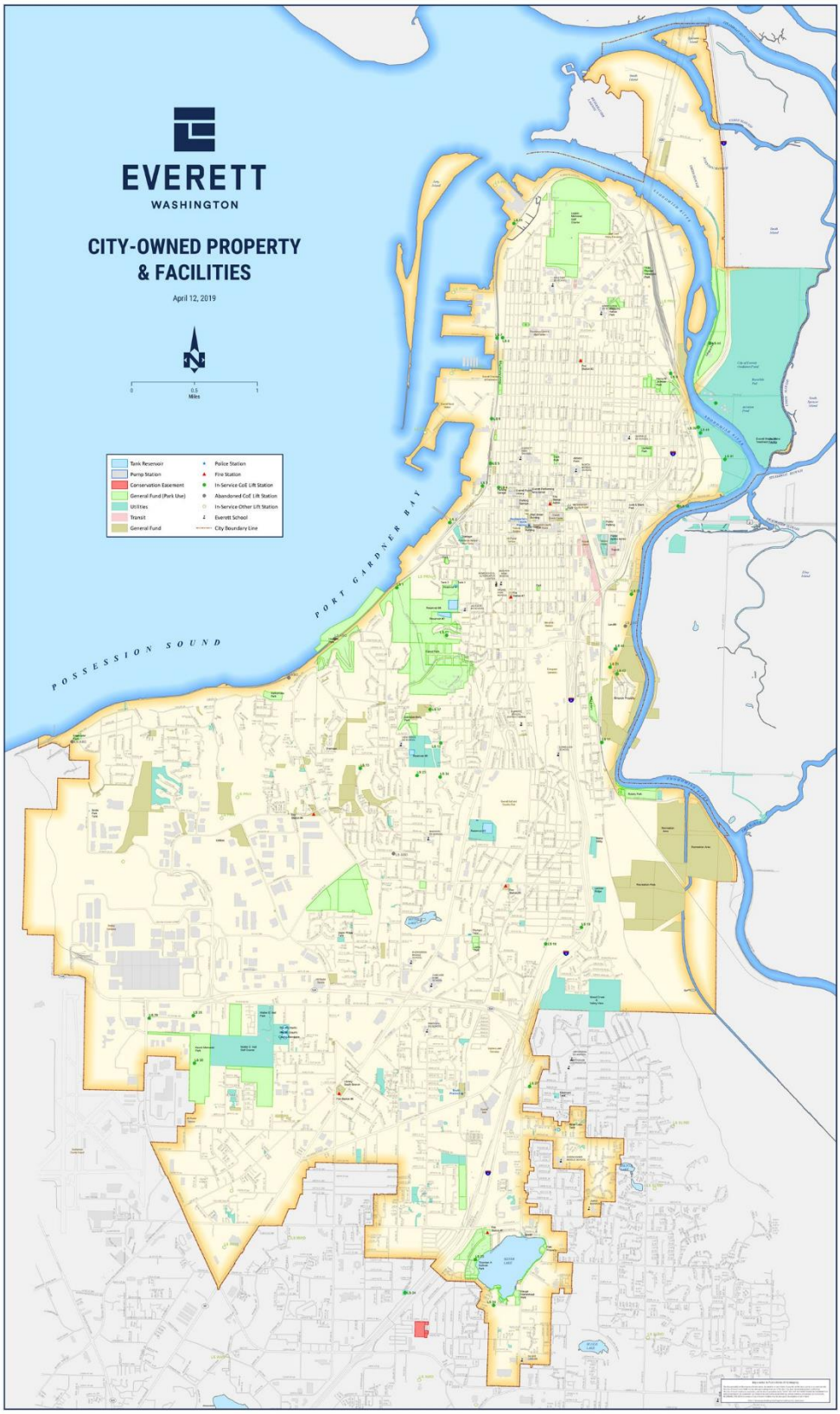


Figure 3-4 City of Everett Facilities and Property

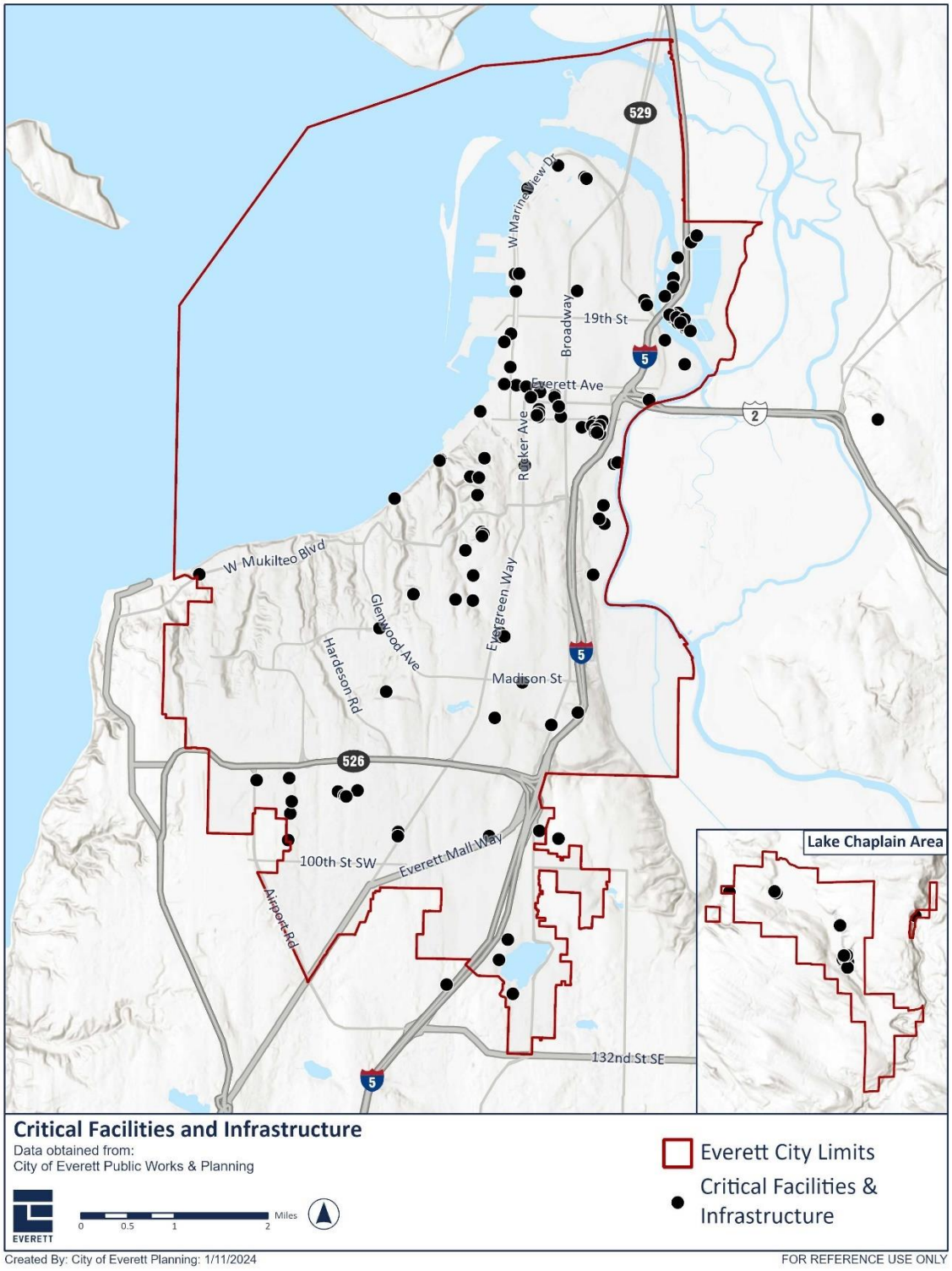


Figure 3-5 Critical Facilities and Infrastructure

Table 3-3 City of Everett Critical Facilities		
Critical Facility Type	**Count**	**Building & Content Values (Combined)***
Commercial	6	$7.19 million
Cultural	2	$19.7 million
Government/Administration	11	$116.4 million
Hazmat (Government Owned Facilities)	3	$1.6 million
Natural Resources/Agricultural	5	$10.8 million
Protective	11	$76.2 million
Power/Energy (Transmission Lines one point; ~77 miles)	4	$91.8 million
Shelters (Gathering Structures – Senior Center, Libraries, Animal Shelter, Conference Center)	5	$89.0 million
Transportation (Pedestrian overpass, Transit structures and stations)	6	$93.5 million
Wastewater	54	$241.5 million
Water	43	$358.8 million
Totals ***Rounded**	**151**	**$1.106 Billion**

3.4.3 Community Lifelines

A community lifeline enables the continuous operation of critical government and business functions and is essential to human health and safety or economic security.[4] They are the fundamental services which enable other aspects of society to function, supporting the reoccurring needs of a community, and enable other aspects of society to function. However, when any element of these lifelines are disrupted, that disruption can negatively impact other lifelines from functioning appropriately.

In serious but purely local incidents, interruptions of water service, electric power, and other community lifeline components are typically brief and can be mitigated more easily. However, severe and widespread incidents such as a Cascadia earthquake, severe flood or wildfire event can halt lifeline services for many weeks or months. Such disruptions are especially extensive in catastrophic incidents and may result in mass casualties and other cascading consequences. FEMA has identified seven community lifelines, identified in Table 3-4. Each lifeline depends on multiple infrastructure sectors, businesses, and supply chains to function. Focusing on community lifelines allows emergency

[4] National Response Framework, 4th Edition. (2019)

managers and their partners to account for these complex interdependencies and prioritize response operations to achieve high-impact, multi-sector benefits.

Table 3-4
Community Lifeline Descriptions

Community Lifeline	Description
Safety and Security	Law enforcement and government services, as well as the associated assets that maintain communal security, provide search and rescue, evacuations, and firefighting capabilities, and promote responder safety.
Food, Water, Shelter	Support systems that enable the sustainment of life, such as water treatment, transmission, and distribution systems; food retail and distribution networks; wastewater collection and treatment systems; as well as sheltering, and agriculture.
Health and Medical	Infrastructure and service providers for medical care, public health, patient movement, fatality management, behavioral health, veterinary support, and health or medical supply chains.
Energy	Service providers for electric power infrastructure, composed of generation, transmission, and distribution systems, as well as gas and liquid fuel processing, transportation, and delivery systems. Disruptions can have a limiting effect on the functionality of other community lifelines.
Communications	Infrastructure owners and operators of broadband Internet, cellular networks, landline telephony, cable services (to include undersea cable), satellite communications services, and broadcast networks (radio and television). Communication systems encompass a large set of diverse modes of delivery and technologies, often intertwined but largely operating independently. Services include elements such as alerts, warnings, and messages, as well as 911 and dispatch. Also includes accessibility of financial services.
Transportation	Multiple modes of transportation that often serve complementary functions and create redundancy, adding to the inherent resilience in overall transportation networks. Transportation infrastructure generally includes highway/roadways, mass transit, railway, aviation, maritime, pipeline, and intermodal systems.
Hazardous Material	Systems that mitigate threats to public health/welfare and the environment. This includes assessment of facilities that use, generate, and store hazardous substances, as well as specialized conveyance assets and efforts to identify, contain, and remove incident debris, pollution, contaminants, oil or other hazardous substances.

In an effort to help ensure the on-going functionality of those Community Lifelines, throughout this HMP update process, the city has been inclusive of the elements of the Community Lifelines, and identifying critical facilities which encompass the functionality of the various sectors. This includes local governments for continuity of government, energy (as well as other public utilities providing water and wastewater, etc.), entities providing communications, health and medical services, safety and security (including law enforcement, fire, corrections), transportation, and identification and assessment of hazardous materials locations. All of these elements are integrated into the various plan components, including by identification of the critical facilities making up the lifelines, through the risk assessment completed to identify potential impact from the various hazards of concern, and

identification of mitigation action items which, when implemented, will help reduce the impact on those lifelines.

3.4.4 Transportation and Utilities

Transportation

The major north-south route serving Everett, Interstate 5 (I-5), crosses over the Snohomish River floodplain at the northeast corner of the city. The interstate has a number of large overpasses crossing I-5. State Route 529, formerly the old Highway 99, also connects Everett to Marysville, providing a secondary north-south route across the Snohomish River delta. The major east-west route for Everett is State Route 2. US Highway 2 also crosses over the Snohomish River as it heads east. This highway parallels the Burlington Northern/Santa Fe (BNSF) railroad route that travels east towards the cities of Snohomish and Sultan and the Cascade Mountains. Other major routes directly serving Everett include Highway 99 to the north and south, and State Route 526, serving the southern areas of the city.

The primary responsibility for coordination of ice and snow control on city streets rest with Public Works. The Public Works Department maintains an inclement weather plan that includes primary and secondary route priorities. Snow routes along the interstate and major highways that serve Everett are primarily the responsibility of the Washington State Department of Transportation (WSDOT) and their highway maintenance division. While the service crews maintain the roads to provide a clear route, during periods of severe snow or ice storms, these routes may experience periods of closure.

Port

The Port of Everett, created in 1918, is situated on Port Gardner Bay at the mouth of the Snohomish River. The Port District operates piers, wharfs, warehouses, and cold storage plants, together with rail, water and terminal facilities. The Port District encompasses major areas of western Snohomish County that include Everett. The Port operates eight berths on approximately one hundred acres of land. The three terminals (Hewitt, Pacific, and South) handle approximately one million tons of cargo per year and are served by the BNSF rail line. The terminals are concrete decks and piers and include a refrigerated warehouse, a log yard, an intermodal container facility and a 55,000-ton concrete storage dome. The Port's marina provides moorage to approximately 2,000 vessels. While open to the public, the marina also provides moorage to commercial fishing vessels.

Port-owned Jetty Island has provided a protected harbor and navigation channel since the late 1800s. The 2500-foot long, 15-foot Mean Lower Low Water high sand berm was developed utilizing dredged material from the harbor bottom. It now provides benefits to both port activities and the environment by providing habitat for salmon and various birds, including bald eagles.

The Port of Everett's Waterfront Place Central development project unifies the marina and surrounding property as one economic unit, creating a sustainable commercial, recreation, and residential community. The pedestrian-oriented community takes advantage of its waterfront and recreational boating setting. The Riverside Business Park, situated along Everett's waterfront, is also home to Amazon and FedEx, among other large employers.

Airport

The City of Everett is serviced by one airport certified for carrier operations. Located just outside southern Everett, Paine Field is the largest nearby airfield outside of King County. The airport is home to over 500 aircraft and has a portion of its flight path located over Everett. Paine Field also provides all flight services for the Everett Boeing wide-body airplane factory, located just north of the airport. Paine Field is the newest commercial airport terminal in Washington, opening since completion of the last plan (see Figure 3-6).[5]

Figure 3-6 Pain Field

Rail

The BNSF railroad travels along two separate routes through Everett. One-line travels east-west through downtown Everett. This line travels through the BNSF tunnel between California Street & Hewitt Avenue from Oakes Avenue to West Marine View Drive and then west along Everett's waterfront. The second line travels along the Snohomish River north, with the line splitting, with one line going south to Seattle and one line going north to Canada. This second line intersects the first line at the Everett waterfront and then follows the Puget Sound shoreline to Seattle.

The Seattle Sounder uses the BNSF line through an agreement among Burlington Northern Railroad, Amtrak, Snohomish County and Sound Transit. The Everett Station for the Sounder and Amtrak is located on 3201 Smith Avenue. This represents the main passenger terminal along the BNSF rail line in Everett.

This east-west rail corridor is also the location of U.S. Route 2 as it travels east over the Cascade Mountains. This rail line is a major thoroughfare, taking materials and goods (including hazardous materials) from Everett to eastern Washington and beyond.

[5] Paine Field. About our Airport. Accessed 5 July 2023. Available online at: About Our Airport | Paine Field, WA - Official Website

Water and Wastewater

Everett's water distribution system relies primarily on gravity. The Water Filtration Plant, located at a higher elevation and east of the city, conveys water via three forty-eight-inch and one fifty-one-inch transmission lines to Everett and most of Snohomish County.[6]

The city's potable water is treated and stored in large, closed reservoirs and pumped to other water districts for distribution; this system provides water to 75 percent of Snohomish County, with an estimated 657,000 residents and businesses gaining access to water through Everett's systems.

The source of water is the Sultan Basin Watershed in the Cascade Mountains. The water collected in Spada Lake Reservoir (50 billion gallons) is then diverted to the Lake Chaplin Reservoir (5.2 billion gallons), where it is treated in the Water Filtration Plant at the base of the fifty-foot earthen dam that defines the south-end of the reservoir. Public access is restricted at the Spada Lake Reservoir and other important locations along Everett's water treatment system. In 2021, the Everett water system delivered 18.7 billion gallons of water to customers in Snohomish County.

The Water Pollution Control Facility, located on Smith Island in north Everett, handles wastewater for 180,000 people (20,000 more than the previous plan edition) through 35 lift stations and 335 miles of sewer mains located throughout the city. The treatment facility consists of hundreds of acres of non- and -aerated ponds, as well as mechanical treatment unit that serves Everett and a small portion of the following:

- Alderwood Water and Wastewater District
- Silver Lake Water and Sewer District
- Mukilteo Water and Wastewater District

Everett has two wastewater collection systems, with one serving the northern third of the city and one serving the southern two-thirds. The northern system combines both storm sewer drains and sanitary sewer and routes them to the facility. The southern system is designed to collect only sanitary sewage. The city's wastewater system also requires that specific industries pre-treat their effluent before it enters the system.

With respect to development trends, the Utilities spent $17.7 million on capital improvement projects in 2021. These projects were financed from a combination of capital contributions, revenues from operations, government loans and capital grants, with $29m in revenue generated from grants. Many of these projects are mitigation activities previously identified and discussed within Chapter 12. The 2021 projects included:

- Reservoir #2 replacement
- Jackson Park Stormwater improvement
- WFP generator replacement, to ensure continued operation during power outages

[6] City of Everett Utilities Annual Financial Report (2021). Accessed 5 July 2023. Available online at: 2021 utilities annual report web-spreads.pdf

Henry M. Jackson Hydroelectric Project

The City of Everett and Snohomish County PUD are co-licensees under the Federal Energy Regulatory Commission (FERC) for the construction and operation of the Henry M. Jackson Hydroelectric Project on the Sultan River. As indicated, the project supplies water for Everett's water utility, and Spada Lake, which was built as part of the project, is the main water reservoir for the City of Everett. Spada Lake is located approximately seven miles east of Lake Chaplain. Spada Lake is not in Everett's city limits and is regulated under Snohomish County's shoreline master program.

Lake Chaplain is a reservoir formed by construction of two dams in a side valley near the Sultan River, which is the source of water for Everett's water utility. A concrete diversion dam constructed in the Sultan River originally diverted water to form the reservoir. However, since construction of the Jackson Hydropower Project and raising of Spada Lake reservoir, water is diverted to Lake Chaplain reservoir via a pipeline from the powerhouse. Under normal operating conditions, water from the Jackson powerhouse is directed back to the Sultan River through a tunnel to the diversion dam to maintain in-stream flows for fish. A pump station and a water filtration plant are located immediately south of Lake Chaplain. Four large-diameter transmission pipelines and two tunnels deliver water from the plant to customers throughout Everett's service area. Other facilities and activities associated with the water supply include, but are not limited to, roads, emergency power generation, a backwash solids drying bed, and a disposal area for dried backwash solids.

Power

The Snohomish County Public Utility District (PUD) No. 1 offices are located on 2320 California Street. The largest municipal corporation in the state has been providing electricity to Snohomish County and Camano Island since 1949. The service area of the Snohomish County PUD covers 2,200 square miles and maintains over 6,388 miles of distribution lines. The PUD serves 332,746 residential customers, 314,071 commercial customers, and 76 industrial customers.[7]

As of FY 2021, the electric system's ten largest customers in terms of revenues accounted for approximately 10% of total retail kWh energy sales and 8% of retail energy sales revenue in 2021. For 2021, the district's ten largest customers (in alphabetical order) are: The Boeing Company, City of Everett, The Everett School District, Fred Meyer Inc. (QFC/Kroger), Providence Medical Center, Safeway Stores, Snohomish County, State of Washington, Tulalip Tribes and U.S. Navy.

Natural Gas

Puget Sound Energy (PSE), based out of Bellevue, Washington, provides natural gas service to Everett. In Snohomish County, PSE provides for 126,634 customers through 1,975 miles of pipeline.

3.4.5 Hazardous Materials

Hazardous materials can be released for many reasons, including as a potential terrorist target, human error, or the structural integrity being compromised by a natural hazard event, such as an earthquake, tsunami, flood, or landslide (among others). Release of hazardous materials could cause

[7] Snohomish County PUD No. 1. Annual Report (2021). Accessed 5 July 2022. Available online at: 2021 EL.GS Financial Tables.xlsb (msrb.org)

significant damage to the environment and people. Figure 3-7 identifies the location of potential hazmat sites in the City of Everett as identified in Washington State Department of Ecology's Hazardous Materials Annual Report (2023). These facilities include both public and private structures required to report chemicals based on their quantity and type. Figure 3-6 identifies the Tier II facilities within Everett's city limits. A list of Tier II Facilities is available through the Snohomish County LEPC (Local Emergency Planning Committee). Many of the Tier II facilities in Everett are smaller in nature, but a significant event such as an earthquake or flood could pose a serious threat when chemicals from multiple sources are released, particularly given its proximity to waterbodies which could carry the chemicals a great distance. Planning considerations discussed by the planning team include the following information.

- Most transport of hazardous materials through Snohomish County and Everett is accomplished either by rail or by I-5, the major interstate route on the west coast.
- Of concern with respect to hazardous materials is the significant percentage of the material hauled by rail from Tacoma to Everett. The chemicals carried along rail routes include chlorine, caustic soda, anhydrous ammonia, and methanol. The most common materials shipped through Snohomish County include LPG, vinyl chloride, methanol, and motor fuel anti-knock compound. The east/west rail corridor typically carries lesser amounts of methanol, chlorine, and LPG. The I-5, US-2, SR-99 and SR-526 corridors handle most of the roadway hazmat transport in Snohomish County. However, much of this traffic may subsequently travel short distances along a few heavily used arterials serving the Port of Everett, Boeing, and other industrial areas.
- As indicated, there are two major rail yards in Everett – the Delta Yard and the West Yard, located along Everett's waterfront. These two lines handle mixed traffic, which include cargo, passenger trains, and garbage. At the Delta yard, there are also two large propane tanks. Hazardous materials that pass through the yards could pose a hazard to the surrounding area in the event of an accidental release.
- Some of the other materials passing through the county as a whole via the highway system could potentially include low-level radioactive wastes, Class C explosives, blasting agents, corrosives, and other hazardous materials. Marine transport is responsible for a very small percentage of the area's total tonnage of hazardous materials.
- Transport of hazardous materials by air is essentially confined to the actual fuels and lubricating fluids carried on board aircraft as a normal function of flight operations. While Paine Field Airport does have a significant air traffic load, the total quantities of non-fuel substances are relatively small. Paine Field has 2.3 million gallons of aviation fuel stored on site to service the approximately 500 aircraft using the airport daily.
- The probability of a hazardous materials release in Everett is higher than much of the rest of Snohomish County due to the number of Tier II Facilities located in Everett. Additionally, the confluence of major transportation and rail lines in the city, as well as the location of the Port of Everett along Everett's waterfront, increases the potential of a hazardous materials incident from a transportation related accident.

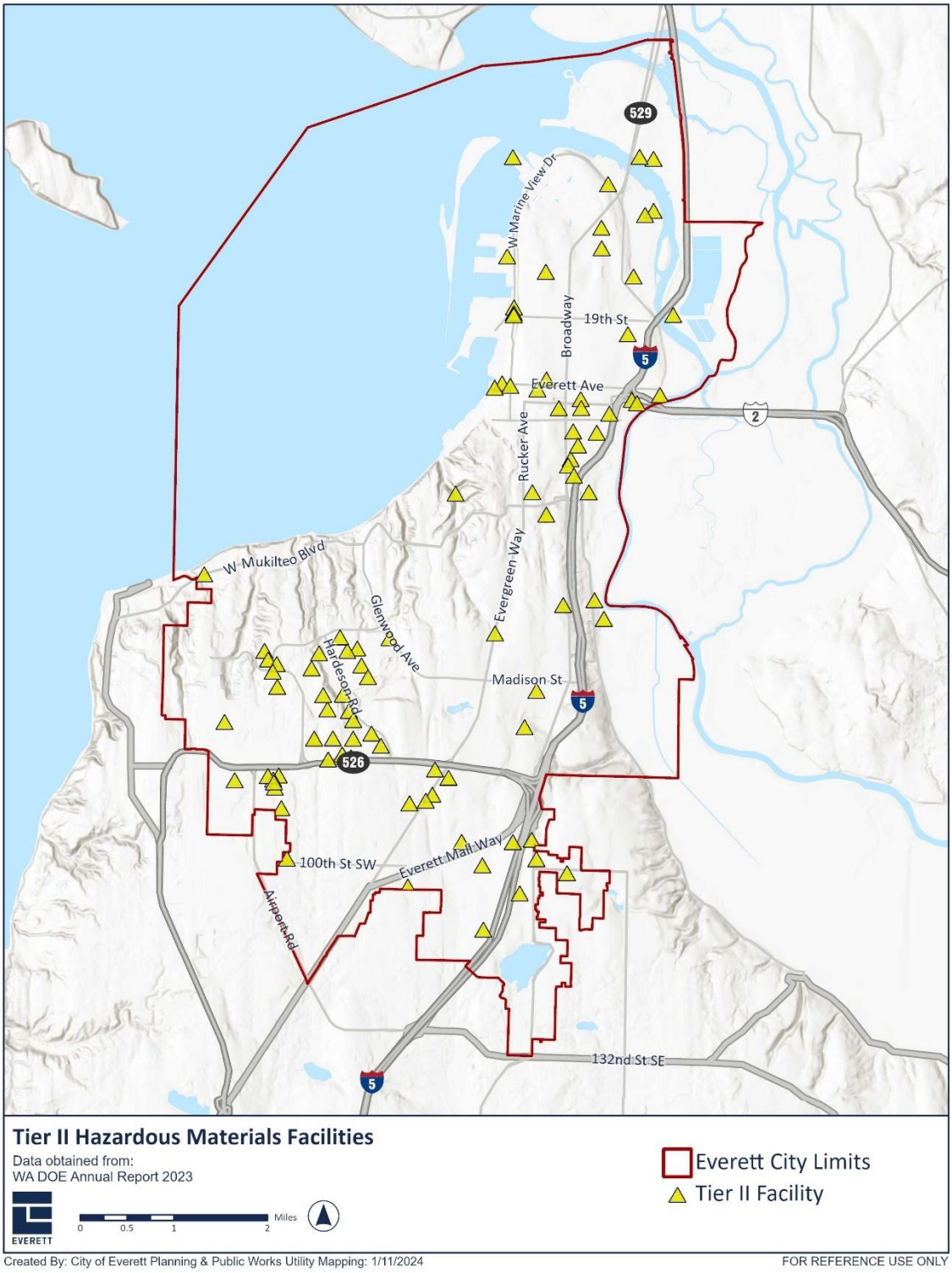


Figure 3-7 Hazardous Materials Facilities (2023)

3.5 POPULATION AND POPULATION TRENDS

Some populations are at greater risk from hazard events because of decreased resources or physical abilities. Elderly people, for example, may be more likely to require additional assistance. Research has shown that people living near or below the poverty line, the elderly (especially older single men), the disabled, women, children, ethnic minorities, single parent homes, and renters all experience, to some degree, more severe effects from disasters than the general population.

These vulnerable populations may vary from the general population in risk perception, living conditions, access to information before, during and after a hazard event, capabilities during an event, and access to resources for post-disaster recovery. Indicators of vulnerability—such as disability, age, poverty, and minority race and ethnicity—often overlap spatially and often in the geographically most vulnerable locations. Detailed spatial analysis to locate areas where there are higher concentrations of vulnerable community members would assist the city in extending focused public outreach and education to these most vulnerable citizens.

Knowledge of the composition of the population, how it has or may change in the future is needed for informed planning decisions. Information about population is a critical part of planning because it directly relates to land needs such as housing, industry, stores, public facilities and services, and transportation.

Due to its location within Snohomish County, one of the largest counties in the state, it is also important to identify the county's data in addition to the city's, as many of the city's resources may also be utilized to support individuals traveling through the City of Everett, particularly as the city is the county seat.

Utilizing the US Census 2022 data, as of July 2022, Snohomish County has 840,079 residents. The City of Everett has a population of 111,337. Population changes are also useful socio-economic indicators. A growing population generally indicates a growing economy, while a decreasing population signifies economic decline. Table 3-5 presents Snohomish County and the City of Everett's population, population change, area, and density data as established by the U.S. Census Bureau. As of this update (2024), the City has no indication that population values will decline and anticipates a continued steady growth as has been experienced over the last 10 years.

Table 3-5
2022 Population and Percent Increase, Area, and Density Figures

Geographic area	Population	Housing units	Persons Per Household	Area in square miles	Density per square mile of land area
				Land area	Population
Snohomish County	840,079 +1,5% (percent increase since 2020)	333,824	2.67	2,087	396.8

Table 3-5
2022 Population and Percent Increase, Area, and Density Figures

Geographic area	Population	Housing units	Persons Per Household	Area in square miles	Density per square mile of land area
				Land area	Population
Everett, City of	111,337 +.07% (percent increase since 2020)	Not identified in 2022 Census	2.43	33.45	3,333.1

Based on 2022 US Census Data

3.5.1 Social Vulnerability and Social Equity

Some populations are at greater risk from hazard events because of decreased resources or physical abilities. Elderly people may be more likely to require additional assistance during a disaster incident or be less able to provide such care during a crisis, finding the magnitude of the task of providing that care beyond their capability. Research has shown that people living near or below the poverty line, the elderly, the disabled, women, children, ethnic minorities, and renters all experience, to some degree, more severe effects from disasters than the general population. These vulnerable populations may vary from the general population in risk perception, living conditions, access to information before, during and after a hazard event, capabilities during an event, and access to resources for post-disaster recovery. Indicators of vulnerability—such as disability, age, poverty, and minority race and ethnicity—often overlap spatially and often in the geographically most vulnerable locations. Detailed spatial analysis to locate areas where there are higher concentrations of vulnerable community members would allow more focused public outreach to the vulnerable citizens (see Figure 3-8 identifying community indicators utilized to identify vulnerable populations).

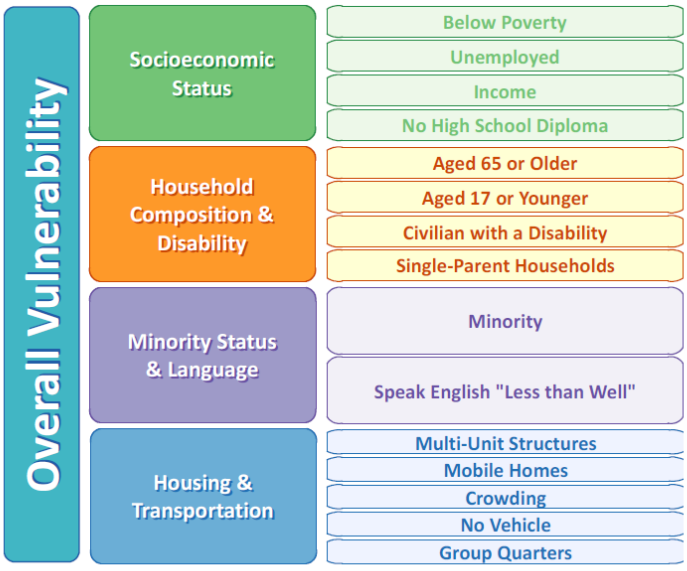


Figure 3-8 Community Indicators of Social Vulnerability

During emergencies, real-time evacuation information may not be provided to people with limited English proficiency, the hearing and visually impaired, those without a smartphone, and other special needs group. Many low-income people may be stranded because they have no personal transportation, and no mass transit (especially during emergencies) is available. For the poor, they are less likely to have the income/assets needed to prepare for or recover from a disaster. Although the value of their property may be less than other households, it likely represents a larger portion of the total assets owned. As such, lost property is proportionately more expensive and difficult to replace, especially without insurance. The unemployed do not have employee benefits that provide health care assistance. High-income populations who suffer higher household losses (absolute terms) find their overall position mitigated by insurance and other financial investments not available to lower income households.

To assist in helping to visualize and analyze data about local communities, FEMA developed the Resilience Analysis & Planning Tool (RAPT), which contains data supporting emergency management (and other) decisions for outreach, planning, mitigation, response and recovery (see Figure 3-9).

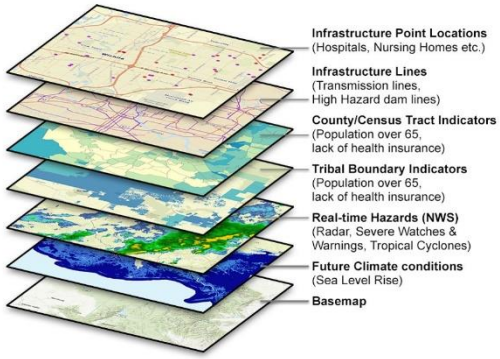


Figure 3-9 Examples of RAPT Data Layers

Review of FEMA's RAPT data, which utilizes 2020 Census data, Snohomish County is identified within the Community Resilience Challenges Index (CRCI) percentile at 7 of 100.[8] The City of Everett is not separately identified. The following information is recognized as the FEMA CRCI Indicators for the planning area:

Percent without High School Diploma:	7.14%
Percent Age 65 and Older:	13.57%
Percent with a Disability:	11.44%
Percent HH without a Vehicle:	4.60%
Percent HH with Limited English:	4.29%
Percent Single-Parent HH:	16.76%
Percent HH without a Smartphone:	8.76%
Percent Mobile Homes:	4.70%
Percent Owner-Occupied Housing:	64.95%
Number of Hospitals per 10,000 People:	0.07
Number of Medical Practitioners per 1,000 People:	16.59
Percent without Health Insurance:	6.13%
Percent Below Poverty Level:	7.32%
Median HH Income:	$95,618

[8] FEMA Resilience Analysis and Planning Tool (2023). Accessed various times. Available online at: Resilience Analysis and Planning Tool (RAPT) (arcgis.com)

Percent Unemployed Labor Force:	4.36%
Percent Unemployed Women in Labor Force:	4.39%
Percent Workforce Employed in Predominant Sector:	19.94%
Income Inequality (Gini Index):	0.41
Social/Civic Organizations per 10,000 People:	0.83
Percent without Religious Affiliation:	57.11%
Percent Inactive Voters:	7.14
Population Change:	0.67

3.5.2 Age Distribution

As a group, the elderly are more apt to lack the physical and economic resources necessary for response to hazard events and more likely to suffer health-related consequences making recovery slower. They are more likely to be vision, hearing, and/or mobility impaired, and more likely to experience mental impairment or dementia. Additionally, the elderly are more likely to live in assisted-living facilities where emergency preparedness occurs at the discretion of facility operators. These facilities are typically identified as "critical facilities" by emergency managers because they require extra notice to implement evacuation.

Elderly residents may have more difficulty evacuating their homes and could be stranded in dangerous situations. This population group is more likely to need special medical attention, which may not be readily available during natural disasters due to isolation caused by the event. Specific planning attention for the elderly is an important consideration given the current aging of the American population.

Based on 2022 U.S. Census Data, the City of Everett is a younger community compared to the county and State of Washington, with approximately 13.5 percent of its population 65 years and over compared to 15.0 percent at the county level and ~17 percent at the state level. The median age in Everett is 35.9 years, compared to 38.2 in Washington.

Children under 5 are particularly vulnerable to disasters because of their dependence on others for basic necessities. Very young children are additionally vulnerable to injury or sickness; this vulnerability can be worsened during a natural disaster because they may not understand the measures that need to be taken to protect themselves. Approximately 5 percent of the population is 5 years and under. Approximately 20.2 percent of county residents are younger than 18.

3.5.3 Race, Ethnicity, and Language

Research shows that minorities are less likely to be involved in pre-disaster planning and experience higher mortality rates during a disaster event. Post-disaster recovery can be ineffective and is often characterized by cultural insensitivity. Since higher proportions of ethnic minorities live below the poverty line than the majority white population, poverty can compound vulnerability.

According to the 2022 U.S. Census Bureau's QuickFacts, racial makeup of the city was 67% white, 0.7% American Indian, 9.4% Asian, and 6.5% black or African American. Those of Hispanic or Latino origin made up 16.5% of the population. The city also had approximately 7,055 Veterans (20.1%), higher than the state average. Approximately 28.2% of the county's population indicated a language other than English spoken in the home.

3.5.4 Disabled Populations

People with disabilities are more likely than the general population to have difficulty responding to a hazard event. As disabled populations are increasingly integrated into society, they are more likely to require assistance during the 72 hours after a hazard event, the period generally reserved for self-help. There is no "typical" disabled person, which can complicate disaster-planning processes that attempt to incorporate them. Disability is likely to be compounded with other vulnerabilities, such as age, economic disadvantage, and ethnicity, all of which mean that housing is more likely to be substandard.

Approximately 10.5 percent of the city's population 65 years and under is disabled, which is higher than the state's value of 8.9 percent, and higher than Snohomish County's population for the same category, which is 8.1 percent. Population total of disabled individuals with is 11.44 percent.

3.6 ECONOMY AND BUILDING STOCK

Knowing the economic characteristics of a community can assist in the analysis of the community's ability to prepare, respond, and rebuild safer after a natural hazard. Categorizing economic vulnerability can encompass many factors, including median household income, poverty rates, employment and unemployment rates, housing tenure, and community building inventory.

Based on information contained within the US Census Data, the economy of Everett, WA employs nearly 56,000 people. The largest industry in Everett is Manufacturing (8,985 people). This is proportionally higher than any other county in Washington and above the national average. Aerospace products and parts manufacturing makes up the largest portion of employment in this sector. Aerospace manufacturers supplied 31,600 jobs in 2021. The manufacturing base, coupled with proximity to a major urban center, provides the foundation for a diverse local economy.

Other major industry sectors throughout the county employing more than 20,000 included government (37,600), educational and health services (36,500), retail trade (34,000), professional and business services (28,300), leisure and hospitality (23,900) and construction (24,800). The highest paying industries are Utilities ($84,886), Management of Companies & Enterprises ($71,765), and Information ($68,917).

Males in Washington have an average income that is 1.35 times higher than the average income of females, which is $61,193. The income inequality in Washington (measured using the Gini index) is 0.466, which is lower than the national average.

Everett is fortunate to retain a strong manufacturing sector lead by The Boeing Company. Everett is dependent for a large proportion of its tax base on this sector. Manufacturing relies on a network of roadways, railways, seaports and airports. Everett would face significant economic harm if a major disaster impacted these sectors and the transportation network.

Port of Everett

The Port of Everett and the waterfront are significant economic hubs for the city (see Figure 3-10 – photo courtesy of the City of Everett). These areas also face a variety of hazards which are potentially devastating, including earthquake related ground-shaking, soil liquefaction, hazardous material spills, tsunamis and seiches. In the coming decades, the Port will also be impacted by climate change

and related increases in severe weather and sea level rise (SLR). Fortunately, the rate of SLR is among the slowest in the nation.

Figure 3-10 Pedestrian Bridge to Waterfront.

The new waterfront development is incorporating climate change impacts into the future design and construction guidance. With new development there will be opportunities to improve emergency services and access while addressing expected climate change impacts. The Port has recently completed new residential developments called the Waterfront Place – the first housing project on the Everett waterfront. The first two phases resulted in over 250 apartments, with the next phase planned to occur during the life cycle of this plan and will include 300 proposed units. As of this 2024 update, the Port of Everett has applied for a mitigation grant to allow for a detailed risk assessment and data capture of its structures, and the potential impact the hazards of concern may impose upon those structures. Figure 3-11 identifies additional occupation for the City of Everett by sector based on US Census Bureau 5-year estimate data.[9]

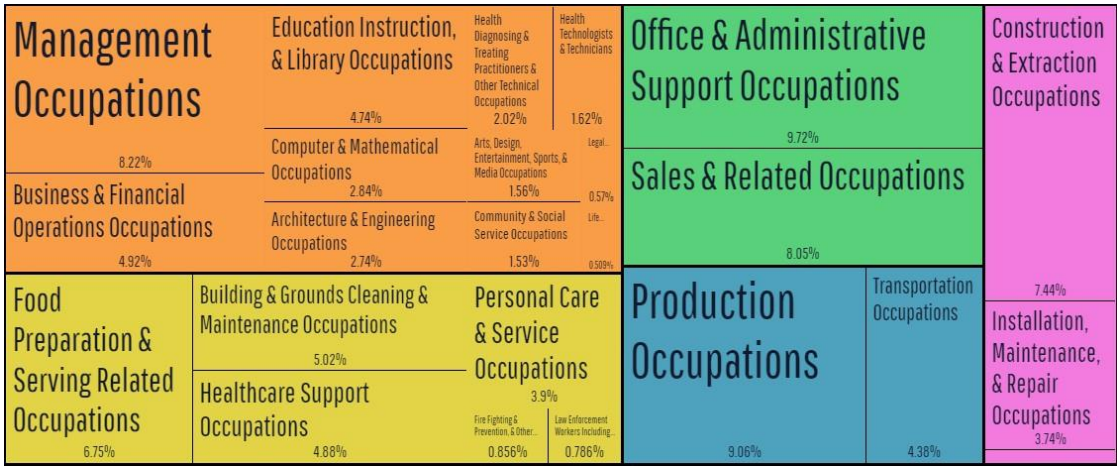


Figure 3-11 Occupation by Sector

[99] Census Bureau ACS 5-year Estimate. Employment Sector. Accessed 26 June 2023. Available online at: Everett, WA | Data USA

3.6.1 Income and Employment

In the United States, individual households are expected to use private resources to prepare for, respond to, and recover from disasters to some extent. This means that households living in poverty are automatically disadvantaged when confronting hazards. Additionally, the poor typically occupy more poorly built and inadequately maintained housing. Mobile or modular homes, for example, are more susceptible to damage in earthquakes and floods than other types of housing. In urban areas, the poor often live in older houses and apartment complexes, which are more likely to be made of un-reinforced masonry, a building type that is particularly susceptible to damage during earthquakes. Furthermore, residents below the poverty level are less likely to have insurance to compensate for losses incurred from natural disasters. This means that residents below the poverty level have a great deal to lose during an event and are the least prepared to deal with potential losses. Personal household economics also significantly impact people's decisions on evacuation. Individuals who cannot afford gas for their cars will likely decide not to evacuate.

The median household income in 2021 Snohomish County was $95,618, with the City of Everett's median household income at $71,357. The city's median was less than the state's ($82,400). The county's poverty rate was 7.2 percent, with the city's at 11 percent, which is considerably higher than the state rate at 9.9 percent.

In 2020, the COVID-19 pandemic-induced recession hit Snohomish County and the City of Everett. Average annual total nonfarm employment dropped by 6.0 percent from 2019 to 2020, and began to recover as businesses, government and individuals navigated the new environment. In 2021, total nonfarm employment continued to fall an additional 0.4 percent: a reflection of layoffs in the manufacturing sector. As of April 2022 (preliminary), total nonfarm employment was estimated at 291,800 or 6.2 percent above the observed employment level 12 months earlier. [10]

As of this 2024 update, the three-year average unemployment in the area was 4.9 percent, with distressed areas for the state incurring an unemployment rate greater than or equal to 6.8 percent (see Figure 3-12).[11]

[10] Washington State Employment Security Department – [Snohomish County] Community Profile. Accessed 27 June 2023. Available at: ESDWAGOV - Snohomish County profile

[11] Washington State Employment Security Division. Accessed 27 June 2023. Available online at: ESDWAGOV - Distressed areas list

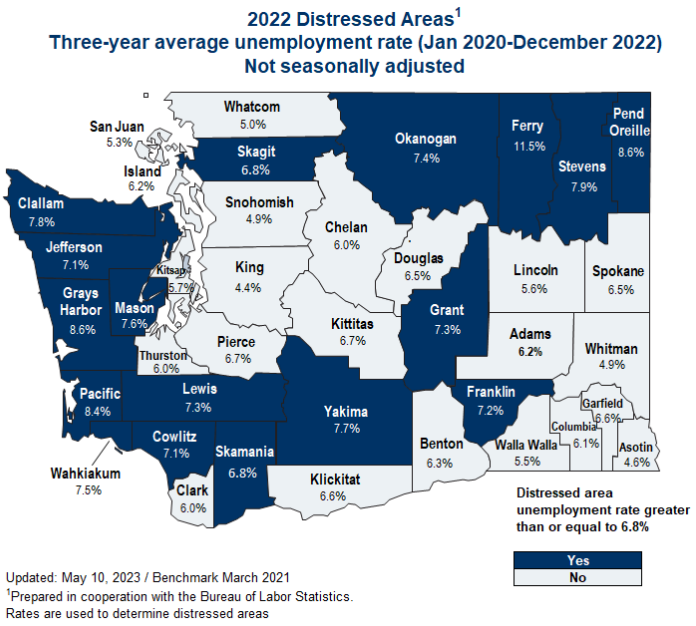


Figure 3-12 Washington State 2022 Distressed Areas and Unemployment Rates

3.6.2 Housing Stock

According to *A Social Vulnerability Index for Disaster Management* (Journal of Homeland Security and Emergency Management, 2011), housing quality is an important factor in assessing disaster vulnerability. It is closely tied to personal wealth: people in lower income brackets often live in more poorly constructed homes that are especially vulnerable to strong storms or earthquakes. Mobile homes are not designed to withstand severe weather or flooding, and typically do not have basements. They are frequently found outside of metropolitan areas and, therefore, may not be readily accessible by interstate highways or public transportation. Also, because mobile homes are often clustered in communities, their overall vulnerability is increased. Rent in the area is considerably lower than statewide average.

Based on data from the Washington State Office of Financial Management (OFM) 2022 (Postcensal) data, there are approximately 1,163 mobile homes in the City of Everett, with a total of 48,649 housing units (all types, including stacked housing). [12] The median value of housing stock was $394,900 (US Census QuickFacts, 2020).

[12] Washington State Office of Financial Management. 2022. Accessed 27 June 2023. Available online at: April 1 official population estimates | Office of Financial Management (wa.gov)

3.6.3 Building Stock Age

The age of a building in determining vulnerability is a significant factor, as it helps identify the building code to which a structure was built. Homes built prior to 1975 are considered pre-code since there was no statewide requirement to include specific standards to address the various hazards of concern (e.g., there were no seismic provisions contained within the building code). Structures built after 1975 are considered of moderate code. It was at that point in time in which all Washington jurisdictions were required to adhere to the provision of the most recently adopted version of the Uniform Building Code (UBC) (Noson et al., 1988). It should be noted that the data may be slightly skewed due to the fact that actual building code adoption dates vary slightly by jurisdiction. Structures may also have undergone remodel, or improvements which changed the building code classification, increasing the level of code applied. That data may not have been captured or applied in a manner which would reflect a change in the year of construction. Additionally, while building codes may not have been in place, houses may have been constructed to higher standards. As a result, this data should be used for planning purposes only. Questions concerning actual structural integrity should be determined by appropriate subject matter experts in the field.

Review of data indicates that Everett has a large number of unreinforced masonry (URMs) buildings mostly constructed prior to WWII. These structures contribute to Everett's unique character, with some also being historic landmarks. Everett also has a large inventory of homes built prior to building codes. Figure 3-13 identifies the age of the building stock within the City of Everett.[13]

[13] Everett Community, Planning & Economic Development Census & Demographic Info. Accessed 27 June 2023. Available online at: Census & Demographic Info | Everett, WA - Official Website (everettwa.gov)

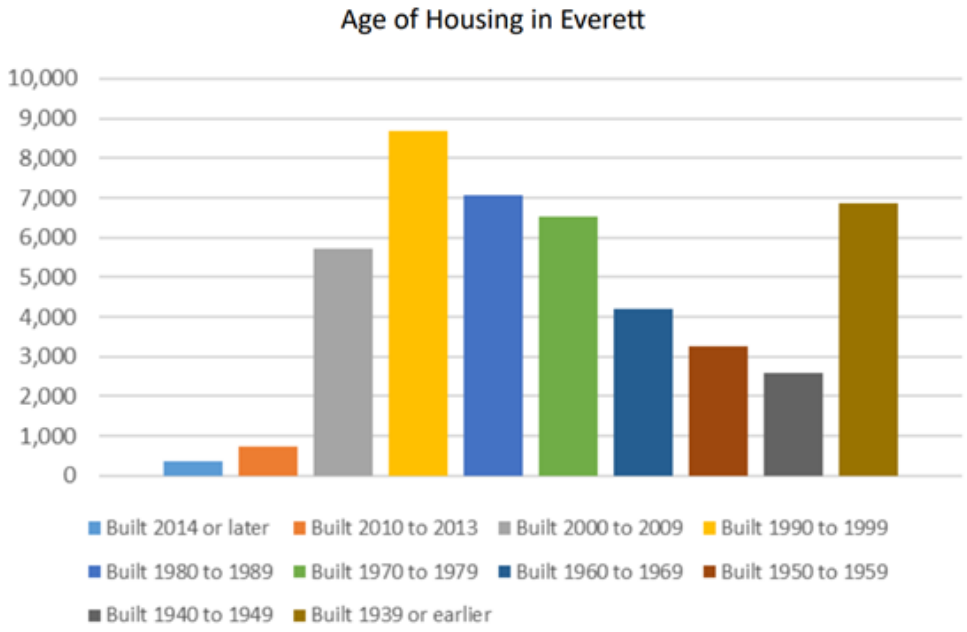


Figure 3-13 Building Stock Age

3.6.4 Additional Structure Data

Unreinforced Masonry

Since completion of the 2018 HMP, in April 2023, a pilot project was completed by Washington State Department of Archaeology and Historic Preservation to identify the state of (some) unreinforced masonry (URM) buildings within the City of Everett. A total of 131 structures were identified for inspection; three could not be inspected. Of those inspected, 102 were determined to be URM. The study identified structures built as far back as 1810. One public facility, a fire station, was built in 1925, composed of URM. The city has completed a retrofit of that structure, which serves as Fire Headquarters. Five of the structures identified as having URM are government or public assembly structures (one being the retrofitted fire headquarters). One structure is a mixed-use structure, including residential apartments. A total of 84 of the structures are commercial in nature, privately owned.

Burlington Northern Santa Fe Downtown Tunnel

The BNSF railway tunnel running under much of the central business district represents a major risk within the City of Everett. The tunnel is in excess of 100-years old. The tunnel itself is thought to be of timber construction and later lined with concrete. In 1989 the tunnel tracks were lowered but it is unknown if there were other improvements. The tunnel is owned by the City of Everett but operated and maintained by BNSF Railways. There are many unreinforced masonry (URMs) buildings above the tunnel, including residential and high-rise office spaces identified in future development plans. As identified in the 2018 HIVA, the tunnel is likely to collapse along with the buildings above during a strong earthquake (Everett HIVA, 2018).

Figure 3-14 illustrates the graphic in the 2018 HIVA; Figure 3-15 illustrates the same graphic, but with the 2023 URM data identified.

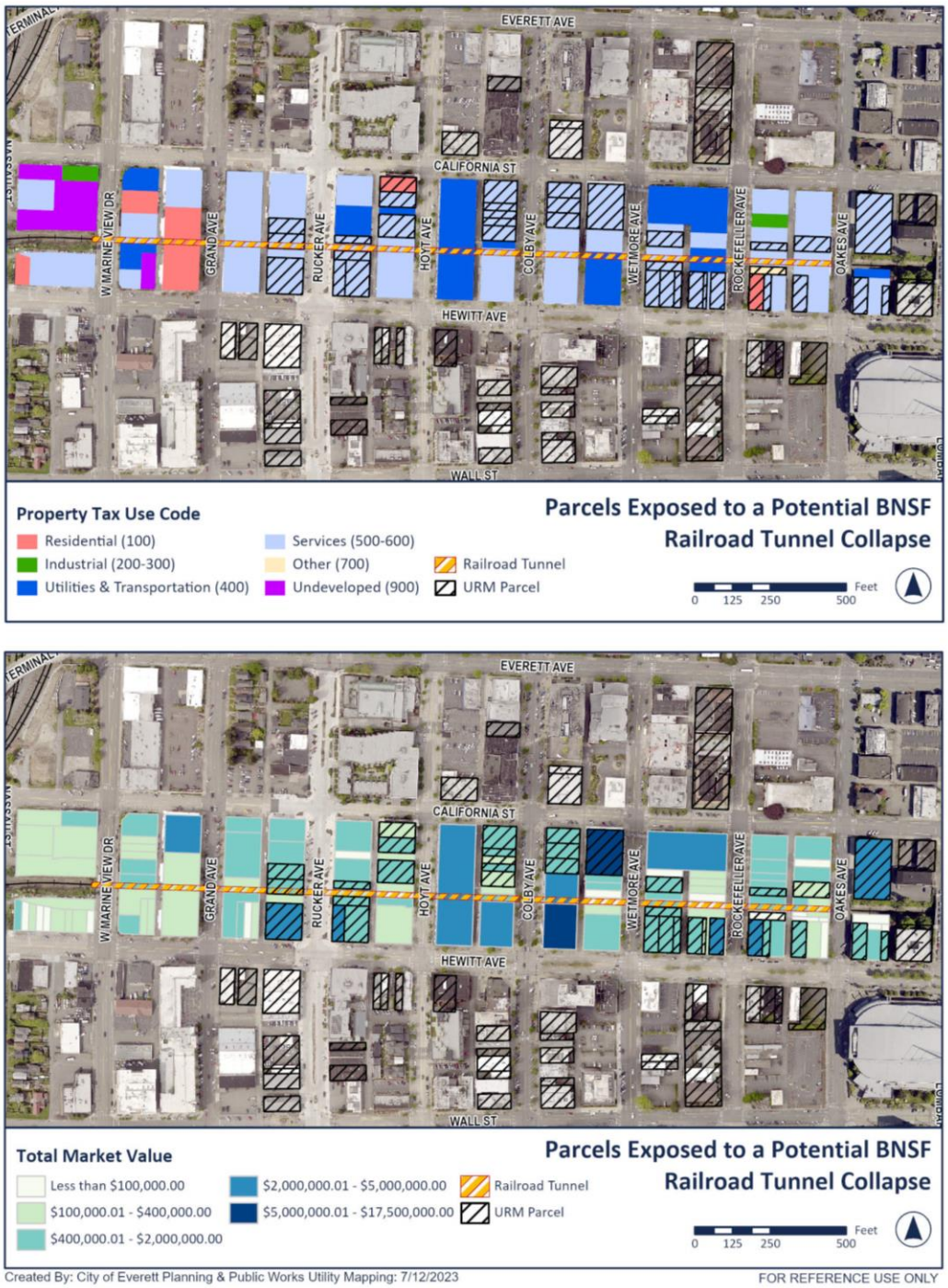


Figure 3-14 BNSF Railway Tunnel and Exposed Structures (2018 HIVA)

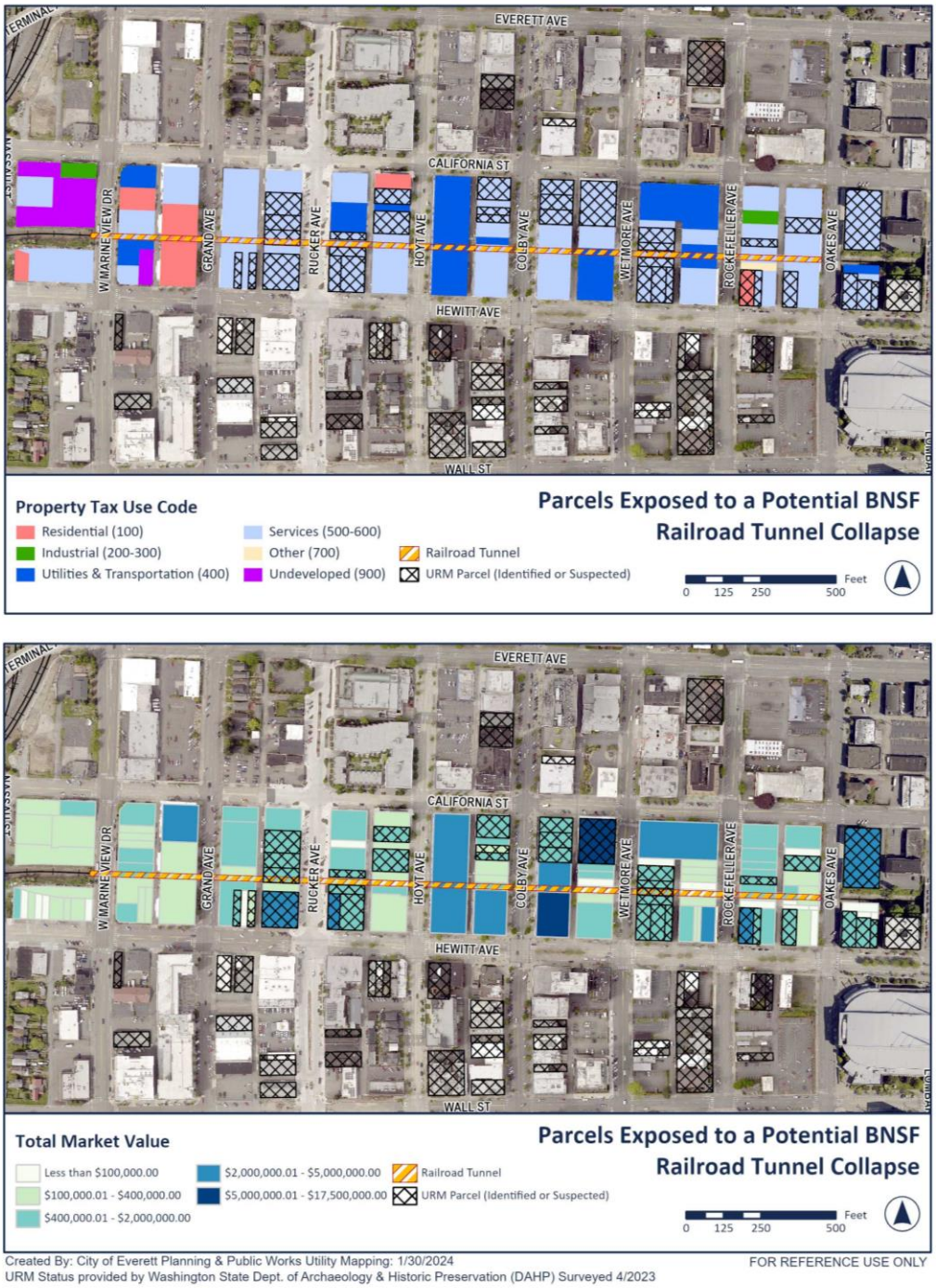


Figure 3-15 BNSF Railway Tunnel and Exposed Structures Incorporating 2023 URM Study Data

3.7 LAND USE PLANNING AND FUTURE DEVELOPMENT TRENDS

The City of Everett's Comprehensive Land Use Plan includes components that help to guide the vision for the City: Planning Policies, Future Land Use Analysis, Critical Areas, and Capital Facilities, among others. Within Washington State, the State Growth Management Act (GMA) requires state and local governments to manage Washington's growth by identifying and protecting critical areas and natural resource lands, designating urban growth areas, preparing comprehensive plans, and implementing those plans through capital investments and development regulations. The city is in compliance with GMA requirements and guidelines and has developed regulatory authority which helps reduce the impact of the hazards of concern, including as they relate to critical areas.

Critical areas are environmentally sensitive natural resources that have been designated for protection and management in accordance with the requirements of the GMA. Protection and management of these areas are important to the preservation of ecological functions of our natural environment, as well as the protection of the public health, safety, and welfare of our community. Information from this mitigation plan will continue to help identify the critical areas throughout the city. Information from this HMP update will also be used during the update of the comprehensive plan.

The Planning Director (or their designee) is responsible for floodplain management and enforcement actions in the city (with the most recent NFIP maps adopted in 2020) and adoption and implementation of the 2021 International Building Codes (which are in process of adoption as of this 2024 update).

The city's comprehensive plan governs its land use decision- and policy-making process in accordance with GMA guidelines, as well as other regulatory authority, including identification of flood prone areas. As of this 2024 HMP update, the city is also in the process of updating its Comprehensive Land Use Plan, with completion of the plan occurring during 2024, after adoption of the HMP. Data from this plan will continue to assist city programs that support wise land use in the future by providing vital information on the risk associated with natural hazards in the City of Everett. Data from the HMP will be identified and utilized as appropriate within the City of Everett's Comprehensive Land Use Plan.

With respect to floodplain regulations, Section 19.26.040 of the City of Everett's Municipal Code establishes guidelines and regulatory authority under which development occurs. The regulation specifically states that "land identified in the Everett flood insurance study dated June 19, 2020, or subsequent update, with accompanying flood insurance maps, shall not be subdivided unless the requirements of the city's flood damage prevention regulations as set forth in Chapter 19.30 EMC, as amended, are met. (Ord. 3774-20 § 5(N) (Exh. 3), 2020.)"[14]

EMC 19.30 identifies the basis for establishing the areas of special flood hazard as follows:

[14] City of Everett Municipal Code Section 19.26.040. Accessed 10 July 2023. Available online at: Ch. 19.26 Land Division Development Standards | Everett Municipal Code

> The special flood hazard areas identified by the Federal Insurance Administrator in a scientific and engineering report entitled "The Flood Insurance Study (FIS) for Snohomish County, Washington and Incorporated Areas" dated June 19, 2020, and any revisions thereto, with accompanying flood insurance rate maps (FIRMs) dated June 19, 2020, and any revisions thereto, are hereby adopted by reference and declared to be a part of this chapter. The FIS and the FIRM are on file at 2930 Wetmore Avenue, Everett, WA 98201.[15]

EMC 19.30.040 further states that "All development within special flood hazard areas is subject to the terms of this chapter and other applicable regulations. No structure or land shall hereafter be constructed, located, extended, converted, or altered without full compliance with the terms of this chapter and other applicable regulations. Enforcement of the provisions of this chapter shall be performed in accordance with the procedures established in Chapter 1.20 EMC." (ibid)

EMC 19.30.080 – Administration, states:

> (c) For all new or substantially improved floodproofed nonresidential structures where base flood elevation data is provided through the FIS, FIRM, or as required in subsection C.2 of this section.
>
> > (1) Obtain and maintain a record of the elevation (in relation to mean sea level) to which the structure was floodproofed.
> >
> > (2) Maintain the floodproofing certifications required in subsection A.2.c of this section. (ibid)

The Community, Planning & Economic Development Department works closely with other city (and county, as appropriate) departments, the general public, landowners, special interest groups, and businesses to oversee development in the city, ensuring land use remains consistent with federal, state and county regulations.

Utilzing estimated population growth statistics, the city has estimated how the future growth in population will be distributed among the different Urban Growth Areas (UGAs) in its Comprehensive Plan. Figure 3-16 illustrates the future land use within the City of Everett as of the map update in January 2022.

Impact of Future Population Growth

Everett's UGAs are equipped to handle the continued increase in population and structure growth with respect to the ability to provide critical infrastructure and resources needed. For some hazards, there will be little effect on increased population. For other hazards such as earthquake, landslide, flood, etc., regulatory authority in place serves as a mechanism to help ensure the safety of citizens through increased building standards or restricting development in those critical or high-hazard areas. While population density and associated new structures will increase the overall potential exposure, the standards to which new structures are built are such that increased vulnerability will

[15] City of Everett Municipal Code Section 19.30. Accessed 10 July 2023. Available online at Ch. 19.30 Flood Damage Prevention | Everett Municipal Code

be limited. With increased population, there is also the need for increased emergency services. It is anticipated that those services would also increase respective to the increase in population based on revenues generated and needs.

Enforcement

Floodplain management is addressed through the NFIP, FEMA, and the zoning code of Everett. The Code Compliance Department is responsible for enforcing various chapters of the Municipal Code that address public health and safety issues, including regulations related to rubbish, other nuisances, removal of vegetation, zoning, housing, dangerous buildings, environmental violations, and junk vehicles on private property.

Enforcement actions are taken both proactively and in response to incoming complaints. Code Compliance works in partnership with the people of Everett and coordinates with the Legal Department, Police Department, Fire Department, Building Division, Community, Planning & Economic Development Department, Office of Neighborhoods, Public Works, and Parks and Community Services Department.

Research in the area of growth management has demonstrated that communities experiencing economic growth who are able to invest in new development, including mitigation efforts, increase the resilience of both existing and new buildings and infrastructure. Newly constructed buildings and infrastructure are more resilient to hazards of concern and the associated impact by those hazards (e.g., ground shaking) as they are built to higher building code standards. The use of data within plans such as these play a significant role in education with respect to identifying those areas of concern addressed within Growth Management.

Since 2018, the city has continued to grow and expand, with permits issued to ensure regulatory compliance and building standards are met. Table 3-6 illustrates the numbers of permits for new construction issued, along with the total value of the project, and the fees paid for the various permits. This list is not all-inclusive of all permits issued, but rather those which would have a more significant impact on mitigation efforts to ensure appropriate building codes and standards are met, helping to reduce the impacts of new construction on the existing hazards of concern, and thereby helping to increase the city's resilience to future impacts. Review of the data does illustrate the drop in construction as a result of COVID, but as of 2023, the number of permits has steadily increased to pre-COVID numbers.

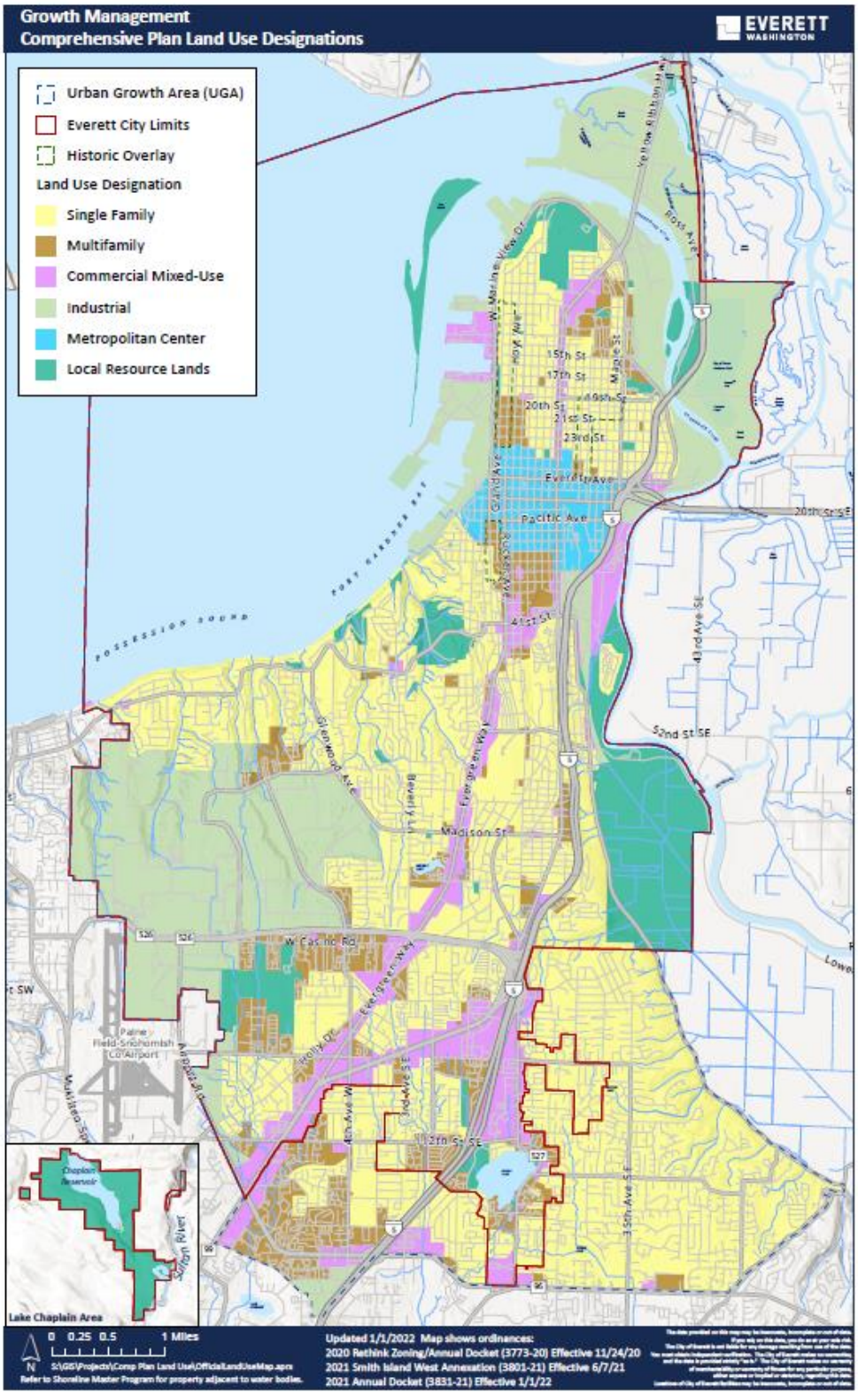


Figure 3-16 City of Everett Land Use Designation (January 2022)

Table 3-6
Permit Applications 2019-2023*

Year	Number	Total Value	Fees Paid
1/1/2019 – 12/31/2019	143	$141,155,849	$4,184,328
1/1/2020-12/31/2020 (COVID lockdown)	43	$80,820,142	$2,618,358
1/1/2021 – 12/31/2021	70	$193,560,258	$3,549,828
1/1/2022 – 12/31/2022	91	$131,664,974	$3,050,466
1/1/2023 – 12/31/2023	146	$98,789,175	$2,812,211
Total	**493**	**$645,990,398**	**$16,215,191**

*Permit Issued for new construction, inclusive of all types: Residential (single family, multi-family, ADUs, etc.), Commercial (gas stations, retail stores), Medical (health facilities and clinics), Industrial (Boeing, the Port of Everett), and Government (including by the Housing Authority for multi-family housing units), etc.

Wildlife Habitat

The Federal Energy Regulatory Commission (FERC) license for the Jackson Hydropower Plant requires the implementation of a Wildlife Habitat Management Plan to mitigate for the impacts resulting from the construction and operation of the power facility. Except for the water filtration plant site, including the adjacent grass field, the 2,216 acres of city-owned lands around Lake Chaplain (Lake Chaplain Tract) are managed under the Wildlife Habitat Management Plan. The existing vegetation on the Lake Chaplain Tract is predominantly second growth coniferous forest; with lesser amounts of old-growth forest, mixed forest, deciduous forest, wetland and permanent shrub/brush. Approximately 55 acres along the east shore of Lake Chaplain have never been harvested and now support old growth forest. The Wildlife Habitat Management Plan calls for the preservation of existing old-growth, mixed forest, deciduous forest and wetland habitats, and the management of second growth coniferous forest on a 60 year rotation to maximize habitat value for a wide range of wildlife species.

Shoreline Master Program[16]

The City of Everett has about 25 miles of marine and freshwater shorelines. The beauty and recreational opportunities of the shoreline come with a responsibility to balance development in an urban setting with environmental protection and public access to Everett's shorelines.

[16] City of Everett Shoreline Master Program (2019). Accessed 7 July 2023. Available online at: Microsoft Word - Binder Cover.docx (everettwa.gov)

The shorelines under the jurisdiction of the City of Everett which have been designated as having statewide significance are: Port Gardner Bay lying seaward from the line of extreme low tide and the Snohomish River and the associated estuary areas, including Steamboat Slough and Union Slough, and their shorelands.

With continued growth, the shoreline areas of Everett will continue to change, with the area supporting a multitude of land uses, including a secure seaport, maritime industries and trades, Naval Station Everett, as well as recreation opportunities, tourism, and agriculture/agri-tourism. Waterfront and riverfront redevelopment will likely include mixed use projects that offer a range of commercial services and housing where people can live, work, and enjoy a waterfront setting with outstanding views, access to the water's edge, and opportunities to learn about the cultural heritage on Port Gardner Bay.

Impact from Growth

While new structures in the city will increase the overall potential impacts from hazards of concern, the standards to which these structures are built, when coupled with mitigation strategies imposed, the risk is such that increased vulnerability will be limited beyond the mere fact of increased numbers of structures and residents.

Inclusion of the vulnerability data identified in this plan will be utilized in the city's land use and development practices. This will help assure that all future development will be established with the benefits of the information on risk and vulnerability to natural hazards identified in this plan.

Chapter 13 includes an assessment of regulatory, technical, and financial capability to carry out proactive hazard mitigation initiatives, including applicable regulatory codes and ordinances.

3.8 CLIMATE CHANGE

Climate, consisting of patterns of temperature, precipitation, humidity, wind and seasons, plays a fundamental role in shaping natural ecosystems and the human economies and cultures that depend on them. Climate change is a long-term shift in global or regional climate patterns. Often climate change refers specifically to the rise in global temperatures from the mid-20th century to present.

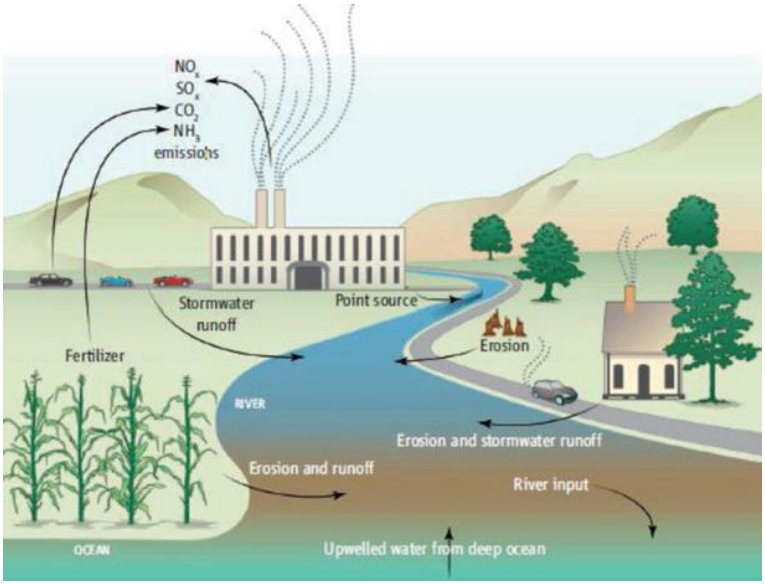


Figure 3-17 Climate Change Contributors

The warming trend and its related impacts are caused by increasing concentrations of carbon dioxide and other greenhouse gases in the earth's atmosphere. Greenhouse gases are gases that trap heat in the atmosphere, resulting in a warming effect. Carbon dioxide is the most commonly known greenhouse gas; however, methane, nitrous oxide and fluorinated gases also contribute to

warming. Emissions of these gases come from a variety of sources, such as the combustion of fossil fuels, agricultural production, and changes in land use (see Figure 3-17).

Climate change will affect the people, property, economy, and ecosystems of Everett in a variety of ways. Some impacts will have negative consequences for the planning area and others may present opportunities. The most important effect for the development of this plan is that climate change will have a measurable impact on the occurrence and severity of natural hazards.

3.8.1 How Does Climate Change Affect Hazard Mitigation?

An essential aspect of hazard mitigation is predicting the likelihood of hazard events in a planning area. Typically, predictions are based on statistical projections from records of past events. This approach assumes that the likelihood of hazard events remains essentially unchanged over time. Thus, averages based on the past frequencies of, for example, floods are used to estimate future frequencies: if a river has flooded an average of once every five years for the past 100 years, then it can be expected to continue to flood an average of once every five years.

For hazards that are affected by climate conditions, the assumption that future behavior will be equivalent to past behavior is not valid if climate conditions are changing. As flooding is generally associated with precipitation frequency and quantity, for example, the frequency of flooding will not remain constant if broad precipitation patterns change over time. The risks of avalanche, landslide, severe weather, severe winter weather and wildfire are all affected by climate patterns as well.

For this reason, an understanding of climate change is pertinent to efforts to mitigate natural hazards. At present, the city has been unable to conduct a detailed assessment of climate impact due to cost and staffing levels. However, with the completion of this plan, the city will continue eligibility for various grant programs, and may elect to pursue funding which will help develop an assessment to determine potential impacts. As such, for this 2024 HMP update, the planning team elected to incorporate the impact of climate change on the specific hazards of concern within each hazard's profile, enabling a more clear understanding of the potential impacts of climate change on the hazards of concern in a generalized manner.

Information about how climate patterns are changing provides insight on the reliability of future hazard projections used in mitigation analysis. Table 3-7 identifies the relationship between climate change risk and its influence on the various hazards of concern within the planning region.

Table 3-7
Relationship Between Climate Change and Identified Hazards

Hazards of Concern		Coastal Erosion	Drought	Earthquake	Flood	Landslide	Severe Weather			Wildfire	Tsunami	Volcano
							Cold	Heat	Winter storms			
CLIMATE RISKS	Increased temperatures	X	P		X	X	X	X	X	P		
	Changes in hydrology	X	P	X	P	P			X	X	X	
	Increased wildfires		X		X	X				P		
	Increase in ocean temperatures and changes in ocean chemistry	P			X				P			
	Increased drought		P									
	Increased coastal erosion	P									X	
	Changes in habitat	X	X		X	X				X		
	Increase in invasive species and pests		X		X	X		X		P		
	Decrease in natural vegetation	X	X		P	P	X		X	P		
	Loss of Wetland ecosystems and services	X	P		P	X				X		
	Increased frequency of extreme precipitation events and flooding				P	P			X			
	Increased landslides	X	X		X	P			X	X		

"P" identifies the primary relationship between the risk and the identified hazard.

"X" identifies a secondary relationship.

Based on review and analysis of the data, the MPT has determined that while climate change will not be a separate hazard profile, it would be appropriate to rank climate change as an individual hazard, based on the following: the probability for impact from climate change throughout the area is likely. While there are still many uncertainties associated with climate change, indicators of impact already exist. The area has previously experienced drought conditions, with a drought incident occurring in 2015, which required the city to institute its Drought Response Plan. During the summer of 2017, the state experienced one of its driest summers on record, although it did not result in a drought situation in Everett. With anticipated increase in temperatures as a result of climate change such that occurred in June 2021, drought situations will only intensify; however, planning team members do not remember any incident beyond the 2015 drought which required activation of its Drought Response Plan.

The impact of climate change on earthquake, while relatively unknown, could be exacerbated as a result of increased liquefaction due to increased flooding issues. Anticipated sea level rise would impact the coastal areas of the city, increasing storm surge which exacerbate landslide and erosion incident, as well as increasing the potential for flooding in areas which customarily experienced no or limited flooding. Historical hydrologic patterns of weather events would become increasingly inaccurate, increasing potential vulnerability due to uncertainty for water supplies, flood management, and ecological functions. Increased temperatures would also impact snow levels, decreasing water supplies in the various watersheds, even those outside of the planning area. Higher temperatures anticipated with climate change would increase vulnerability of the population due to excessive heat. Based on the potential impact, the Planning Team determined the CPRI score to be 2.35, with overall vulnerability determined to be a medium level.

CHAPTER 4.
RISK ASSESSMENT METHODOLOGY

4.1 OVERVIEW

The DMA requires measuring potential losses to critical facilities and property resulting from natural hazards. A hazard is an act or phenomenon that has the potential to produce harm or other undesirable consequences to a person or thing. Natural hazards can exist with or without the presence of people and land development. However, hazards can be exacerbated by societal behavior and practice, such as building in a floodplain, along a sea cliff, or on an earthquake fault. Natural disasters are inevitable, but the impacts of natural hazards can, at a minimum, be mitigated or, in some instances, prevented entirely.

The goal of the risk assessment is to determine which hazards present the greatest risk and what areas are the most vulnerable to hazards. The City of Everett is exposed to many hazards. The risk assessment and vulnerability analysis help identify where mitigation measures could reduce loss of life or damage to property in the planning area. Each hazard-specific risk assessment provides risk-based information to assist the city in determining priorities for implementing mitigation measures.

The risk assessment approach used for this plan entailed using geographic information system (GIS), Hazus hazard-modeling software, and hazard-impact data to develop vulnerability models for people, structures and critical facilities, and evaluating those vulnerabilities in relation to hazard profiles that model where hazards exist. This approach is dependent on the detail and accuracy of the data used. In all instances, this assessment used Best Available Science and data to ensure the highest level of accuracy possible.

The risk assessment is broken down into three phases, as follows:

> The first phase, hazard identification, involves the identification of the geographic extent of a hazard, its intensity, and its probability of occurrence (discussed below). This level of assessment typically involves producing a map. The outputs from this phase can be used for land use planning, management, and development of regulatory authority; public awareness and education; identifying areas which require further study; and identifying properties or structures appropriate for mitigation efforts, such as acquisition or relocation.
>
> The second phase, the vulnerability assessment, combines the information from the hazard identification with an inventory of the existing (or planned) property and population exposed to the hazard. It then attempts to predict how different types of property and population groups will be impacted or affected by the hazard of concern. This step assists in justifying changes to building codes or regulatory authority, property acquisition programs, such as those available through various granting opportunities; developing or modifying policies concerning critical or essential facilities; developing or modifying emergency management (and other) plans, and enhancing public awareness and education campaigns.

The third phase, the risk analysis, involves estimating the damage, injuries, and costs likely to be incurred in the geographic area of concern over a period of time. Risk has two measurable components:

1. The magnitude of the harm that may result, defined through the vulnerability assessment; and
2. The likelihood or probability of harm occurring.

Utilizing those three phases of assessment, information was developed which identifies the hazards that affect the planning area, the likely location of natural hazard impact, the severity of the impact, previous occurrences, and the probability of future hazard events. That data, once complete, is utilized to complete the Risk Ranking process described in Chapter 11, which applies all of the data captured in the Calculated Priority Risk Index (CPRI).

The following is provided as the foundation for the standardized risk terminology:

- Hazard: Natural (or human caused) source or cause of harm or damage, demonstrated as actual (deterministic/historical events) or potential (probabilistic) events.
- Risk: The potential for an unwanted outcome resulting from a hazard event, as determined by its likelihood and associated consequences. For this plan, where possible, risk includes potential future losses based on probability, severity, and vulnerability, expressed in dollar losses when possible. In some instances, dollar losses are based on actual demonstrated impact, such as through the use of the Hazus model. In other cases, losses are demonstrated through exposure analysis due to the inability to determine the extent to which a structure is impacted.
- Location: The area of potential or demonstrated impact within the area in which the analysis is being conducted. In some instances, the area of impact is within a geographically defined area, such as a floodplain. In other instances, such as for severe weather, there is no established geographic boundary associated with the hazard, as it can impact the entire area.
- Severity/Magnitude: The extent or magnitude upon which a hazard is ranked, demonstrated in various means, e.g., Richter Scale.
- Vulnerability: The degree of damage, e.g., building damage or the number of people injured.
- Probability of Occurrence and Return Intervals: These terms are used as a synonym for likelihood, or the estimation of the potential of an incident to occur.

4.2 METHODOLOGY

The risk assessment for this hazard mitigation plan evaluates the risk of natural hazards prevalent in the City of Everett and meets requirements of the DMA (44 CFR Section 201.6(c)(2)). The methodology used to complete the risk assessment is described below.

4.2.1 Hazard Identification and Profiles

For this plan, the MPT and stakeholders considered the full range of natural hazards that could impact the planning area and then listed hazards that present the greatest concern. The process incorporated review of state, county, and local hazard planning documents, as well as information on the frequency, magnitude, and costs associated with hazards that have impacted or could impact the planning area. Anecdotal information regarding natural hazards and the perceived vulnerability of the planning area's assets to them was also used.

This plan update will focus on the natural hazards of concern, with the non-natural and manmade hazards addressed within the City of Everett's Hazard Identification and Vulnerability Assessment (HIVA). The natural hazards addressed in this plan will be utilized to update the HIVA during its next update cycle.

The Volcano hazard was discussed, but the city had little historic impact from previous occurrences. Review of the county's plan ranks the hazard as number 17 (out of 18), with the city not falling within the expected lahar zone. While ash could fall, the prevailing wind to the east would somewhat limit accumulation, although it does not take a large amount of ash to have negative impact. Based on the potential limited direct impact, the hazard was tabled during this update, but will again be reviewed for inclusion in future updates.

The planning team further reviewed the hazards considered during the 2018 plan update. Based on the review, the planning team confirmed the following natural hazards that this plan addresses as the hazards of concern, which are the same hazards addressed during the last update:

- Climate Change (Qualitative assessment incorporated into impacted hazards)
- Earthquake
- Flood (including dam)
- Hazardous Materials (not as a stand-alone hazard but in association with the primary hazard of concern, and the potential impact from hazardous materials on that hazard.
- Landslide
- Severe Weather
- Tsunami
- Wildfire

The hazard profiles describe the risks associated with identified hazards of concern. Each chapter describes the hazard, the planning area's vulnerabilities, and, when possible, probable event scenarios. The following were used to profile each hazard:

- General overview and description of hazard;
- Identification of previous occurrences;
- Identification of the geographic areas most affected by the hazard;
- Determine event frequency estimates;
- Calculate severity estimates;
- Discuss warning time likely to be available for response;

- Complete the risk and vulnerability assessment, which includes identification of impact on people, property, economy, and the environment.

4.2.2 Risk Assessment Process and Tools

The hazard profiles and risk assessments contained in the hazard chapters describe the risks associated with each identified hazard of concern. Each chapter describes the hazard, the planning area's vulnerabilities, and probable event scenarios.

Once the profiles identified above were completed, the following steps were used to define the risk of each hazard:

- Determine exposure to each hazard—Exposure was determined by overlaying hazard maps with an inventory of structures, facilities, and systems to determine which of them would be exposed to each hazard.
- Assess the vulnerability of exposed facilities—Vulnerability of exposed structures and infrastructure was determined by interpreting the probability of occurrence of each event and assessing structures, facilities, and systems that are exposed to each hazard. Tools such as GIS and Hazus were used in this assessment.
- Where specific quantitative assessments could not be completed, vulnerability was measured in general, qualitative term, summarizing the potential impact based on past occurrences, spatial extent, and subjective damage and casualty potential. Those items were categorized utilizing the criteria established in the CPRI index.
- The final step in the process was to determine the cumulative results of vulnerability based on the risk assessment and Calculated Priority Risk Index (discussed below) scoring, assigning a final qualitative (ordinal) assessment based on the following classifications:
  - Extremely Low—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
  - Low—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
  - Medium—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
  - High—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
  - Extremely High—Very widespread with catastrophic impact.

4.2.3 Hazus and GIS Applications

Earthquake and Flood Modeling Overview

Hazus is a GIS-based software program used to support risk assessments, mitigation planning, and emergency planning and response. It provides a wide range of inventory data, such as demographics,

building stock, critical facility, transportation and utility lifeline, and multiple models to estimate potential losses from natural disasters. The program maps and displays hazard data and the results of damage and economic loss estimates for buildings and infrastructure. Its advantages include the following:

- Provides a consistent methodology for assessing risk across geographic and political entities.
- Provides a way to save data so that it can readily be updated as population, inventory, and other factors change and as mitigation-planning efforts evolve.
- Facilitates the review of mitigation plans because it helps to ensure that FEMA methodologies are incorporated.
- Supports grant applications by calculating benefits using FEMA definitions and terminology.
- Produces hazard data and loss estimates that can be used in communication with local stakeholders.
- Is administered by the local government and can be used to manage and update a hazard mitigation plan throughout its implementation.

Building Inventory

The critical facilities list was again reviewed and updated for this 2024 edition of the HMP. Assistance was provided by the GIS department to capture necessary information. Critical infrastructure data was based on the MPT's definition of Critical Facility (see Section 3.4.2).

Hazus Application for this Plan

The following methods were used to assess specific hazards for this plan:

- **Flood—** Analysis was based on current FEMA regulatory 100- and 500-year flood hazard data based on the 2020 Flood Study, which included Hazus runs. The updated critical facilities data was utilized at the exposure level to identify structures at risk.
- **Earthquake—** Earthquake shake maps and probabilistic data prepared by the U.S. Geological Survey (USGS) were used for the analysis of this hazard. A modified version of the National Earthquake Hazard Reduction Program (NEHRP) soils inventory was used.
- **Tsunami** – Tsunami modeling was utilized as conducted and established by Washington State Department of Natural Resources 2022 studies, along with FEMA's on-going studies in the area.

GIS Application for this Plan

Dam, Landslide, and Severe Weather - For dam, landslide, and severe weather, historical data is not adequate to model future losses as no specific damage functions have been developed. However, GIS is able to map hazard areas and calculate exposure if geographic information is available with respect to the location of the hazard and inventory data. Areas and inventory susceptible to some of the hazards of concern were mapped and exposure was evaluated. For other hazards, a qualitative analysis was conducted using the best available data and professional judgment. Locally relevant

information was gathered from a variety of sources. Frequency and severity indicators include past events and the expert opinions of geologists, staff, emergency management personnel and others. The primary data source was the City of Everett GIS data, augmented with county, state and federal data sets, including FEMA's FIS data. Additional data sources for specific hazards were as follows:

- **Dam Failure**—Inundation data was utilized to the extent available for the high- or medium-hazard dams in the city (2018, 2024).
- **Landslide**—Historic landslide hazard data was used to illustrate potential areas of risk using Washington DNR Landslide Susceptibility data. No landslide analysis was completed as a result of this update, as such exceeds its scope.
- **Severe Weather**—Severe weather data was downloaded from the Natural Resources Conservation Service and the National Climatic Data Center, as well as other sources as cited.

4.2.4 Calculated Priority Risk Index Scoring Criteria

Vulnerabilities are described in terms of critical facilities, structures, population, economic values, and functionality of government which can be affected by the hazard event. Hazard impact areas describe the geographic extent a hazard can impact a jurisdiction and are uniquely defined on a hazard-by-hazard basis. Mapping of the hazards, where spatial differences exist, allows for hazard analysis by geographic location. Some hazards can have varying levels of risk based on location. Other hazards cover larger geographic areas and affect the area uniformly. Therefore, a system must be established which addresses all elements (people, property, economy, continuity of government) in order to rate each hazard consistently. The use of the Calculated Priority Risk Index allows such application, based on established criteria of application to determine the risk factor. For identification purposes, the six criteria on which the CPRI is based are probability, magnitude, geographic extent and location, warning time/speed of onset, and duration of the event. Those elements are further defined as follows:

Probability

Probability of a hazard event occurring in the future was assessed based on hazard frequency over a 100- year period (where available). Hazard frequency was based on the number of times the hazard event occurred divided by the period of record. If the hazard lacked a definitive historical record, the probability was assessed qualitatively based on regional history and other contributing factors. Probability of occurrence was assigned a 40% weighting factor, and was broken down as follows:

Rating	Likelihood	Frequency of Occurrence
1	Unlikely	Less than 1% probability in the next 100 years.
2	Possible	Between 1% and 10% probability in the next year, or at least one chance in the next 100 years.
3	Likely	Between 10% and 100% probability in next year, or at least one chance in the next 10 years.
4	Highly Likely	Greater than 1 event per year (frequency greater than 1).

Magnitude

The magnitude of potential hazard events was evaluated for each hazard. Magnitude is a measure of the strength of a hazard event, usually determined using specific technical measures. Magnitude was calculated for each hazard where property damage data was available, and was assigned a 25% weighting factor. (Magnitude calculation was determined using the following mathematical equation: *(Property Damage / Number of Incidents) / $ of Building Stock Exposure = Magnitude.)* Magnitude was broken down as follows:

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	Less than 5% Very minor impact to people, property, economy, and continuity of government at 90%.
2	Limited	6% to 24% Injuries or illnesses minor in nature, with only slight property damage and minimal loss associated with economic impact; continuity of government only slightly impacted, with 80% functionality.
3	Critical	25% to 49% Injuries result in some permanent disability; 25-49% of population impacted; moderate property damage ; moderate impact to economy, with loss of revenue and facility impact; government at 50% operational capacity with service disruption more than one week, but less than a month.
4	Catastrophic	More than 50% Injuries and illness resulting in permanent disability and death to more than 50% of the population; severe property damage greater than 50%; economy significantly impacted as a result of loss of buildings, content, inventory; government significantly impacted; limited services provided, with disruption anticipated to last beyond one month.

Extent and Location

The measure of the percentage of the people and property within the planning area impacted by the event, and the extent (degree) to which they are impacted. Extent and location were assigned a weighting factor of 20%, and broken down as follows:

Rating	Magnitude	Percentage of People and Property Affected
1	Negligible	Less than 10% Few if any injuries or illness. Minor quality of life lost with little or no property damage. Brief interruption of essential facilities and services for less than four hours.
2	Limited	10% to 24% Minor injuries and illness. Minor, short term property damage that does not threaten structural stability. Shutdown of essential facilities and services for 4 to 24 hours.

Rating	Magnitude	Percentage of People and Property Affected
3	Critical	25% to 49% Serious injury and illness. Major or long-term property damage, that threatens structural stability. Shutdown of essential facilities and services for 24 to 72 hours.
4	Catastrophic	More than 50% Multiple deaths Property destroyed or damaged beyond repair Complete shutdown of essential facilities and services for 3 days or more.

Warning Time/Speed of Onset

The rate at which a hazard occurs, or the time provided in advance of a situation occurring (e.g., notice of a cold front approaching or a potential storm, etc.) provides the time necessary to prepare for such an event. Sudden-impact hazards with no advanced warning are of greater concern. Warning Time/Speed of onset was assigned a 10% weighting factor, and broken down as follows:

Rating	Probable amount of warning time
1	More than 24 hours warning time.
2	12-24 hours warning time.
3	5-12 hours warning time.
4	Minimal or no warning time.

Duration

The time span associated with an event was also considered, the concept being the longer an event occurs, the greater the threat or potential for injuries and damages. Duration was assigned a weighting factor of 5%, and was broken down as follows:

Rating	Duration of Event
1	6-24 hours
2	More than 24 hours
3	Less than 1 week
4	More than 1 week

Chapter 11 summarizes all of the analysis conducted by way of completion of the Calculated Priority Risk Index (CPRI) for hazard ranking.

4.3 PROBABILITY OF OCCURRENCE AND RETURN INTERVALS

Natural hazard events with relatively long return periods, such as a 100-year flood or a 500- or 1,000-year earthquake, are often thought to be very unlikely. In reality, the probability that such events occur over the next 30 or 50 years is relatively high, having significant probabilities of occurring during the lifetime of a building:

- Hazard events with return periods of 100 years have probabilities of occurring in the next 30 or 50 years of about 26 percent and about 40 percent, respectively.
- Hazard events with return periods of 500 years have about a 6 percent and about a 10 percent chance of occurring over the next 30 or 50 years, respectively.
- Hazard events with return periods of 1,000 years have about a 3 percent chance and about a 5 percent chance of occurring over the next 30 or 50 years, respectively.

For life safety considerations, even natural hazard events with return periods of more than 1,000 years are often deemed significant if the consequences of the event happening are very severe (extremely high damage and/or substantial loss of life). For example, the seismic design requirements for new construction are based on the level of ground shaking with a return period of 2,475 years (2 percent probability in 50 years). Providing life safety for this level of ground shaking is deemed necessary for seismic design of new buildings to minimize life safety risk. Of course, a hazard event with a relatively long return period may occur tomorrow, next year, or within a few years. Return periods of 100 years, 500 years, or 1,000 years mean that such events have a 1 percent, a 0.2 percent or a 0.1 percent chance of occurring in any given year.

4.4 LIMITATIONS

The models and information presented in this document do not replace or supersede any official document or product generated to meet the requirements of any state, federal, or local program, which may be much more detailed and encompassing beyond the scope of this project. The datasets presented in this document are the product of modeling and reprojection of existing data. As such, it carries an inherent degree of error and uncertainty. Users are strongly encouraged to read and fully comprehend the full reports of the data presented prior to data use. No warranty is made as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by the Originator. No life safety measures should be based on this document.

Information contained in this plan is not absolute in terms of its accuracy regarding quantity, quality or location. It shall only be used as a source for generalized information, and it is not a substitute for site-specific information where such information is required by local, state, or federal government laws or ordinance.

This document is intended for planning purposes only and does not include any scientific analysis completed as a result of the document, as such far exceeds the intent of this document. This document and its contents have been prepared and are intended solely for the City of Everett for information purposes, and use with respect to hazard mitigation planning, incorporating other relevant data into other planning mechanisms as appropriate. While this process utilized best available science and scientific data, the planning team, city, nor consultant conducted any scientific analysis within this document, and none should be construed. In some instances, national data sets are the only source available, and are for the purpose of comparing relative risk. Data included is not intended to replace studies completed by engineers, geologists, hydrologists, or other subject matter experts. It is the responsibility of the user to be familiar with the value, assumptions, and limitations of this document. Reviewers must evaluate these data according to the scale and requirements specific to their needs. The process only reproduced existing data in different ways to meet the

guidelines and requirements of 44 CFR 201.6. All data layers utilized are identified within the various sections of this document should reviewers wish greater clarification and information.

Loss estimates, exposure assessments, and hazard-specific vulnerability evaluations rely on the best available data and methodologies. Uncertainties are inherent in any loss estimation methodology and arise in part from incomplete scientific knowledge concerning natural hazards and their effects on the built environment. Uncertainties also result from the following:

- approximations and simplifications necessary to conduct a study
- incomplete or outdated inventory, demographic or economic parameter data
- the unique nature, geographic extent, and severity of each hazard
- mitigation measures already employed
- the amount of advance notice residents have to prepare for a specific hazard event.

These factors can affect loss estimates by a factor of two or more. Therefore, potential exposure and loss estimates are approximate. The results do not predict precise results and should be used only to understand relative risk. Over the long term, the city will collect additional data to assist in estimating potential losses associated with other hazards.

Some assumptions were made by the planning team in an effort to capture as much data as necessary to supplant any significant data gaps. One example of this is the valuation for structures within the assessed data, most commonly as it relates to the general building stock. For structures for which data was not provided, the missing information was determined using averages of similar types of structures, determining square footage and applying a multiplier. This process is identified in the Hazus User's Guide.

Some hazards, such as earthquake, are pre-loaded with scientifically determined scenarios which are used during the modeling process. This does not allow for manipulation of the data as with other hazards, such as flood. In the case of earthquake, greater reliance existed on the use of the Hazus default data, which is known to be less accurate, most often causing higher loss values. Therefore, while loss estimates are provided, they should be viewed with this flaw in mind. A much more in-depth scientific analysis is necessary to rely on this type of data with a high degree of accuracy. Readers should view this document as a baseline or starting point, and information should be further studied and analyzed by scientists and other subject matter experts in specific hazard fields.

CHAPTER 5.
EARTHQUAKE

An earthquake is the vibration of the earth's surface following a release of energy in the earth's crust. This energy can be generated by a sudden dislocation of the crust or by a volcanic eruption. Its epicenter is the point on the earth's surface directly above the hypocenter of an earthquake. The location of an earthquake is described by the geographic position of its epicenter and by its focal depth. Earthquakes many times occur along a fault, which is a fracture in the earth's crust.

DEFINITIONS

Earthquake—The shaking of the ground caused by an abrupt shift of rock along a fracture in the earth or a contact zone between tectonic plates.

Epicenter—The point on the earth's surface directly above the hypocenter of an earthquake. The location of an earthquake is commonly described by the geographic position of its epicenter and by its focal depth.

Fault—A fracture in the earth's crust along which two blocks of the crust have slipped with respect to each other.

Focal Depth—The depth from the earth's surface to the hypocenter.

Hypocenter—The region underground where an earthquake's energy originates

Liquefaction— Loosely packed, water-logged sediments losing their strength in response to strong shaking, causing major damage during earthquakes.

5.1 GENERAL BACKGROUND

Most destructive quakes are caused by dislocations of the crust. The crust may first bend and then, when the stress exceeds the strength of the rocks, break and snap to a new position. In the process of breaking, vibrations called "seismic waves" are generated. These waves travel outward from the source of the earthquake at varying speeds.

Earthquakes tend to reoccur along faults, which are zones of weakness in the crust. Even if a fault zone has recently experienced an earthquake, there is no guarantee that all the stress has been relieved. Another earthquake could still occur.

Geologists classify faults by their relative hazards. Active faults, which represent the highest hazard, are those that have ruptured to the ground surface during the Holocene period (about the last 11,000 years). Potentially active faults are those that displaced layers of rock from the Quaternary period (the last 1,800,000 years). Determining if a fault is "active" or "potentially active" depends on geologic evidence, which may not be available for every fault.

Faults are more likely to have earthquakes on them if they have more rapid rates of movement, have had recent earthquakes along them, experience greater total displacements, and are aligned so that movement can relieve accumulating tectonic stresses. A direct relationship exists between a fault's length and location and its ability to generate damaging ground motion at a given site. In some areas, smaller, local faults produce lower magnitude quakes, but ground shaking can be strong, and damage can be significant as a result of the fault's proximity to the area. In contrast, large regional faults can generate great magnitudes but, because of their distance and depth, may result in only moderate shaking in the area.

It is generally agreed that three source zones exist for Pacific Northwest quakes: a shallow (crustal) zone; the Cascadia Subduction Zone; and a deep, intraplate "Benioff" zone. These are shown in Figure 5-1. More than 90 percent of Pacific Northwest earthquakes occur along the boundary between the Juan de Fuca plate and the North American plate.

An earthquake will generally produce the strongest ground motions near the epicenter (the point on the ground above where the earthquake initiated) with the intensity of ground motions diminishing with increasing distance from the epicenter. The intensity of ground shaking at a given site depends on four main factors:

- Earthquake magnitude
- Earthquake epicenter
- Earthquake depth
- Soil or rock conditions at the site, which may amplify or de-amplify earthquake ground motions.

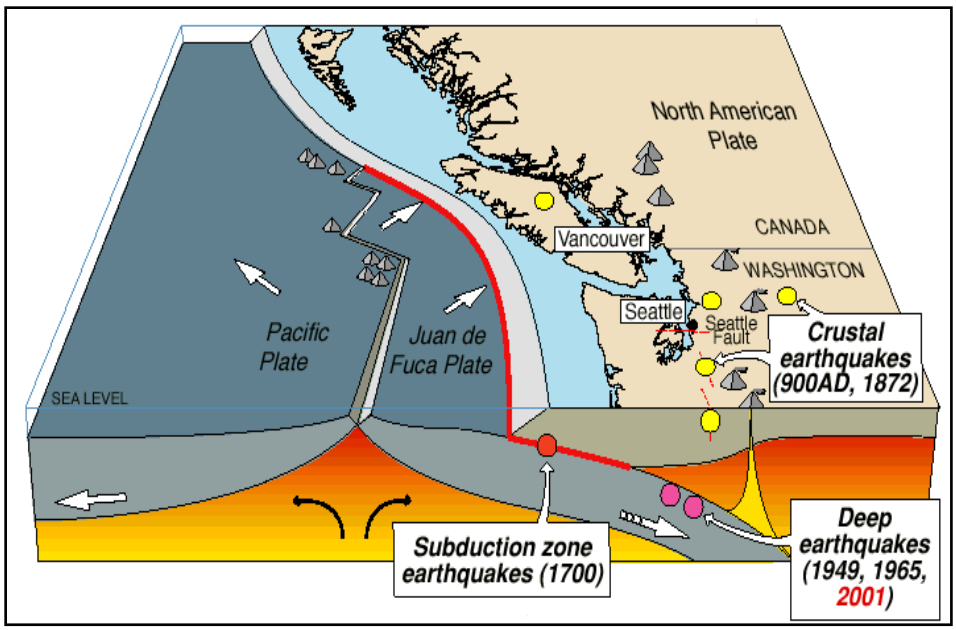


Figure 5-1 Earthquake Types in the Pacific Northwest

For any given earthquake, there will be contours of varying intensity of ground shaking with distance from the epicenter. The intensity will generally decrease with distance from the epicenter, and often in an irregular pattern, not simply in concentric circles. The irregularity is caused by soil conditions, the complexity of earthquake fault rupture patterns, and directionality in the dispersion of earthquake energy.

5.1.1 Earthquake Classifications

Earthquakes are typically classified in one of two ways: By the amount of energy released, measured as **magnitude** (size or power based on the Richter Scale); or by the impact on people and structures, measured as **intensity** (based on the Mercalli Scale). Magnitude is related to the amount of seismic energy released at the hypocenter of an earthquake. It is determined by the amplitude of the earthquake waves recorded on instruments. Magnitude is represented by a single, instrumentally determined value for each earthquake event. Intensity indicates how the earthquake is felt at various distances from the earthquake epicenter.

Magnitude

Currently, the most commonly used magnitude scale is the moment magnitude (M_w) scale, with the follow classifications of magnitude:

- Great—$M_w \geq 8$
- Major—$M_w = 7.0$—7.9
- Strong—$M_w = 6.0$—6.9
- Moderate—$M_w = 5.0$—5.9
- Light—$M_w = 4.0$—4.9
- Minor—$M_w = 3.0$—3.9
- Micro—$M_w < 3$

Estimates of moment magnitude roughly match the local magnitude scale (ML) commonly called the Richter scale. One advantage of the moment magnitude scale is that, unlike other magnitude scales, it does not saturate at the upper end. That is, there is no value beyond which all large earthquakes have about the same magnitude. For this reason, moment magnitude is now the most often used estimate of large earthquake magnitudes.

Intensity

There are many measures of the severity or intensity of earthquake ground motions. The Modified Mercalli Intensity scale (MMI) (Table 5-1) was widely used beginning in the early 1900s. MMI is a descriptive, qualitative scale that relates severity of ground motions to the types of damage experienced. MMI values range from I to XII (USGS, 1989).

Table 5-1
Modified Mercalli Intensity (MMI) Scale Descriptions

MMI VALUE	DESCRIPTION
I	Not felt except by a very few under especially favorable conditions
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it is an earthquake. Standing cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like a heavy truck striking building. Standing cars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all; many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.

Table 5-1 Modified Mercalli Intensity (MMI) Scale Descriptions	
MMI VALUE	**DESCRIPTION**
VII	Damage negligible in buildings of good design and construction; slight in well-built ordinary structures; considerable in poorly built or badly designed structures. Some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

More accurate, quantitative measures of the intensity of ground shaking have largely replaced the MMI and are used in this mitigation plan. These scales use terms that can be physically measured with seismometers, such as the acceleration, velocity, or displacement (movement) of the ground. The intensity may also be measured as a function of the frequency of earthquake waves propagating through the earth. In the same way that sound waves contain a mix of low-, moderate- and high-frequency sound waves, earthquake waves contain ground motions of various frequencies. The behavior of buildings and other structures depends substantially on the vibration frequencies of the building or structure versus the frequency of earthquake waves. Earthquake ground motions also include both horizontal and vertical components.

Ground Motion

Earthquake hazard assessment is also based on expected ground motion. This involves determining the probability that certain ground motion accelerations will be exceeded over a time period of interest. A common physical measure of the intensity of earthquake ground shaking, and the one used in this mitigation plan, is peak ground acceleration (PGA). PGA is a measure of the intensity of shaking relative to the acceleration of gravity (g). For example, an acceleration of 1.0 g PGA is an extremely strong ground motion, which does occur near the epicenter of large earthquakes. With a vertical acceleration of 1.0 g, objects are thrown into the air. With a horizontal acceleration of 1.0 g, objects accelerate sideways at the same rate as if they had been dropped from the ceiling. A PGA equal to 10% g means that the ground acceleration is 10 percent that of gravity, and so on.

Damage levels experienced in an earthquake vary with the intensity of ground shaking and with the seismic capacity of structures. The following generalized observations provide qualitative statements about the likely extent of damage for earthquakes with various levels of ground shaking (PGA) at a given site:

- Ground motions of only 1% g or 2% g are widely felt by people; hanging plants and lamps swing strongly, but damage levels, if any, are usually very low.
- Ground motions below about 10% g usually cause only slight damage.
- Ground motions between about 10% g and 30% g may cause minor to moderate damage in well-designed buildings, with higher levels of damage in more vulnerable buildings. At this level of ground shaking, some poorly built buildings may be subject to collapse.
- Ground motions above about 30% g may cause significant damage in well-designed buildings and very high levels of damage (including collapse) in poorly designed buildings.
- Ground motions above about 50% g may cause significant damage in most buildings, even those designed to resist seismic forces.

PGA is the basis of seismic zone maps that are included in building codes such as the International Building Code. Building codes that include seismic provisions specify the horizontal force due to lateral acceleration that a building should be able to withstand during an earthquake. PGA values are directly related to these lateral forces that could damage "short period structures" (e.g. single-family dwellings). Longer period response components determine the lateral forces that damage larger structures with longer natural periods (apartment buildings, factories, high-rises, bridges). The amount of earthquake damage and the size of the geographic area affected generally increase with earthquake magnitude:

- Earthquakes below M5 are not likely to cause significant damage, even near the epicenter.
- Earthquakes between about M5 and M6 are likely to cause moderate damage near the epicenter.
- Earthquakes of about M6.5 or greater (e.g., the 2001 Nisqually earthquake in Washington) can cause major damage, with damage usually concentrated fairly near the epicenter.
- Larger earthquakes of M7+ cause damage over increasingly wider geographic areas with the potential for very high levels of damage near the epicenter.
- Great earthquakes with M8+ can cause major damage over wide geographic areas.
- An M9 mega-quake on the Cascadia Subduction Zone could affect the entire Pacific Northwest from British Columbia, through Washington and Oregon, and as far south as Northern California, with the highest levels of damage nearest the coast.

Table 5-2 lists damage potential and perceived shaking by PGA factors, compared to the Mercalli scale.

Table 5-2
Comparison Of Mercalli Scale and Peak Ground Acceleration

Modified Mercalli Scale	Perceived Shaking	Potential Structure Damage: Resistant Buildings	Potential Structure Damage: Vulnerable Buildings	Estimated PGA[a] (%g)
I	Not Felt	None	None	<0.17%
II-III	Weak	None	None	0.17%—1.4%
IV	Light	None	None	1.4%—3.9%
V	Moderate	Very Light	Light	3.9%—9.2%
VI	Strong	Light	Moderate	9.2%—18%
VII	Very Strong	Moderate	Moderate/Heavy	18%—34%
VIII	Severe	Moderate/Heavy	Heavy	34%—65%
IX	Violent	Heavy	Very Heavy	65%—124%
X—XII	Extreme	Very Heavy	Very Heavy	>124%

a. PGA measured in percent of g, where g is the acceleration of gravity

Sources: USGS, 2008; USGS, 2010

5.1.2 Effect of Soil Types

Liquefaction is a secondary effect of an earthquake in which soils lose their shear strength and flow or behave as liquid, thereby damaging structures that derive their support from the soil. Liquefaction generally occurs in soft, unconsolidated sedimentary soils. The National Earthquake Hazard Reduction Program (NEHRP) creates maps based on soil characteristics to help identify locations subject to liquefaction. Table 5-3 summarizes NEHRP soil classifications. NEHRP Soils B and C typically can sustain ground shaking without much effect, dependent on the earthquake magnitude. Areas that are commonly most affected by ground shaking and susceptible to liquefaction have NEHRP Soils D, E and F.

Review of existing data illustrates that the majority of Everett sits on NEHRP soil class C, which is relatively stable in the event of an earthquake. In Everett, the areas that will be most affected by ground shaking are located in NEHRP soil classes D and E. There are some small areas of F soils located in Everett, generally along the Snohomish River delta, around the Port of Everett and in the waterfront along the Puget Sound. There are very few structures on F soils (Everett HIVA, 2018). Table 5-4 identifies the acres within each NEHRP soils type which falls within the city .

Table 5-3 NEHRP Soil Classification System		
NEHRP Soil Type	**Description**	**Mean Shear Velocity to 30 Meters (m/s)**
A	Hard Rock	1,500
B	Firm to Hard Rock	760-1,500
C	Dense Soil/Soft Rock	360-760
D	Stiff Soil	180-360
E	Soft Clays	< 180
F	Special Study Soils (liquefiable soils, sensitive clays, organic soils, soft clays >36 m thick)	

Table 5-4 Acres of NEHRP Soil Classification by Type within City of Everett	
NEHRP Soil Type	**Number of Acres within Everett**
A	0
B	309.77
B-C	46.61
C	13273.15
C-D	3139.65
D	1253.21
D-E	2851.00
E	457.34
F	211.49
Gray shaded soils type are less stable, liquifiable soils with A, B, C the best, and D, E, F getting progressively worse.	

5.1.3 Fault Classification

The U.S. Geologic Survey defines four fault classes based on evidence of tectonic movement associated with large-magnitude earthquakes during the Quaternary period, which is the period from about 1.6 million years ago to the present:

- Class A—Geologic evidence demonstrates the existence of a Quaternary fault of tectonic origin, whether the fault is exposed by mapping or inferred from liquefaction or other deformational features.
- Class B—Geologic evidence demonstrates the existence of Quaternary deformation, but either (1) the fault might not extend deep enough to be a potential source of significant earthquakes, or (2) the currently available geologic evidence is too strong to confidently assign the feature to Class C but not strong enough to assign it to Class A.
- Class C—Geologic evidence is insufficient to demonstrate (1) the existence of tectonic faulting, or (2) Quaternary slip or deformation associated with the feature.
- Class D—Geologic evidence demonstrates that the feature is not a tectonic fault or feature; this category includes features such as joints, landslides, erosional or fluvial scarps, or other landforms resembling fault scarps but of demonstrable non-tectonic origin.

5.2 HAZARD PROFILE

Seismic-related hazards in Everett include ground motion from shallow (less than 20 miles deep) or deep faults, as well as a Cascadia Subduction Zone earthquake; liquefaction and differential settling of soil in areas with saturated sand, silt, or gravel; and tsunamis that result from seismic activities. Earthquakes also can cause damage by triggering landslides or bluff failure. The Puget Sound region is entirely within Seismic Risk Zone 3, requiring that buildings be designed to withstand major earthquakes measuring 7.5 in magnitude. It is anticipated, however, that earthquakes caused from subduction plate stress can reach a magnitude greater than 8.0. High-magnitude earthquakes are possible in Everett when the Juan de Fuca slips beneath the North American plates. Deep zone or Benioff zone quakes have occurred within the San De Fuca plate (1949, 1965, and 2001) and can be expected in the future.

The City of Everett does have a high number of older structures, with ~130 that are also unreinforced masonry (see Chapter 3 for building structure data). Several of those are commercial, with many being vacant. One of the structures identified is a fire station, but that structure underwent a seismic upgrade in 2023, and now serves as fire headquarters.

5.2.1 Extent and Location

Washington State as a whole is one of the most seismically active states in United States. There are a number of faults running near or through Everett (see Figure 5-2).

South Whidbey Island Fault

The South Whidbey Island Fault (SWIF) which runs in a north-westward direction from Woodinville to near Port Townsend and through the southwest portion of Everett is a potential source of

earthquakes in the area. It is concluded to be capable of producing a 6.5 to 7.4 magnitude earthquake. An earthquake generated from the SWIF has the potential to cause VIII to IX intensity shaking on the Modified Mercalli scale. Figure 5-3 illustrates the potential intensity of ground shaking expected as a result of a M7.4 earthquake on a segment of the South Whidbey Island Fault. (This illustration represents a ShakeMap developed to support the 2012 Evergreen Earthquake Exercise, developed by the USGS, in conjunction with FEMA and the State of Washington.[17]) Additional ShakeMaps for various potential earthquakes is available at: ShakeMapGeologicSummaries (washington.edu)

Seattle Fault

The Seattle fault forms the south margin of the Seattle basin. Other active faults may be present in the greater Seattle area, but geologists have only documented young (in the last 14,000 years) motion on the Seattle fault. Currently the Seattle fault zone can be mapped from Dyes Inlet to Lake Washington, a distance of approximately forty kilometers. Historical events associated with this fault includes events that occurred at Point Robinson on January 29, 1995 with a magnitude 5.0 and at the southwestern end of Bainbridge Island on June 23, 1997 with a magnitude of 4.9.[18]

Everett Basin

Another important factor when considering seismic activity and hazards in Everett is the Everett Basin. Tacoma, Seattle and Everett are each situated above sedimentary basins, which affect the impacts that earthquakes have in each city. A basin is a deep, bowl-shaped geologic feature that is filled with softer soils and contained by bedrock and other harder materials. These basins can amplify the effects of seismic waves on the surface soils above the basin. Fortunately for Everett, this influence on seismic activity is not as strong as in Seattle and Tacoma. According to the U.S. Geological Survey (USGS), "the amplitudes of the resonance peaks increase southward, with the amplification in the Everett basin being the lowest and the amplification in the Tacoma basin is the highest." The USGS only speculates as to the differences attributed to the low amplification around Everett, but they suspect that higher compaction of soils during the last glaciation period is at least partially responsible, with receding glaciers exposing areas of southern Puget Sound for longer periods of time. Figure 5-4 illustrates some of the basins in the Puget Sound region.

[17] A ShakeMap illustrates (potential or real-life) ground motion and shaking intensity. Often developed near-real-time after a significant event (or recreated thereafter), these maps are used by federal, state, and local organizations, both public and private, for post-earthquake response and recovery, public and scientific information, as well as for preparedness exercises and disaster planning. Figure 5-2 was developed for exercise purposes, but is based on previous events on the SWIF, and has a high probability of occurrence.

[18] Dewberry, S.R., and Crosson, R.S., "The MD5.0 earthquake of January 29, 1995, in the Puget Lowland of western Washington-An event on the Seattle fault?," *Bulletin of the Seismological Society of America* 86 (1996): 1167-1172.

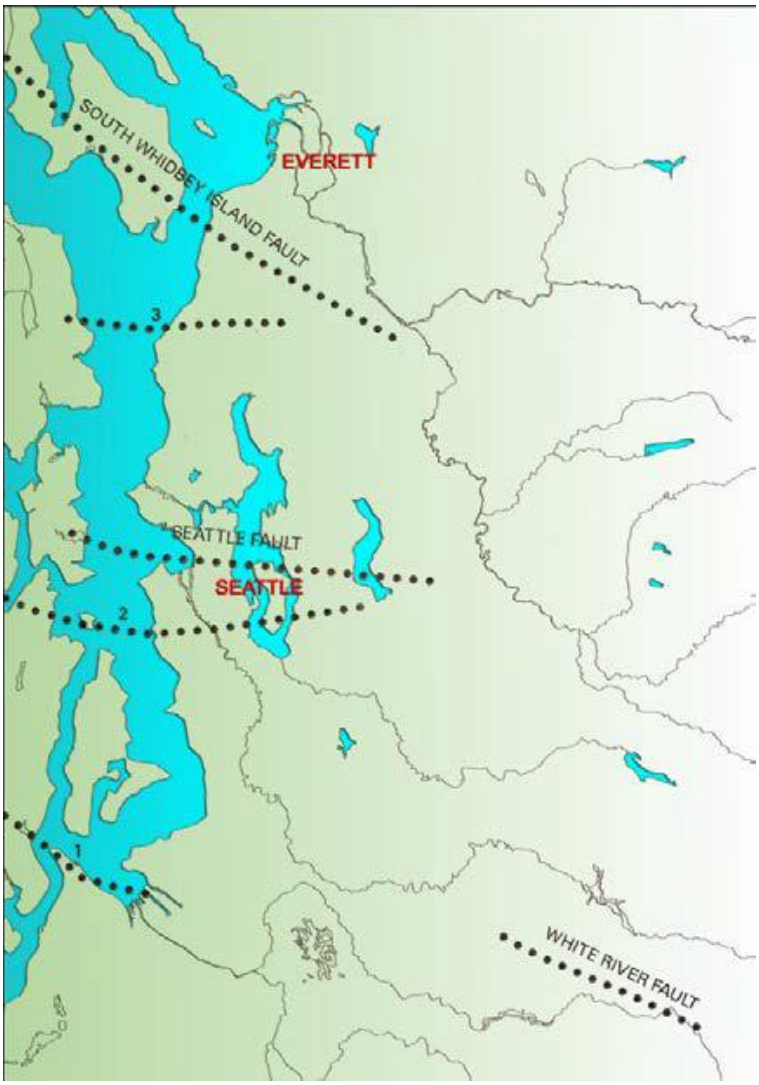


Figure 5-2 Potentially Active Crustal Faults in the Puget Sound

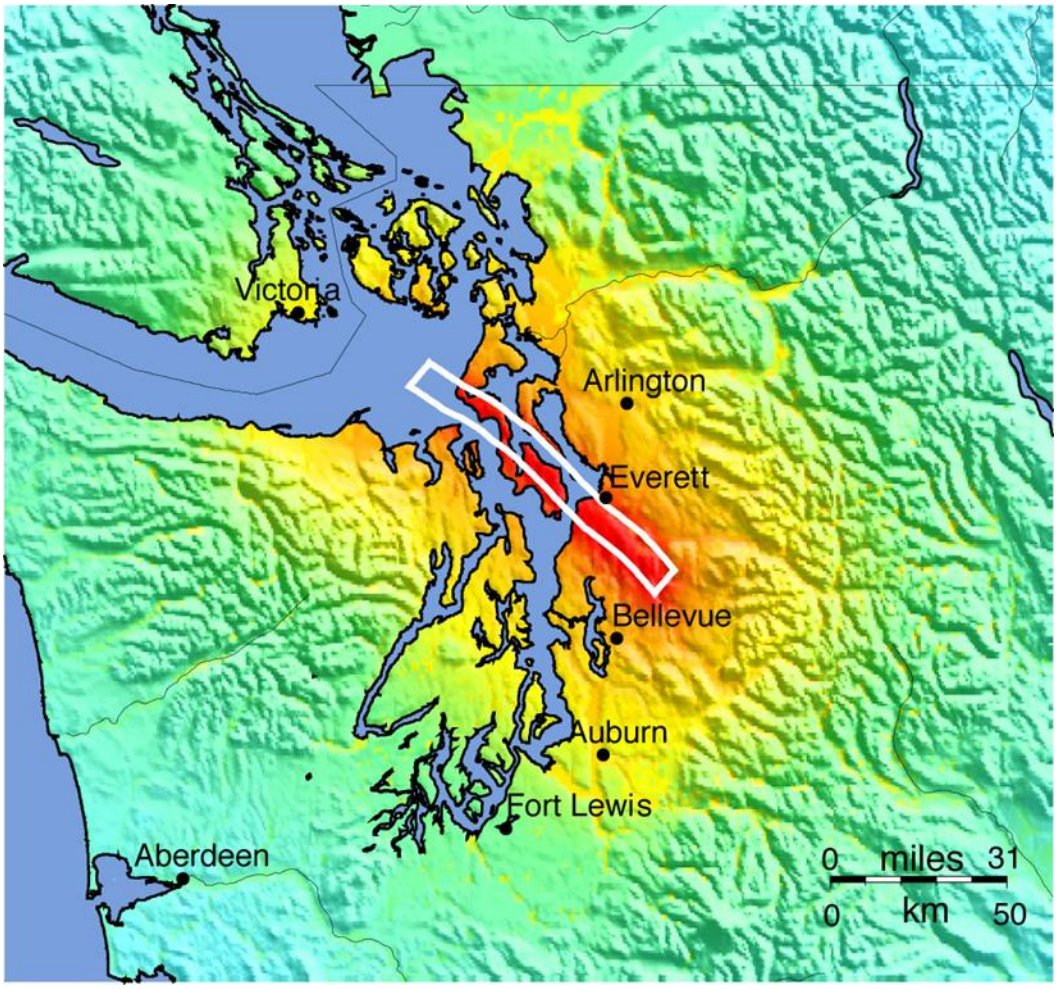


Figure 5-3 Southern Whidbey Island Fault (SWIF) Zone Intensity of Ground Shaking
(Red indicates most violent shaking.)

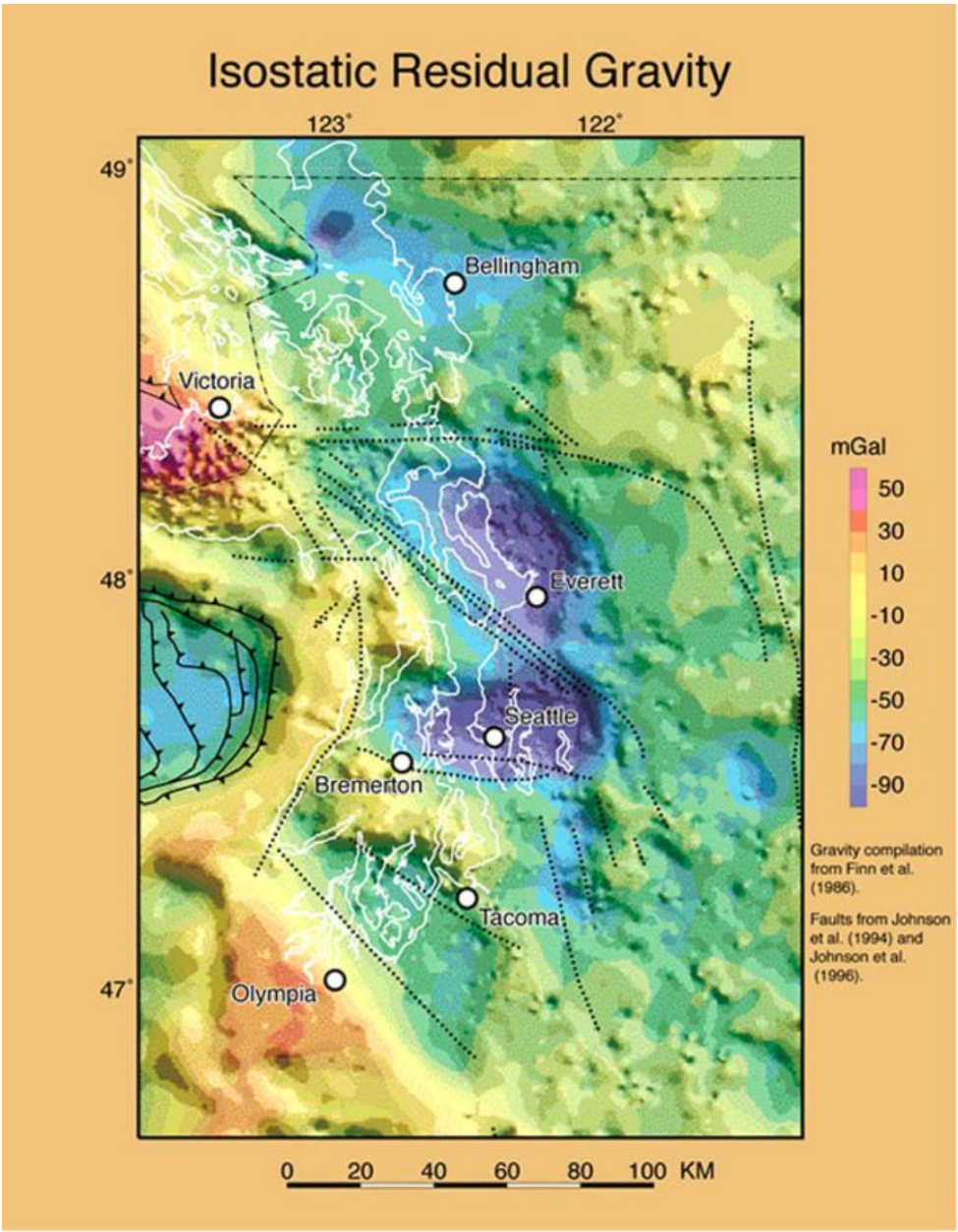


Figure 5-4 Isostatic Residual Gravity for Everett, Seattle and Tacoma Basins

NEHRP Soil Maps

NEHRP soil types define the locations that will be significantly impacted by an earthquake. NEHRP Soils B and C typically can sustain low-magnitude ground shaking without much effect. The areas that are most commonly affected by ground shaking have NEHRP Soils D, E, and F. Figure 5-5 shows NEHRP soil classifications in Everett, as well as valuation of parcels (all types) within the various soils type.

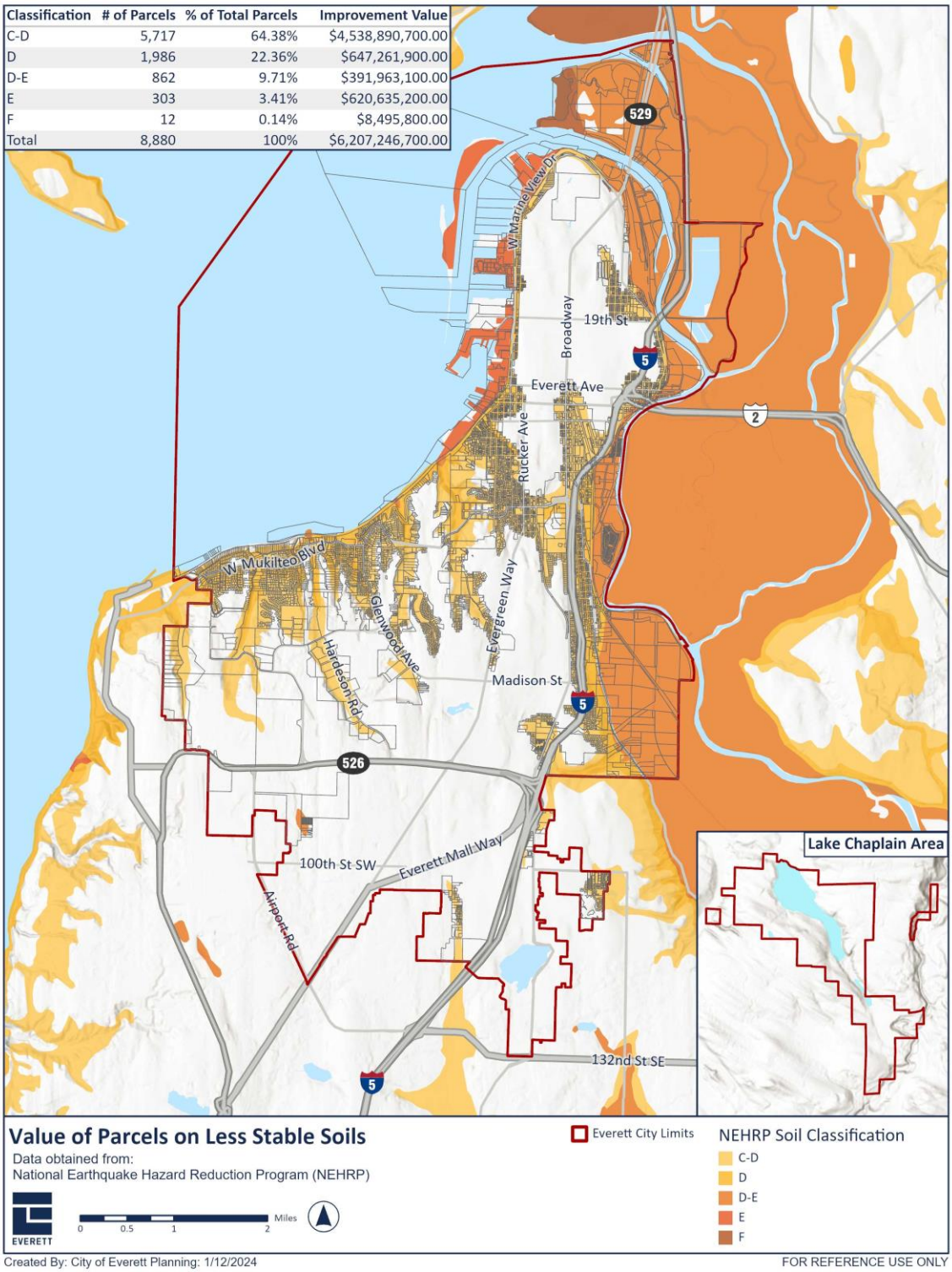


Figure 5-5 NEHRP Soils Classification with Exposed Parcels and Valuations within Each Type

Liquefaction Maps

Soil liquefaction maps are useful tools to assess potential damage from earthquakes. When the ground liquefies, sandy or silty materials saturated with water behave like a liquid, causing pipes to leak, roads and airport runways to buckle, and building foundations to be damaged. In general, areas with NEHRP Soils D, E and F are susceptible to liquefaction. If there is a dry soil crust, excess water will sometimes come to the surface through cracks in the confining layer, bringing liquefied sand with it and creating sand boils. Figure 5-6 shows liquefaction susceptibility throughout the city . Figure 5-7 illustrates some of the local earthquake faults and their respect soil classifications. Figure 5-8 illustrates the NEHRP soils classifications with primary roadways (HMP 2018).

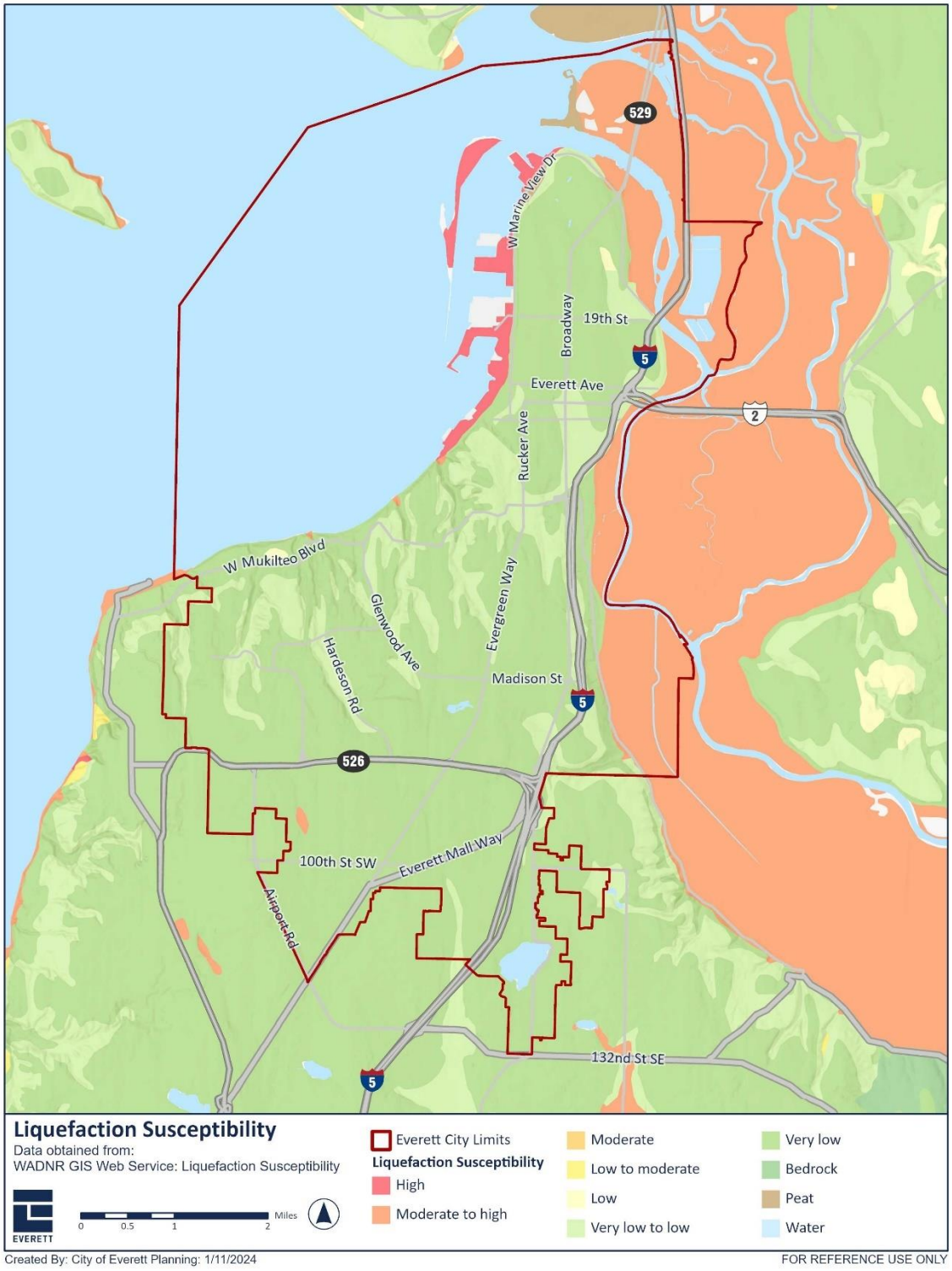


Figure 5-6 Liquefaction Susceptibility Zones

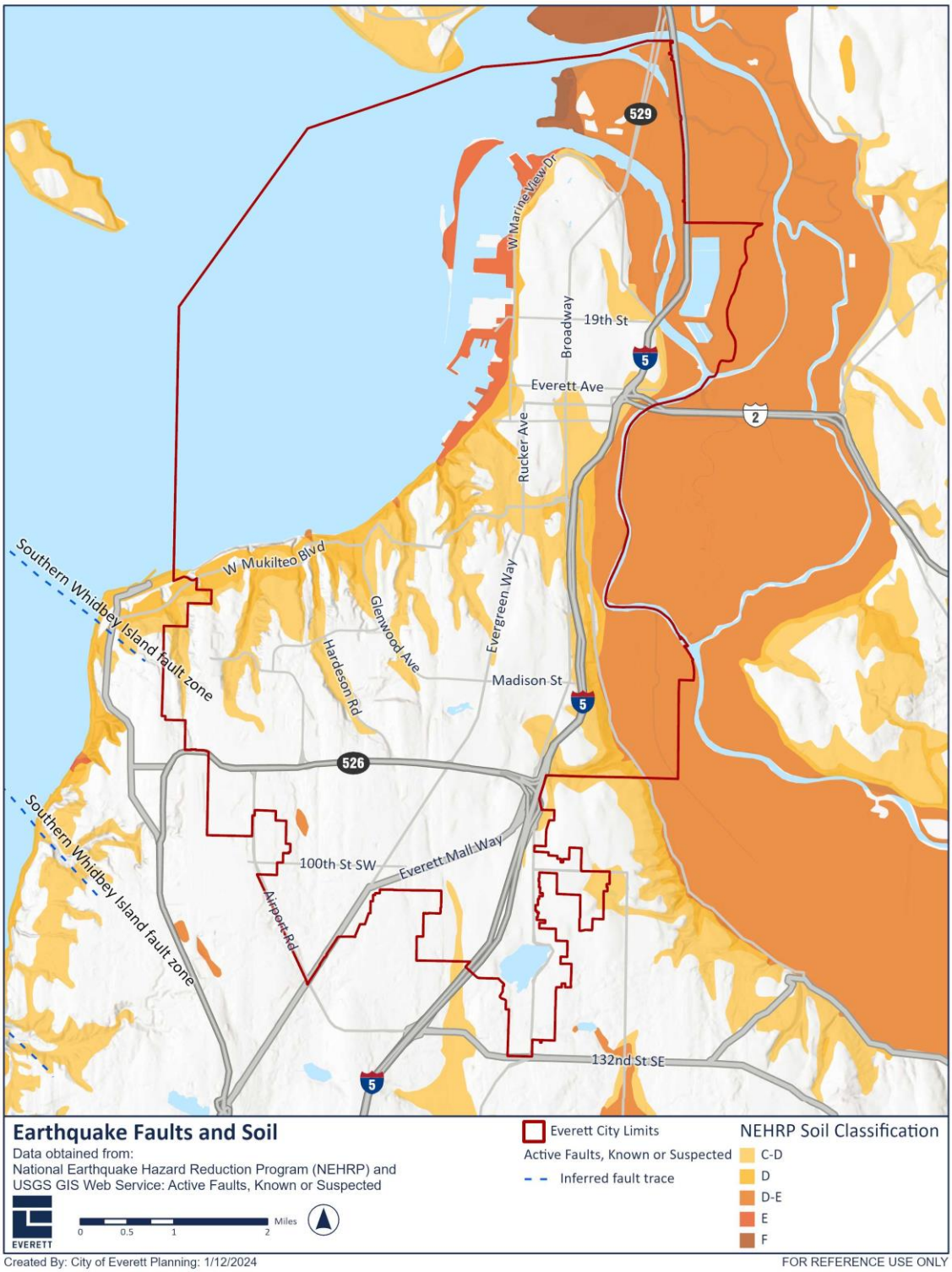


Figure 5-7 Earthquake Faults with Soil Classification

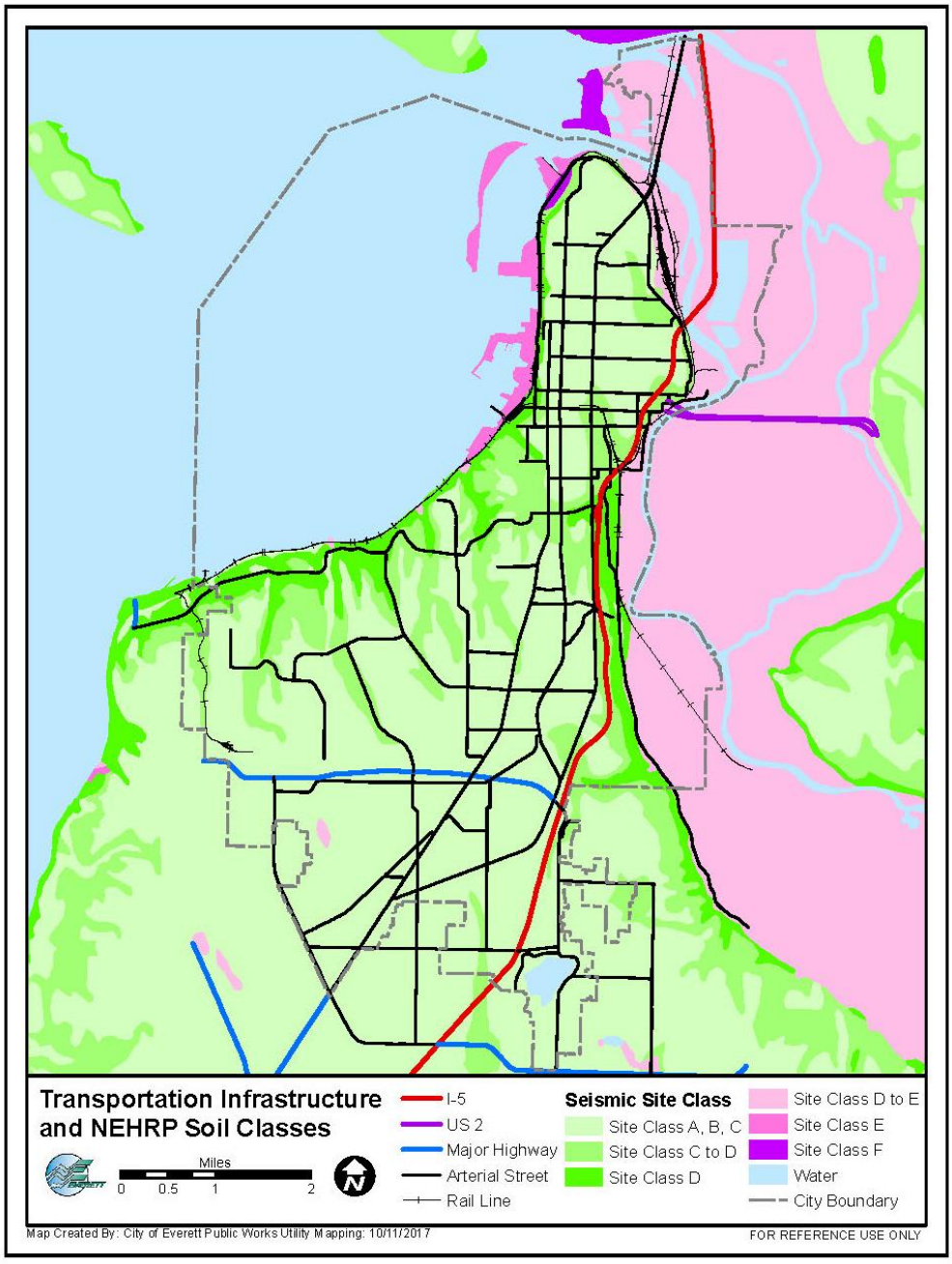


Figure 5-8 Transportation Infrastructure with Soils Classification (2018)

5.2.2 Previous Occurrences

Based on geologic evidence along the Washington coast, the Cascadia Subduction Zone has ruptured and created tsunamis at least seven times in the past 3,500 years and has a considerable range in recurrence intervals, from as little as 140 years between events to more than 1,000 years. The last Cascadia Subduction Zone-related earthquake is believed to have occurred on January 26, 1700, and researchers predict a 10 to 14 percent chance that another could occur in the next 50 years.

In more recent years, there has been a study of earthquake activity in the Snohomish Delta region, which includes Everett. In particular, scientists found two crustal events, one occurring around 900-950 AD and another sometime between 1450 and 1620 AD. The study took soil samples from the delta and found evidence of liquefaction through upward thrusts of sand and woody debris. These seismic events occurred at regular intervals from 130 AD to 1640 AD.[19]

Table 5-5 lists past seismic events that have affected the areas in and around Everett. The following are the largest earthquakes that have occurred in historic time in Puget Sound (Snohomish County HMP, 2020, Vol. 1):

- 1872: 7.4 (estimated) magnitude—shallow origin—approximately seventy-five miles northeast of Everett near Mount Baker and just east of the Cascade crest (largest recorded earthquake in Washington). No record of any fatalities in Snohomish County.
- 1949: 7.1 magnitude—deep origin—Nisqually Delta area north of Olympia. No Snohomish County fatalities.
- 1965: 6.5 magnitude—deep origin—near Renton. No Snohomish County fatalities.
- 2001: 6.8 magnitude—deep origin—Nisqually Delta area north of Olympia. For Snohomish County, no fatalities, 13 injuries (all minor). Estimated damages: $2-$3 million.
- The largest earthquake to occur in western Washington during the modern era took place on April 13, 1949. The magnitude of the earthquake was measured at magnitude7.1; it had a maximum intensity of VIII-IX on the MM Scale, based upon damage to the human-built environment. The epicenter was located between Tacoma and Olympia. Strong shaking during the Olympia earthquake lasted about twenty seconds.
- During the 1965 earthquake, two of three 48-inch water supply lines were broken in Everett where the trestle carrying them crossed an area of seismically vulnerable soil.[20]
- The second largest and most recent earthquake within Puget Sound occurred February 28, 2001 with an epicenter again located north of Olympia in the vicinity of the Nisqually River Delta. This earthquake measured magnitude 6.8 and caused damage throughout the state from Bellingham to Vancouver between the Olympics and eastern Washington. Twenty-two of the state's counties were included in the federal disaster declaration for the quake. Snohomish County's damages were relatively light (between $2 and $3 million for public and private sector combined) and casualties were exceptionally light (thirteen injuries, all minor). A few older, un-reinforced masonry structures suffered significant damage, but there were no building collapses in the county. The greatest shaking and highest percentage of damaged structures were in the main stem river valleys and the cities or towns built along the rivers: Darrington, Sultan, Monroe, and Snohomish.

[19] Bourgeois, Joanne and Johnson, Samuel Y. "Geologic evidence of earthquakes at the Snohomish delta, Washington, in the past 1200 years, " Geological Society of America, 2001, GSA Bulletin Vol.113, p. 482-494

[20] Noson, Linda et al. "Where Has Earthquake Damage Occurred in Washington State?" Accessed online on April 1, 2011 from http://www.ess.washington.edu/SEIS/PNSN/INFO_GENERAL/NQT/where_damage.html

Table 5-5
Historical Earthquakes Impacting The Planning Area

Year	Magnitude	Epicenter	Type
2/28/2001 (DR 1361)	6.8	Olympia (Nisqually)	Benioff
6/10/2001	5.0	Matlock	Benioff
7/3/1999	5.8	8.0 km N of Satsop	Benioff
6/23/1997	4.7	Bremerton	Shallow Crustal
5/3/1996	5.5	Duvall	Shallow Crustal
1/29/1995	5.1	Seattle-Tacoma	Shallow Crustal
1990	5	NW Cascades	Crustal
2/14/1981	5.5	Mt. St. Helens (Ash)	Crustal
9/9/76	4.5	Union	Benioff Zone (28 miles deep)
5/11/1965 (DR 196)	6.6	18.3 KM N of Tacoma	Benioff
4/29/1965	6.5	12 miles North of Tacoma	Benioff
1/13/1949	7.0	12.3 KM ENE of Olympia	Benioff
6/23/1946	7.3	Strait of Georgia	Benioff
2/14/1946	6.3	Puget Sound	Benioff
4/1945	5.7	North Bend (8 miles south/southeast)	Crustal
1939	5.8	Puget Sound – Near Vashon Island	Benioff
1932	5.3	Central Cascades	Crustal
1/23/1920	5.5	Puget Sound	Unknown
12/6/1918	7.0	Vancouver Island	Unknown
8/18/1915	5.6	North Cascades	Unknown
1/11/1909	6.0	Puget Sound	Benioff
4/30/1882	5.8	Olympia area	Benioff
1872	6.8	North Cascades	Crustal

5.2.3 Severity

Earthquakes can last from a few seconds to over five minutes; they may also occur as a series of tremors over several days. The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Casualties generally result from falling objects and debris, because the shocks shake, damage or demolish buildings and other structures. Disruption of communications, electrical power supplies and gas, sewer and water lines should be expected. Earthquakes may trigger fires, dam failures, landslides, or releases of hazardous material, compounding their disastrous effects.

Small, local faults produce lower magnitude quakes, but ground shaking can be strong, and damage can be significant in areas close to the fault. In contrast, large regional faults can generate earthquakes of great magnitudes but, because of their distance and depth, they may result in only moderate shaking in an area.

USGS ground motion maps based on current information about fault zones show the PGA that has a certain probability (2 or 10 percent) of being exceeded in a 50-year period. The PGA is measured in %g. Figure 5-9 shows the PGA with a 2 percent exceedance chance in 50 years in Washington.

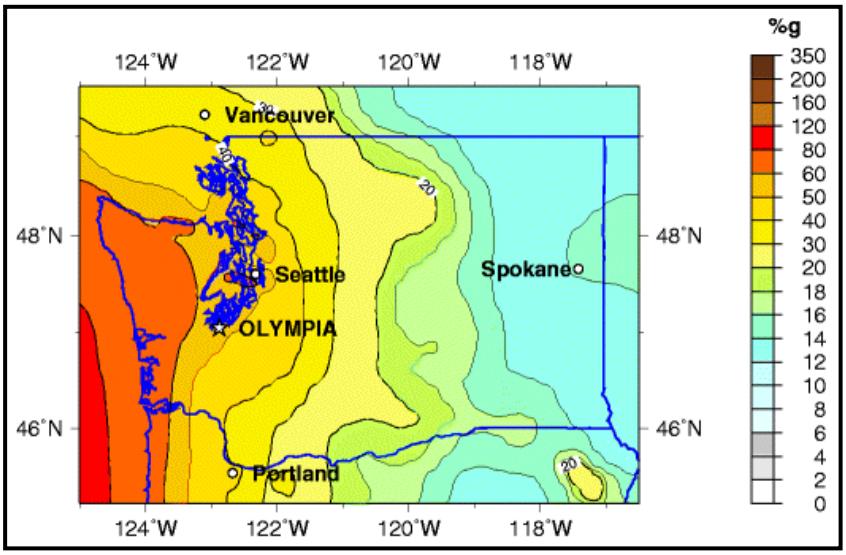


Figure 5-9 PGA with 2-Percent Probability of Exceedance in 50 Years, Northwest Region

A Cascadia Subduction Zone earthquake could produce an earthquake with a magnitude as large as a 9.0 located on the Pacific Coast of Washington. Benioff zone earthquakes as large as magnitude 7.5 are expected everywhere west of the eastern shores of Puget Sound. A crustal zone earthquake could produce a 7.4 magnitude earthquake affecting Everett. The City of Everett has the potential to be affected by a subduction, Benioff, or crustal zone earthquake, but historically has been spared their most damaging effects.

Effects of a major earthquake in the Puget Sound basin area could be catastrophic, providing the worst-case disaster short of drought-induced wild fire sweeping through a suburban area. Hundreds of residents could be killed, and a multitude of others left homeless. Although recorded damage sustained to date in Everett has been relatively low, depending on the time of day and time of year, a catastrophic earthquake could cause hundreds of injuries, deaths, and millions of dollars in property damage.

The time of day an earthquake occurs would determine how much of the total population is vulnerable. During daytime hours there is more activity in Everett's downtown, commercial, and industrial areas. An event that occurred during the day could affect much of the population in these areas. A nighttime event would place the greater populations in residential areas of Everett at a higher level of vulnerability.

5.2.4 Frequency

Scientists are currently developing methods to more accurately determine when an earthquake will occur. Recent advancements in determining the probability of an earthquake in a given period use a log-normal, Brownian Passage Time, or other probability distribution in which the probability of an event depends on the time since the last event. Such time-dependent models produce results broadly consistent with the elastic rebound theory of earthquakes. The USGS and others are beginning to develop such products as new geologic and seismic information regarding the dates of previous events along faults becomes more and more available (USGS, 2015a).

Scientists currently estimate that a Magnitude-9 earthquake in the Cascadia Subduction Zone occurs about once every 500 years. The last one was in 1700. Paleoseismic investigations have identified 41 Cascadia Subduction Zone interface earthquakes over the past 10,000 years, which corresponds to one earthquake about every 250 years. About half were M9.0 or greater earthquakes that represented full rupture of the fault zone from Northern California to British Columbia. The other half were M8+ earthquakes that ruptured only the southern portion of the Subduction Zone.

The 300+ years since the last major Cascadia Subduction Zone earthquake is longer than the average of about 250 years for M8 or greater and shorter than some of the intervals between M9.0 earthquakes. Based on a June 2023 presentation by Washington State Emergency Management Division, there is a 15-25% chance of a Cascadia type event at an 8.0-9.0+ earthquake occurring in the next 50 years (WA EMD, June 2023 Power Point).

Scientists currently estimate the frequency of deep earthquakes similar to the 1965 Magnitude-6.5 Seattle-Tacoma event and the 2001 Magnitude-6.8 Nisqually event as about once every 35 years. The USGS estimates an 84-percent chance of a Magnitude-6.5 or greater deep earthquake over the next 50 years.

Scientists estimate the approximate recurrence rate of a Magnitude-6.5 or greater earthquake anywhere on a shallow fault in the Puget Sound basin to be once in about 350 years.

Earthquakes on the Seattle Faults have a 2-percent probability of occurrence in 50 years. A Benioff zone earthquake has an 85 percent probability of occurrence in 50 years, making it the most likely of the three types.

There have been five earthquakes of less than Magnitude 5 in the past 25 years, the most recent of which occurred during the update of this plan – a M4.3 occurring on October 8, 2023, south of Port Townsend and west of Whidbey Island.

5.3 VULNERABILITY ASSESSMENT

5.3.1 Overview

Several faults within the planning region have the potential to cause direct impact. The area also is vulnerable to impact from an event outside the city and/or county, although the intensity of ground motions diminishes with increasing distance from the epicenter. As a result, the entire population of the planning area is exposed to both direct and indirect impacts from earthquakes. The degree of direct impact (and exposure) is dependent on factors including the soil type on which homes are constructed, the proximity to fault location, the type of materials used to construct residences and facilities, etc. Indirect impacts are associated with elements such as the inability to evacuate the area

as a result of earthquakes occurring in other regions of the state as well as impact on commodity flow for goods and services into the area.

Warning Time

There is currently no reliable way to predict the day or month that an earthquake will occur at any given location. Research has developed warning systems that use the low energy waves that precede major earthquakes. These potential warning systems give approximately 40 seconds notice that a major earthquake is about to occur. The warning time is very short, but it could allow for someone to get under a desk, step away from a hazardous material they are working with, or shut down a computer system.

5.3.2 Impact on Life, Health, and Safety

The entire population of the planning area is potentially exposed to direct and indirect impacts from earthquakes. Two of the most vulnerable populations to a disaster incident such as this are the young and the elderly. Approximately 13.6 percent of the City of Everett's population is comprised of the elderly (lower than state and county comparable in this age group), with 11.44 percent of the individuals within the city having some form of disability. Approximately 5 percent of the population is 5 years and under. Approximately 20.2 percent of residents are younger than 18.

The need for increased rescue efforts and/or to provide assistance to such a large population base could tax the first-responder resources in the area during an event. Although many injuries may not be life-threatening, people will require medical attention and, in many cases, hospitalization. Potential life-threatening injuries and fatalities are expected; these are likely to be at an increased level if an earthquake happens during the afternoon or early evening.

The degree of exposure is dependent on many factors, including the soil type on which homes are constructed, quality of construction, proximity to fault location, etc. Whether impacted directly or indirectly, the entire population will have to deal with the consequences of earthquakes to some degree. Business interruption could keep people from working, road closures could isolate populations, and loss of functions of utilities could impact populations that suffered no direct damage. The number of people without power will be high. The city also provides water to city and county residents. Water distribution lines would also sustain some impact.

Review of data contained in Figure 5-5 illustrate that the city lies primarily on NEHRP C soils, but it also has some areas of D, E, and a minimal amount of F soils. The E soil areas are of most concern since they demonstrate a high level of potential liquefaction during earthquake events. In general, these soils are located along the Snohomish River floodplain and delta, and along the city's waterfront and port. There are also approximately four miles of I-5, the major north-south route serving Everett, which are located on E soils north of the city (see Figure 5-8). There are also a number of overpasses crossing I-5 that could result in earthquake-induced blockage. Should sections of the interstate fail during a major seismic event, it is possible that evacuation along these routes may become compromised (2018 HMP).

Residential populations located on D and E soils are a concern. In Everett there are limited residential structures located on E soils, but many homes are located on D Soils along the slopes to Everett's waterfront and along the eastern edge of the city, near the Snohomish River floodplain, as well as a narrow band that crosses the peninsula near its base. Also, the large number of creek ravines that separate areas of the city could potentially lead to isolation issues should a major seismic event occur.

In addition, populations in hospitals and schools are especially vulnerable to a seismic event because of age and potential ambulatory limitations. The Providence Regional Medical Center Everett Colby Campus is the largest exposed facility and is located on C soils that are fairly stable in a seismic event. The Pacific Campus, which also includes some long-term elderly care, is located on the slightly more vulnerable D soils, making it potentially more vulnerable to impacts from an earthquake (2018 HMP).

It can be assumed that all of these factors will increase the number of individuals seeking shelter (or other) assistance until infrastructure is re-established, and damaged structures are repaired.

5.3.3 Impact on Property

There are over 33,000 buildings in the planning area. Most buildings are residential (48,600 including multi-family units). Much of the building stock is of considerable age and not supported by building codes which increase resilience to seismic events. Portions of these buildings are constructed out of unreinforced masonry; many have chimneys that may be in need of repair, and many, because of the age of the building stock, may contain some level of asbestos in building components such as the boiler room, ceiling tiles, carpeting, or glue. Since all structures in the planning area are susceptible to earthquake impacts to varying degrees (including liquefaction and landslides), the figure represents total numbers city-wide for property exposure to seismic events. Of the structures analyzed, there are approximately 2,078 residential structures that are situated on less stable soil, including single family, multi-family and condominiums (stacked). When considering all building types, there are over 8,800 on the less stable soils, valued in excess of $6.2 billion.

Building Age

Structures that are in compliance with the Uniform Building Code (UBC) of 1970 or later are generally less vulnerable to seismic damage because 1970 was when the UBC started including seismic construction standards based on regional location. This stipulated that all structures be constructed to at least seismic risk Zone 2 standards.

The State of Washington adopted the UBC as its state building code in 1972, so it is assumed that buildings in the planning area built after 1972 were built in conformance with UBC seismic standards and have less vulnerability. Issues such as code enforcement and code compliance could impact this assumption. Construction material is also important when determining the potential risk to a structure. However, for planning purposes, establishing this line of demarcation can be an effective tool for estimating vulnerability. In 1994, seismic risk Zone 3 standards of the UBC went into effect in Washington, requiring all new construction to be capable of withstanding the effects of 0.3 g. More recent housing stock is in compliance with Zone 3 standards. In July 2004, the state again upgraded the building code to follow International Building Code Standards. While the "zones" are still referenced, they are, in large part, no longer used in the capacity they once were as there can be different zones within political subdivisions, making it difficult to apply. For instance, within Washington, there are both Seismic Zones 2B and 3. Table 5-6 further discusses the timelines of the various building code standards. Chapter 3, Section 3.6.3 discusses the age of the existing building stock in place as of this 2024 update.

Table 5-6 Timeline of Building Code Standards	
Time Period	**Code Significance for Identified Time Period**
Pre-1974	No standardized earthquake requirements in building codes. Washington State law did not require the issuance of any building permits, or require actual building officials
1975-2003	UBC seismic construction standards were adopted in Washington.
1994-2003	Seismic Risk Zone 3 was established within the Uniform Building Code in 1994, requiring higher standards.
2004-Present	Washington State upgrades its building codes to follow the International Building Code Standard. As upgrades occur, the State continues to adopt said standards.

5.3.4 Impact on Critical Facilities and Infrastructure

All critical facilities in Everett are exposed to the earthquake hazard. For this risk assessment, those equate to an estimated loss of $1.337 billion (total insured value, including structures and content). Additionally, hazardous materials releases can occur during an earthquake from fixed facilities or transportation-related incidents. Transportation corridors can be disrupted during an earthquake, leading to the release of materials to the surrounding environment. Facilities holding hazardous materials are of particular concern because of possible isolation of residences surrounding them. During an earthquake, structures storing these materials could rupture and leak into the surrounding area or an adjacent waterway, having a disastrous effect on the environment. As a portion of the city is bound by water, this is of particular concern as spills into water bodies, including the coastline or significant rivers in the area, could have devastating impact. Additionally, the potential for landslide-induced roadway closure is of significant concern. Closure of major arterials could require increased evacuation periods in some instances by several hours depending on the area impacted.

5.3.5 Impact on Economy

Economic losses due to earthquake damage include damage to buildings, including the cost of structural and non-structural damage, damage to contents, and loss of inventory, loss of wages and loss of income. Loss of tax base both from revenue and lack of improved land values will increase the economic loss to the city.

For the city itself, based on the various sectors, the potential annual income loss exceeds $18 million. In addition, economic damage should also include potential losses to major industries in the area. But one example is the Port of Everett, which is a major contributor to the economy of not only the city, but county, state, and private industry globally for import and export items shipped in/out of the Port. The Port of Everett operates three lines of business: Seaport, Marina, and Real Estate. Other large-scale industry within the Port include Amazon, FedEx, and Safran. Based on a 2019 report prepared for the Port of Everett, the Port sustains an economic value for the region of $7.9 billion (2019 figures), providing nearly 40,000 jobs (direct, induced and indirect), with $1.4 billion in direct

personal income, and $3.0 billion in re-spending/local consumption. Local level taxes equate to $199.6 million, with $233.8 million state-level taxes.[21]

The Port also has an industrial shipyard with the capability of supporting Coast Guard and Navy vessels, both of which could support recovery efforts through maritime efforts to deliver needed goods, and potentially evacuation and hospital services through Navy hospital ships.

In addition, loss of goods and services may hamper recovery efforts, and even preclude residents from rebuilding within the area. No specific loss data is available with respect to loss of inventory, wages, or loss of income; however, economic loss with respect to building impact is the same as identified above.

5.3.6 Impact on Environment

Earthquake-induced landslides can significantly impact habitat. It is also possible for streams to be rerouted after an earthquake. This can change water quality, possibly damaging habitat and feeding areas. There is a possibility of streams fed by groundwater drying up because of changes in underlying geology. Impact from hazardous materials sites will also be significant. Most transport of hazardous materials through Snohomish County and Everett is accomplished either by rail or by I-5, the major interstate route on the west coast. There are approximately 126 Tier II facilities within the city limits. The Port of Everett Marina also offers fuel dockside, increasing the potential for hazardous materials release into the Puget Sound.

While many of the Tier II facilities in Everett are smaller in nature, a significant event such as an earthquake would pose a serious threat when chemicals from multiple sources are released, particularly given its proximity to waterbodies which could carry the chemicals a great distance.

5.3.7 Impact from Climate Change

The impacts of global climate change on earthquake probability are unknown. Some scientists say that melting glaciers could induce tectonic activity. As ice melts and water runs off, tremendous amounts of weight are shifted on the earth's crust. As newly freed crust returns to its original, pre-glacier shape, it could cause seismic plates to slip and stimulate volcanic activity, according to research into prehistoric earthquakes and volcanic activity. Sea level rise is not anticipated to impact the earthquake hazard, as the normal tidal flows mimic a similar increase.

Secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms could experience liquefaction or an increased propensity for slides during seismic activity due to the increased saturation. Dams storing increased volumes of water due to changes in the hydrograph could fail during seismic events. There are currently no models available to estimate these impacts.

[21] 2019 Port of Everett Economic Impact Results. Martin Associates. Accessed 12 Oct. 2023. Available online at: 2019 Port of Everett Economic Impact.pdf (revize.com)

5.4 FUTURE DEVELOPMENT TRENDS

As the population in the city continues to grow, the exposure to people, infrastructure and property will increase. The City of Everett continues to utilize the International Building Code, which requires structures to be built at a level which supports soil types and earthquake hazards (ground shaking). As existing buildings are renovated, provisions are also in place which require reconstruction at higher standards. With these in place, as population in the area increases, the city feels it is well situated to limit exposure through regulated building standards and performance measures so that the degree of risk is reduced.

5.5 ISSUES

While the area has a high probability of an earthquake event occurring within its boundaries, an earthquake does not necessarily have to occur in the planning area to have a significant impact as such an event would disrupt transportation to and from the region as a whole and impact commodity flow. As such, any seismic activity of 6.0 or greater on faults in or near the planning area would have significant impact. Potential warning systems could give approximately 40 seconds notice that a major earthquake is about to occur. This would provide limited time for preparation. Earthquakes of this magnitude or higher would lead to massive structural failure of property on NEHRP C, D, E, and F soils. Levees and revetments built on these poor soils would likely fail, representing a loss of critical infrastructure. These events could cause secondary hazards, including landslides and mudslides that would further damage structures. River valley hydraulic-fill sediment areas are also vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. Soil liquefaction would occur in water-saturated sands, silts, or gravelly soils.

Earthquakes can cause large and sometimes disastrous landslides and mudslides. River valleys are vulnerable to slope failure, often as a result of loss of cohesion in clay-rich soils. Soil liquefaction occurs when water-saturated sands, silts or gravelly soils are shaken so violently that the individual grains lose contact with one another and float freely in the water, turning the ground into a pudding-like liquid. Building and road foundations lose load-bearing strength and may sink into what was previously solid ground. Unless properly secured, hazardous materials can be released, causing significant damage to the environment and people. Earthen dams and levees are highly susceptible to seismic events and the impacts of their eventual failures can be considered secondary risks for earthquakes. Earthquakes at sea can generate destructive tsunamis. Important issues associated with an earthquake include, but are not limited to the following:

- More information is needed on the exposure and performance of construction within the planning area. Much information on the age, type of construction, or updated work on facilities is not readily available in a useable format for a risk assessment of this type.
- It is presently unknown to what standards portions of the planning area's building stock were constructed or renovated.
- Geotechnical standards should continue to take into account the probable impacts from earthquakes in the design and construction of new or enhanced facilities.
- Dam failure warning, evacuation plans and procedures should be updated (and maintained) to reflect dam risk potential associated with earthquake activity in the

region, with said information being distributed to the city and county to allow for appropriate planning to occur.

- Earthquakes could trigger other natural hazard events such as a tsunami, which would have far-reaching impacts.

5.6 RESULTS

Based on review and analysis of the data, the Planning Team has determined that the probability for impact from an Earthquake throughout the area is highly likely. A SWIF or Cascadia-type event have a high probability of occurring within the region, while also generating large amounts of damage. The losses related to an earthquake are largely due to the proximity to the faults. With the Everett Basin in place, those losses could further be exacerbated.

In general, the city lies on NEHRP C soils, but it also has some areas of D, E, and a minimal amount of F soils. The E soil areas are of most concern since they demonstrate a high level of potential liquefaction during earthquake events. In general, these soils are located along the Snohomish River floodplain and delta, and along the city's waterfront and port. Residential populations located on D and E soils are also a concern. While there are limited residential structures located on E soils, there are many homes located on D Soils along the slopes to Everett's waterfront and along the eastern edge of the city, near the Snohomish River floodplain, as well as a narrow band that crosses the peninsula near its base (Everett HMP 2018). This equates to ~8,800 buildings located in the less stable soils areas out of 32,659 structures citywide, including 2,078 residential structures (all types).

Due to the age of many buildings throughout the planning area, there are large amounts of pre-code structures (primarily residential). With the absence of building codes at time of construction, the structures would undoubtedly be impacted and perform poorly when compared to structures built after code implementation. Based on the potential impact, the Planning Team determined the CPRI score to be 3.85, with overall vulnerability determined to be a high level.

CHAPTER 6.
FLOOD

Floods are one of the most common natural hazards in the U.S. They can develop slowly over a period of days or develop quickly, with disastrous effects that can be local (impacting a neighborhood or community) or regional (affecting entire river basins, coastlines and multiple counties or states) (FEMA, 2010). Most communities in the U.S. have experienced some kind of flooding, after spring rains, heavy thunderstorms, coastal storms, or winter snow thaws. Floods are one of the most frequent and costly natural hazards in terms of human hardship and economic loss, particularly to communities that lie within flood-prone areas or floodplains of a major water source.

DEFINITIONS

Flood—The inundation of normally dry land resulting from the rising and overflowing of a body of water.

Floodplain—The land area along the sides of a river that becomes inundated with water during a flood.

100-Year Floodplain—The area flooded by a flood that has a 1-percent chance of being equaled or exceeded each year. This is a statistical average only; a 100-year flood can occur more than once in a short period of time. The 1-percent annual chance flood is the standard used by most federal and state agencies.

Floodway—The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

6.1 GENERAL BACKGROUND

Flooding is a general and temporary condition of partial or complete inundation on normally dry land from the following:

- Riverine flooding, including overflow from a river channel, flash floods, alluvial fan floods, dam-break floods, and ice jam floods;
- Local drainage or high groundwater levels;
- Fluctuating lake levels;
- Coastal flooding;
- Coastal erosion;
- Unusual and rapid accumulation or runoff of surface waters from any source;
- Mudflows (or mudslides);
- Collapse or subsidence of land along the shore of a lake or similar body of water that result in a flood, caused by erosion, waves or currents of water exceeding anticipated levels (Floodsmart.gov, 2012);
- Sea level rise; and
- Climate change.

6.1.1 Flooding Types

Many floods fall into one of three categories: riverine, coastal, or shallow (urban flooding) (FEMA, 2005). Other types of floods include alluvial fan floods, dam failure floods, and floods associated with local drainage or high groundwater.

Riverine

Riverine floods are the most common flood type. They occur along a channel, and include overbank and flash flooding. Channels are defined ground features that carry water through and out of a watershed. They may be called rivers, creeks, streams, or ditches. When a channel receives too much water, the excess water flows over its banks and inundates low-lying areas.

Flash Floods

A flash flood is a rapid, extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). The time may vary in different areas. Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising floodwaters (NWS, 2009).

Coastal Flooding

Coastal (or tidal) flooding is the flooding of normally dry, low-lying coastal land, primarily caused by severe weather events along the coast, estuaries, and adjoining rivers. These flood events are some of the more frequent, costly, and deadly hazards that can impact coastal communities. Factors causing coastal flooding include:

- Storm surges, which are rises in water level above the regular astronomical tide caused by a severe storm's wind, waves, and low atmospheric pressure. Storm surges are extremely dangerous, because they are capable of flooding large coastal areas.
- Large waves, whether driven by local winds or swell from distant storms, raise average coastal water levels and individual waves roll up over land.
- High tide levels are caused by normal variations in the astronomical tide cycle.
- Other larger scale regional and ocean scale variations are caused by seasonal heating and cooling and ocean dynamics.

Coastal floods are extremely dangerous, and the combination of tides, storm surge, and waves can cause severe damage. Coastal flooding is different from river flooding, which is generally caused by severe precipitation. Depending on the storm event, in the upper reaches of some tidal rivers, flooding from storm surge may be followed by river flooding from rain in the upland watershed. This increases the flood severity. Within the National Flood Insurance Flood Maps (discussed below), coastal flood zones identify special flood hazard areas (SFHA) which are subject to waves with heights of between 1.5 and 3 feet during a 1-percent annual chance storm (100-year event). Figure 6-1 illustrates the various SFHA zones.

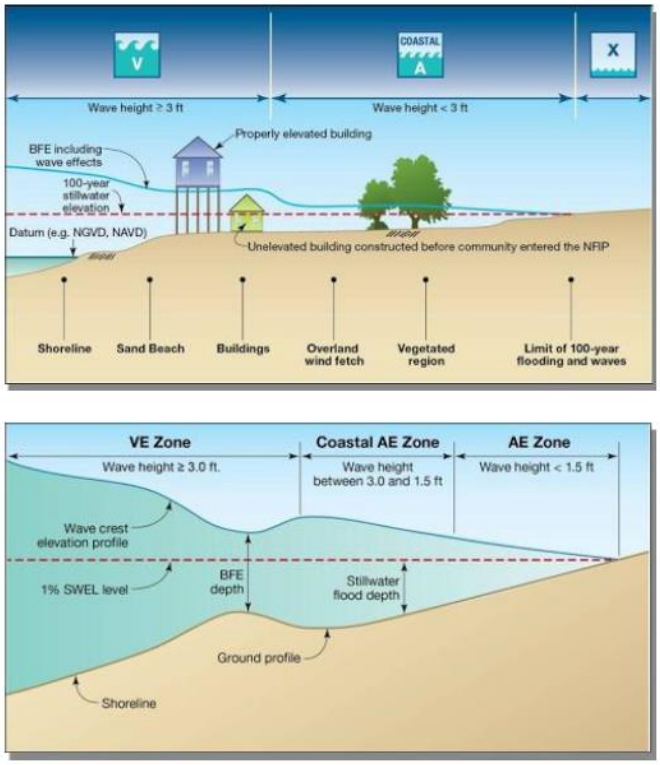


Figure 6-1 Schematic of Coastal Flood Zones within the National Flood Insurance Program

6.1.2 Dam Failure

Dam failures in the United States typically occur in one of four ways (Association of State Dam Safety Officials, 2012):

- Overtopping of the primary dam structure, which accounts for 34 percent of all dam failures, can occur due to inadequate spillway design, settlement of the dam crest, blockage of spillways, and other factors.
- Foundation defects due to differential settlement, slides, slope instability, uplift pressures, and foundation seepage can also cause dam failure. These account for 30 percent of all dam failures.
- Failure due to piping and seepage accounts for 20 percent of all failures. These are caused by internal erosion due to piping and seepage, erosion along hydraulic structures such as spillways, erosion due to animal burrows, and cracks in the dam structure.
- Failure due to problems with conduits and valves, typically caused by the piping of embankment material into conduits through joints or cracks, constitutes 10 percent of all failures.

The remaining 6 percent of U.S. dam failures are due to miscellaneous causes. Many dam failures in the United States have been secondary results of other disasters. The prominent causes are earthquakes, landslides, extreme storms, massive snowmelt, equipment malfunction, structural damage, foundation failures, and sabotage. The most likely disaster-related causes of dam failure in

the City of Everett or Snohomish County are earthquakes. The City has never experienced a dam failure.

Poor construction, lack of maintenance and repair, and deficient operational procedures are preventable or correctable by a program of regular inspections. Terrorism and vandalism are serious concerns that all operators of public facilities must plan for; these threats are under continuous review by public safety agencies.

The potential for catastrophic flooding due to dam failures led to passage of the National Dam Safety Act (Public Law 92-367). The National Dam Safety Program requires a periodic engineering analysis of every major dam in the country. The goal of this FEMA-monitored effort is to identify and mitigate the risk of dam failure so as to protect the lives and property of the public.

Washington Department of Ecology Dam Safety Program

The Dam Safety Office (DSO) of the Washington Department of Ecology regulates over 1,000 dams in the state that impound at least 10 acre-feet of water. The DSO has developed dam safety guidelines to provide dam owners, operators, and design engineers with information on activities, procedures, and requirements involved in the planning, design, construction, operation, and maintenance of dams in Washington. The authority to regulate dams in Washington and to provide for public safety is contained in the following laws:

- State Water Code (1917)—RCW 90.03
- Flood Control Act (1935)—RCW 86.16
- Department of Ecology (1970)—RCW 43.21A

Where water projects involve dams and reservoirs with a storage volume of 10 acre-feet or more, the laws provide for the Department of Ecology to conduct engineering review of the construction plans and specifications, to inspect the dams, and to require remedial action, as necessary, to ensure proper operation, maintenance, and safe performance. The DSO was established within Ecology's Water Resources Program to carry out these responsibilities.

The DSO provides reasonable assurance that impoundment facilities will not pose a threat to lives and property, but dam owners bear primary responsibility for the safety of their structures, through proper design, construction, operation, and maintenance. The DSO regulates dams with the sole purpose of reasonably securing public safety; environmental and natural resource issues are addressed by other state agencies. The DSO neither advocates nor opposes the construction and operation of dams.

U.S. Army Corps of Engineers Dam Safety Program

The U.S. Army Corps of Engineers is responsible for safety inspections of some federal and non-federal dams in the United States that meet the size and storage limitations specified in the National Dam Safety Act. The Corps has inventoried dams; surveyed each state and federal agency's capabilities, practices and regulations regarding design, construction, operation, and maintenance of the dams; and developed guidelines for inspection and evaluation of dam safety (U.S. Army Corps of Engineers, 1997).

Federal Energy Regulatory Commission Dam Safety Program

The Federal Energy Regulatory Commission (FERC) cooperates with a large number of federal and state agencies to ensure and promote dam safety. There are over 3,000 dams that are part of

regulated hydroelectric projects in the FERC program. Two-thirds of these are more than 50 years old. As dams age, concern about their safety and integrity grows, so oversight and regular inspection are important. FERC staff inspects hydroelectric projects on an unscheduled basis to investigate the following:

- potential dam safety problems
- complaints about constructing and operating a project
- safety concerns related to natural disasters
- issues concerning compliance with the terms and conditions of a license

Every five years, an independent engineer approved by the FERC must inspect and evaluate projects with dams higher than 32.8 feet, or with a total storage capacity of more than 2,000 acre-feet.

FERC staff monitors and evaluates seismic research and applies it in investigating and performing structural analyses of hydroelectric projects. FERC staff also evaluates the effects of potential and actual large floods on the safety of dams. During and following floods, FERC staff visits dams and licensed projects, determines the extent of damage, if any, and directs any necessary studies or remedial measures the licensee must undertake. The FERC publication *Engineering Guidelines for the Evaluation of Hydropower Projects* guides the FERC engineering staff and licensees in evaluating dam safety. The publication is frequently revised to reflect current information and methodologies.

The FERC requires licensees to prepare emergency action plans and conducts training sessions on how to develop and test these plans. The plans outline an early warning system if there is an actual or potential sudden release of water from a dam due to failure. The plans include operational procedures that may be used, such as reducing reservoir levels and reducing downstream flows, as well as procedures for notifying affected residents and agencies responsible for emergency management. These plans are frequently updated and tested to ensure that everyone knows what to do in emergency situations.

Hazard Ratings

The DSO classifies dams and reservoirs in a hazard rating system based solely on the potential consequences to downstream life and property that would result from a failure of the dam and sudden release of water. The following codes are used as an index of the potential consequences in the downstream valley if the dam were to fail and release the reservoir water:

- 1A = Greater than 300 lives at risk (High hazard)
- 1B = From 31 to 300 lives at risk (High hazard)
- 1C = From 7 to 30 lives at risk (High hazard)
- 2 = From 1 to 6 lives at risk (Significant hazard)
- 3 = No lives at risk (Low hazard)

The Corps of Engineers developed the hazard classification system for dam failures shown in Table 6-1. The Washington and Corps of Engineers hazard rating systems are both based only on the potential consequences of a dam failure; neither system takes into account the probability of such failures.

Table 6-1
Corps of Engineers Hazard Potential Classification

Hazard Category[a]	Direct Loss of Life[b]	Lifeline Losses[c]	Property Losses[d]	Environmental Losses[e]
Low	None (rural location, no permanent structures for human habitation)	No disruption of services (cosmetic or rapidly repairable damage)	Private agricultural lands, equipment, and isolated buildings	Minimal incremental damage
Significant	Rural location, only transient or day-use facilities	Disruption of essential facilities and access	Major public and private facilities	Major mitigation required
High	Certain (one or more) extensive residential, commercial, or industrial development	Disruption of essential facilities and access	Extensive public and private facilities	Extensive mitigation cost or impossible to mitigate

a. Categories are assigned to overall projects, not individual structures at a project.
b. Loss of life potential based on inundation mapping of area downstream of the project. Analyses of loss of life potential should take into account the population at risk, time of flood wave travel, and warning time.
c. Indirect threats to life caused by the interruption of lifeline services due to project failure or operational disruption; for example, loss of critical medical facilities or access to them.
d. Damage to project facilities and downstream property and indirect impact due to loss of project services, such as impact due to loss of a dam and navigation pool, or impact due to loss of water or power supply.
e. Environmental impact downstream caused by the incremental flood wave produced by the project failure, beyond what would normally be expected for the magnitude flood event under which the failure occurs.

Source: U.S. Army Corps of Engineers, 1995

As of 2024, the City of Everett Public Works owns 10 dams within its boundaries identified by the Washington State Department of Ecology Dam Safety Program. One additional dam, the George Culmback Dam is owned and operated by Snohomish County PUD No. 1, but is situated in the Spada Lake area, which is owned by the City of Everett outside of the city limits. That dam is home to the Henry M. Jackson Hydroelectric Project, a FERC regulatory energy producer which provides power for over 56,000 homes in the area.

Of the dams owned by the City of Everett, all are owned by Public Works and serve as freshwater reservoirs or stormwater detention ponds. Of the 10 dams, three are classified as Hazard Class 1 dams; five are Hazard Class 2 dams, and two are Hazard Class 3 dams.[22] The oldest of the dams (Everett Reservoir No. 2), was originally built in 1913, with the newest dam (Pigeon Creek No. 1 Stormwater Detention) originally constructed in 1990. The entire list is available for review at the

[22] https://fortress.wa.gov/ecy/publications/documents/94016.pdf

Washington State Department of Ecology's website at Inventory of Dams Report for Selected Washington Counties and Selected Dam Hazard Categories.

Dam Inundation

The owner of a dam is responsible for developing an Emergency Action Plan (EAP) or Incident Response Plans (IRP) for each dam that illustrates an inundation map which is used in determining exposure from a potential dam failure or breech. Review of some of the City's Emergency Action Plans (EAPs) developed for the various dams owned by the city provides the following data (note: not all dams are discussed):

- ***Reservoir 2*** - 0 homes would be affected by a breach (City of Everett Incident Response Plan – 2024 – Reservoir No. 2). (Note: Reservoir two consists of two 2.5m gallon pre-stressed concrete cylindrical reservoirs.)
- ***Reservoir 3*** – 290 homes would be affected by a major flood caused by a sudden breach (City of Everett Incident Response Plan – Reservoir No. 3, date unknown).
- ***Reservoir 4*** – 0 homes would be affected by a breach. (City of Everett Incident Response Plan – Reservoir No. 4, date unknown).
- ***Lake Chaplain North Dam***: In the Department of Ecology Open File Technical Report 97 - 01 (OFTR 97-01) titled "Chaplain Lake North and South Dams Second Periodic Inspection Report" dated February 1997, under section 4.3 Dam Breach Analysis, "Downstream from the North Dam, the flood would flow down an unnamed creek to Woods Creek, a distance of 1.2 miles. The flood would then follow Woods Creek for 12.8 miles to the confluence with the Skykomish River at the City of Monroe. The dam break would be attenuated from 22,800 CFS at the dam to 20,000 CFS at the confluence with the West Fork Woods Creek, to 16,800 CFS at Monroe. This flood would cause significant damage along Woods Creek, impacting over 50 homes" (City of Everett Incident Response Plan – Chaplain North Dam, date unknown).
- ***Lake Chaplain South Dam***: In the Department of Ecology Open File Technical Report 97 - 01 (OFTR 97-01) titled "Chaplain Lake South and South Dams Second Periodic Inspection Report" dated February 1997, under section 4.3 Dam Breach Analysis, "The flood would follow Chaplain Creek for 2.1 miles, then it would flow down the Sultan River for 6 miles through the town of Sultan to the confluence of the Skykomish River." Once the flood enters the Skykomish River flood plain, the peak discharge attenuates greatly until it is less than the 5- year flood discharge about 3 miles downstream from the Sultan River confluence. The flood routing for the South Dam ended at this point because a dam break flood would then be confined to commonly flooded areas of the Skykomish flood plain. The analysis showed that the South Dam flood would attenuate greatly along its length from 91,000cfs at the dam to 66,000cfs at the town of Sultan to 38,000cfs at the end of the routing at mile 11. However, the flood would cause considerable damage in its path impacting over 100 homes (City of Everett Incident Response Plan – Chaplain South Dam, date unknown).

In addition to reviewing the EAPs for the city-owned dams, the Planning Team also reviewed the inundation data illustrated in the Snohomish County Hazard Mitigation Plan (2020), which identified a potential 14,549 individuals (countywide) which could be affected by inundation should the Culmback Dam fail. A total of 218 structures valued at in excess of $29 million (structure only) were exposed countywide for the Culmback Dam. Approximately 4,724 people would be affected

countywide if the South Fork Tolt River Dam were to breach. Approximately 60 structures are exposed to the South Fork Tolt River Dam failure, totaled at $6.7 million. Figure 6-2 and Figure 6-3 illustrate the potential inundation zones.[23]

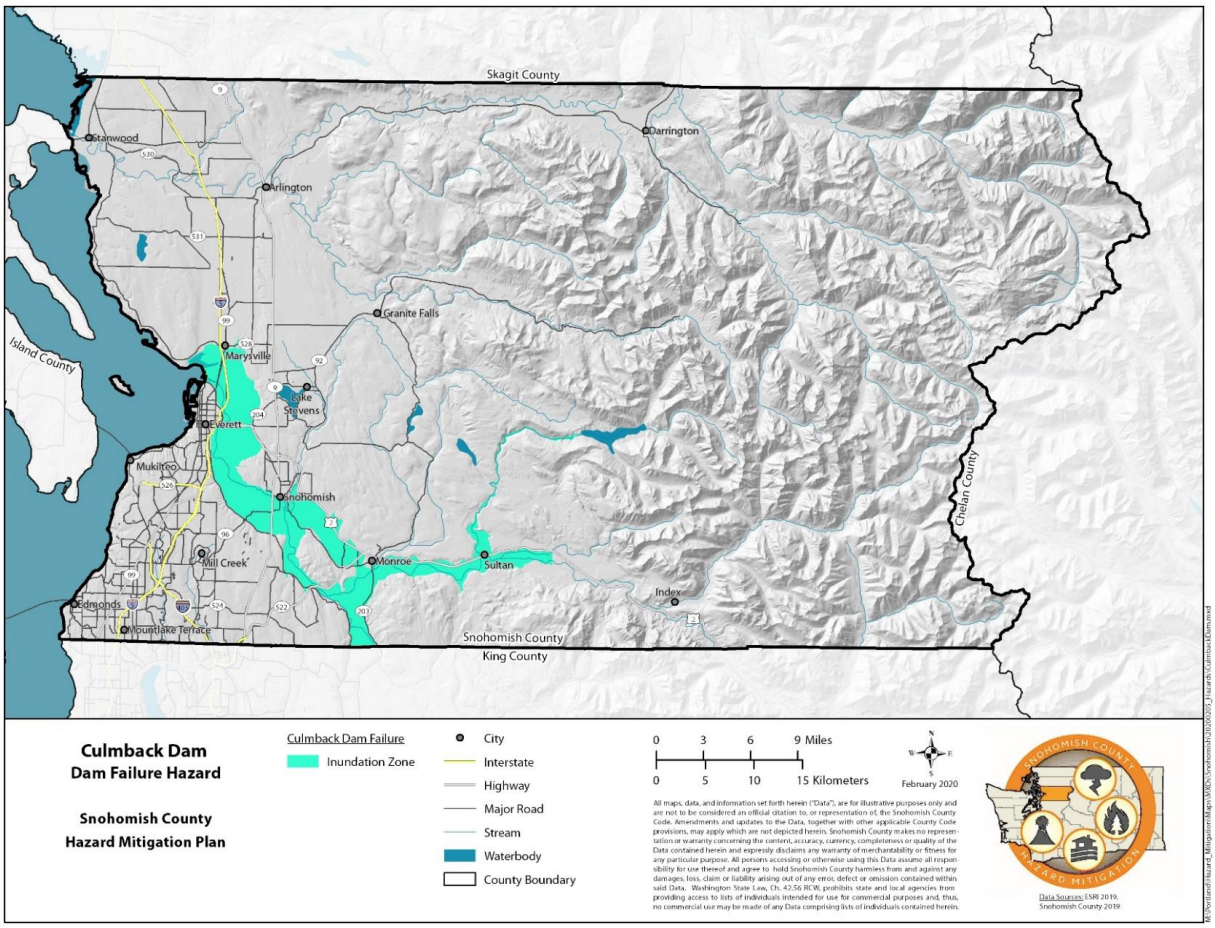


Figure 6-2 Culmback Dam Failure Inundation Zone (Snohomish County HMP, 2020)

[23] Snohomish County Hazard Mitigation Plan. (2020). Accessed 1 Nov. 2023. Available online at: SnoCo_HMP_Voume-1_09302020_Final (snohomishcountywa.gov)

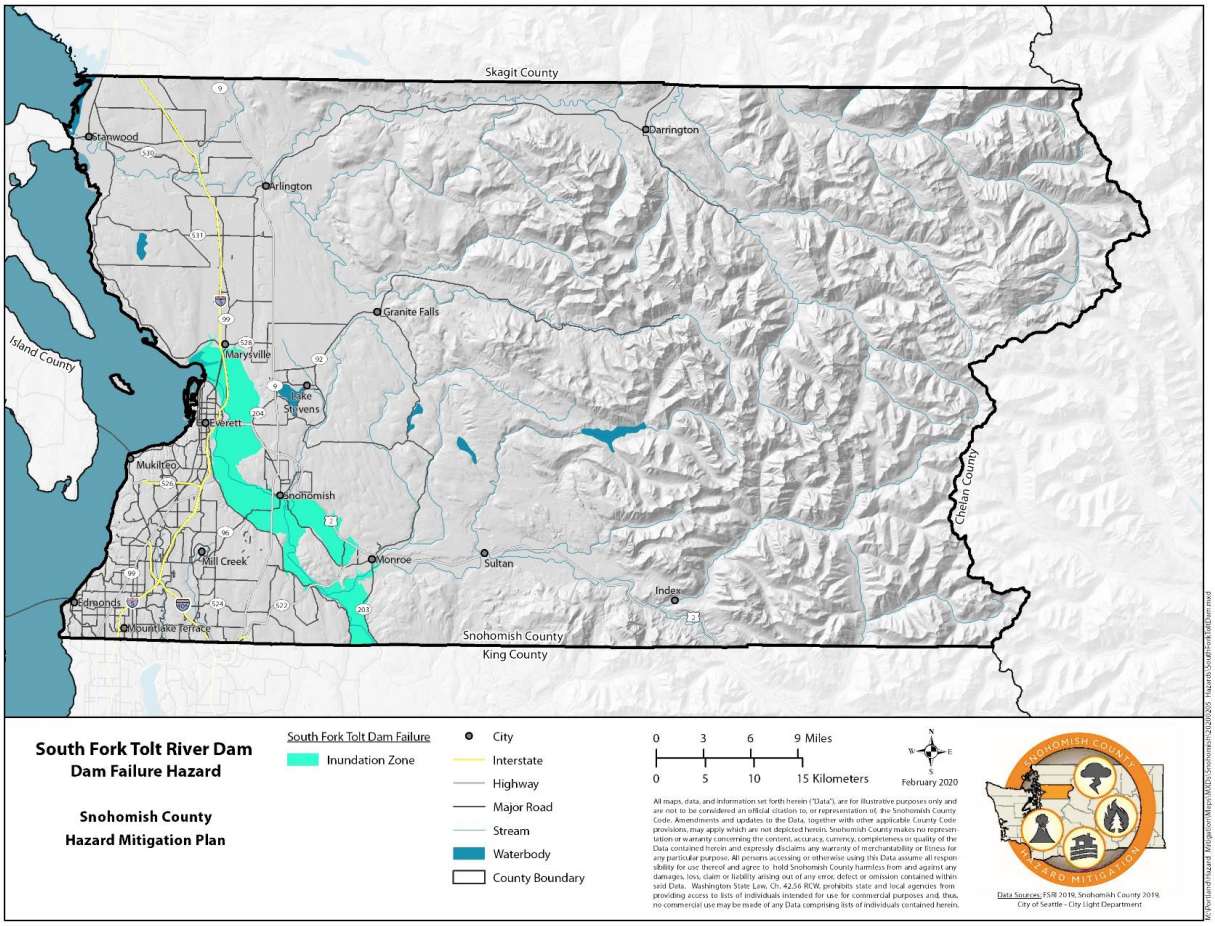


Figure 6-3 South Fork Tolt River Inundation Zone (Snohomish County HMP, 2020)

6.1.3 Measuring Floods and Floodplains

A floodplain is the area adjacent to a river, creek or lake that becomes inundated during a flood. Floodplains may be broad, as when a river crosses an extensive flat landscape, or narrow, as when a river is confined in a canyon. Connections between a river and its floodplain are most apparent during and after major flood events. These areas form a complex physical and biological system that not only supports a variety of natural resources but also provides natural flood and erosion control. When a river is separated from its floodplain with levees and other flood control facilities, natural, built-in benefits can be lost, altered, or significantly reduced.

In the case of riverine or flash flooding, once a river reaches flood stage, the flood extent or severity categories used by the NWS include minor flooding, moderate flooding, and major flooding. Each category has a definition based on property damage and public threat (NWS, 2011):

- Minor Flooding—Minimal or no property damage, but possibly some public threat or inconvenience.
- Moderate Flooding—Some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations are necessary.

- Major Flooding—Extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.

6.1.4 Flood Insurance Rate Maps

According to FEMA, flood hazard areas are defined as areas that are shown to be inundated by a flood of a given magnitude on a map (see Figure 6-4). These areas are determined using statistical analyses of records of river flow, storm tides, and rainfall; information obtained through consultation with the community; floodplain topographic surveys; and hydrologic and hydraulic analyses. Three primary areas make up the flood hazard area: the floodplains, floodways, and floodway fringes. Figure 6-5 further depicts the relationship among the various designations, collectively referred to as the special flood hazard area.

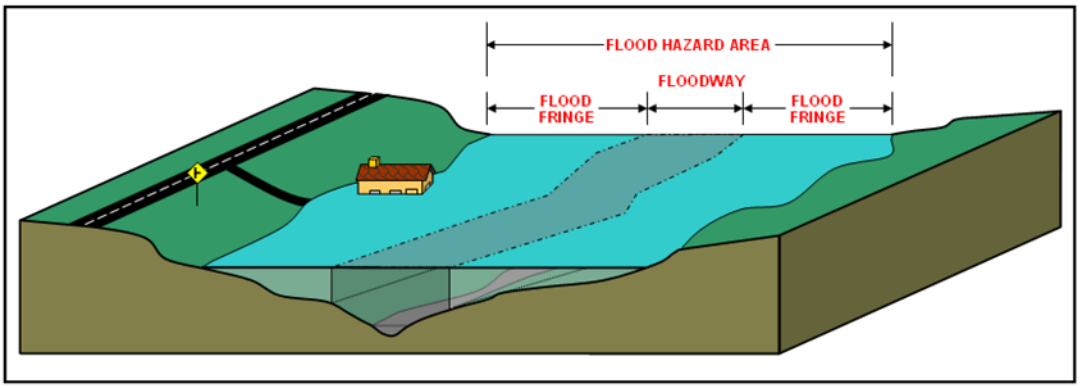


Figure 6-4 Flood Hazard Area Referred to as a Floodplain

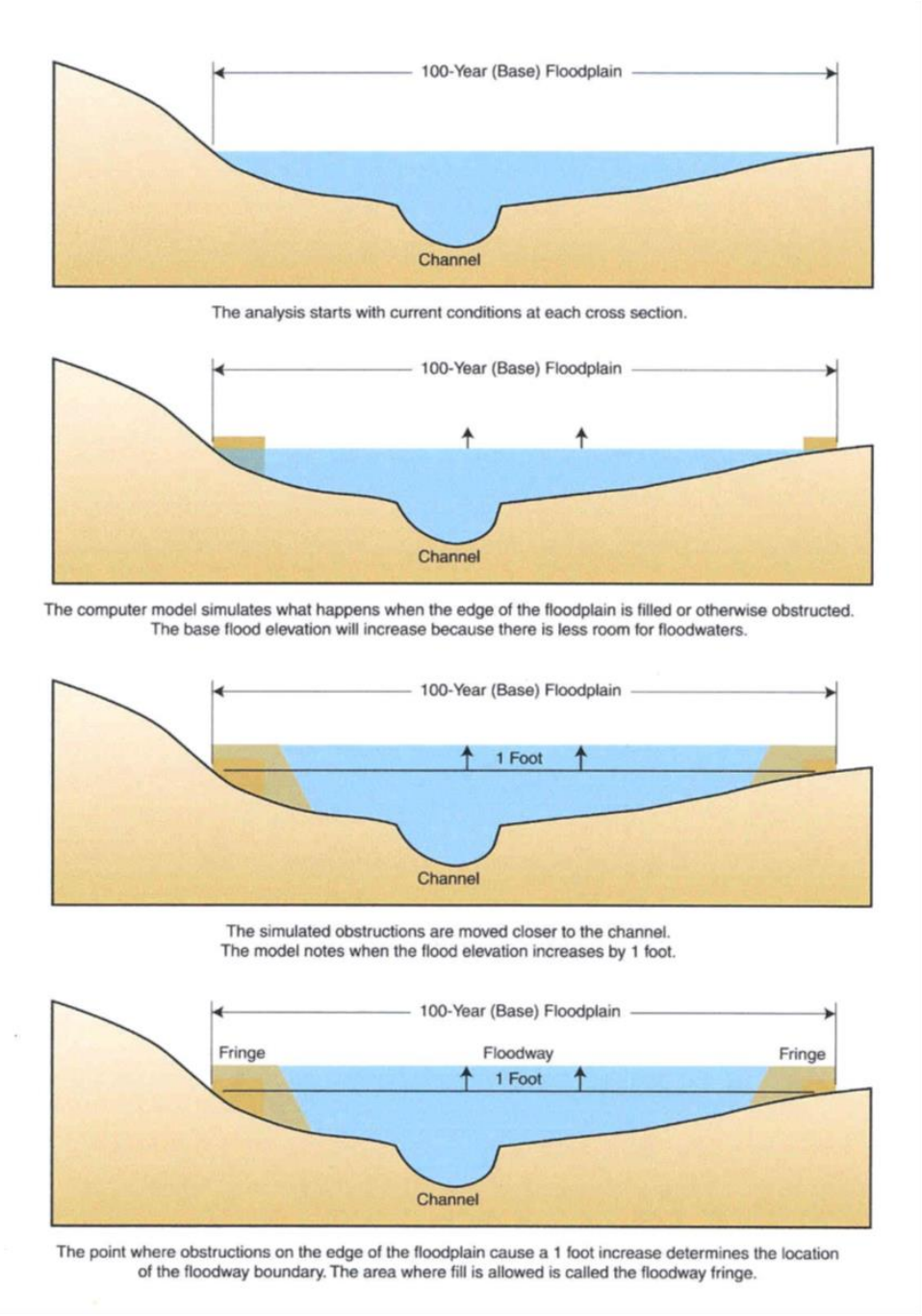


Figure 6-5 Special Flood Hazard Area

Flood hazard areas are delineated on FEMA's Flood Insurance Rate Maps (FIRM), which are official maps of a community on which the Federal Insurance and Mitigation Administration has indicated both the special flood hazard areas and the risk premium zones applicable to the community. These maps identify the special flood hazard areas; the location of a specific property in relation to the special flood hazard area; the base (100-year) flood elevation at a specific site; the magnitude of a flood hazard in a specific area; and undeveloped coastal barriers where flood insurance is not

available. The maps also locate regulatory floodways and floodplain boundaries—the 100-year and 500-year floodplain boundaries (FEMA, 2003; FEMA, 2005; FEMA, 2008).

The frequency and severity of flooding are measured using a discharge probability, which is a statistical tool used to define the probability that a certain river discharge (flow) level will be equaled or exceeded within a given year. Flood studies use historical records to determine the probability of occurrence for the different discharge levels.

The extent of flooding associated with a 1-percent annual probability of occurrence (the base flood or 100-year flood) is used as the regulatory boundary by many agencies. Also referred to as the special flood hazard area, this boundary is a convenient tool for assessing vulnerability and risk in flood-prone communities. Many communities have maps that show the extent and likely depth of flooding for the base flood. Corresponding water-surface elevations describe the elevation of water that will result from a given discharge level, which is one of the most important factors used in estimating flood damage.

A structure located within a 1 percent (100-year) floodplain has a 26 percent chance of suffering flood damage during the term of a 30-year mortgage. The 100-year flood is a regulatory standard used by federal agencies and most states to administer floodplain management programs. The 1 percent (100-year) annual chance flood is used by the NFIP as the basis for insurance requirements nationwide. FIRMs also depict 500-year flood designations, which is a boundary of the flood that has a 0.2-percent chance of being equaled or exceeded in any given year. It is important to recognize, however, that flood events and flood risk are not limited to the NFIP delineated flood hazard areas.

6.1.5 National Flood Insurance Program (NFIP)

The NFIP is a federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damage. The U.S. Congress established the NFIP with the passage of the National Flood Insurance Act of 1968 (FEMA's 2002 *National Flood Insurance Program (NFIP): Program Description*). There are three components to the NFIP: flood insurance, floodplain management and flood hazard mapping. Nearly 20,000 communities across the U.S. and its territories participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities. Community participation in the NFIP is voluntary.

For most participating communities, FEMA has prepared a detailed Flood Insurance Study. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-year flood). Base flood elevations and the boundaries of the 100- and 500-year floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principle tool for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program.

NFIP participants must regulate development in floodplain areas in accordance with NFIP criteria. Before issuing a permit to build in a floodplain, participating jurisdictions must ensure that three criteria are met:

- New buildings and those undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 100-year flood.
- New floodplain development must not aggravate existing flood problems or increase damage to other properties.
- New floodplain development must exercise a reasonable and prudent effort to reduce its adverse impacts on threatened salmonid species.

NFIP Status and Severe Loss/Repetitive Loss Properties

The City of Everett is a member in good standing in the NFIP and does incorporate regulatory authority within its land use planning. Within its NFIP ordinance and various building codes, there are definitions for "substantial damage" and "substantial improvement" with respect to improvement costs, existing violations, and historic structures, etc. The requirements of the flood ordinance also address requirements and regulations for development permits, elevation certificates, floodproofing, elevation above base flood elevation, structure anchoring, and additional provisions for flood hazard reduction, all of which are applied to all new construction and buildings undergoing substantial improvements, including those damaged as a result of flood events. The City maintains building officials that regularly inspect and enforce all building (and other) codes and construction regulations to ensure compliance with the established County codes.

As of June 30, 2023, the City of Everett had a total of 57 National Flood Insurance Policies in force, totaling approximately $22 million in coverage.[24]

Repetitive Flood Claims

Residential or non-residential (commercial) properties that have received one or more NFIP insurance payments are identified as repetitive flood properties under the NFIP. Such properties are eligible for funding to help mitigate the impacts of flooding through various FEMA programs, subject to meeting certain criteria and based on the State's Hazard Mitigation Plan maintaining a Repetitive Loss Strategy. Washington State's 2023 Hazard Mitigation Plan does contain such a strategy. Specifically, the Repetitive Loss Strategy must identify the specific actions the State has taken to reduce the number of repetitive loss properties, which must include severe repetitive loss properties, and specify how the State intends to reduce the number of such repetitive loss properties. In addition, the hazard mitigation plan must describe the State's strategy to ensure that local jurisdictions with severe repetitive loss properties take actions to reduce the number of these properties, including the development of local hazard mitigation plans.

Repetitive flood claims provide funding to reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP that have had one or more claim payments for flood damages.

[24] FEMA NFIP Data. Accessed 21 July 2023. Available online at: nfip policy-information-by-state 20230630.xlsx (live.com)

Severe Repetitive Loss Program

The severe repetitive loss program is authorized by Section 1361A of the National Flood Insurance Act (42 U.S.C. 4102a), with the goal of reducing flood damages to residential properties that have experienced *severe* repetitive losses under flood insurance coverage and that will result in the greatest savings to the NFIP in the shortest period of time. A severe repetitive loss property is a residential property that is covered under an NFIP flood insurance policy and:

- a) That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
- b) For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

For both (a) and (b) above, at least two of the referenced claims must have occurred within any 10-year period, and must be greater than 10 days apart.

As of this 2024 update, there are three properties which are Repetitive Loss properties; two single family residences and one "other" non-residential. The city has no severe repetitive loss properties.

The Community Rating System

The Community Rating System (CRS) is a voluntary program within the NFIP that encourages floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions. The city is not a CRS community. At present, the city does not have the capacity to facilitate such an endeavor.

6.2 HAZARD PROFILE

6.2.1 Extent and Location

Flooding is the most common hazard occurring in Snohomish County and the City of Everett, and is mostly due to riverine and urban flooding. Riverine flooding is seen on all main rivers and tributaries in the rural portions of Snohomish County, which does impact the flooding within the city. Tidal or storm surge flooding generally occurs along the Port and Waterfront areas.

FEMA Flood Maps

FEMA performed a new flood study for Snohomish County that resulted in the creation of new flood maps in 2020 and adopted by the county thereafter. That data supports the information contained within this hazard profile. Everett's 100- and 500-year flood areas are illustrated in Figure 6-6 and

Figure 6-7. It should be noted that only a very small area of land falls within the 500-year flood hazard area based on FEMA's FIRMs. [25]

The first NFIP Map for Snohomish County was published June 21, 1974, Initial FIRM Effective date April 3, 1978. Since then, there have been four FIRM revision dates in 1990, 1999, 2005, and June 19, 2020, with the latest Letter of Map Amendment or Revision (LOMAR) effective date being March 3, 2022, removing portions of the Port of Everett from the Special Flood Hazard Area (SFHA).

The City of Everett has Flood Zone Designations in the A, AE, VE and X zones. The city does maintain a series of levees along various waterways, although their ability to effectively provide 1-percent-annual-chance of flood protection has not been confirmed by FEMA for those purposes (FEMA, FIS 2020). Everett has identified this as a potential mitigation strategy to enhance the levees to full capacity. Detailed information containing all data in the various reports are available for download from FEMA's website, or available for viewing from the city (or Snohomish County's) Floodplain Manager.

[25] FEMA Flood Map Service Center. FIRMette (2020). Accessed 18 July 2023. Available online at: FEMA Flood Map Service Center | Search By Address

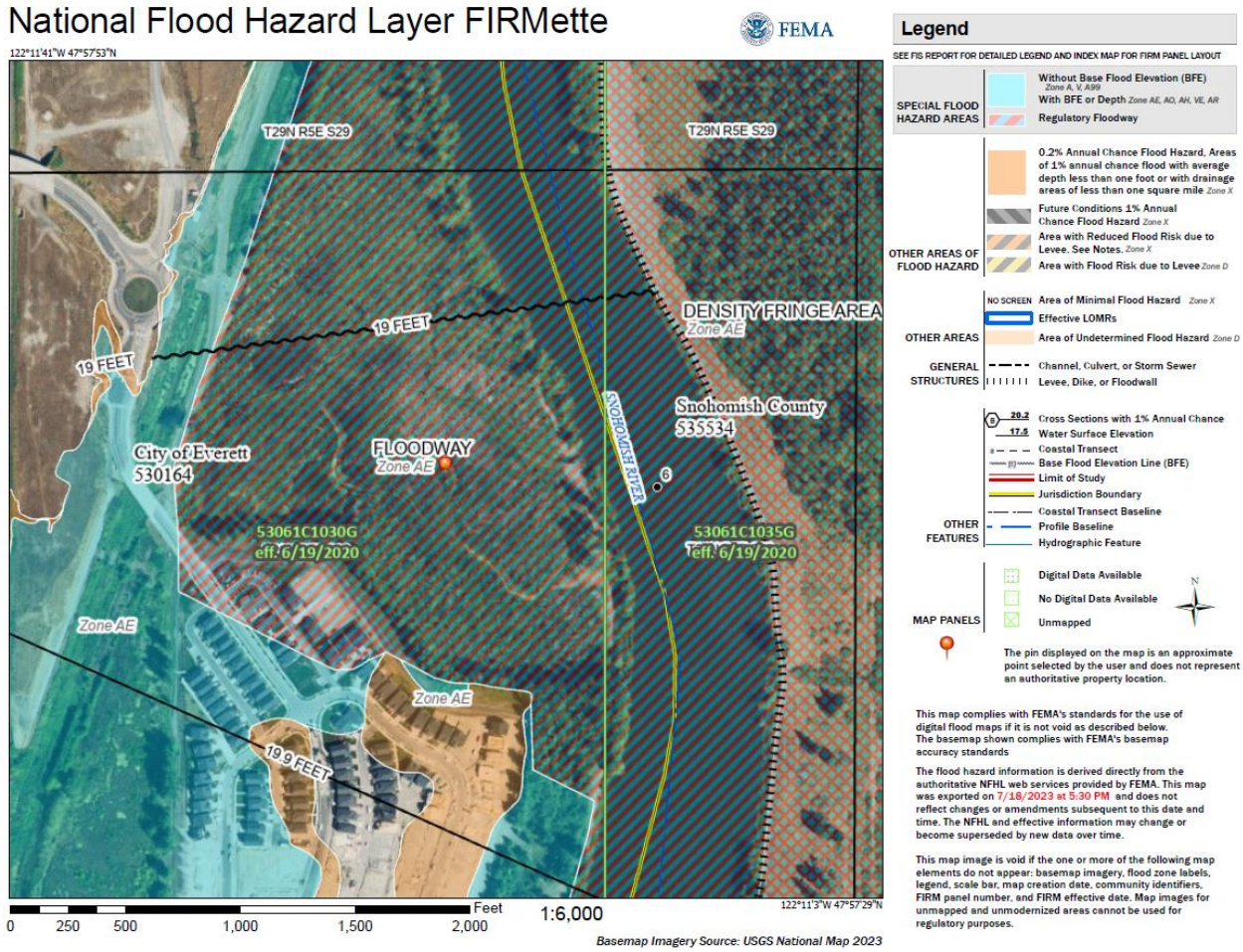


Figure 6-6 FEMA FIRMette

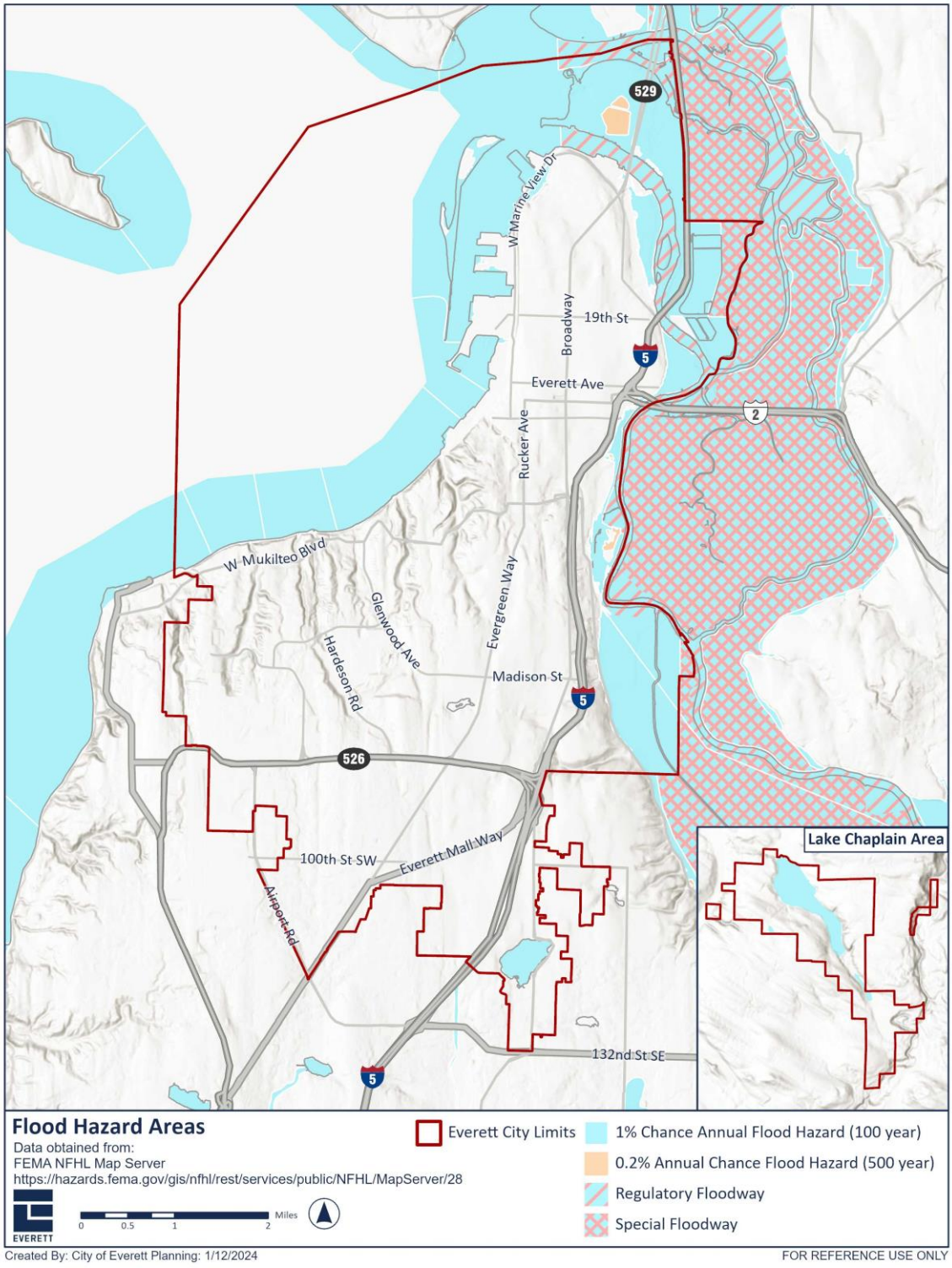


Figure 6-7 City of Everett 100-and 500-Year Flood Hazard Areas

Principal Flooding Sources

Most flooding in Everett and Snohomish County is due to river and urban flooding. Riverine flooding is seen on all main rivers and tributaries in portions of the county. Urban flooding generally occurs within the boundaries of the urban growth areas. Flooding sources identified in the various Flood Insurance Study data identify the following as potential sources which may impact Everett:[26]

- Possession Sound, reported in the June 19, 2020 STARR FIS, with the affected communities being the City of Everett, parts of unincorporated Snohomish County, and portions of the Tulalip Tribe encompassing the entire shoreline, with AE and VE zones.
- Snohomish River, reported in the September 16, 2005, FIS with affected communities being the City of Everett and unincorporated areas of Snohomish County, approximately 0.84 miles upstream of SR-522 along the confluence with Possession Sound encompassing approximately 20.8 miles of the stream.
- Steamboat Slough, reported in the September 16, 2005 FIS, including the City of Everett, City of Marysville, unincorporated areas of Snohomish County, and the Tulalip Tribe, approximately 7.1 miles above the confluence with Possession Sound in the AE zone.
- Union Slough, reported in the September 16, 2005 FIS, including the City of Everett and unincorporated areas of Snohomish County, approximately 4.5 miles upstream of the confluence of Steamboat Slough, including 5.1 miles of in the AE zone.
- Marshland Diversion Channel, approximately 6.3 miles within the AE zone, with the downstream limit confluence above the mouth of the channel.

6.2.2 Previous Occurrences

Major floods in the planning area have resulted from intense rainstorms customarily between November and April. Chapter 3, Table 3-1 identifies the declared flood events occurring in the area. It should be noted that due to the disaster typing which occurs at the FEMA level, there are other types of events which also include flooding, but due to the typing, those are not referenced within this chapter. Specific examples of this include Severe Weather events which include flooding as a hazard of impact. Viewers should also review the Severe Weather hazard profile for additional information. Table 3-2 identifies the months most often associated with flood events. Review of the data indicates December has received five federally declared flood events, followed by April with two flood events. Figure 6-8 illustrates flooding along Everett's Marine View Drive as a result of the December 27, 2022 rain event.[27]

[26] FEMA Flood Insurance Study. Volume 2 of 3. Snohomish County and Incorporated Areas. Dated June 19, 2020. Available online at: FEMA Flood Map Service Center | Search All Products

[27] **HeraldNe**t. (2022). *Rain pelts Everett, bringing flood risk and road closures*. Accessed 1 Nov. 2023. Available online at: Rain pelts Everett, bringing flood risk and road closures | HeraldNet.com

6.2.3 Severity

The severity of a flood depends not only on the amount of water that accumulates in a period of time, but also on the land's ability to manage this water. One element is the size of rivers and streams in an area; but an equally important factor is the land's absorbency. When it rains, soil acts as a sponge. When the land is saturated or frozen, infiltration into the ground slows and any more water that accumulates must flow as runoff (Harris, 2001).

The principal factors affecting flood damage are flood depth and velocity. The deeper and faster flood flows become, the more damage they can cause. Shallow flooding with high velocities can cause as much damage as deep flooding with slow velocity. This is especially true when a channel migrates over a broad floodplain, redirecting high velocity flows and transporting debris and sediment. Flood severity is often evaluated by examining peak discharges.

The Snohomish River, a primary cause of flooding in the city, flows twenty-three miles from the confluence of the Snoqualmie and the Skykomish Rivers at the city of Monroe to Port Gardner Bay in Everett. The drainage basin extends from an elevation of 8,000 feet in the Cascade Mountains to sea level at Everett. Tidal action affects river stages in the lower thirteen miles. The river's gradient is approximately one foot per mile. At bank-full the width of the river channel varies from 35 to 500 feet.

6.2.4 Frequency

Everett and Snohomish County experience some level of flooding on an annual basis. What customarily constituted the "normal" flood season of November through April in Western Washington does not necessarily apply to the Snohomish River due to snowpack and snowmelt.

Large floods that have caused property damage have occurred 11 times during the time period 1953 through 2022. Frequency for this calculation was based on the period covering 1953 to 2022, and the number of events averaged based on years and number of floods. It should be noted that this does not reflect the recurrence interval, as that calculation is specific on varying factors, such as the incident type, discharge rate, etc., and that type of analysis was not included in this process. Based on this method of assessment, the return interval is 6.36 years, or a 15.71 percent chance of some level of a flood event occurring every year.

Figure 6-8 December 27, 2022 Flooding Along Marine View Drive in Everett WA

6.3 VULNERABILITY ASSESSMENT

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For this planning purpose, the flood hazard areas identified include the 100- and 500-year floodplain.

6.3.1 Overview

All types of flooding can cause widespread damage throughout rural and urban areas, including but not limited to: water-related damage to the interior and exterior of buildings; destruction of electrical and other expensive and difficult-to-replace equipment; injury and loss of life; proliferation of disease vectors; disruption of utilities, including water, sewer, electricity, communications networks and facilities; loss of agricultural crops and livestock; placement of stress on emergency response and healthcare facilities and personnel; loss of productivity; and displacement of persons from homes and places of employment.

Warning Time

Due to the sequential pattern of meteorological conditions needed to cause serious flooding, it is unusual for a flood to occur without some warning. Warning times for floods can be between 24 and 48 hours. Flash flooding can be less predictable, but potential hazard areas can be warned in advanced of potential flash flooding danger.

6.3.2 Impact on Life, Health, and Safety

The impact of flooding on life, health and safety is dependent upon several factors including the severity of the event and whether or not adequate warning time is provided to residents. Exposure represents the population living in or near floodplain areas that could be impacted should a flood event occur. Additionally, exposure should not be limited to only those who reside in a defined hazard zone, but everyone who may be affected by the effects of a hazard event (e.g., people are at risk while

traveling in flooded areas, or their access to emergency services is compromised during an event). The degree of that impact will vary and is not measurable.

Of concern within the planning area is the number of employees for the various large economic hubs within Everett who can be impacted during periods of flooding. This is particularly true of the waterfront and port areas, which could be impacted. Everett supports a large economy within the planning area, with many employees traveling into the city from other areas.

To estimate the population exposed to the 1 percent and 0.2 percent annual chance (100- and 500-year) flood events, the DFIRM floodplain boundaries were intersected with residential parcels (based off of the city's parcel data) whose centers intersect the floodplain. Total population was estimated by multiplying the number of residential structures by the average city household size of 2.5 persons per household. Table 6-2 identifies the estimated population located within these flood zones.

Table 6-2
Population Exposed within Flood Hazard Areas

Jurisdiction	Number Residential Structures Impacted*	Population in the 1% annual chance event (100- Year) Flood Boundary	Population in the 0.2% annual chance (500-Year) Flood Boundary
City of Everett	40 Single Family	103	0

**Based on 2023 Parcel data for residential structures within the 100-year and 500-year floodplains and an estimate of 2.5 persons per residential structure*

Of the population exposed, the most vulnerable include the economically disadvantaged and the population over the age of 65. Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on the net economic impact on their family. The population over the age of 65 is also more vulnerable because they are more likely to seek or need medical attention which may not be available due to isolation during a flood event and they may have more difficulty evacuating.

The number of injuries and casualties resulting from flooding is generally limited based on advance weather forecasting, blockades, and warnings. Therefore, injuries and deaths generally are not anticipated if proper warning and precautions are in place. Ongoing mitigation efforts should help to avoid the most likely cause of injury, which results from persons trying to cross flooded roadways or channels during a flood.

6.3.3 Impact on Property

Table 6-3 identifies the number of acres within the 100- and 500-year flood hazard areas, as well as identifying the total number of structures within the SFHAs which would be inundated by the 1- and 0.2%-percent-annual-chance flood, and their associated losses.

Table 6-3 Acres in 100 and 500 Year Flood Hazard Areas for Jurisdiction's Boundary			
Flood Zone	**Acres***	**Number of Structures**	**Value of Structures**
100 Year Flood Zone - (Includes Zones A, AE, AH, AO, VE)	7447.31	287	$174,514,900.00
500-Year Flood or Zone X (area protected by Levee)	103.57	9	$ 4,571,800.00
*Includes all parcels/structures which intersect (at any point or to any level) any/all flood hazard areas.			

6.3.4 Impact on Critical Facilities and Infrastructure

In addition to considering general building stock at risk, the risk of flood to critical facilities and utilities was evaluated. Exposure analysis was utilized based on FEMA's 2020 flood maps and the 2024 critical facilities identified for this update. Table 6-4 and Table 6-5 identify the critical facilities and infrastructure located in the FEMA identified flood hazard areas. Figure 6-9 illustrates all critical facilities and proximity to the 100- and 500-year flood zones.

Also potentially impacted from large floods are portions of State Route 2, and the BNSF Railroad due to the damaging effect of the floodwaters on supports. These may become weak or may suffer damage when exposed to heavy pressure from river-borne debris and high velocity waters. I-5 is also vulnerable where it crosses over the Snohomish River to the north of the city. There are water transmission lines which run from Sultan to Everett across streams, rivers and floodplains. Fortunately, the majority of these lines are protected by Snohomish County Diking Districts 1 and 6.

The wastewater treatment facility located on Smith Island, northeast of the city may be vulnerable to flooding damage. To help mitigate flood damage, the facility does have a dike surrounding its perimeter as part of Diking District 5. There may still exist the potential for wastewater to discharge into the river should the facility flood. While not owned by the city, the BNSF Railway, as it crosses north around Everett, is also vulnerable to flooding. The railway crosses more flood-prone lands as it heads east into the county. The Port of Everett is also at risk from flooding from the Snohomish River and from coastal flooding.

Table 6-4
Critical Facilities in the 100-Year Floodplain

Jurisdiction	Medical and Health Services	Government Function	Protective	Hazardous Materials*	Shelter	**Total**
City of Everett	0	0	0	7	0	**7**
*2023 Tier II Facilities from DOE						

Table 6-5
Critical Infrastructure in the 100-Year Floodplain

Jurisdiction	Water Supply	Wastewater/ Stormwater	Power	Communications	Other	**Total**
City of Everett	3	19	0	0	5	**27**
Other= Animal shelter, landfill gas facility, shell houses, fishing pier						

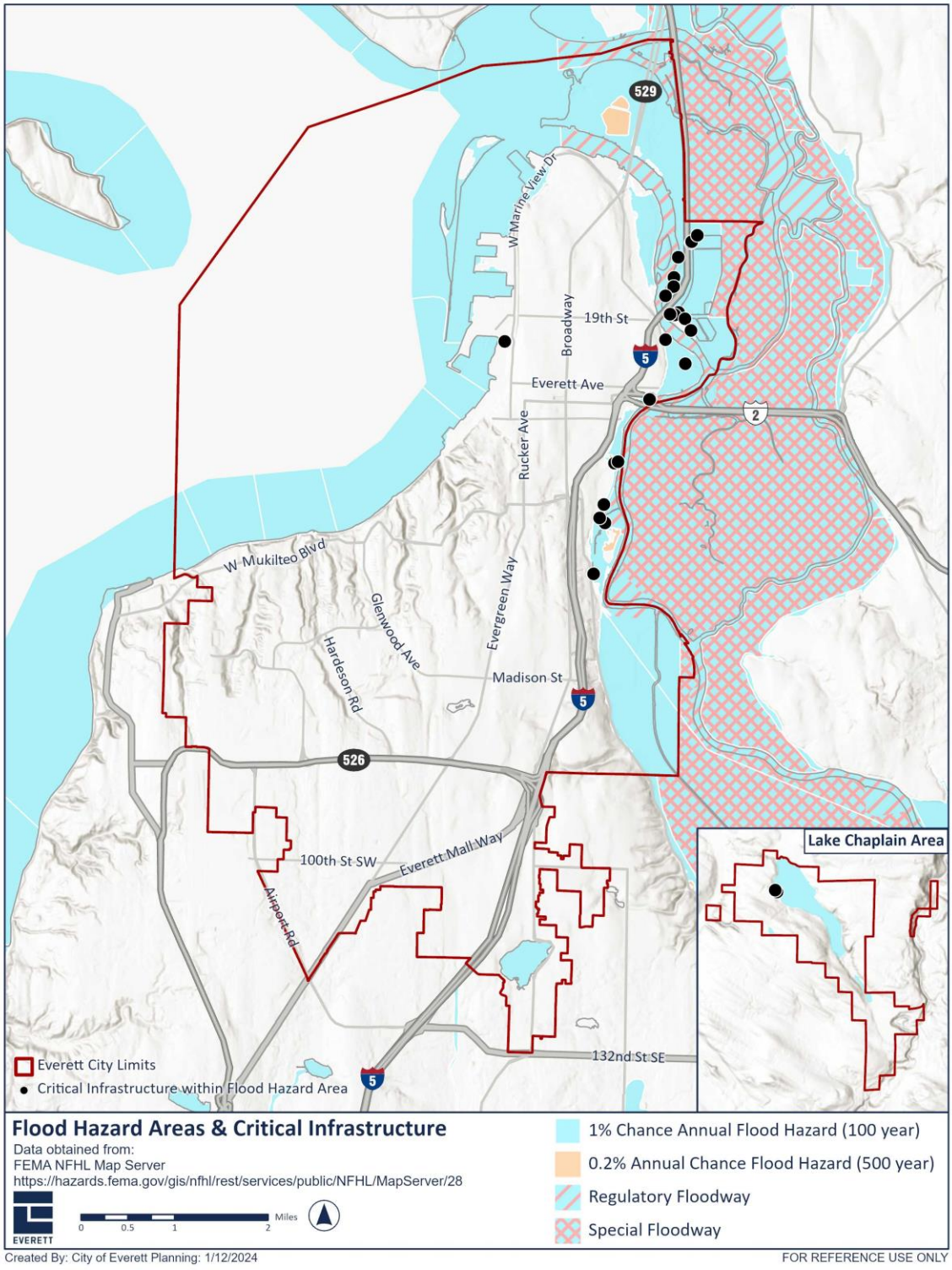


Figure 6-9 Critical Facility Proximity to 100- and 500-Year Flood Hazard Areas

In cases where short-term functionality is impacted by a hazard, other facilities of neighboring municipalities may need to increase support response functions during a disaster event. Mitigation planning should consider means to reduce impact on critical facilities and ensure sufficient emergency and school services remain when a significant event occurs.

6.3.5 Impact on Economy

Impact on the economy related to a flood event in Everett would include loss of property, associated tax revenue (real estate), as well as potential loss of businesses and the associated revenues generated from those businesses, both in taxes and on individual income loss of spending. Depending on the duration between onset of the event and recovery, businesses within the area may not be able to sustain the economic loss of their business being disrupted for an extended period of time. Historical data has demonstrated that those businesses impacted by a disaster are less likely to reopen after an event.

6.3.6 Impact on Environment

Flooding is a natural event, and floodplains provide many natural and beneficial functions. Nonetheless, with human development factored in, flooding can impact the environment in negative ways.

Because they border water bodies, floodplains have historically been popular sites to establish settlements. Human activities tend to concentrate in floodplains for a number of reasons: water is readily available; land is fertile and suitable for farming; transportation by water is easily accessible; and land is flatter and easier to develop. But human activity in floodplains frequently interferes with the natural function of floodplains. It can affect the distribution and timing of drainage, thereby increasing flood problems. Human development can create local flooding problems by altering or confining drainage channels. This increases flood potential in two ways: it reduces the stream's capacity to contain flows, and it increases flow rates or velocities downstream during all stages of a flood event. Migrating fish can wash into roads or over dikes into flooded fields, with no possibility of escape.

Pollution from roads, such as oil, and hazardous materials can wash into rivers and streams. During floods, these can settle onto normally dry soils, polluting them for agricultural uses. Human development such as bridge abutments and levees, and logjams from timber harvesting can increase stream bank erosion, causing rivers and streams to migrate into non-natural courses.

Floodplains can support ecosystems that are rich in quantity and diversity of plant and animal species. A floodplain can contain 100 or even 1000 times as many species as a river. Wetting of the floodplain soil releases an immediate surge of nutrients: those left over from the last flood, and those that result from the rapid decomposition of organic matter that has accumulated since then. Microscopic organisms thrive and larger species enter a rapid breeding cycle. Opportunistic feeders (particularly birds) move in to take advantage. The production of nutrients peaks and falls away quickly; however, the surge of new growth endures for some time. This makes floodplains particularly valuable for agriculture. Species growing in floodplains are markedly different from those that grow outside floodplains. For instance, riparian trees (trees that grow in floodplains) tend to be very tolerant of root disturbance and very quick-growing compared to non-riparian trees.

6.3.7 Impact from Climate Change

Global climate change is expected to result in warmer and wetter winters and are projected to increase flooding frequency in most Western Washington river basins. Future floods are expected to exceed the capacity and protective abilities of many existing flood protection facilities, threatening lives, property, major transportation corridors, communities, and regional economic centers.

Changes in Hydrology

Use of historical hydrologic data has long been the standard of practice for designing and operating water supply and flood protection projects. For example, historical data are used for flood forecasting models and to forecast snowmelt runoff for water supply. This method of forecasting assumes that the climate of the future will be similar to that of the period of historical record. However, the hydrologic record cannot be used to predict changes in frequency and severity of extreme climate events such as floods. Going forward, model calibration or statistical relation development must happen more frequently, new forecast-based tools must be developed, and a standard of practice that explicitly considers climate change must be adopted. Climate change in many areas is already impacting water resources, and resource managers have observed the following:

- Historical hydrologic patterns can no longer be solely relied upon to forecast the water future.
- Precipitation and runoff patterns are changing, increasing the uncertainty for water supply and quality, flood management and ecosystem functions.
- Extreme climatic events will become more frequent, necessitating improvement in flood protection, drought preparedness, and emergency response.

The amount of snow is critical for water supply and environmental needs, but so is the timing of snowmelt runoff into rivers and streams. Rising snowlines caused by climate change will allow more mountain area to contribute to peak storm runoff. High frequency flood events (e.g. 10-year floods) in particular will likely increase with a changing climate. Along with reductions in the amount of the snowpack and accelerated snowmelt, scientists project greater storm intensity, resulting in more direct runoff and flooding. Changes in watershed vegetation and soil moisture conditions will likewise change runoff and recharge patterns. As stream flows and velocities change, erosion patterns will also change, altering channel shapes and depths, increased sedimentation will occur, and affecting habitat and water quality. With potential increases in the frequency and intensity of wildfires due to climate change, there is potential for more floods following fire, which increase sediment loads and water quality impacts.

As hydrology changes, what is currently considered a 100-year flood may strike more often, leaving many communities at greater risk. Planners will need to factor a new level of safety into the design, operation, and regulation of flood protection facilities such as dams, bypass channels and levees, as well as the design of local wastewater treatment facilities and storm drains.

Dams

Dams are designed partly based on assumptions about a river's flow behavior, expressed as hydrographs. Changes in weather patterns can have significant effects on the hydrograph used for the design of a dam. If the hygrograph changes, it is conceivable that the dam can lose some or all of its designed margin of safety, also known as freeboard. If freeboard is reduced, dam operators may be forced to release increased volumes earlier in a storm cycle in order to maintain the required margins of safety. Such early releases of increased volumes can increase flood potential downstream.

Throughout the west, communities downstream of dams are already experiencing increases in stream flows from earlier releases from dams.

Dams are constructed with safety features known as "spillways." Spillways are put in place on dams as a safety measure in the event of the reservoir filling too quickly. Spillway overflow events, often referred to as "design failures," result in increased discharges downstream and increased flooding potential. Although climate change will not increase the probability of catastrophic dam failure, it may increase the probability of design failures.

Sea Level Rise

Sea level and temperature are interrelated (U.S. EPA, 2016). Warmer temperatures result in the melting of glaciers and ice sheets. This melting means that less water is stored on land and, thus, there is a greater volume of water in the oceans. Water also expands as it warms, and the heat content of the world's oceans has been increasing over the last several decades. The impacts of sea level rise could include increased coastal community flooding, coastal erosion and landslides, seawater well intrusion, acidification of waters, and lost wetlands and estuaries.

6.4 FUTURE DEVELOPMENT TRENDS

Everett is subject to the provisions of the Washington State Growth Management Act (GMA), which regulates identified critical areas. The city's critical areas regulations include frequently flooded areas, defined as the FEMA 100-year mapped floodplain. The GMA establishes review and evaluation programs that monitor commercial, residential, and industrial development and the densities at which this development has occurred under each jurisdiction's GMA comprehensive plan and development regulations. An evaluation is required at least every five years of the sufficiency of remaining land within urban growth areas to accommodate projected residential, commercial, and industrial growth at development densities observed since the adoption of GMA plans. Identified as the *buildable lands report*, it compares planned versus actual urban densities in order to determine whether original plan assumptions were accurate. In addition, the city has developed shoreline management practices, which also support mitigation efforts with respect to reduced flooding and building more resilient communities. Section 3 of this plan discusses the city's land use designations, including identification of critical areas. Since completion of the 2018 HMP, the city has updated its Shoreline Master Program (2019) and is currently in the process of updating its Comprehensive Land Use Plan.

A growing population may increase the number of people and infrastructure exposed to the flood risk, potentially leading to health hazards and potential displacement. In some cases, this may also cause loss of life, although with advanced warning of potential flood incidents, exposure would be limited in this respect. Much of the area is already built out, but additional roadways supporting new development would increase impervious surface area, thereby reducing natural infiltration, increasing runoff, while also reducing natural water storage areas and ecosystems. However, the floodplain portions of the planning area are regulated under the GMA and the NFIP. Development will occur in the floodplain; however, it will be regulated such that the degree of risk will be reduced through building standards and performance measures. As NFIP map updates have occurred, those updates will continue to be utilized to further expand, modify, and enhance planning efforts occurring within the city. Such measures will help to effectively manage anticipated growth in population, ensuring that as density increases, vulnerability to the population is mitigated.

6.5 ISSUES

The City of Everett does have portions of its land mass which have the potential to flood, generally in response to a succession of winter rainstorms. Storm patterns of warm, moist air are normal events, usually occurring between November and April can cause severe flooding in the planning area, although flooding can occur at any time. The issue of high tides, particularly in light of anticipated sea level rise, will continue to be of issue. Such issues would be of even greater concern if the high tide occurs in conjunction with a wind-driven event.

A worst-case scenario for a flood event within the city would be a series of storms that result in high accumulations of runoff surface water within a relatively short time period. This could overwhelm response capabilities within the city, and surrounding areas of the county. Major roads could be blocked as has previously occurred, preventing critical access for residents and critical functions in portions of the planning region. High in-channel flows could cause watercourses to scour, possibly washing out roads or impacting bridges, creating more isolation problems, and further exacerbating erosion along the coastline. In the case of multi-basin flooding, repairs could not be made quickly enough to restore critical facilities and infrastructure. While human activities influence the impact of flooding events, human activities can also interface effectively with a floodplain as long as steps are taken to mitigate the activities' adverse impacts on floodplain functions.

The following flood-related issues are relevant to the planning area:

- The risk associated with the flood hazard overlaps the risk associated with other hazards such as severe storm events, high tides, earthquakes, and landslides. This provides an opportunity to seek mitigation goals with multiple objectives to reduce the risk of multiple hazards.
- Climate change will impact flood conditions throughout the city.
- More information is needed on flood risk with respect to structure type, year built, elevation, etc., to support the concept of risk-based analysis of capital projects.
- The city feels that there are areas protected by dikes and/or levees, but the capabilities of those protection devices need further examination to determine their effectiveness.
- There needs to be a sustained effort to gather historical damage data, such as high-water marks on structures and damage reports, to measure the cost-effectiveness of future mitigation projects.
- Ongoing flood hazard mitigation will require funding from multiple sources.
- There needs to be a coordinated hazard mitigation effort between the county, the city, and the Washington Department of Transportation as it relates to flooding and flood induced issues and the potential for areas to experience isolation as a result of limited ingress and egress to certain areas of the city (and county) during storm/flooding events.
- Floodplain residents need to continue to be educated about flood preparedness and the resources available during and after floods.
- The promotion of flood insurance as a means of protecting property from the economic impacts of frequent flood events should continue. Since completion of the last plan, the city has experienced a reduction in the number of policies in force.

- Existing floodplain-compatible uses such as agricultural and open space need to be maintained.

6.6 RESULTS

Based on review and analysis of the data, the Planning Team has determined that the probability for impact from Flood throughout the area is highly likely. The area experiences some level of flood almost annually. Historically, the impact of flooding to Everett-area properties has been low, even though there are some properties within the floodplain. Continuing this low level of risk is dependent upon maintaining the low density and low value of projects built within floodplain areas, and upon constructing new projects in a way that mitigates their flood risk (Everett HMP, 2018). While structural damage may vary due to flood depths and existing floodplain management regulations, there is a fairly high rate of property ownership that does not have flood insurance, with only 57 NFIP insured structures in place. Based on the potential impact, the Planning Team determined the CPRI score to be 2.85, with overall vulnerability determined to be a high level.

CHAPTER 7. LANDSLIDE

DEFINITIONS

Landslide—The movement of masses of loosened rock and soil down a hillside or slope. Such failures occur when the strength of the soils forming the slope is exceeded by the pressure, such as weight or saturation, acting upon them.

Mass Movement—A collective term for landslides, debris flows, falls and sinkholes.

Mudslide (or Mudflow or Debris Flow)—A river of rock, earth, organic matter and other materials saturated with water.

A landslide is defined as the sliding movement of masses of loosened rock and soil down a hillside or slope. Such failures occur when the strength of the soils forming the slope is exceeded by the pressure acting upon them, such as weight or saturation. Earthquakes provide many times more energy than needed to initiate soil liquefaction, enhancing not only the probability of a landslide, but also its magnitude. Washington State climate, topography, and geology create a perfect setting for landslides, which occur in the state every year.

In Western Washington, most landslides are triggered during fall and winter after storms dump large amounts of rain or snow (Washington Department of Natural Resources, 2015). Landslides can be shallow or deep. Shallow landslides typically occur in winter in Western Washington and summer in Eastern Washington, but are possible at any time. They often form as slumps along roadways or fast-moving debris flows down valleys or concave topography. They are commonly called "mudslides" by the news media. Deep-seated landslides are often slow moving, but can cover large areas and devastate infrastructure and housing developments.

A mudslide or debris flow is a fast-moving fluid mass of rock fragments, soil, water, and organic material with more than half of the particles being larger than sand size. Generally, these types of movement occur on steep slopes or in gullies and can travel long distances. Typically, debris flows result from unusually high rainfall, or rain-on-snow events.

A rock fall is the fall of newly detached segments of bedrock of any size from a cliff or steep slope. The rock descends by free fall, bouncing, or rolling. Movements are very rapid to extremely rapid, and may not be preceded by minor movements.

7.1 GENERAL BACKGROUND

A landslide, or a mass of rock, earth or debris moving down a slope, may be minor or very large, and can move at slow to very high speeds. They can be initiated by storms, earthquakes, fires, volcanic eruptions, or human modification of the land.

Mudslides (or mudflows or debris flows) are rivers of rock, earth, organic matter, and other soil materials saturated with water. They develop in the soil overlying bedrock on sloping surfaces when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt. Water pressure in the pore spaces of the material increases to the point that the internal strength of the soil is drastically weakened. The soil's reduced resistance can then easily be overcome by gravity, changing the earth into a flowing river of mud or "slurry." A debris flow or mudflow can move rapidly down slopes or through channels, and can strike with little or no warning at avalanche speeds. The slurry can travel miles from its source, growing as it descends, picking up trees, boulders, cars, and anything else in its path. Although these slides behave as fluids, they pack many times the hydraulic

force of water, due to the mass of material included in them. Locally, they can be some of the most destructive events in nature.

All mass movements are caused by a combination of geological and climate conditions, as well as the encroaching influence of urbanization. Vulnerable natural conditions are affected by human residential, agricultural, commercial, and industrial development and the infrastructure that supports it.

The occurrence of a landslide is dependent on a combination of site-specific conditions and influencing factors. Most commonly, the factors that contribute to landslides fall into four broad categories:

- Climatic or hydrologic (rainfall or precipitation)
- Geomorphic (slope form and conditions, e.g., slope, shape, height, steepness, vegetation, and underlying geology)
- Geologic/geotechnical/hydrogeological (groundwater)
- Human activity

Change in slope of the terrain, increased load on the land, shocks and vibrations, change in water content, groundwater movement, frost action, weathering of rocks, and removing or changing the type of vegetation covering slopes are all contributing factors. In general, landslide hazard areas are where the land has characteristics that contribute to the risk of the downhill movement of material, such as the following:

- Areas identified as having slopes greater than 33 percent
- A history of landslide activity or movement during the last 10,000 years
- Stream or wave activity, which has caused erosion, undercut a bank, or cut into a bank to cause the surrounding land to be unstable
- The presence of an alluvial fan, indicating vulnerability to the flow of debris or sediments
- The presence of impermeable soils, such as silt or clay, which are mixed with granular soils such as sand and gravel

Flows and slides are commonly categorized by the form of initial ground failure. Common types of slides are shown on Figure 7-1 through Figure 7-4 (Washington State Department of Ecology, 2014). The most common is the shallow colluvial slide, occurring particularly in response to intense, short-duration storms, where antecedent conditions are prevalent (Baum, et. al, 2000). The largest and most destructive are deep-seated slides, although they are less common.

Deep-seated landslides are much larger than shallow landslides and can occur at any time of the year. Soil degradation can happen over years, decades, and centuries with little to no warning to people above ground. The most notable and deadliest deep-seated landslide event in the United States was SR 530 (also known as the Oso Landslide) that took the lives of 43 people in Oso, (Snohomish County) Washington, in 2014. That area is approximately 31 miles southeast of Everett.

Slides and earth flows can pose serious hazard to property in hillside terrain. They tend to move slowly and thus rarely threaten life directly. When they move—in response to such changes as increased water content, earthquake shaking, addition of load, or removal of downslope support—

they deform and tilt the ground surface. The result can be destruction of foundations, offset of roads, breaking of underground pipes, or overriding of downslope property and structures.

Erosion is the process by which material is removed from a region of the earth's surface. It can occur by weathering and transport of solids (sediment, soil, rock, and other particles) in the natural environment. This also leads to the deposition of these materials elsewhere, which can increase the impacts from flood events. Erosion usually occurs as a result of transport of solids by wind, water or ice, and by down-slope creep of soil and other material under the force of gravity, similar to landslides. It can also be caused by animals burrowing, reducing soil stability.

Although erosion is a natural process, as with landslides, human land use policies have an effect on erosion, especially industrial agriculture, deforestation, and urban sprawl. Land that is used for industrial agriculture generally experiences a significantly greater rate of erosion than land with natural vegetation or land used for sustainable agricultural. This is particularly true if tillage is used in farm practices, which reduces vegetation cover on the surface of the soil and disturbs both soil structure and plant roots that would otherwise hold the soil in place.

Improved land use practices can limit erosion, using techniques such as terracing or terrace-building, no or limited tilling, limited logging or replanting after logging, and the planting of vegetation to limit erosion through ground cover.

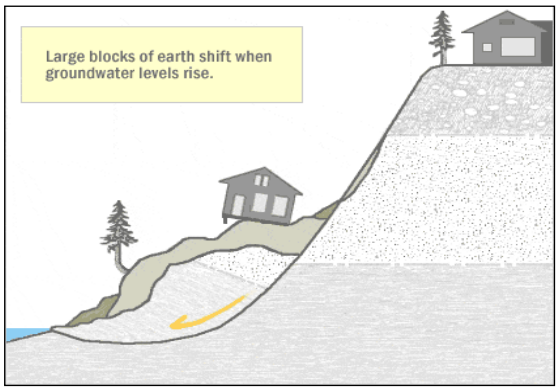


Figure 7-1 Deep Seated Slide

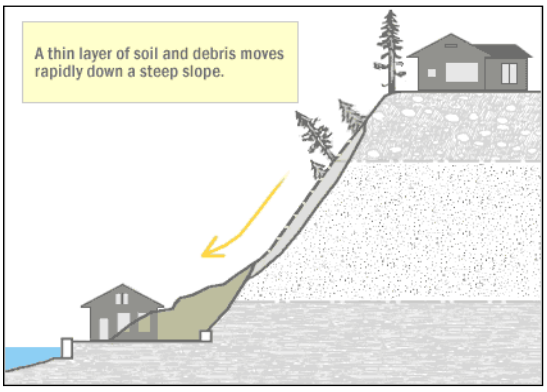


Figure 7-2 Shallow Colluvial Slide

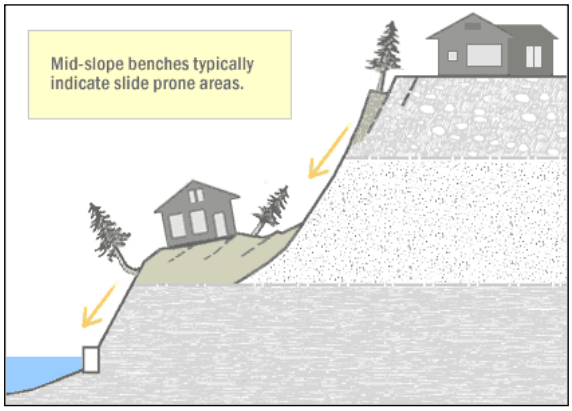


Figure 7-3 Bench Slide

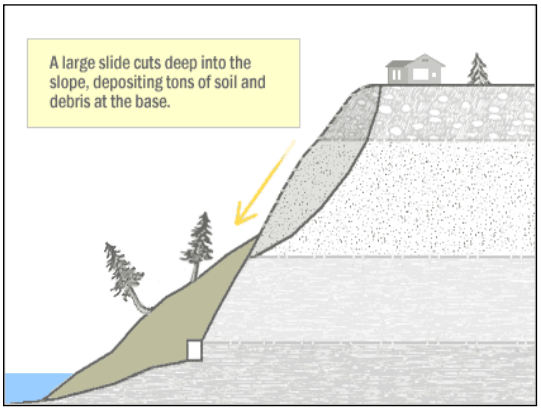


Figure 7-4 Large Slide

While a certain amount of erosion is natural and healthy for an ecosystem—such as gravel continuously moving downstream in watercourses—excessive erosion causes serious problems, such as receiving water sedimentation, ecosystem damage and loss of soil and slope stability. Erosion can cause a loss of forests and trees, which causes serious damage to aquatic life, irrigation, and power development by heavy silting of streams, reservoirs, and rivers. Concentrated surface water runoff in drainages and swales can lead to channel-confined slope failures, involving the rapid transport of fluidized debris, known as debris flows.

City of Everett Classified Landslide Hazard Areas:

Within Everett's Ordinances, specifically Everett Municipal Code 19.37.080 – Geologically hazardous areas, the following are classified as Landslide Hazard Areas: [28]

1. Landslide hazard areas:

    a. Those areas defined as high and very high/severe risk of landslide hazard in the Dames and Moore Methodology for the Inventory, Classification and Designation of Geologically Hazardous Areas, City of Everett, Washington: July 1, 1991, or as revised through best available science:

        (1) Very high/severe: slopes greater than fifteen percent in the Qtb, Qw, and Qls geologic units; and slopes greater than fifteen percent with uncontrolled fill.

        (2) High: slopes greater than forty percent in all other geologic units (not Qtb, Qw, and Qls or uncontrolled fill).

    b. Those areas defined as medium risk of landslide hazard in the Dames and Moore Methodology for Inventory, Classification and Designation of Geologically Hazardous Areas, City of Everett, Washington: July 1, 1991, or as revised through best available science, when combined with springs or seeps, immature vegetation, and/or no vegetation:

        (1) Slopes less than fifteen percent for Qtb, Qw, and Qls geologic units and uncontrolled fill.

        (2) Slopes of twenty-five percent to forty percent in all other geologic units.

    c. Any area with all three of the following characteristics:

        (1) Slopes greater than fifteen percent; and

        (2) Hillsides intersecting geologic contacts with a relatively permeable sediment overlying a relatively impermeable sediment or bedrock; and

        (3) Springs, ground water seepage, or saturated soils.

[28] Everett Municipal Code. Geologically Hazardous Areas. Accessed 24 Oct 2023. Ch. 19.37 Critical Areas | Everett Municipal Code

d. Any area which has shown movement during the Holocene epoch (from ten thousand years ago to the present) or which is underlain or covered by mass wastage debris of that epoch.

e. Any area potentially unstable as a result of rapid stream incision, stream bank erosion or undercutting by wave action.

f. Areas of historic failures, including areas of unstable, old and recent landslides or landslide debris within a head scarp, and areas exhibiting geomorphological features indicative of past slope failure, such as hummocky ground, slumps, earthflows, mudflows, etc.

g. Any area with a slope of forty percent or steeper and with a vertical relief of fifteen or more feet, except those manmade slopes created under the design and inspection of a geotechnical professional, or slopes composed of consolidated rock.

h. Areas that are at risk of landslide due to high seismic hazard.

i. Areas that are at risk of landslides or mass movement due to severe erosion hazards.

7.2 HAZARD PROFILE

7.2.1 Extent and Location

The best predictor of where slides and earth flows might occur is the location of past movements. Past landslides can be recognized by their distinctive topographic shapes, which can remain in place for thousands of years. Most landslides recognizable in this fashion range from a few acres to several square miles. Most show no evidence of recent movement and are not currently active. A small portion of them may become active in any given year. The recognition of ancient dormant mass movement sites is important in the identification of areas susceptible to flows and slides because they can be reactivated by earthquakes or by exceptionally wet weather. Also, because they consist of broken materials and frequently involve disruption of groundwater flow, these dormant sites are vulnerable to construction-triggered sliding. Data presented in the following maps and tables are not a substitute for site-specific investigations by qualified practitioners. The information contained in this document are for planning purposes only, and not life-safety or specific site assessments.

Everett is subject to landslides and soil erosion due to wind, water, and flooding at all times of the year. Landslides can occur in areas of relatively low to high slopes, including flat areas if relative conditions are met, such as areas with uncontrolled fill, immature vegetation, or where springs or seeps exist. Slides can also occur where previous geologic events have occurred, in areas subject to high seismic hazards, and in areas where mass movement such as erosion occurs at the toe of a bluff, increasing the chance of a landslide occurring above the bluff area.

Soil erosion is concentrated along coastal areas which cover a fairly large percent of the total marine shoreline within Everett, particularly in the area of the Port of Everett and its waterfront area. This is the location of most steep slopes found in Everett - primarily located along the edges of the city as the landscape slopes down to either the Puget Sound and Everett waterfront or the Snohomish River floodplain. For the most part, landslide-prone areas follow along the general location of the E soils, with the toe of the steep slopes located in E soils.

Much of western portion of the city encompasses coastal areas (see Figure 7-5).[29] Everett's shorelines include approximately 25 miles of marine and freshwater shorelines. Approximately 43% of the City of Everett is within shoreline jurisdiction regulated by the Shoreline Management Act (SMA). The SMA jurisdiction extends over approximately 20.65 square miles combined land and water areas including the following:

1. Silver Lake and its shorelands
2. Lake Chaplain and its shorelands
3. Portions of Woods Creek and the Sultan River and their shorelands within Everett's city limits
4. Within the extent of Everett's city limits, portions of the Snohomish River and its associated estuary, Union and Steamboat Sloughs and adjacent shorelands including Jetty Island
5. Port Gardner Bay from the ordinary high water to mid channel within Everett's city limits including the adjacent shorelands and associated wetlands[30]

Figure 7-6 illustrates some of the landslide hazard area with very high/high/medium slopes. For planning purposes, those areas are defined as:

- **Low Slopes** < 25% in "other" geologic units (not Qtb, Qw, Qls or uncontrolled fill)
- **Medium Slopes** < 15% for Qtb, Qw, Qls geologic units and uncontrolled fill. Slopes of 25% - 40% in "other" geologic units (Studies are required for these areas when combined with springs or seeps, immature vegetation, and/or no vegetation)
- **High Slopes** > 40% in "other" geologic units
- **Very High** > 15% in the Qtb, Qw, and Qls geologic units, or with uncontrolled fill

[29] Ibid.

[30] Everett Shoreline Master Program. Accessed 24 Oct. 2023. Available online at: Microsoft Word - Binder Cover.docx (everettwa.gov)

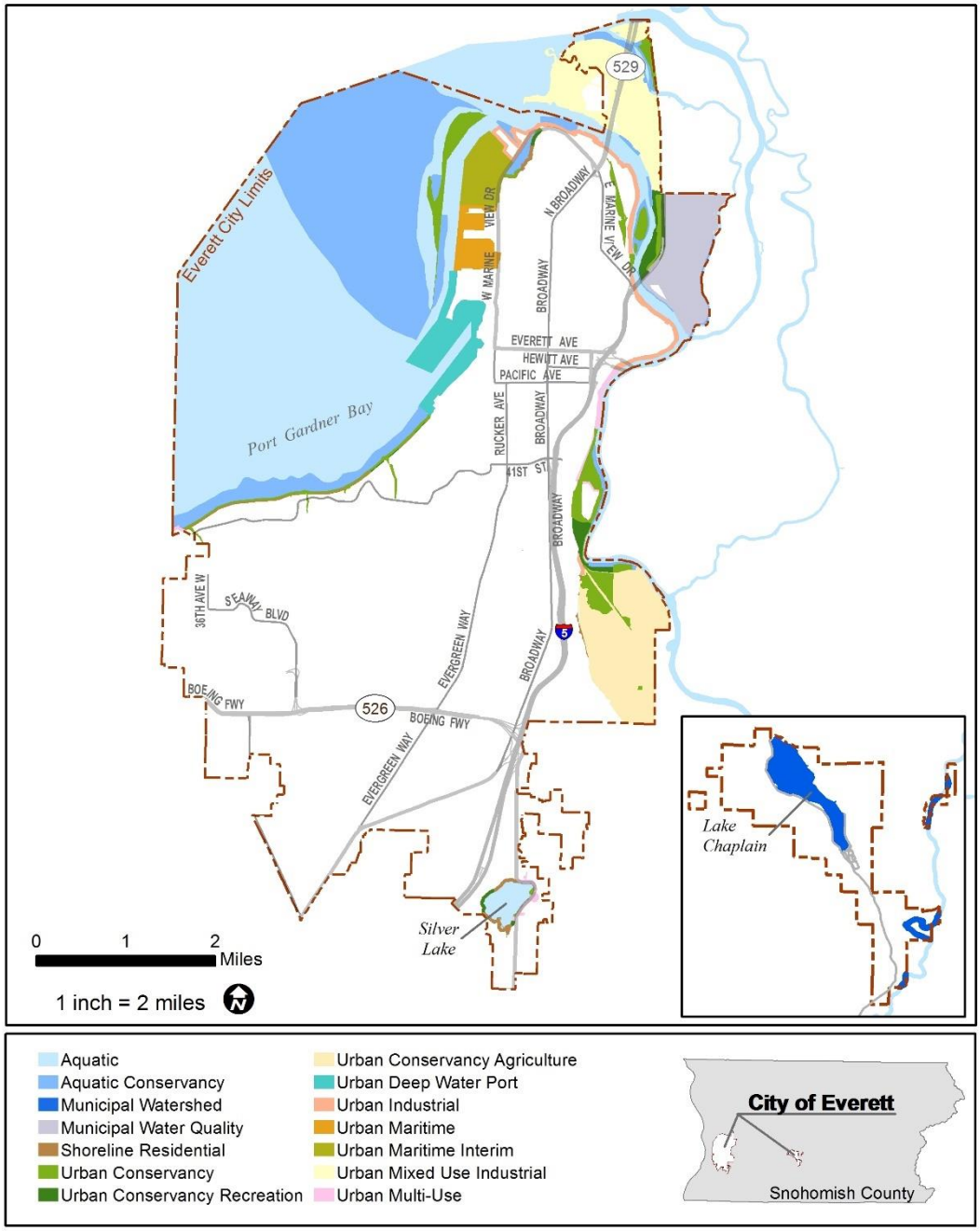


Figure 7-5 Shoreline Designations (2019)

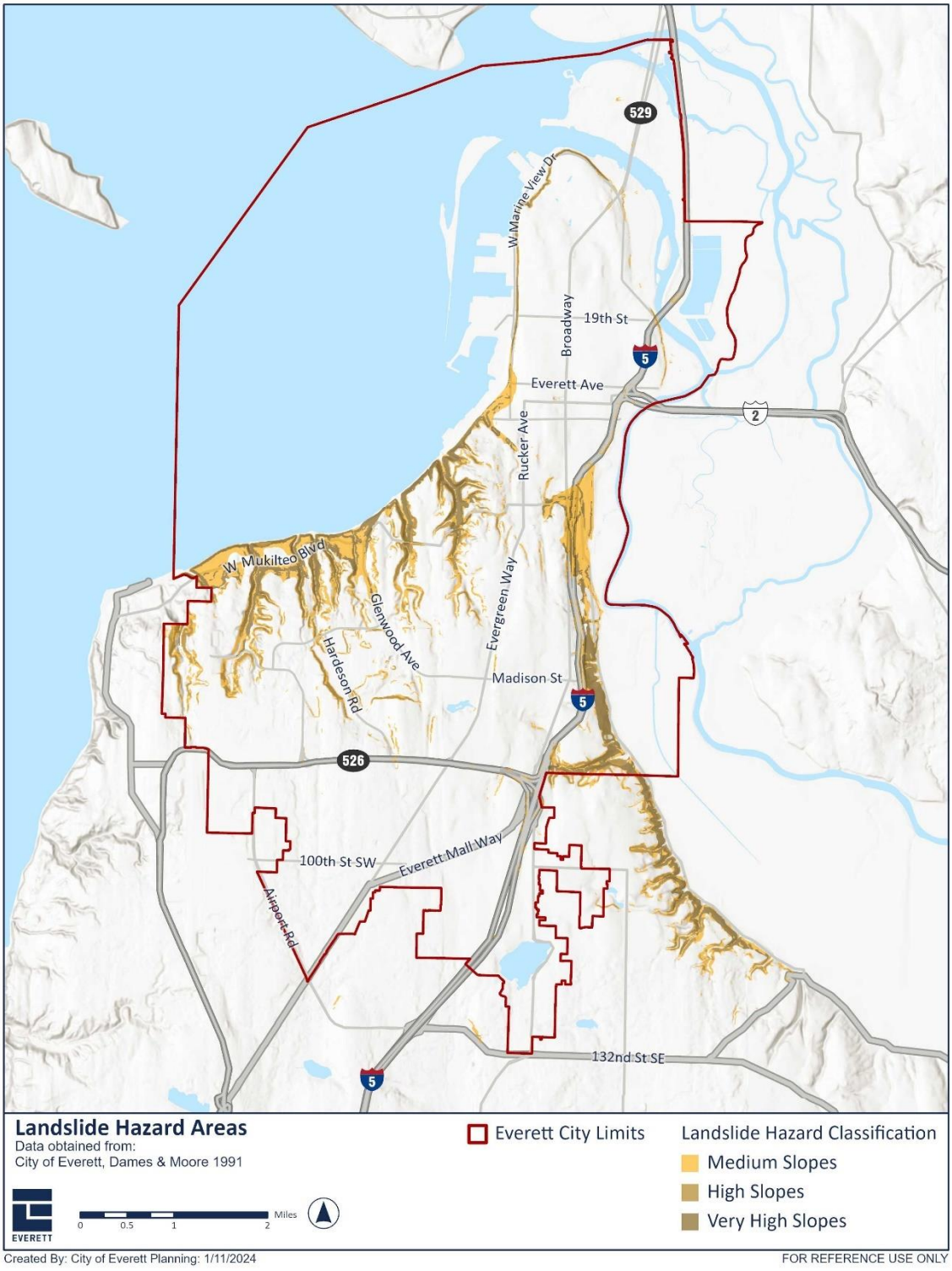


Figure 7-6 Landslide Hazard Area

7.2.2 Previous Occurrences

Landslides within the planning area are fairly common, with landslides associated with disaster declarations for severe storms and flooding events in Snohomish County, as listed in Chapter 3, Section 3.3.

As indicated, Snohomish County has received one disaster declaration specifically typed *Landslide* by FEMA – DR4168, the Oso Landslide. It is the most notable and deadliest deep-seated landslide event in the United States, occurring in March 2014, approximately 31 miles southeast of Everett. That landslide took the lives of 43 people.

In addition to Oso, since 1953, within Snohomish County, a total of 11 severe weather events have occurred which have included impact from landslides (declared events including land/mud-slides).

The following synopsis identifies some (additional) historic landslide events impacting the county and the city, as well as mitigation activities taken to correct issues.

- In January 1997, a massive landslide in Snohomish County pushed five freight cars into Puget Sound and knocked out a hundred yards of track used regularly by Sounder, Amtrak, and Burlington Northern rail lines. The Woodway landslide moved some 100,000 cubic meters of material over the BNSF line.
- In March 2011, a landslide in the Valley View neighborhood of Everett claimed two homes. The slide, near Burl Avenue and Panaview Boulevard, appeared after heavy rains weakened the already-unstable slopes in the at-risk area.
- The railway on the west coast of Everett is also often impacted by fallen debris or landslides, usually after periods of prolonged precipitation, causing interruption of transport and passenger service.
- January 2022 a slide appeared to impact three homes near 59th St SW (see Figure 7-7, identifying approximate landslide area; source unknown).

Figure 7-7 Approximate Landslide Area - January 2022

Review of WA DNR data identifies an additional 13 landslides occurring in the area during the period 2002 through 2015.[31] Most were classified as Undifferentiated, with movement of earth or debris. Four of the slides were identified as complex. Figure 7-8 illustrates WA DNR landslide data as of 2023, illustrating areas of previous landslides occurrence (Washington State Department of Natural Resources data, 2023).

7.2.3 Severity

Landslides destroy property and infrastructure, and can have a long-lasting effect on the environment and can take the lives of people. Nationally, landslides account for more than $2 billion in losses annually and result in an estimated 25 to 50 deaths a year (Spiker and Gori, 2003; Schuster and Highland, 2001; Schuster, 1996).

Washington is one of seven states listed by the Federal Emergency Management Agency as being especially vulnerable to severe land stability problems. Topographic and geologic factors cause certain areas of Everett to be susceptible to landslides, as well as areas within Snohomish County which are highly susceptible and have the potential to impact ingress and egress into the city for major thoroughfares. Ground saturation and variability in rainfall patterns are also important factors affecting slope stability in areas susceptible to landslides. Strong earthquake shaking can cause landslides on slopes that are otherwise stable.

[31] Washington State Department of Natural Resources. Accessed 29 Nov. 2023. Available online at: https://gis.dnr.wa.gov/site1/rest/services/Public_Geology/Landslides/MapServer/1//metadata?format=fgdc&output=html

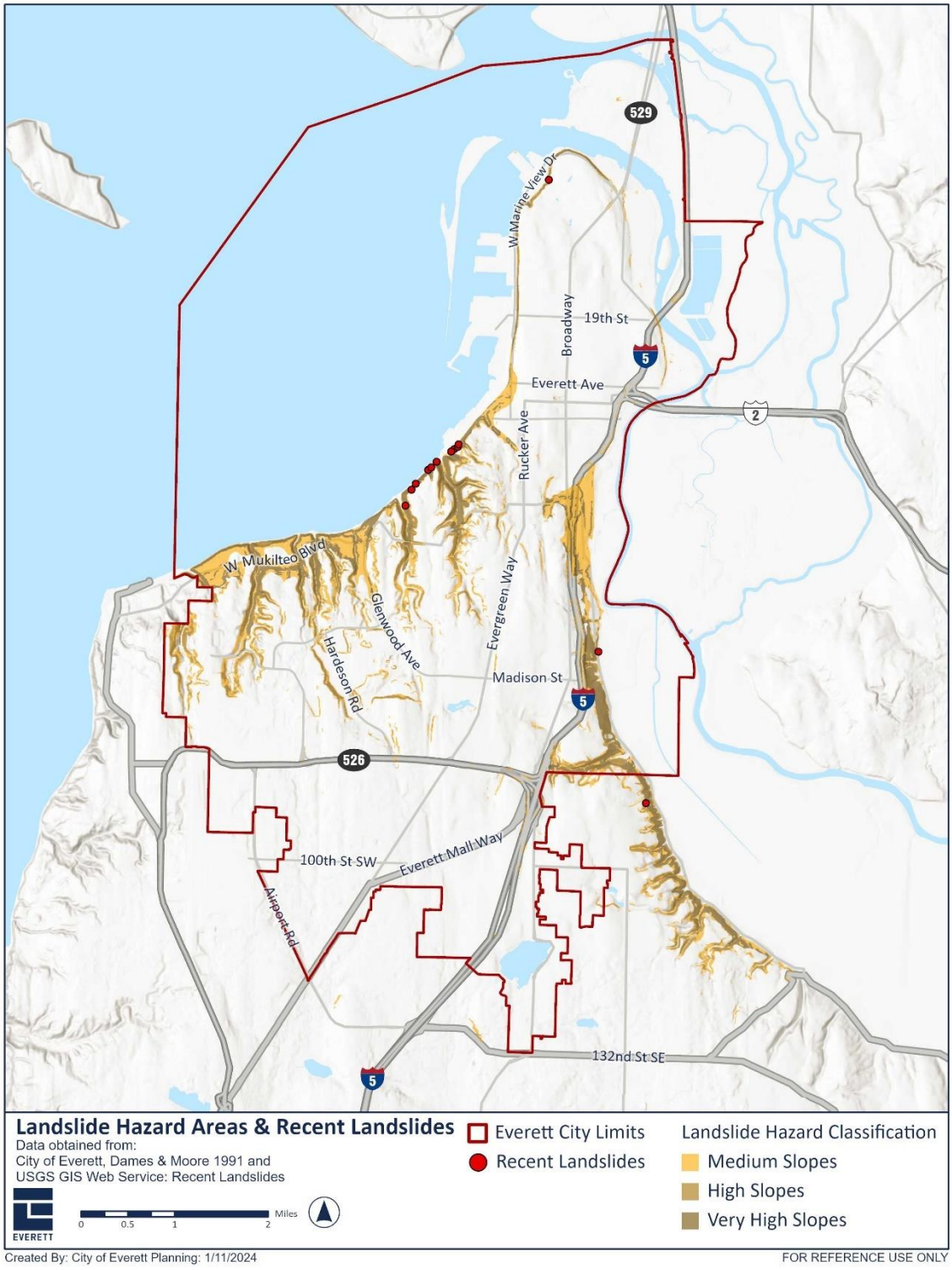


Figure 7-8 Washington DNR Recorded Landslide Data (2023)

7.2.4 Frequency

Landslides are often triggered by other natural hazards such as earthquakes, heavy rain, floods, or wildfires, so landslide frequency is often related to the frequency of these other hazards. Landslides typically occur during and after major storms, so the potential for landslides largely coincides with the potential for sequential severe storms and flood events that saturate steep, vulnerable soils.

One *Landslide* disaster declaration has been issued for the county for the Oso Landslide. In addition, there have been 11 disaster declarations which have included mud- or land-slides which occurred in conjunction with severe storm events since 1953. Some type of landslide event occurs almost annually within the planning region, in some cases, multiple slides in the planning area of the county have been reported as a result of a single weather event. A specific recurrence interval has not been established by geologists, but historical data indicates several successive years of slide activities, followed by dormant periods.

Landslides are most likely to occur during periods of higher than average rainfall. The ground in many instances is already saturated prior to the onset of a major storm, which increases the likelihood of significant landslides to occur.

Precipitation influences the timing of landslides on three scales: total annual rainfall, monthly rainfall, and single precipitation events. In general, landslides are most likely during periods of higher than average rainfall.

The ground must be saturated prior to the onset of a major storm for significant landslides to occur. Studies conducted by the USGS have identified two precipitation thresholds to help identify when landslides are likely (USGS, 2007) :[32]

- Cumulative Precipitation Threshold —A measure of precipitation over the last 18 days, indicating when the ground is wet enough to be susceptible to landslides. Rainfall of 3.5 to 5.3 inches is required to exceed this threshold, depending on how much rain falls in the last 3 days.
- Intensity Duration Threshold —A measure of rainfall during a storm, indicating when it is raining hard enough to cause multiple landslides if the ground is already wet.

These thresholds are most likely to be crossed during the rainy season. The 2007 USGS study indicates that by comparing recent and forecast rainfall amounts to the thresholds, meteorologists, geologists, and city officials can help people know when to be prepared for landslides. The thresholds as developed and tested are accurate, but imperfect indicators of when landslides may occur. During the study, statistical analysis of landslides that occurred between 1978 and 2003 showed that 85% occurred when the Cumulative Precipitation

[32] USGS Landslide Hazards in the Seattle, Washington, Area. Accessed 10 Oct. 2023. Available at: https://pubs.usgs.gov/fs/2007/3005/pdf/FS07-3005_508.pdf

Threshold was exceeded. The thresholds are felt to work best in areas along the east side of Puget Sound, from Tacoma to Everett (USGS, 2007).

Review of historic disasters provides the following breakdown of severe weather events which included landslide as a subset (data also includes the March 2014 Oso Landslide). The data is based on incident period, not the date on which the incident was declared:

- January – 2
- March - 1 (Oso Landside)
- November - 3
- December - 5

7.3 VULNERABILITY ASSESSMENT

7.3.1 Overview

Historical occurrences, combined with analysis of the slope and the type of soil, are the most effective indicator of areas at risk to landslide. The Washington Department of Natural Resources collects data for local municipalities to use in determining historical events and, to some extent, landslide vulnerability. Everett utilizes a similar methodology for determining landslide hazard area (as identified in Section 7.2.1).

Landslides have the potential to cause widespread damage throughout both rural and urban areas. While some landslides are more of a nuisance-type event, even the smallest of slides has the potential to injure or kill individuals and damage infrastructure. Given Everett's relatively steep slopes in certain areas (approximately 5.23% of its landmass are identified as high or very high slopes – primarily along the coastlines or riverbeds), the various types of soils, and its historical patterns of previous slide occurrences, the landslide hazard is a concern for the planning team, particularly when considering the landslide history in areas outside of Everett which have the potential to impact the city through ingress/egress and supply chain issues if it is a significant slide.

For purposes of this overview, a combination of datasets were used to extrapolate relevant data to identify the landslide hazard areas, including those identified by Washington State DNR as having previous landslide events, and includes areas of slopes with a slope greater than or equal to 40 percent (or 21.8 degrees), which coincides with the city's calculation of landslide hazard areas as defined in their Critical Areas Ordinance.

It should be noted that t*his data is for mitigation planning purposes only, and should not be considered for life safety matters. No landslide hazard analysis was conducted during this HMP update process. Rather, only reprojection of existing data was utilized. Additional landslide data is available at:* Landslides | WA - DNR

Warning Time

Unlike flood hazards which often are predictable, mass movements or landslides are generally unpredictable, with little or no advanced warning. The speed of onset and velocity associated with a slide event can have devastating impacts. While some methods used to monitor mass movements can

provide an idea of the type of movement and provide some indicators (potentially) with respect to the amount of time prior to failure, exact science is not available.

Mass movements can occur suddenly or slowly. The velocity of movement may range from a slow creep of inches per year to many feet per second, depending on slope angle, material, and water content. Generally accepted warning signs for landslide activity include:

- Springs, seeps, or saturated ground in areas that have not typically been wet before
- New cracks or unusual bulges in the ground, street pavements or sidewalks
- Soil moving away from foundations
- Ancillary structures (decks or patios) tilting or moving relative to the main house
- Tilting or cracking of concrete floors and foundations
- Broken water lines and other underground utilities
- Leaning telephone poles, trees, retaining walls or fences
- Offset fence lines
- Sunken or down-dropped road beds
- Rapid increase in creek water levels, possibly accompanied by increased turbidity
- Sudden decrease in creek water levels though rain is still falling or just recently stopped
- Sticking doors and windows, and visible open spaces indicating frames out of plumb
- A faint rumbling sound that increases in volume as the landslide nears
- Unusual sounds, such as trees cracking or boulders knocking together

It is possible, based on historical occurrences, to determine what areas are at a higher risk. Assessing the geology, vegetation, and amount of predicted precipitation for an area can help in these predictions; such an analysis is beyond the scope of this planning effort. However, there is no practical warning system for individual landslides. Historical events remain the best indicators of potential landslide activity, but it is generally impossible to determine with precision the size of a slide event or when an event will occur. Increased precipitation in the form of snow or rain increases the potential for landslide activity. Steep slopes also increase the potential for slides, especially when combined with specific types of soil.

Within Washington State, in a partnership with the National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service, Washington State Department of Natural Resources (WA-DNR) monitors conditions that could produce shallow landslides. Landslide warning information can be viewed at WA-DNR's website.

7.3.2 Impact on Life, Health, and Safety

Population vulnerable to landslides in the area would include not only the individuals living in the landslide prone areas, but also those traveling through those prone areas for business or tourism, particularly when considering the waterfront and Port areas.

Also to be taken into account when determining affected population are the area-wide impacts on transportation systems and the isolation of residents who may not be directly impacted, but whose

ability to ingress and egress is restricted, such as areas along the I-5 corridor (among others) which have a high transient population. Landslides can also damage water and wastewater treatment facilities, potentially harming water quality, and disrupt power and communication lines. This may increase the level of first-responder requirements for residents whose structures were not directly impacted but who were affected by power outages or lack of logistical support, etc. Table 7-1 identifies the number of residential parcels and individuals at a potential medium-to-very high risk to a landslide hazard area.

Table 7-1
Residential and Commercial Parcels which Intersect the Landslide Hazard Areas

Landslide Class	Parcels at Risk	Individuals at Risk*	Residential Structures Improvement Value**	Commercial Structures at Risk	Commercial Structures Improvement Value**
Medium	2,364	5910	$700,388,600.00	139	$383,730,700
High	654	1635	$179,575,200.00	51	$640,942,400
Very High	670	1675	$284,657,300.00	57	$189,646,700
Total	**3,688**	**9,220**	**$1,164,621,100.00**	**247**	**$1,214,319,800.00**

*Individuals at risk is calculated utilizing the number of parcels at risk by 2.5 persons per household (average number) as determined by the 2022 US Census QuickFacts

**Structure county and dollar values are gained from the Snohomish County Assessor's Office Improvement Value Data

7.3.3 Impact on Property

Landslides affect all types of property, including private, commercial/industrial, and public infrastructure and facilities. Review of impacted data at any landslide level of significance identifies the following:

- The predominant land use in the planning area is single-family residential. Of all residential structures, 3,688 are impacted.
- There are approximately 31 apartment buildings in the landslide hazard area, with a combined value in excess of $255 million.
- There is one nursing home identified within the medium hazard area, valued in excess of $14 million.
- There are 19 commercial garages at risk, valued at $7.8 million. These garages, if impacted, would also impact the potential for release of hazardous materials.
- There is one day care facility in the very high landslide hazard area.

- 50 general office buildings/structures are impacted, with a potential loss value in excess of $166 million.
- 25 light warehousing structures are potentially impacted.
- Eight medical offices are impacted, with a structure value in excess of $47 million. For medical offices and clinics dealing with medical/special equipment, the content value in many instances far exceeds the structure value.
- Seven research and development structures are potentially impacted at a value in excess of $65 million.

There are many additional small businesses in the area as well as large commercial industries, including the Port of Everett, and government facilities, which may also be impacted. In total, there are approximately 3,940 structures (out of over 33,200 structures citywide) at some level of exposure (see Table 7-1).

Development in landslide hazard areas is guided by building code and the critical area ordinance to prevent the acceleration of manmade and natural geological hazards, and to neutralize or reduce the risk to the property owner or adjacent properties from development activities. The City of Everett's Critical Areas Ordinance does require geological assessment for development within proximity of certain slopes and buffers at the top or toe of a slope.

For mitigation planning purposes only, utilizing the categories of Medium, High and Very High slopes (defined above), the acres of the planning area exposed to the landslide hazard in the planning area are summarized in Table 7-2. Data presented in these maps and tables are not a substitute for site-specific investigations by qualified practitioners.

Table 7-2
Acres of Landslide Hazard Areas by Slope or Type

Everett Landslide Area	Low Slopes	Medium Slopes	High Slopes	Very High	Total Acres Impacted
Acres	13,047.45	1,046.52	301.74	662.10	15,057.81
Percent of Everett Land	70.78%	5.68%	1.64%	3.59%	81.68%

7.3.4 Impact on Critical Facilities and Infrastructure

Table 7-3 illustrates the critical facilities at risk within the various hazard areas as identified. Loss of these structures would have the potential to impact not only loss of services, but in some instances, loss of continuity of government due to the type of structure lost.

Table 7-3
Critical Facilities in Landslide Hazard Zones

Hazard Zone	Government Function	Communications	Medical	Hazardous Materials*	Protective Services	Power/Utility**	Other	Water	Wastewater
Medium	0	0	4	32	0	2	0	0	3
High	1	0	0	18	1	1	0	0	0
Very High	0	0	4	6	0	1	0	0	1
TOTAL	**1**	**0**	**8**	**56**	**1**	**4**	**0**	**0**	**4**

*Includes commercial garages, truck terminal warehouse (fuel), auto services, manufacturing, and mini-lube facilities
**Includes utility storage facilities

Several types of infrastructure are exposed to mass movements, including transportation facilities, airports, bridges, and water, sewer, and power infrastructure. Highly susceptible areas include mountain and coastal roads and transportation infrastructure. All infrastructure and transportation falling within the hazard areas are considered vulnerable until more information becomes available. Significant infrastructure in the planning region exposed to mass movements includes the following:

- **Roads**—Access to major roads is crucial to life-safety after a disaster event and to response and recovery operations. Landslides can block egress and ingress on roads, causing isolation for neighborhoods, traffic problems and delays for public and private transportation. This can result in economic losses for businesses.
- **Bridges and Boat/Ferry Docks**—Landslides can significantly impact road bridges and boat/ ferry docks. Mass movements can knock out bridge and dock abutments, causing significant misalignment and restricting access and usages, as well as significantly weaken the soil supporting the structures, making them hazardous for use.
- **Power Lines**—Power lines are generally elevated above steep slopes, but the towers supporting them can be subject to landslides. A landslide could trigger failure of the soil beneath a tower, causing collapse and ripping down the lines. Power and communication failures due to landslides can create problems for vulnerable populations and businesses.

7.3.5 Impact on Economy

A landslide can have catastrophic impact on the private sector and governmental agencies. Economic losses include damage costs and lost revenue and taxes. Damaged bridges, roadways, marinas, boat docks, municipal airports all can have a significant impact on the economy. Damages in this capacity could have a significant economic impact on not only the City of Everett, but also other areas of the state given the large industries within the city, and the potential number of employees that can be impacted either directly or indirectly.

The impact on commodity flow from a significant landslide shutting down major access routes would not only limit the resources available for citizens' use, but also would cause economic impact on businesses in the area, particularly in light of the Port of Everett's significance for shipping and receiving of goods. Debris could impact cargo staging areas and lands needed for business operations. Marine travel, the I-5 corridor, Paine Field, and BNSF Rail all serve as primary transportation sources in the area that could be impacted by landslides. The Port of Everett alone provides nearly 40,000 jobs (direct, induced, and indirect), with $1.4 billion in direct personal income, and $3.0 billion in re-spending and local consumption.

Review of data indicates that 247 various types of commercial and industrial (among other) structures are at risk to the landslide hazard at some level. Based on Snohomish County's Assessor's Data for structure valuation, this equates to over $1.214 billion. That figure does not include the actual loss to the economy for the city, but rather the loss of potential property tax revenues from the loss of the structure itself.

7.3.6 Impact on Environment

Environmental problems as a result of mass movements are numerous. Landslides that fall into water bodies, wetlands or 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. With impact already occurring due to increased sediment loads in the floodplain, landslides could cause additional impact within the local watersheds, including the Sultan Basin Watershed, or water storage reservoirs such as the Spada Lake Reservoir and the Lake Chaplin Reservoir. There are also over 50 hazardous materials facilities within the landslide hazard area, which could release chemicals into the environment if impacted.

7.3.7 Impact from Climate Change

Climate change may impact storm patterns, increasing the probability of more frequent, intense storms with varying duration. Increase in global temperature could affect the snowpack and its ability to hold and store water, raise sea levels, and increase beach. Warming temperatures also could increase the occurrence and duration of droughts, which would increase the probability of wildfire, reducing the vegetation that helps to support steep slopes. All of these factors would increase the probability for landslide occurrences.

7.4 FUTURE DEVELOPMENT TRENDS

Under the Growth Management Act, the city is required to address geologic hazards within its Critical Areas Ordinance, which it does. Continued application of land use and zoning regulations, as well as

implementation of the International Building Codes, will assist in reducing the risk of impact from landslide hazards.

The city is attempting to expand its business base, which will increase economic vitality by providing businesses that stimulate retail sales and services. However, this will also increase the potential exposure to people and the structures facilitating such growth. A higher population density could also result in development in higher-risk landslide areas, with development potentially altering the natural landscape, leading to increased landslide susceptibility.

Continued land use supported by regulatory authority which supports economic growth but practices smart planning will be vital. The city is committed to assessing the landslide risk and developing mitigation efforts to reduce impact or enhance resiliency. There are four basic strategies to mitigate landslide risk:

- Stabilization
- Protection
- Avoidance
- Maintenance and monitoring.

Stabilization seeks to counter one or more key failure mechanisms necessary to prevent slope failure. The other three strategies seek to avoid, protect against or limit associated impacts. Development of this mitigation plan creates an opportunity to enhance and develop wise land use decision-making policies. It allows for the expansion of capital improvement plans to sustain future growth through the use of these four basic strategies. While it should be anticipated that some new development will be exposed to some level of landside risk, these land use provisions ensure that new construction will be built to standards that reduce the vulnerability to the landslide risk.

7.5 ISSUES

Landslides throughout the city occur as a result of soil conditions that have been affected by severe storms, groundwater, or human development. The worst-case scenario for landslide hazards in the planning area would generally correspond to a severe storm that had heavy rain and caused flooding. Landslides are most likely during late fall or early spring —months when the water tables are high. After heavy rains during October to April, soils become saturated with water. As water seeps downward through upper soils that may consist of permeable sands and gravels and accumulates on impermeable silt, it will cause weakness and destabilization in the slope. A short intense storm could cause saturated soil to move, resulting in landslides. As rains continue, the groundwater table rises, adding to the weakening of the slope. Gravity, a small tremor or earthquake, poor drainage, steep bank cutting, a rising groundwater table, and poor soil exacerbate hazardous conditions.

Mass movements are becoming more of a concern as development moves outside of urban centers and into areas less developed in terms of infrastructure. While most mass movements would be isolated events affecting specific areas, the areas impacted can be very large. It is probable that private and public property, including infrastructure, will be affected. Mass movements could affect bridges that pass over landslide prone ravines and knock out ferry services. Road obstructions caused by mass movements would create isolation problems for residents and businesses in sparsely developed areas, and impact commodity flows. Property owners exposed to steep slopes may suffer damage to property or structures. Landslides carrying vegetation such as shrubs and trees may cause

a break in utility lines, cutting off power and communication access to residents; they may block ingress and egress to areas of the city, especially for areas with limited roadways.

Important issues associated with landslides throughout the area include the following:

- There are existing structures in landslide risk areas in the city. The degree of vulnerability of these structures depends on the codes and standards the structures were constructed to. Information to this level of detail is not currently available.
- Future development could lead to more homes in landslide risk areas.
- Portions of the city do have steep banks, particularly along the waterfront areas and the Port of Everett. Coastal erosion causes landslides as the ground washes away.
- Mapping and assessment of landslide hazards are constantly evolving. As new data and science become available, assessments of landslide risk should be re-evaluated. LiDAR data would greatly enhance the ability to determine landslide hazards, as well as other hazards.
- While the impact of climate change on landslides in general is uncertain, the impact of sea level rise caused by increased temperatures has already enhanced coastal erosion within the planning area. As climate change continues to impact atmospheric conditions, the exposure to landslide risks is likely to increase.
- Landslides cause many negative environmental consequences, including water quality degradation, degradation of fish spawning areas, and destruction of vegetation along waterways, ultimately impacting the flow of water bodies.
- The risk associated with the landslide hazard overlaps the risk associated with other hazards such as earthquake, flood, and wildfire. This provides an opportunity to seek mitigation goals with multiple objectives that can reduce risk for multiple hazards.

7.6 RESULTS

Based on review and analysis of the data, the Planning Team has determined that the probability for impact from Landslide throughout the area is likely, but the impact is more limited with respect to geographic extent. The city has experienced 13 landslide events between 2002 and 2015 based on WA DNR data, with additional slides occurring since that time not recorded by DNR, including the one in 2022 illustrated above. The county experiences some level of landslides annually, and while not directly impacting structures in the city, those along the major roadways and rail systems which fall outside of the city can have an indirect impact on ingress and egress, and its economy in some instances. The coastal and shoreline areas do have identifiable landslide risk. While there are areas where no landslide risk is identified, landslides can nonetheless occur on fairly low slopes, and areas with no slopes can be impacted by slides at a distance. Construction in critical areas, which includes geologically sensitive areas such as landslide areas, is regulated; however, beyond the structural impact, economic impact to business hubs could be significant. Secondary impact to infrastructure causing isolation or commodity shortages also has the potential to impact the region as a whole. Based on the potential impact, the Planning Team determined the CPRI score to be 2.35, with overall vulnerability determined to be a medium level.

CHAPTER 8.
SEVERE WEATHER

Severe weather refers to any dangerous meteorological phenomena with the potential to cause damage, serious social disruption, or loss of human life. It includes thunderstorms, downbursts, wind, tornadoes, waterspouts, and snowstorms (among others). Severe weather differs from extreme weather, which refers to unusual weather events at the extremes of the historical distribution. For purposes of this HMP update, all severe weather types are grouped as one hazard when ranked, and not ranked individually.

General severe weather covers wide geographic areas; localized severe weather affects more limited geographic areas. The severe weather event that most typically impacts the planning area is a damaging windstorm, which causes storm surges exacerbating coastal erosion. Flooding associated with severe weather is discussed in Chapter 8.

DEFINITIONS

Freezing Rain—The result of rain occurring when the temperature is below the freezing point. The rain freezes on impact, resulting in a layer of glaze ice up to an inch thick. In a severe ice storm, an evergreen tree 60 feet high and 30 feet wide can be burdened with up to six tons of ice, creating a threat to power and telephone lines and transportation routes.

Hail Storm—Any thunderstorm which produces hail that reaches the ground is known as a hailstorm. Hail has a diameter of 0.20 inches or more. Hail is composed of transparent ice or alternating layers of transparent and translucent ice at least 0.04 inches thick. Although the diameter of hail is varied, in the United States, the average observation of damaging hail is between 1 inch and golf ball-sized 1.75 inches. Stones larger than 0.75 inches are usually large enough to cause damage.

Severe Local Storm—"Microscale" atmospheric systems. These storms may cause a great deal of destruction and even death, but their impact is generally confined to a small area. Typical impacts are on transportation infrastructure and utilities.

Thunderstorm—A storm featuring heavy rains, strong winds, thunder and lightning, typically about 15 miles in diameter and lasting about 30 minutes. Hail and tornadoes are also dangers associated with thunderstorms. Lightning is a serious threat to human life. Heavy rains over a small area in a short time can lead to flash flooding.

Tornado— Most tornadoes have wind speeds less than 110 miles per hour are about 250 feet across, and travel a few miles before dissipating. The most extreme tornadoes can attain wind speeds of more than 300 miles per hour, stretch more than two miles across, and stay on the ground for dozens of miles. They are measured using the Enhanced Fujita Scale, ranging from EF0 to EF5.

Windstorm—A storm featuring violent winds. Southwesterly winds are associated with strong storms moving onto the coast from the Pacific Ocean. Southern winds parallel to the coastal mountains are the strongest and most destructive winds. Windstorms tend to damage ridgelines that face into the winds.

Winter Storm—A storm having significant snowfall, ice, and/or freezing rain; the quantity of precipitation varies by elevation.

8.1 GENERAL BACKGROUND

8.1.1 Semi-Permanent High- and Low-Pressure Areas Over the North Pacific Ocean

During summer and fall, the circulation of air around a high-pressure area over the north Pacific brings a prevailing westerly and northwesterly flow of comparatively dry, cool, and stable air into the Pacific Northwest. As the air moves inland, it becomes warmer and drier, resulting in a dry season. In the winter and spring, the high pressure is further south and low pressure prevails in the northeast Pacific. Circulation of air around both pressure centers brings a prevailing southwesterly and westerly flow of mild, moist air into the Pacific Northwest. Condensation occurs as the air moves inland over the cooler land and rises along the windward slopes of the mountains. This results in a wet season beginning in late October or November, reaching a peak in winter, and gradually decreasing by late spring.

West of the Cascade Mountains, summers are cool and relatively dry while winters are mild, wet, and generally cloudy. Measurable rainfall occurs on 150 days each year in interior valleys and on 190 days in the mountains and along the coast.

Thunderstorms occur up to 10 days each year over the lower elevations and up to 15 days over the mountains. Damaging hailstorms are rare in western Washington. During July and August, the driest months, two to four weeks can pass with only a few showers; however, in December and January, the wettest months, precipitation is frequently recorded on 25 days or more each month. Snowfall is light in the lower elevations and heavier in the mountains. During the wet season, rainfall is usually of light to moderate intensity and continuous over a long period rather than occurring in heavy downpours for brief periods; heavier intensities occur along the windward slopes of the mountains.

8.1.2 Atmospheric Phenomenon

Atmospheric rivers (see Figure 8-1) are relatively long, narrow regions in the atmosphere – like rivers in the sky – that transport most of the water vapor outside of the tropics. These columns of vapor move with the weather, carrying an amount of water vapor roughly equivalent to the average flow of water at the mouth of the Mississippi River. When the atmospheric rivers make landfall, they often release this water vapor in the form of rain or snow. Those that contain the largest amounts of water vapor, and the strongest winds can create extreme rainfall and floods, often by stalling over watersheds vulnerable to flooding. These events can disrupt travel, induce mudslides, and cause catastrophic damage to life and property. A well-known example is the "Pineapple Express," a strong atmospheric river that is capable of bringing moisture from the tropics near Hawaii over to the U.S. West Coast.[33]

El Niño-Southern Oscillation (ENSO) cycle is a scientific term that describes the fluctuations in temperature between the ocean and atmosphere in the east-central Equatorial Pacific. ENSO is one of the most important climate phenomena on Earth due to its ability to change the global atmospheric circulation, which in turn, influences temperature and precipitation across the globe. Though ENSO is a single climate phenomenon, it has three states, or phases, it can be in. The two opposite phases, "El Niño" and "La Niña," require certain changes in both the ocean and the atmosphere because ENSO is a coupled climate phenomenon. "Neutral" is in the middle of the continuum.

- La Nina (translated from Spanish as "little girl") is a natural ocean-atmospheric phenomenon marked by cooler-than-average sea surface temperatures across the central and eastern Pacific Ocean near the equator. La Nina typically brings above-average precipitation and colder-than-average temperatures along the northern tier of the U.S., along with below-average precipitation and above-average temperatures across the South.

[33] NOAA. What are atmospheric rivers? Accessed 9 Sept. 2023. Available online at: https://www.noaa.gov/stories/what-are-atmospheric-rivers

- An El Nino (translated from Spanish as "little boy") is marked by warmer-than-average sea surface temperatures in the region. Typical El Niño effects are likely to develop over North America during the upcoming winter season. Those include warmer-than-average temperatures over western and central Canada, and over the western and northern United States. Wetter-than-average conditions are likely over portions of the U.S. Gulf Coast and Florida, while drier-than-average conditions can be expected in the Ohio Valley and the Pacific Northwest. The presence of El Niño can significantly influence weather patterns, ocean conditions, and marine fisheries across large portions of the globe for an extended period of time.

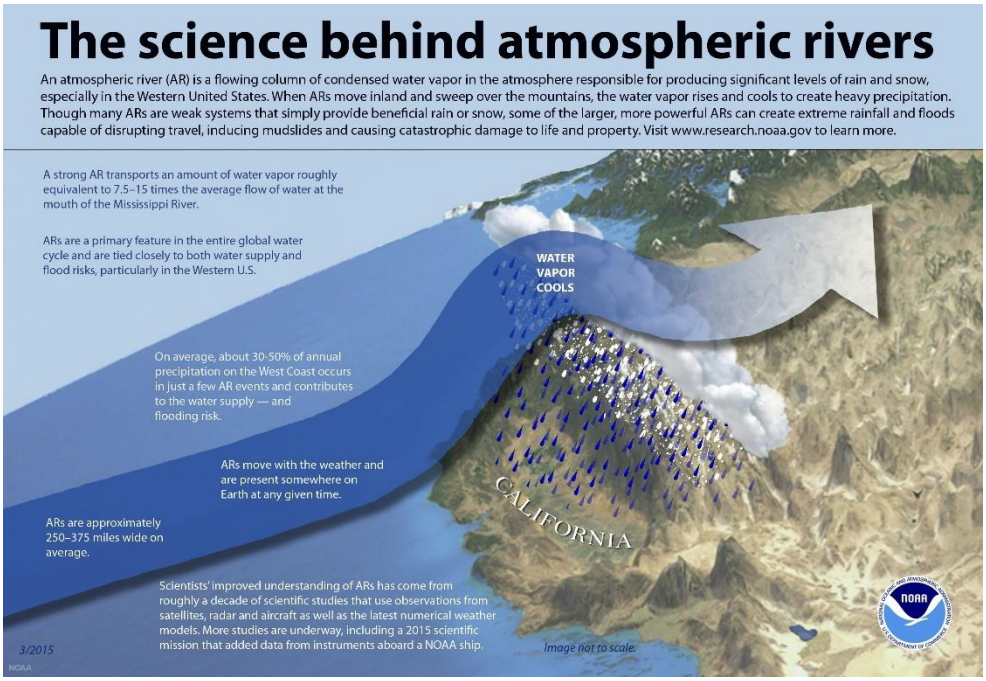


Figure 8-1 Atmospheric Rivers

8.1.3 Thunderstorms

A thunderstorm is a rain event that includes thunder and lightning. A thunderstorm is classified as "severe" when it contains one or more of the following: hail with a diameter of three-quarter inch or greater, winds gusting in excess of 50 knots (57.5 mph), or tornado. Thunderstorms have three stages (see Figure 8-2):

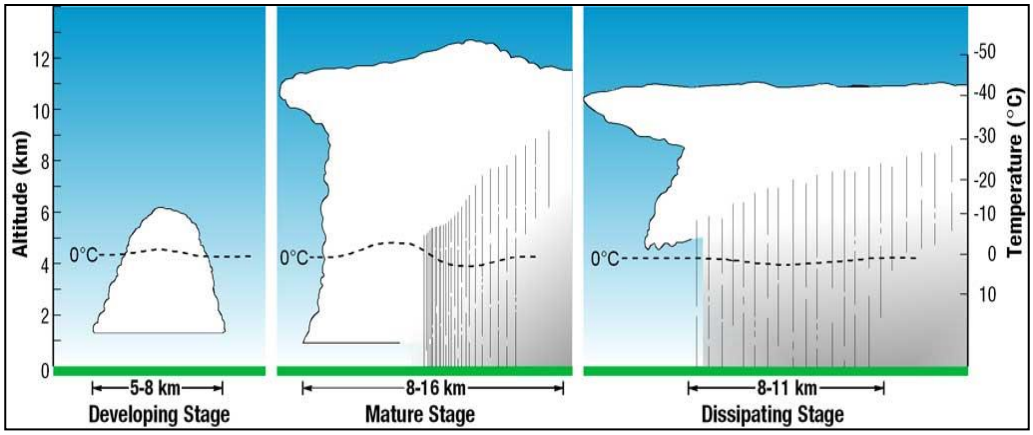


Figure 8-2 The Thunderstorm Life Cycle

Three factors cause thunderstorms: moisture, rising unstable air (air that keeps rising once disturbed), and a lifting mechanism to provide the disturbance. The sun heats the surface of the earth, which warms the air above it. If this warm surface air is forced to rise (hills or mountains can cause rising motion, as can the interaction of warm air and cold air or wet air and dry air) it will continue to rise as long as it weighs less and stays warmer than the air around it. As the air rises, it transfers heat from the earth surface to the upper atmosphere (the process of convection). The water vapors it contains begins to cool and it condenses into a cloud. The cloud eventually grows upward into areas where the temperature is below freezing. Some of the water vapor turns to ice and some of it turns into water droplets. Both have electrical charges. Ice particles usually have positive charges, and rain droplets usually have negative charges. When the charges build up enough, they are discharged in a bolt of lightning, which causes the sound heard as thunder. There are four types of thunderstorms:

- **Single-Cell Thunderstorms—**Single-cell thunderstorms usually last 20 to 30 minutes. A true single-cell storm is rare, because the gust front of one cell often triggers the growth of another. Most single-cell storms are not usually severe, but a single-cell storm can produce a brief severe weather event. When this happens, it is called a pulse severe storm.
- **Multi-Cell Cluster Storm—**A multi-cell cluster is the most common type of thunderstorm. The multi-cell cluster consists of a group of cells, moving as one unit, with each cell in a different phase of the thunderstorm life cycle. Mature cells are usually found at the center of the cluster and dissipating cells at the downwind edge. Multi-cell cluster storms can produce moderate-size hail, flash floods and weak tornadoes. Each cell in a multi-cell cluster lasts only about 20 minutes; the multi-cell cluster itself may persist for several hours. This type of storm is usually more intense than a single cell storm.
- **Multi-Cell Squall Line—**A multi-cell line storm, or squall line, is a long line of storms with a continuous well-developed gust front at the leading edge. The storms can be solid, or have gaps and breaks in the line. Squall lines can produce hail up to golf-ball size, heavy rainfall, and weak tornadoes, but they are best known as the producers of strong downdrafts. Occasionally, a strong downburst will accelerate a portion of the squall line ahead of the rest of the line. This produces what is called a bow echo. Bow echoes can develop with isolated cells as well as squall lines. Bow echoes are easily detected on radar but are difficult to observe visually.

- **Super-Cell Storm—**A super-cell is a highly organized thunderstorm that poses a high threat to life and property. It is similar to a single-cell storm in that it has one main updraft, but the updraft is extremely strong, reaching speeds of 150 to 175 miles per hour. Super-cells are rare. The main characteristic that sets them apart from other thunderstorms is the presence of rotation. The rotating updraft of a super-cell (called a mesocyclone when visible on radar) helps the super-cell to produce extreme weather events, such as giant hail (more than 2 inches in diameter), strong downbursts of 80 miles an hour or more, and strong to violent tornadoes.

In 2022, Washington ranked 40th nationwide in deaths associated with lightning strikes, having five deaths during the time period 1959-2023. No deaths in Washington have been experienced since 2013 as a result of lightning strikes. One death was related to lightning strike occurring in Marysville in 1996. One strike (no injury or death) occurred in Everett in 2005. Figure 8-3 illustrates the ranking nationwide. Figure 8-4 illustrates the lightning fatalities based on the type of activity at the time of strike.[34]

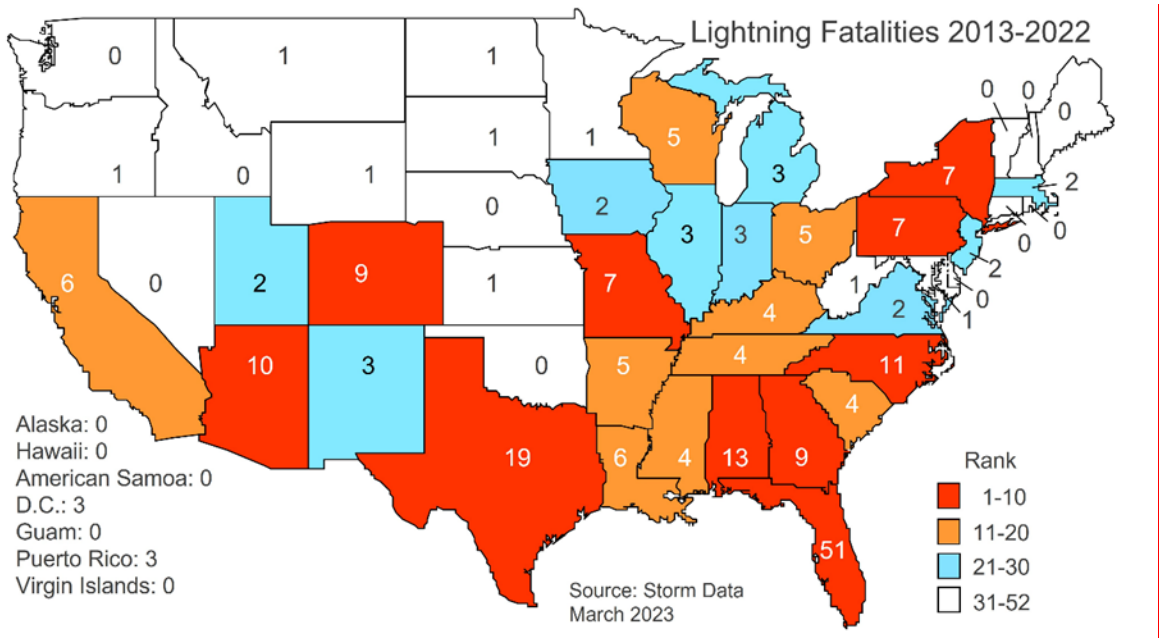


Figure 8-3 Lightning Fatalities by State, 2013-2022

[34] Lightning Safety Council (2023). Accessed 26 Sept. 2023. Available online at: A Detailed Analysis Of Lightning Deaths in the United States From 2006 through 2022.pdf (lightningsafetycouncil.org)

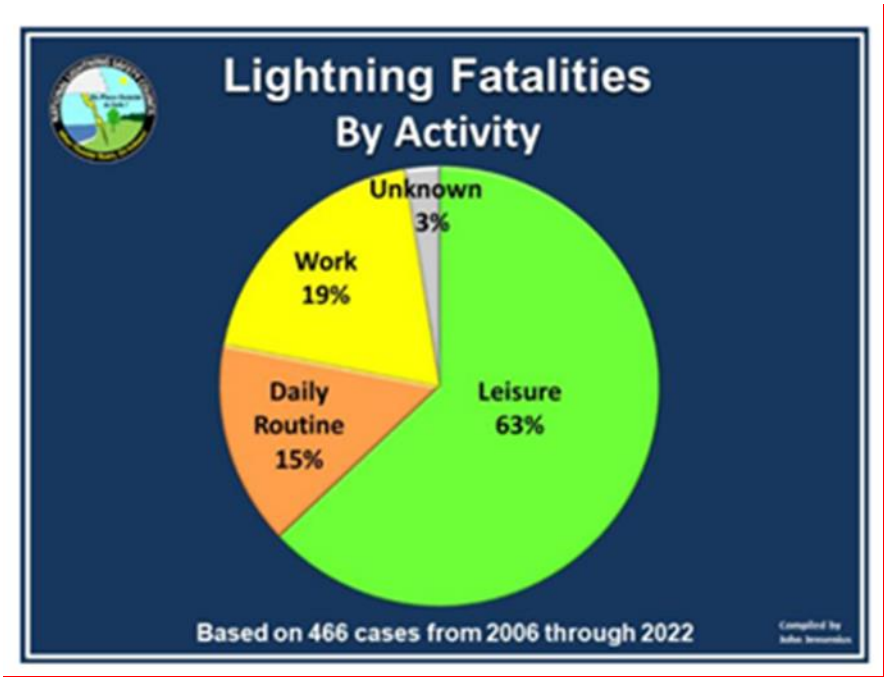


Figure 8-4 Lightning Fatalities by Activity

8.1.4 Damaging Winds

Damaging winds are classified as those exceeding 60 mph. Damage from such winds accounts for half of all severe weather reports in the lower 48 states and is more common than damage from tornadoes. Wind speeds can reach up to 100 mph and can produce a damage path extending for hundreds of miles. There are seven types of damaging winds:

- **Straight-line winds —**Any thunderstorm wind that is not associated with rotation; this term is used mainly to differentiate from tornado winds. Most thunderstorms produce some straight-line winds as a result of outflow generated by the thunderstorm downdraft.
- **Downdrafts —**A small-scale column of air that rapidly sinks toward the ground.
- **Downbursts—**A strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst or damaging winds on or near the ground. Downburst winds may begin as a microburst and spread out over a wider area, sometimes producing damage similar to a strong tornado. Although usually associated with thunderstorms, downbursts can occur with showers too weak to produce thunder.
- **Microbursts—**A small concentrated downburst that produces an outward burst of damaging winds at the surface. Microbursts are generally less than 2.5 miles across and short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph. There are two kinds of microbursts: wet and dry. A wet microburst is accompanied by heavy precipitation at the surface. Dry microbursts, common in places like the high plains and the intermountain west, occur with little or no precipitation reaching the ground.
- **Gust front—**A gust front is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Gust fronts are characterized by a wind shift, temperature drop,

and gusty winds out ahead of a thunderstorm. Sometimes the winds push up air above them, forming a shelf cloud or detached roll cloud.

- **Derecho—**A derecho is a widespread thunderstorm wind caused when new thunderstorms form along the leading edge of an outflow boundary (the boundary formed by horizontal spreading of thunderstorm-cooled air). The word "derecho" is of Spanish origin and means "straight ahead." Thunderstorms feed on the boundary and continue to reproduce. Derechos typically occur in summer when complexes of thunderstorms form over plains, producing heavy rain and severe wind. The damaging winds can last a long time and cover a large area.
- **Bow Echo—**A bow echo is a linear wind front bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be 200 miles long, last for several hours, and produce extensive wind damage at the ground.

There are four main types of windstorm tracks that impact the Pacific Northwest as identified in Figure 8-5. These four tracks are distinguished by two basic windstorm patterns that have emerged in the Puget Sound Region: the South Wind Event and the East Wind Event. South wind events are generally large-scale events that affect large portions of Western Washington and possibly Western Oregon. On occasional cases, they have reached as far south as Northern California.

In contrast, easterly wind events are more limited. High pressure on the east side of the Cascade Mountain Range creates airflow over the peaks and passes, and through the funneling effect of the valleys, the wind increases dramatically in speed. As it descends into these valleys and then exits into the lowlands, the wind can pick up enough speed to damage buildings, rip down power lines, and destroy fences. Once it leaves the proximity of the Cascade foothills, the wind tends to die down rapidly.

Wind patterns most frequently impacting Everett are illustrated in Figure 8-6. The City of Everett is in a 110-mph basic wind speed for zoning.[35] Windstorms impact all of the City of Everett on a regular basis due, in part, to the topography between Seattle and Bellingham along the I-5 Corridor.

The strongest winds are generally from the south or southwest and occur during fall and winter. Some are much more damaging than others. For those like the Hanukkah Eve Windstorm of 2006 (see Figure 8-7), the impact on the public can be severe.

[35] Everett Washington Website. Accessed 26 Sept. 2023. Available online at: FAQs • Everett, WA • CivicEngage (everettwa.gov)

Source: Oregon Climate Service, 2015

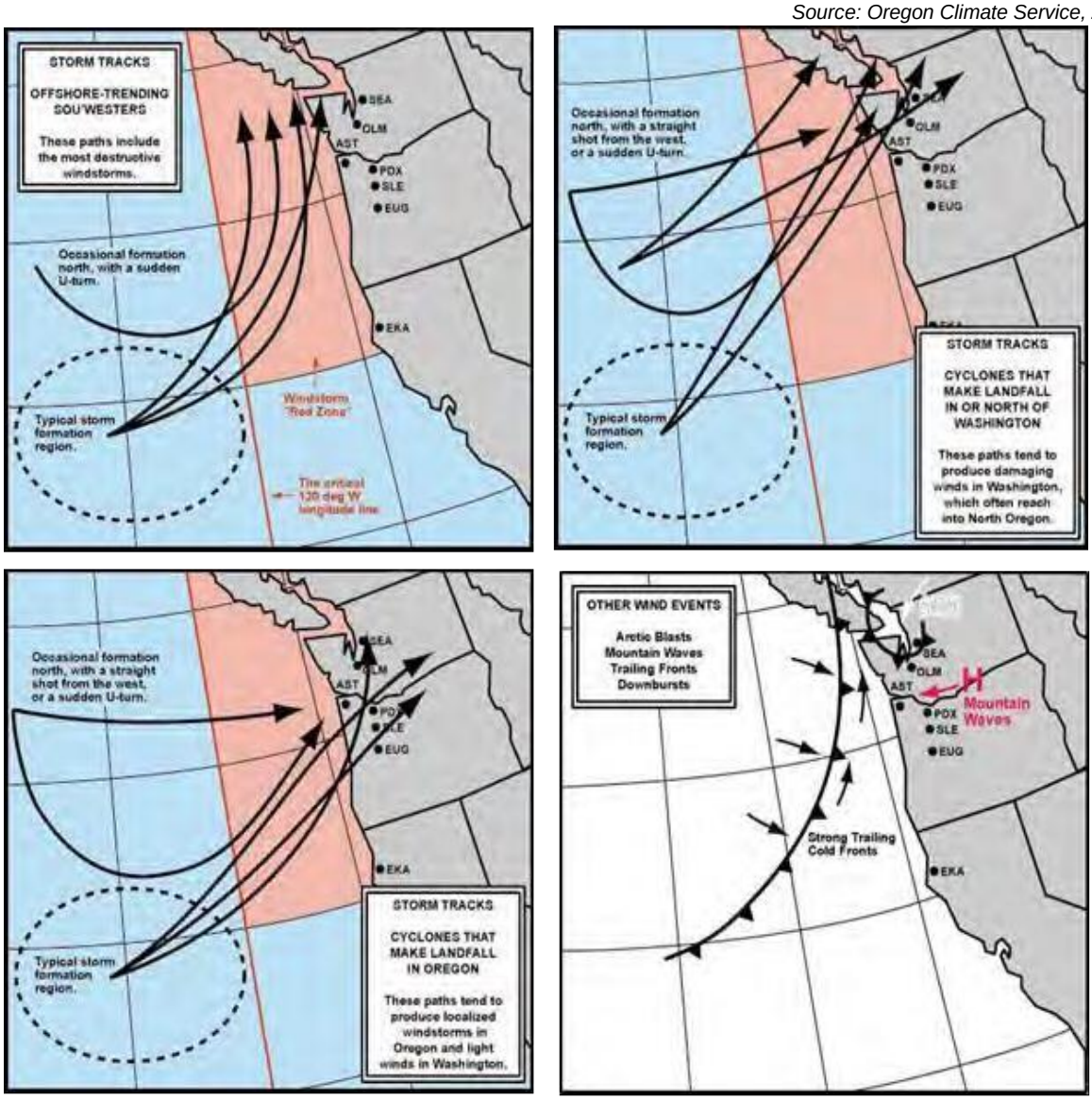


Figure 8-5 Windstorm Tracks Impacting the Pacific Northwest

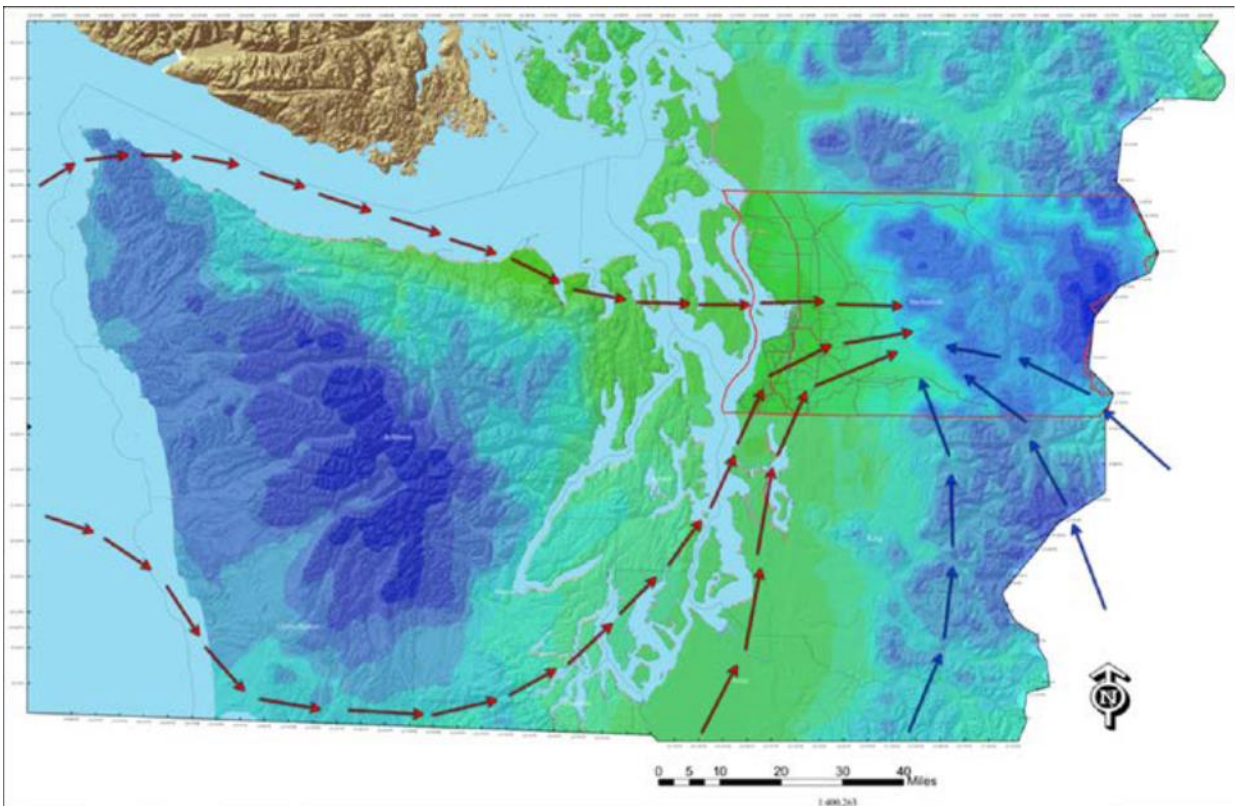


Figure 8-6 Wind Patterns Impacting Everett

One of the strongest windstorms of record was the 1962 Columbus Day Storm, which was the strongest non-tropical windstorm to hit the lower 48 states. It traveled approximately 40 mph from Northern California to the Canadian border and east as far as Montana. The storm killed 46 people, destroyed more than 50,000 homes, left another 469,000 without power, caused $235 million in property damage and flattened 15 billion board feet of timber worth an estimated $750 million. Severe winds also occurred during the Inauguration Day storm of 1993.

Review of NOAA data for the time period 2000-2022 indicates that there have been approximately 18 high wind events recorded within Everett, with no deaths or injuries reported. (It should be noted that some of these events may be duplicate events, reported by different entities and individuals.)

Figure 8-7 Hanukkah Eve Peak Wind Gusts

8.1.5 Hail Storm Events

Hail occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. Recent studies suggest that super-cooled water may accumulate on frozen particles near the back side of a storm as they are pushed forward across and

above the updraft by the prevailing winds near the top of the storm. Eventually, the hailstones encounter downdraft air and fall to the ground.

Based on review of available weather data, the City of Everett has experienced one recorded hail event in 2001 (over 23 years ago), which caused no damages. Review of FEMA National Risk Index identifies the city's risk as very low both for risk and expected annual losses. As such, hail is not profiled any further within this document.[36]

8.1.6 Ice Storms

The National Weather Service defines an ice storm as a storm that results in the accumulation of at least 0.25 inches of ice on exposed surfaces. Ice storms occur when rain falls from a warm, moist, layer of atmosphere into a below freezing, drier layer near the ground. The rain freezes on contact with the cold ground and exposed surfaces, causing damage to trees, utility wires, and structures (see Figure 8-8).[37]

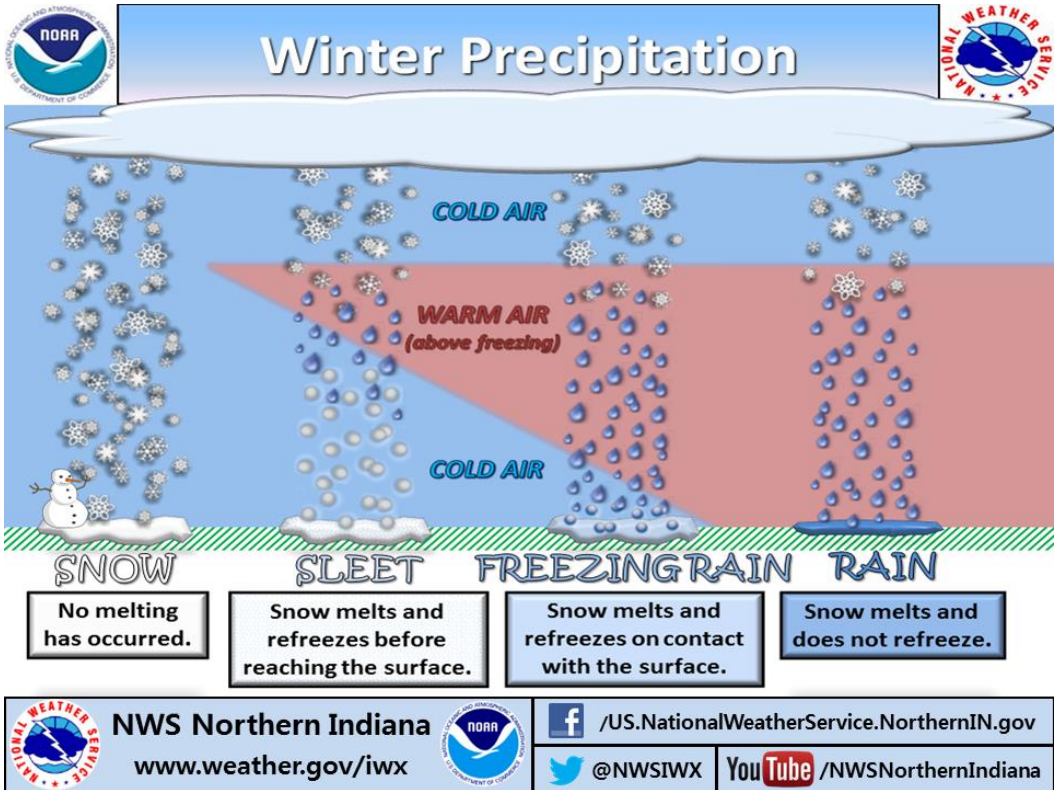


Figure 8-8 Types of Precipitation

[36] FEMA National Risk Index. Map | National Risk Index (fema.gov) Accessed 19 July 2024.

[37] National Weather Service. Winter Precipitation. Accessed 22 July 2024. What is the Difference between Sleet, Freezing Rain, and Snow? (weather.gov)

8.1.7 Extreme Temperatures

Extreme temperature includes both heat and cold events, which can have a significant impact on human health, commercial/agricultural businesses and primary and secondary effects on infrastructure (e.g., burst pipes and power failure). What constitutes "extreme cold" or "extreme heat" can vary across different areas of the country, based on what the population is accustomed to within the region (CDC, 2014).

Extreme Cold

Extreme cold events are when temperatures drop well below normal in an area. In regions relatively unaccustomed to winter weather, near freezing temperatures are considered "extreme cold." Extreme cold can often accompany severe winter storms, with winds exacerbating the effects of cold temperatures by carrying away body heat more quickly, making it feel colder than is indicated by the actual temperature (known as wind chill). Figure 8-9 demonstrates the value of wind chill based on the ambient temperature and wind speed.

Exposure to cold temperatures, whether indoors or outside, can lead to serious or life-threatening health problems such as hypothermia, cold stress, frostbite or freezing of the exposed extremities such as fingers, toes, nose, and ear lobes. Hypothermia occurs when the core body temperature is <95ºF. If persons exposed to excessive cold are unable to generate enough heat (e.g., through shivering) to maintain a normal core body temperature of 98.6ºF, their organs (e.g., brain, heart, or kidneys) can malfunction. Extreme cold also can cause emergencies in susceptible populations, such as those without shelter, those who are stranded, or those who live in a home that is poorly insulated or without heat. Infants and the elderly are particularly at risk, but anyone can be affected.

Extremely cold temperatures often accompany a winter storm, so individuals may have to cope with power failures and icy roads. Although staying indoors can help reduce the risk of injury on the ice, individuals may also face indoor hazards. Many homes will be too cold—either due to a power failure or because the heating system is not adequate for the weather. The use of space heaters and fireplaces to keep warm increases the risk of household fires and carbon monoxide poisoning.

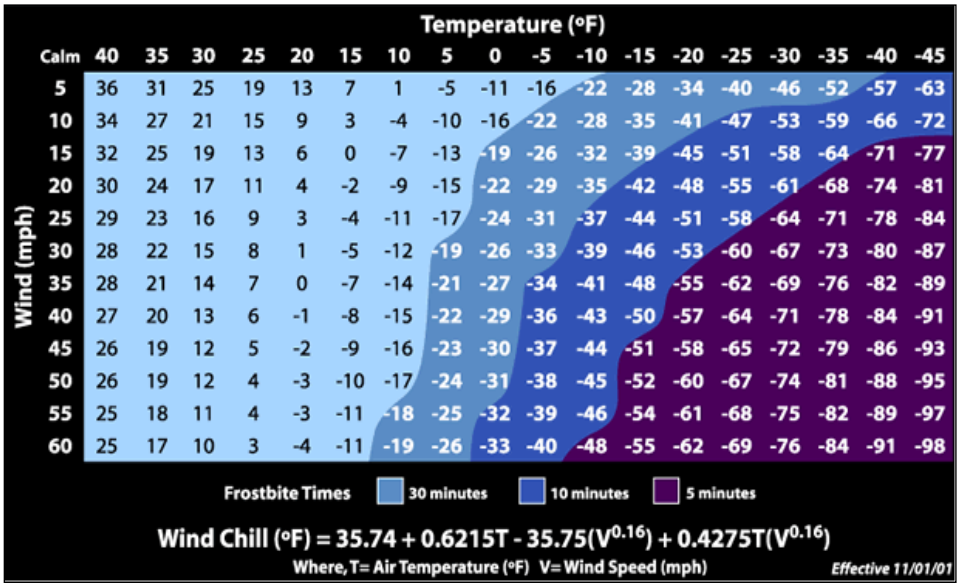


Figure 8-9 NWS Wind Chill Index

During cold months, carbon monoxide may be high in some areas because the colder weather makes it difficult for car emission control systems to operate effectively. Carbon monoxide levels are typically higher during cold weather because the cold temperatures make combustion less complete and cause inversions that trap pollutants close to the ground (USEPA, 2009).

Extreme Heat

Temperatures that hover 10 degrees or more above the average high temperature for the region and last for several days or weeks are defined as extreme heat (FEMA, 2006; CDC, 2006). An extended period of extreme heat of three or more consecutive days is typically called a heat wave and is often accompanied by high humidity (Ready America, Date Unknown; NWS, 2005). There is no universal definition of a heat wave because the term is relative to the usual weather in a particular area. The term heat wave is applied both to routine weather variations and to extraordinary spells of heat which may occur only once a century (Meehl and Tebaldi, 2004). A basic definition of a heat wave implies that it is an extended period of unusually high atmosphere-related heat stress, which causes temporary modifications in lifestyle and which may have adverse health consequences for the affected population (Robinson, 2000). Figure 8-10 identifies some of those consequences and associated temperatures.[38]

Certain populations are considered vulnerable or at greater risk during extreme heat events. These populations include, but are not limited to the elderly age 65 and older, infants and young children under five years of age (see Figure 8-11), pregnant woman, the homeless or poor, the overweight, and people with mental illnesses, disabilities, and chronic diseases (NYS HMP, 2008).

[38] NCDC, 2000

Temperature (°F)																	
Relative Humidity (%)		80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
	40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
	45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
	50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
	55	81	84	86	89	93	97	101	106	112	117	124	130	137			
	60	82	84	88	91	95	100	105	110	116	123	129	137				
	65	82	85	89	93	98	103	108	114	121	128	136					
	70	83	86	90	95	100	105	112	119	126	134						
	75	84	88	92	97	103	109	116	124	132							
	80	84	89	94	100	106	113	121	129								
	85	85	90	96	102	110	117	126	135								
	90	86	91	98	105	113	122	131									
	95	86	93	100	108	117	127										
	100	87	95	103	112	121	132										

Category	Heat Index	Health Hazards
Extreme Danger	130 °F – Higher	Heat Stroke / Sunstroke is likely with continued exposure.
Danger	105 °F – 129 °F	Sunstroke, muscle cramps, and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Extreme Caution	90 °F – 105 °F	Sunstroke, muscle cramps, and/or heat exhaustions possible with prolonged exposure and/or physical activity.
Caution	80 °F – 90 °F	Fatigue possible with prolonged exposure and/or physical activity.

Figure 8-10 Heat Stress Index

Wind-Chill Factor Chart (in Fahrenheit)

Air Temperature \ Wind Speed in mph	Calm	5	10	15	20	25	30	35	40
40	40	36	34	32	30	29	28	28	27
30	30	25	21	19	17	16	15	14	13
20	20	13	9	6	4	3	1	0	-1
10	10	1	-4	-7	-9	-11	-12	-14	-15
0	0	-11	-16	-19	-22	-24	-26	-27	-29
-10	-10	-22	-28	-32	-35	-37	-39	-41	-43

Comfortable for out door play | Caution | Danger

Heat Index Chart (in Fahrenheit %)

Air Temperature (F) \ Relative Humidity (Percent)	40	45	50	55	60	65	70	75	80	85	90	95	100
80	80	80	81	81	82	82	83	84	84	85	86	86	87
84	83	84	85	86	88	89	90	92	94	96	98	100	103
90	91	93	95	97	100	103	105	109	113	117	122	127	132
94	97	100	103	106	110	114	119	124	129	135			
100	109	114	118	124	129	130							
104	119	124	131	137									

Figure 8-11 Temperature Index for Children

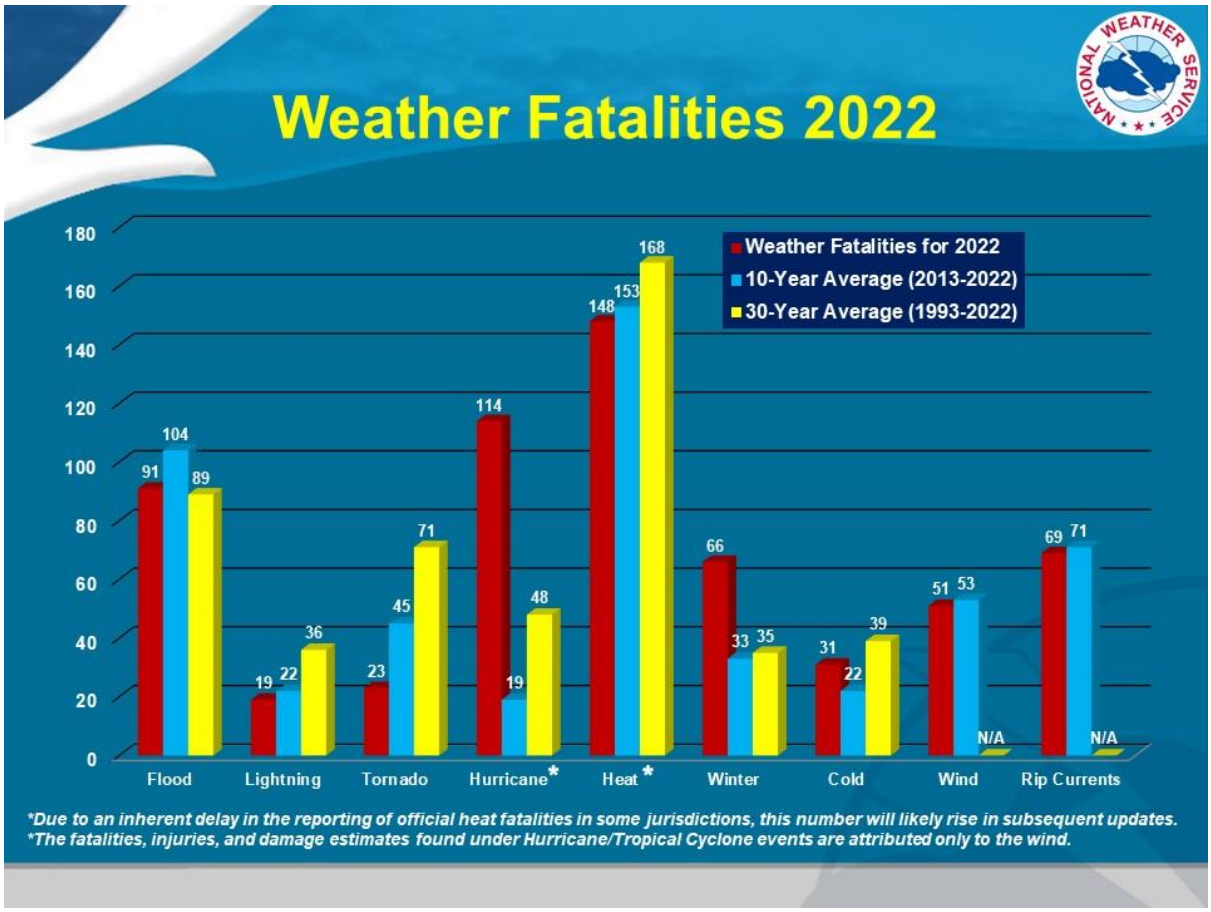


Figure 8-12 Weather Fatalities

Figure 8-12 illustrates the number of weather fatalities based on 10-year and 30-year averages.[39] Extreme heat is the number one weather-related cause of death in the U.S. over the 30-year average, followed by flood.

Depending on severity, duration, and location; extreme heat events can create or provoke secondary hazards including, but not limited to, dust storms, droughts, wildfires, water shortages and power outages (FEMA, 2006; CDC, 2006). This could result in a broad and far-reaching set of impacts throughout a local area or entire region. Impacts could include significant loss of life and illness; economic costs in transportation, agriculture, production, energy, and infrastructure; and losses of ecosystems, wildlife habitats and water resources (Adams, Date Unknown; Meehl and Tebaldi, 2004; CDC, 2006; NYSDPC, 2008).

[39] NOAA, 2023 (http://www.nws.noaa.gov/om/hazstats.shtml)

8.2 HAZARD PROFILE

8.2.1 Extent and Location

The entire planning area is susceptible to the impacts of severe weather. Severe weather events customarily occur during the months of October to April, although they have occurred year-round. Everett has been impacted by strong winds, rain, snow, or other precipitation. Considerable snowfall does not customarily occur throughout the region, although there have been 12 days of "heavy snow" identified within NOAA's database occurring during the period 2000-2022.

Communities in low-lying areas next to coastlines, rivers, streams, or lakes are more susceptible to flooding as a result of storm surge. Winds coming off of the Pacific Coast can have a significant impact on the planning region as a result of both the wind and associated storm surge. For the planning region as a whole, wind events are one of the most common weather-related incidents to occur. In some incidents, this has left some areas without power, although customarily not for long, extended periods.

The extent of extreme cold temperatures are generally measured through the wind chill temperature index. Wind Chill Temperature is the temperature that people and animals feel when outside and it is based on the rate of heat loss from exposed skin by the effects of wind and cold. As the wind increases, the body is cooled at a faster rate causing the skin's temperature to drop (NWS, 2009).

Severe storms and weather affect transportation and utilities. Access across certain parts of the Snohomish County is unpredictable as roads are vulnerable to damage from severe storms, snow/ice accumulations in certain areas of Snohomish County, as well as landslide/erosion. When such incidents occur in areas outside of the immediate Everett area, those incidents that do impact the I-5 corridor also impact Everett as well due to proximity. Severe storms and storm surges can also cause flooding and channel migration, particularly if such events occur with King Tides.

8.2.2 Previous Occurrences

Types of severe weather occurring within Everett vary due to the topography of the area encompassing the planning area, but some level of severe weather or storm event impacts the area at least once annually, although not to the level of a disaster declaration. Since 1953 through 2022, there have been 15 declared Severe Weather events.

Events include heavy precipitation, storm surge, and damaging downburst winds. Less frequent severe weather phenomena include heavy snowstorms and ice storms, although all have occurred in the planning area. Review of NOAA's CDC data identifies one ice storm event since completion of the 2018 HMP, occurring on December 23, 2022 (Governor's Proclamation #23.01). The most recent snow event occurred in December 2021 (county declared an emergency event due to snow, ice/freezing temperatures and rain combination impacting several structures). The county has experienced three tornado events (2004 F-0, 2005 F-1, and 2006 F-0), although those occurred in Stanwood, Arlington and Sultan, respectively, and not within Everett. Review of FEMA's National Risk Index (NRI), which provides information with respect to various hazards of concern and the

anticipated impacts, identifies the City of Everett as being at very low risk to a tornado with respect to the risk index and expected annual loss.[40] As such, the tornado hazard is not profiled further.

During the "heat dome" event which occurred during June 26-July 2, 2021, Washington State as a whole was impacted by an unprecedent heat wave, with temperatures reaching 100 degrees in Everett, the hottest temperature recorded. Snohomish County experienced 15 heat-related deaths during that time period.[41] One male in Everett experienced a heat stroke in their residence.[42] The MPT recalls no other events of extreme heat occurring in the area.

During the period 2016-2021, NOAA reported ~30 wind events within the area.[43] On average, the city experiences at least one significant windstorm annually. Review of FEMA disaster declarations and Governor's proclamation identify five severe weather events (combined) which have included wind since completion of the 2018 plan. One hail event was reported at the Everett Airport in 2001, with no other significant events occurring. There has been one reported death which occurred as a result of the heat dome in 2021. No other deaths or injuries have occurred in the city as a direct result of a severe weather event. [44]

8.2.3 Severity

The most common problems associated with severe storms are immobility and loss of utilities. As indicated, the city has experienced no fatalities as a result of a severe weather event.

During severe storms, roads may become impassable due to flooding, downed trees, ice or snow, or although infrequent, a landslide. Power lines may also be downed due to high winds or ice accumulation, and services such as water or phone may not be able to operate without power. Lightning can cause severe damage and injury, although no deaths have occurred as a result of a lightning strike. Physical damage to homes and facilities caused by wind, or by accumulation of snow or ice can also occur. Due to the limited amount of snow customarily received in the region, even a small accumulation of ice or snow can, and has, caused havoc on transportation systems, particularly those in hilly terrain, the level of experience of drivers to maneuver in snow and ice conditions, and the lack of snow clearing equipment and resources within the region, which is, in certain areas, much more rural in nature in areas of Everett.

[40] FEMA National Risk Index. Map | National Risk Index (fema.gov) Accessed 19 July 2024.

[41] Washington State Department of Health. Heat Wave 2021. Available online at: Heat Wave 2021 | Washington State Department of Health

[42] Associated Press. 29 June 2021. Blackouts in US Northwest due to heat wave, deaths reported. Available at: Blackouts in US Northwest due to heat wave, deaths reported | AP News

[43] NOAA reporting may include duplications of the same events reported multiple times by various reporters.

[44] NOAA Storm Events Database. Accessed 1 Feb. 2024. Available online at: Storm Events Database - Search Page | National Centers for Environmental Information (noaa.gov)

Ice storms, especially when accompanied by high winds, can have an especially destructive impact, with both being able to close major transportation corridors and bridges. Accumulation of ice on trees, power lines, communication towers and wiring, or other utility services can be crippling, and create additional hazards for residents, motorists and pedestrians.

During the last 35 years, Western Washington has had an average annual snowfall of 11.4 inches per year, with the snowfall customarily occurring during November through March, although snow has fallen as late as April. Within the City of Everett, snowfall average is 3.2 inches, with approximately 17 days (averaged) per year with snow depths of 1 inch or more.[45]

Windstorms are common in the planning area, occurring many times throughout the year. The predicted wind speed given for wind warnings issued by the National Weather Service is for a one-minute average, during which gusts may be 25 to 30 percent higher.

8.2.4 Frequency

Since 1953, 15 severe weather events have been declared in the county (see Chapter 3, Section 3.3 for disaster history information). This equates to one declared incident every 4.67 years, with a probability of occurrence per year of 21.43 percent. Severe storm(s) (all types) is the hazard which has impacted the planning area most frequently since 1953, followed by flood events. FEMA ranks Severe Storms as the hazard of highest priority in the planning area based on their ranking.

With respect to wind hazards, Washington State Department of Ecology has estimated frequency intervals for wind speed as follows:

WIND SPEEDS EXCEED	FREQUENCY
55 MPH	Annually
76 MPH	~ 5 years
83 MPH	~10 years
92 MPH	~25 years
100 MPH	~50 years
108 MPH	~100 years

[45] Everett Weather Data - USA.Com Everett Weather. Accessed 26 Sept. 2023. Available online at: Everett, WA Weather - USA.com™

8.3 VULNERABILITY ASSESSMENT

8.3.1 Overview

Severe weather incidents can and regularly do occur throughout the entire planning area. Similar events impact areas within the planning region differently, even though they are part of the same system. While in some instances some type of advanced warning is possible, as a result of climatic differences, topographic and relative distance to the coastline, the same system can be much more severe in certain areas. Therefore, preparedness plays a significant contributor in the resilience of the citizens to withstand such events.

A lack of data separating severe weather damage from flooding, windstorms, and landslide damage prevents a detailed analysis for exposure and vulnerability. For planning purposes, it is assumed that the entire city is exposed to some extent to severe weather. Certain areas are more exposed due to geographic location and local weather patterns, proximity to Puget Sound, as well as the response capabilities of local first responders.

Warning Time

Meteorologists can often predict the likelihood of some severe storms. In some cases, this can give several days of warning time. However, meteorologists cannot predict the exact time of onset or severity of the storm, and the rapid changes which can also occur significantly increasing the impact of a weather event.

8.3.2 Impact on Life, Health and Safety

The entire planning area is susceptible to severe weather events. Populations living at higher elevations with large stands of trees or above-ground power lines may be more susceptible to wind damage and black out conditions, while populations in low-lying areas are at risk for possible flooding and landslides associated with the flooding as a result of heavy rains. Increased levels of precipitation in the form of snow also vary by area, with higher elevations being more susceptible to increased accumulations. Resultant secondary impacts from power outages during cold weather event, when combined with the high population of retired and elderly residents significantly impacts response capabilities and the risk factor associated with such weather incidents. Within the more densely wooded areas, increased fire danger during extreme heat conditions increases the likelihood of fire, which increases fire danger.

Particularly vulnerable populations are the elderly and very young, low income, linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads. Extreme temperature variations, either heat or cold, are of significant concern on both the elderly and the young, increasing vulnerability of those populations.

Review of US Census data indicates that 18.9 percent of the city's population are under five years of age, or 65 or over, which is lower than Snohomish County's population of the same type, and the state's average. 20 percent of the population are veterans, which is higher than the county or state's average. 10.5 percent of the population under the age of 65 have a disability. This is higher than the county or state's average. The percent of individuals living in poverty is 11 percent, again higher than the county or state's averages. When combined, the large population of retirees and the higher rate

of disabled individuals living in the area are of significant concern to the planning team throughout the region when severe weather events occur due to the higher levels of vulnerable populations.

Storm events have cut off access routes to areas of the city, specifically the eastern portion of the city. These storm events include both declared and non-declared incidents, as even minor incidents have the potential to impact ingress and egress. Such issues are of concern for evacuation purposes by first responder if vital advanced life support (ALS) is required, as well as for general evacuation purposes during a period where power is out, and individuals attempt to leave the area. Travel time can be increased significantly if alternate routes are used, or if the I-5 corridor is blocked.

Snohomish County PUD provides electricity to the planning area. Severe weather events can and have disrupted electricity in the planning area, on average though only a few times each year. When most power outages occur, they last for only a few hours, except in extreme conditions.

8.3.3 Impact on Property

Currently, data identifies that there are in excess of 33,200 parcels in the planning area, with over 48,600 residential structures (all types, multi-family/stacked structures). Figure 3-13 in Chapter 3 identifies the age of the structures within the city. A high percentage of structures in Everett could be impacted by significant weather events as many were built without the influence of a structural building code with provisions for wind loads. Review of current wind load capacity identifies current codes requiring structures be built to a 110 mph force, as well as a snow load capacity of 25 psf minimum.[46]

For planning purposes, all properties and buildings within the planning area are considered to be exposed to the severe weather hazard, but structures in poor condition or in particularly vulnerable locations (hilltops or exposed open areas) may be at risk for the most damage. The frequency and degree of damage will depend on specific locations and severity of the weather pattern impacting the region. It is improbable to determine the exact number of structures susceptible to a weather event, and therefore emergency managers and public officials should establish a maximum threshold, or worst-case scenario, of susceptible structures.

8.3.4 Impact on Critical Facilities and Infrastructure

All ~151 number of critical facilities valued at $1.106 billion (structure and content) are vulnerable to some degree. As many of the severe weather events include multiple hazards, information such as that identifying facilities exposed to flooding or landslides (see Flood and Landslide profiles) are also likely exposed to severe weather. Additionally, facilities on higher ground may also be exposed to wind damage or damage from falling trees. Jetty Island could also be significantly impacted by tidal action associated with severe storms. The man-made island provides a protected harbor and navigation channel for the Port of Everett.

[46] City of Everett IRS and IBC Requirements. Accessed 27 Sept. 2023. Available online at: FAQs • Everett, WA • CivicEngage (everettwa.gov)

The most common problems associated with severe weather are loss of utilities. Downed power lines can cause blackouts, leaving areas without power. Such was the case experienced as a result of the 1996 ice storm, which left much of the area without power for several days. Since completion of the last plan, there have been three declared Severe Weather incidents which have occurred, impacting the critical facilities in the city. The more recent incidents included the December 2020-January 2021 Severe Winter Storm, as well as the November 3-8, 2022 Severe Winter Storm.

As a result of historical events, the local utility providers such as Snohomish County PUD continue their practice of tree-trimming operations to reduce the potential impact from wind, ice and snow events. In addition to power loss, the area can also experience the loss of phones (cell and land-line), water, and sewer systems, all of which may not function properly during severe weather events. Loss of electricity and phone connection could also result in some residents being unable to call for emergency assistance as needed. Roads may also become impassable due to ice or snow, or from secondary hazards such as landslides.

Within the planning region, the City of Everett and Snohomish County PUD are co-licensees under the Federal Energy Regulatory Commission (FERC) for the construction and operation of the Henry M. Jackson Hydroelectric Project on the Sultan River. The project supplies water for Everett's water utility, and Spada Lake, which was built as part of the project, is the main water reservoir for the City of Everett. Spada Lake is located approximately seven miles east of Lake Chaplain, and is not in Everett's city limits. The area is regulated under Snohomish County's shoreline master program. The dam produces a significant amount of power to areas well outside of the planning area. Major power lines travel from the dam through a large swath of Snohomish County. As such, wind events occurring in Snohomish County on the co-licensed dam also have the potential to impact power supplies in large metropolitan areas well outside of the planning area. With the City of Everett supplying large quantities of water to its water purveyors, should a significant event occur which impacts waterflow, a significant number of people (both city and county) could be impacted. Likewise, with the city also supplying wastewater treatment to 180,000 residents, a severe weather event could also impact that utility.

Incapacity and loss of roads are the primary transportation failures, most of which are associated with secondary hazards such as landslides. Landslides that block roads are caused by heavy prolonged rains, and often times reoccur in areas previously impacted. High winds can cause significant damage to trees and power lines, with obstructing debris blocking roads, incapacitating transportation, isolating populations (particularly in the eastern portion of Snohomish County), and disrupting ingress and egress. Snowstorms at higher elevations can impact the transportation system and the availability of public safety services. Of particular concern are roads providing access to isolated areas and to the elderly. The eastern portion of the Everett are most frequently impacted by severe weather events which potentially cause isolation.

8.3.5 Impact on Economy

Prolonged obstruction of major routes due to severe weather can disrupt the shipment of goods and other commerce. Severe windstorms, downed trees, and ice can create serious impacts on power and above-ground communication lines. Freezing rain/snow on power and communication lines can cause them to break, disrupting electricity and communication, further impacting businesses within the region. Prolonged outages would also impact consumer and tax bases resulting from lost revenue, (food) spoilage, and lack of production, etc. The city is home to the Port of Everett, which would be

negatively impacted by severe weather events. Large, prolonged storms can have negative economic impacts for an entire region. All severe weather events have the potential to also impact tourism, an industry on which much of the planning region as a whole is dependent, both by providing income from retail businesses and its tax base, and also employment for Everett citizens.

8.3.6 Impact on Environment

The environment is highly exposed to severe weather events. Natural habitats such as streams and trees are exposed to the elements during a severe storm and risk major damage and destruction. Prolonged rains can saturate soils and lead to slope failure. Flooding events caused by severe weather or snowmelt can produce river channel migration or damage riparian habitat, also impacting spawning grounds and fish populations for many years. Storm surges can erode beachfront bluffs and redistribute sediment loads. As indicated, Jetty Island could be significantly impacted by tidal action associated with severe storms. The Island provides habitat for salmon and various birds, including bald eagles. Extreme heat can raise temperatures of rivers, impacting oxygen levels in the water, threatening aquatic life.

8.3.7 Impact from Climate Change

Climate change presents a challenge for risk management associated with severe weather. The frequency of severe weather events has increased steadily over the last century. The number of weather-related disasters during the 1990s was four times that of the 1950s, and cost 14 times as much in economic losses. Historical data shows that the probability for severe weather events increases in a warmer climate.

The last several years, and in particular 2021 and 2022, have seen record temperatures, with meteorologists predicting continued increase. This increase in average surface temperatures can also lead to more intense heat waves that can be exacerbated in urbanized areas by what is known as urban heat island effect. Additionally, the changing hydrograph caused by climate change could have a significant impact on the intensity, duration, and frequency of storm events. All of these impacts could have significant economic consequences.

With the increase in average ambient temperatures, since the 1980s, unusually cold temperatures have become less common in the contiguous 48 states. This trend is expected to continue, and the frequency of winter cold spells will likely decrease. As ambient temperatures increase, more water evaporates from land and water sources. The timing, frequency, duration, and type of precipitation events will be affected by these changes. In general, more precipitation will fall as rain rather than snow.

8.4 FUTURE DEVELOPMENT TRENDS

All future development and increases in population within the city will be affected by severe storms. A higher population density can lead to more people being affected by severe weather, increasing the potential for injuries, casualties, and strain on emergency services. Evacuation and relief efforts may also become more difficult with a larger population.

The ability to withstand or lessen impacts lies in sound land use practices and consistent enforcement of codes and regulations for new construction. The city does have land use regulations in place, which includes implementation of the International Building Codes as well as additional land use authority. These codes are equipped to deal with the impacts of severe weather incidents by identifying

construction standards which address wind speed, roof load capacity, elevation and setback restrictions.

While under the Growth Management Act public power utilities are required by law to supply safe, cost effective and equitable service to everyone in the service area requesting service, most lines in the area are above-ground, causing them to be more susceptible to high winds or other severe weather hazards. However, growth management is also a constraint, which could possibly lead to increased outages or even potential shortages. While most new development expects access to electricity, they do not want to be in close proximity to sub stations. The political difficulty in sighting these sub-stations makes it difficult for the utility to keep up with regional growth.

Land use policies currently in place, when coupled with informative risk data such as that established within this mitigation plan and such other projects like FEMA's flood maps, will also address the severe weather hazard. With the land use tools currently in place, the city will be well-equipped to deal with future growth and the associated impacts of severe weather.

8.5 ISSUES

Important issues associated with a severe weather in the planning area include the following:

- Older building stock in the planning area is built to low code standards or none at all. These structures could be highly vulnerable to severe weather events such as windstorms.
- Redundancy of power supply must be evaluated and increased region-wide in order to more fully understand the vulnerabilities in this area.
- The capacity for backup power generation is limited and should be enhanced, especially in areas of potential isolation due to impact on major thoroughfares or evacuation routes.
- Isolated population centers exist, particularly in the eastern portion of the city.
- Climate change may increase the frequency and magnitude of winter flooding or storm surges, thus exacerbating severe winter events.
- Proximity to the coastline enhances flooding potential through storm surges, as well as severe storms in general.

8.6 RESULTS

Based on review and analysis of the data, the Planning Team has determined that the probability for impact from some form of a severe weather event identified above throughout the area is highly likely. The area experiences some form of a severe storm event annually, albeit not always to the level of a disaster declaration. Based on FEMA's typing of the various events inclusive in the Severe Weather hazard, this equates to a declared event occurring every 4.67 years. While snow and ice do occur annually, impact and severity has been limited. The more significant issue would be a severe storm which causes a flood event (particularly if occurring simultaneous with hightide), isolating areas or blocking ingress and egress. Wind causing power outage is also of concern; however, the PUD maintains an excellent record for low incidents of long-term power outages. Based on the potential impact, the Planning Team determined the CPRI score to be 2.85, with overall vulnerability determined to be a high level.

CHAPTER 9.
TSUNAMI

A tsunami is a series of high-energy waves radiating outward from a disturbance. Earthquakes may produce displacements of the sea floor that can set the overlying column of water in motion, initiating a tsunami.

Tsunamis are classified as local or distant. Distant tsunamis may travel for hours before striking a coastline, giving a community a chance to implement evacuation plans. Local tsunamis have minimal warning times, leaving few options except to run to high ground. They may be accompanied by damage resulting from the triggering earthquake due to ground shaking, surface faulting, liquefaction or landslides. As a result of the high probability of a Cascadia Subduction Zone-type earthquake, occupants of many parts of Washington's coastlines have minimal time to reach high ground, in some areas only 20-30 minutes.

9.1 GENERAL BACKGROUND

9.1.1 Physical Characteristics of Tsunamis

All waves, including tsunamis, are defined by the following characteristics (see Figure 9-1; Earth Science, 2012, Tulane University[47]):

- **Wavelength** is defined as the distance between two identical points on a wave (i.e., between wave crests or wave troughs). Normal ocean waves have wavelengths of about 300 feet. Tsunamis have much longer wavelengths, up to 300 miles.
- **Wave height** is the distance between the trough of a wave and its crest or peak.
- **Wave amplitude** is the height of the wave above the still water line; usually this is equal to 1/2 the wave height. Tsunamis can have variable wave height and amplitude that depends on water depth.

DEFINITIONS

Tsunami—A series of traveling ocean waves of extremely long wavelength usually caused by displacement of the ocean floor and typically generated by seismic or volcanic activity or by underwater landslides.

Tidal bore – A tidal phenomenon in which the leading edge of the incoming tide forms a wave (or waves) of water that travel up a river or narrow bay against the direction of the river or bay's current.

Tsunami Advisory - The purpose of a Tsunami Advisory is to keep people away from rivers, beaches, and harbors for their own personal safety. Tsunami waves during a Tsunami Advisory can also appear as "sneaker waves."

Tsunami Watch A tsunami watch is issued when a tsunami may later impact the watch area. The watch may be upgraded to a warning or advisory or canceled based on updated information and analysis. Emergency management officials and the public should prepare to take action.

Tsunami Warning A tsunami warning is issued when a tsunami with the potential to generate widespread inundation is imminent, expected, or occurring. Warnings alert the public that dangerous coastal flooding accompanied by powerful currents is possible and may continue for several hours after initial arrival. Warnings alert emergency management officials to take action for the entire tsunami hazard zone. Appropriate actions to be taken by local officials may include the evacuation of low-lying coastal areas, and the repositioning of ships to deep waters when there is time to safely do so. Warnings may be updated, adjusted geographically, downgraded, or canceled based on updated information and analysis.

Sneaker wave – A term used to describe disproportionately large coastal waves that can sometimes appear in a wave train without warning.

[47] http://www.tulane.edu/~sanelson/Natural_Disasters/tsunami.htm

- **Wave frequency or period** is the amount of time it takes for one full wavelength to pass a stationary point.
- **Wave velocity** is the speed of a wave. It is equal to the wavelength divided by the wave period. Velocities of normal ocean waves are about 55 mph while tsunamis have velocities up to 600 mph (about as fast as jet airplanes).

Tsunamis are different from the waves most of us have observed on the beach, which are caused by the wind blowing across the ocean's surface. Wind-generated waves usually have periods of 5 to 20 seconds and a wavelength of 300 to 600 feet. A tsunami can have a period in the range of 10 minutes to 2 hours and wavelengths greater than 300 miles. Tsunamis are shallow-water waves, which are waves with very small ratios of water depth to wavelength.

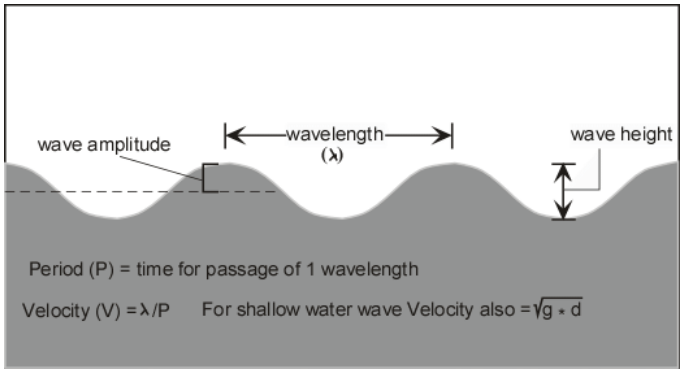


Figure 9-1 Physical Characteristics of Waves

The rate at which a wave loses its energy is inversely related to its wavelength. Since a tsunami has a very large wavelength, it loses little energy as it propagates. Thus, in very deep water, a tsunami will travel at high speeds with little loss of energy. For example, when the ocean is 20,000 feet deep, a tsunami will travel about 600 mph, and thus can travel across the Pacific Ocean in less than one day.

As a tsunami leaves the deep water of the open sea and arrives at shallow waters near the coast, it undergoes a transformation (see Figure 9-2; Earth Science, 2012). Since the velocity of the tsunami is also related to the water depth, as the depth of the water decreases, the velocity of the tsunami decreases. The change of total energy of the tsunami, however, remains constant. Furthermore, the period of the wave remains the same, so more water is forced between the wave crests, causing the height of the wave to increase.

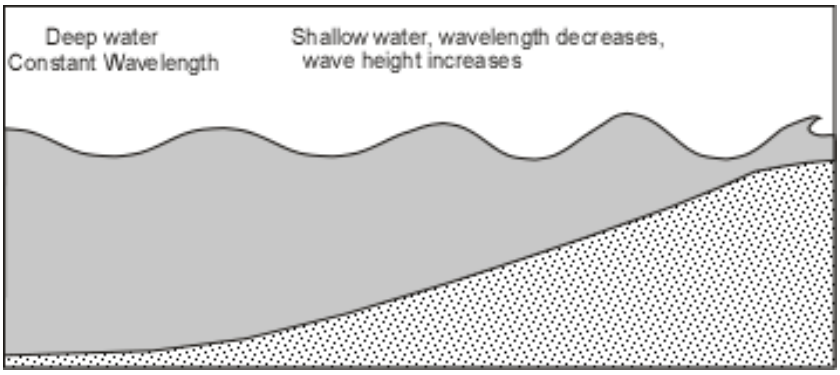


Figure 9-2 Change in Wave Behavior with Reduced Water Depth

Because of this "shoaling" effect, a tsunami that was imperceptible in deep water may grow to have wave heights of several meters. As a tsunami enters the shoaling waters near a coastline, its speed diminishes, its wavelength decreases, and its height increases greatly. The first wave usually is not the largest. Several larger and more destructive waves often follow. As tsunamis reach the shoreline, they may take the form of a fast-rising tide, a cresting wave, or a bore (a large, turbulent wall-like wave). The bore phenomenon resembles a step-like change in water level that advances rapidly (from 10 to 60 miles per hour).

The configuration of the coastline, the shape of the ocean floor, and the characteristics of advancing waves play roles in the destructiveness of tsunamis. Offshore canyons can focus tsunami wave energy and islands can filter the energy. The orientation of the coastline determines whether the waves strike head-on or are refracted from other parts of the coastline. A wave may be small at one point on a coast and much larger at other points. Bays, sounds, inlets, rivers, streams, offshore canyons, islands, and flood control channels may cause various effects that alter the level of damage. It has been estimated, for example, that a tsunami wave entering a flood control channel could reach a mile or more inland, especially if it enters at high tide.

The first indication of a tsunami reaching land may be a trough—called a drawdown—rather than a wave crest. The water along the shoreline recedes dramatically, exposing normally submerged areas. Drawdown is followed immediately by the crest of the wave, which can catch people observing the drawdown off guard. Rapid drawdown can create strong currents in harbor inlets and channels that can severely damage coastal structures due to erosive scour around piers and pilings. As the water's surface drops, piers can be damaged by boats or ships straining at or breaking their mooring lines. The vessels can overturn or sink due to strong currents, collisions with other objects, or impact with the harbor bottom.

Conversely, the first indication of a tsunami may be a rise in water level. The advancing tsunami may initially resemble a strong surge increasing the sea level like the rising tide, but the tsunami surge rises faster and does not stop at the shoreline. Even if the wave height appears to be small, 3 to 6 feet for example, the strength of the accompanying surge can be deadly. Waist-high surges can cause strong currents that float cars, small structures, and other debris. Boats and debris are often carried inland by the surge and left stranded when the water recedes.

When the crest of the wave hits, sea level rises (called run-up). Run-up is usually expressed in height above normal high tide. Run-ups from the same tsunami can vary with the shape of the coastline. One coastal area may see no damaging wave activity while in another area destructive waves can be large

and violent. The flooding of an area can extend inland by 1,000 feet or more, covering large areas of land with water and debris. Tsunami waves tend to carry loose objects and people out to sea when they retreat. Tsunamis may reach a vertical height onshore of 100 feet above sea level.

At some locations, the advancing turbulent wave front will be the most destructive part of the wave. In other situations, the greatest damage will be caused by the outflow of water back to the sea between crests, sweeping all before it and undermining roads, buildings, bulkheads, and other structures. This outflow action can carry enormous amounts of highly damaging debris with it, resulting in further destruction. Ships and boats, unless moved away from shore, may be dashed against breakwaters, wharves, and other craft, or be washed ashore and left grounded after the withdrawal of the seawater.

Because the wavelengths and velocities of tsunamis are large, their period is also large. It may take several hours for successive crests to reach the shore. (For a tsunami with a wavelength of 125 miles traveling at 470 mph, the wave period is about 16 minutes). Thus, people are not safe after the passage of the first large wave, but must wait several hours for all waves to pass. The first wave may not be the largest in the series of waves. For example, in several recent tsunamis, the first, third, and fifth waves were the largest.

9.2 HAZARD PROFILE

9.2.1 Extent and Location

Tsunamis affecting Washington may be induced by local geologic events or earthquakes at a considerable distance, such as in Alaska or South America. Approximately 80 percent of tsunamis originate in the Pacific Ocean and can strike distant coastal areas in a matter of hours, such as the 2011 earthquake and ensuing tsunami occurring in Japan which impacted Washington's coastlines, including within the planning area.

Most recorded tsunamis affecting the Pacific Northwest originated in the Gulf of Alaska. The landslide-generated tsunami in Lituya Bay, Alaska in 1958 produced a 200-foot-high wave. There is also geological evidence of significant impacts from tsunamis along the Cascadia subduction zone, which extends from Cape Mendocino, California to the Queen Charlotte Islands in British Columbia.

There has been one tsunami to strike Snohomish County. That event occurred in 1820 when a large landslide from Camano Head created a tsunami that hit Hat Island, drowning an Indian village. This event inundated the area close to Everett's port and its economic lifeline to global trade. Underwater or submarine landslides off the coast of Mukilteo could also trigger another tsunami.

The Southern Whidbey Island Fault (SWIF) and Seattle Fault Zone (SFZ) also pose a potential danger from a tsunami. An earthquake along the SWIF or SFZ could produce a tsunami with the ability to reach shores in 30 minutes, giving officials little time to warn and evacuate people. The SWIF can generate a tsunami that would affect not only portions of the City of Everett, but also much of the county as a whole, traveling into the Snohomish River, and Ebey and Union Sloughs. The SFZ would also have significant impact along Jetty Island, Smith Island and into the Snohomish Delta.

Earthquakes that occur throughout the region can also trigger landslides, which may create or amplify tsunamis. The locations most susceptible to the tsunami hazard are the western coast of the county, the rivers inland from the bay, and the inland lakes.

Studies indicate that approximately 12 very large earthquakes with magnitudes of 8 (Richter) or more have previously occurred in the Cascadia Subduction Zone off the coast of Washington. Computer models created by Washington State Department of Natural Resources (2022) indicate that tsunami waves from such an event could be up to 60 feet in height and could affect the entire outer coast of Washington at varying degrees and depths. For the City of Everett, wave arrival time for a Cascadia event to be approximately 2 hours and 20 minutes (see Figure 9-3). Such a tsunami would most likely impact the Pacific coastal areas of Washington, including, to some degree, the inlets. In addition to the direct impact of the tsunami, such an event could produce extensive seiche action of nearby waters resulting in additional damage to nearby shoreline areas not directly impacted by the tsunami (SCHMP, 2015).

Computer models utilized to replicate a Seattle Fault Zone indicate that tsunami waves from such an event could be up to 7 feet in height (Map Sheet 3, Washington State Department of Natural Resources, Map Series 2022-03). For the City of Everett, wave arrival time for a SFZ event to be approximately 30 minutes, leaving less time for evacuation (see Figure 9-4).[48]

[48] Inundation Area Based on Washington Geological Survey Map Series – Cascadia and Seattle Fault Earthquakes

Figure 9-3 Inundation Area - Washington Geological Survey Map Series - Cascadia

Figure 9-4 Inundation Area - Washington Geological Survey Map Series - Seattle Fault

9.2.2 Previous Occurrences

There has been one tsunami to strike Snohomish County in 1820, when a large landslide from Camano Head created a tsunami that hit Hat Island, drowning an Indian village. This event inundated an area close to Everett's port.

Other historic incidents that have impacted areas of Washington State as a whole include:

- On May 22, 1960, the biggest earthquake ever recorded at the time occurred just off the coast of Chile, South America. The earthquake measured 9.5 (Richter) with swarms of aftershock earthquakes that measured as large 8.0 (Richter). The earthquakes triggered the creation of a tsunami, which was responsible for most of the ensuing devastation and death. The tsunami, together with the coastal subsidence and flooding, caused tremendous damage along the Chile coast, where about 2,000 people died. The waves spread outwards across the Pacific and fifteen (15) hours after the earthquake, tsunami waves flooded Hilo, on the island of Hawaii, where they built up to thirty (30) feet in height and caused 61 deaths along the waterfront. Seven hours later, the waves flooded the coastline of Japan where waves at least ten (10) feet in height caused 200 deaths. Tsunami waves also caused damage in the Marquesas, Samoa, and New Zealand.
- The 1964 Magnitude-9.2 earthquake in Prince William Sound, Alaska which caused a tsunami that struck Washington, Oregon and California, killing 139 people, mostly in Alaska. There were no reported deaths in Washington, but there were reports of damaged roads, bridges, boats and houses along the coastline in the more southwestern portions of the state.[49]
- On July 17, 1998, an earthquake measuring 7.1 (Richter) occurred about 15 miles off the coast of New Guinea in the southwestern Pacific Ocean. While the magnitude of the quake was not large enough to create the tsunami directly, it is believed the earthquake generated an undersea landslide, which in turn caused the tsunami that generated waves reaching 40 feet killing an estimated 2,200 people.
- On December 26, 2004, a massive earthquake measuring over 9.0 (Richter) occurred under the Indian Ocean floor just of the coast of the Indonesian island of Sumatra. Violent movement of the Earth's tectonic plates in this area displaced an enormous amount of water, sending powerful tsunami waves in every direction. Within hours, tsunami waves radiating from the earthquake's epicenter slammed into the coastline of 12 Indian Ocean countries with wave heights reaching up to 50 feet. As many at 250,000 persons were either killed or listed as missing and presumed dead. As many as 1,125,000 people were displaced by the earthquake and subsequent tsunami. The economic losses exceed $10 billion.
- The February 27, 2010 Chilean Magnitude-8.8 earthquake generated a small tsunami with no reported damage in Washington. NOAA reported increased wave heights above sea level as 5.5 inches in Westport, 7.5 inches in Port Angeles, 8.5 inches in La Push, and 9 inches in Neah Bay. (NOAA, 2011).
- The March 2011 tsunami that resulted from a Magnitude-9.0 earthquake in Japan caused increased wave heights along the California, Oregon and Washington coastlines. Major declarations were issued in California and Oregon, but Washington sustained much less damage. Washington coastline wave heights above sea level were reported at La Push at 28 inches; Port Angeles at 23 inches; Westport at 18 inches; Toke Point at 13 inches; Port

[49] USC Tsunami Research Group NOAA Center for Tsunami Research - Tsunami Event - March 28, 1964 Alaska Tsunami

Townsend at 6 inches; and Neah Bay at 17 inches. No significant damage was reported, but this incident had the potential to be much worse.

- As a result of the Queen Charlotte Island M7.7 Earthquake which occurred on October 28, 2012 Toke Point and Westport experienced a tsunami, with maximum water height at Toke Point .04m and Westport .08m.[50]

9.2.3 Severity

Tsunamis are a threat to life and property to anyone living near the ocean. According to the National Centers for Environmental Information (NCEI), tsunamis took the lives of more than 290,000 million people in the past 100 years.[51] From 1950 to 2007 alone, 478 tsunamis were recorded globally. Fifty-one events caused fatalities, to a total of over 308,000 coastal residents. The overwhelming majority of these events occurred in the Pacific basin. Recent tsunamis have struck Nicaragua, Indonesia, Thailand, and Japan, killing several hundred thousand people. Property damage due to these waves was nearly $1 billion. Historically, tsunamis originating in the northern Pacific and along the west coast of South America have caused more damage on the west coast of the United States than tsunamis originating in Japan and the Southwest Pacific.

The Cascadia Subduction Zone will produce the state's largest tsunami. The Cascadia Subduction Zone is similar to the Alaska-Aleutian trench that generated the Magnitude-9.2 1964 Alaska earthquake and the Sunda trench in Indonesia that produced the Magnitude-9.3 December 2004 Sumatra earthquake. Native American accounts of past Cascadia earthquakes suggest tsunami wave heights on the order of 60 feet, comparable to water levels in Aceh Province Indonesia during the December 2004 tsunami there. The Cascadia Subduction Zone last ruptured on January 26, 1700, creating a tsunami that left markers in the geologic record from Humboldt County, California, to Vancouver Island in Canada and is noted in written records in Japan. Water heights in Japan produced by the 1700 Cascadia earthquake were over 15 feet, comparable to tsunami heights on the African coast after the Sumatra earthquake. At least seven ruptures of the Cascadia Subduction Zone have been observed in the geologic record.

A Cascadia Subduction Zone earthquake is expected to lower the ground surface along much of the coast of Washington, as well as within the basins of Everett, Seattle and Tacoma. Maximum flooding depth, velocity, and extent will depend greatly on the tide height at the time of the tsunami arrival.

If a tsunami were to strike the coast of Washington and Vancouver Island in such a way that a portion of the tsunami directly enters the Strait of Juan de Fuca, a large tsunami wave could travel easterly thereby directly striking the west shore of Whidbey Island (Island County) and would also impact other low-lying shoreline areas. The tsunami from a Cascadia-type event would not require a direct hit to impact the region due to failed infrastructure.

[50] NOAA National Centers for Environmental Information. Accessed various dates. Available online at: https://www.ngdc.noaa.gov/nndc/struts/form?t=101650&s=167&d=166

[51] https://www.ncei.noaa.gov/news/november-5-world-tsunami-awareness-day

Although there is only one recorded event impacting Snohomish County and the City of Everett, scenario events utilized in 2022 by Washington State DNR for an earthquake occurring along the Seattle Fault and the South Whidbey Island Fault do illustrate potential impact. While the Seattle Fault study utilized to develop the inundation layer has, based on review of the study itself, a very low level of probability (~16,000 year recurrence), the fact remains that inundation from a Tsunami could occur.[52]

9.2.4 Frequency

Unlike many natural hazards, the number of tsunamis is low. In the last 100 years, slightly over 100 fatal tsunamis struck coastlines around the globe.[53] Generally four or five tsunamis occur every year in the Pacific Basin, and those that are most damaging are generated off South America rather than in the northern Pacific. Pacific-wide tsunamis are rare, occurring every 10 to 12 years on average. Most of these tsunamis are generated by earthquakes that cause displacement of the seafloor, but a tsunami can also be generated by volcanic eruptions, landslides, underwater explosions, and meteorite impacts (Nelson, undated). The frequency of tsunamis is related to the frequency of the event that causes them, which would include seismic, volcanic, or landslide events.

9.3 VULNERABILITY ASSESSMENT

9.3.1 Overview

Results from several studies conducted over the course of the last several years vary in some degree to impact; however, most reports are consistent in several factors. Due to the close proximity to the earthquake source, subsidence may occur, the degree of which may will result in long-term inundation (Gica, 2014). Short-term inundation is expected to be caused by the generated tsunami waves.

Aside from the tremendous hydraulic force of the tsunami waves themselves, floating debris carried by a tsunami can endanger human lives and destroy inland structures. Ships moored at piers and in harbors often are swamped and sunk or are left battered and stranded high on the shore. Breakwaters and piers collapse, sometimes because of scouring actions that sweep away their foundation material and sometimes because of the sheer impact of the waves. Railroad yards and oil tanks situated near the waterfront are particularly vulnerable. Oil fires frequently result and are spread by the waves.

[52] WA DNR. (2022) Earthquake Scenario for Puget Sound and Other Pars of the Salish Sea. Accessed 9 Jan 2024. Available online at: New Study Details Impacts of Tsunami from Fault Running Through Seattle | WA - DNR

[53] https://www.ncei.noaa.gov/news/november-5-world-tsunami-awareness-day

Methodology

The majority of data utilized within this process is the result of Washington State Department of Natural Resources (and others) 2022 Tsunami inundation modeling and studies as they remain the subject matter experts in the field. The scenario utilized the Seattle Fault zone, utilizing a M7.5 earthquake event, with a very low probability of recurrence (WA-DNR, 2022 Tsunami Study Map Sheet 3). However, DNR also states that t*he mapped hazard areas are a compilation of the maximum modeled tsunami inundation (flooding), gathered from multiple tsunami hazard publications and represents multiple earthquake scenarios. Depending on location, this may be either an offshore earthquake from the Cascadia Subduction Zone or local crustal faults within Puget Sound.*

Exposure analysis was conducted by the City of Everett Public Works GIS to identify potential structure impact, as well as impact to the Critical Facilities identified by the Planning Team during this update cycle. A polygon layer was overlayed on parcel data to identify potential exposure to existing structures and areas. No additional Hazus processes were conducted or utilized.

Structure data utilized the county's building layer data, and the critical infrastructure list prepared at the initiation of this project. As that data is refined, increased accuracy with respect to the number of structures at risk will be modified. Readers requiring additional data on the methodology utilized in the various studies referenced should obtain such information from Washington State Department of Natural Resources for a full copy of the findings. Information presented is for hazard mitigation planning purposes only, and should not be considered for life-safety measures.

Warning Time

In 2022, the Washington State Department of Natural Resources, in conjunction with the University of Washington, State Emergency Management, NOAA, and others, completed a study to determine travel time for various earthquake scenarios which generate tsunami waves.

Based on the Seattle Fault Zone scenario, which was a simulated M7.3 earthquake, anticipated wave arrival time to Everett is 30 minutes with wave height anticipated to be 5 feet or more (WA-DNR, 2022 Map Sheet 3 - Seattle Fault scenario detailed tsunami inundation). Emergency managers, however, recommend that for coastal areas of the state, as soon as the ground stops shaking after an earthquake, that citizens travel inland and/or to higher ground.

Typical signs of a tsunami hazard are earthquakes and/or sudden and unexpected rise or fall in coastal water. The large waves are often preceded by coastal flooding and followed by a quick recession of the water. Tsunamis are difficult to detect in the open ocean, with waves less than 3 feet high. The tsunami's size and speed, as well as the coastal area's form and depth, affect the impact of a tsunami. In general, scientists believe it requires an earthquake of at least a magnitude 7 to produce a tsunami. Figure 9-5 shows typical time for a tsunami to travel across the Pacific Ocean, based on the 1964 Alaska and 1960 Chile earthquakes and resulting tsunamis.

According to previous editions of Washington State's Hazard Mitigation Plan (2013) at that time, at least 13 of Washington State's Pacific Ocean coastal communities and tribal reservations lack natural

high ground that is of sufficient elevation to escape a 30+ foot tsunami triggered by a Cascadia Subduction Zone earthquake.

The lack of natural high ground coupled with preceding earthquake damage, close proximity to the fault (~50-100 miles), and limited time for evacuation (15-30 minutes) preclude the use of traditional horizontal or vehicular evacuation strategies. These limiting factors make the coastal communities in Washington extremely vulnerable to significant loss of life from such an incident. However, this situation is not unique to Washington State, as many low-lying coastal areas within U.S. states, commonwealths, and territories are also constrained by similar geographic factors.

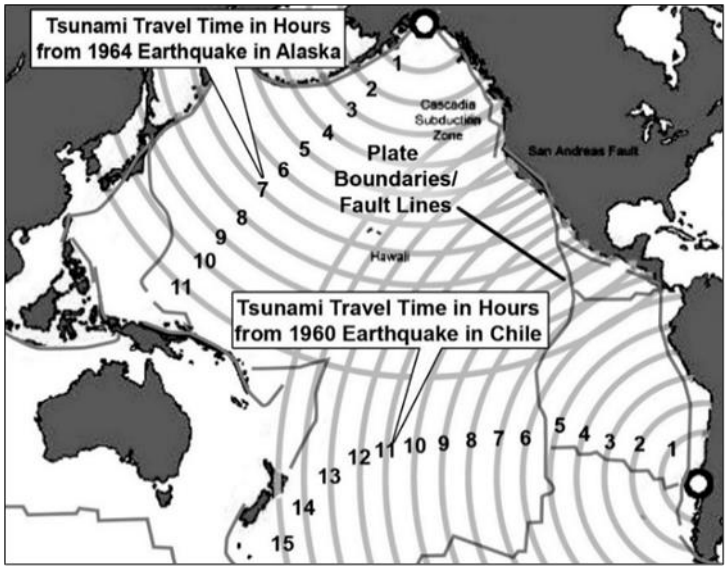


Figure 9-5 Tsunami Travel Times in the Pacific Ocean

To address this unique challenge, the concept of vertical evacuation was established. This evacuation strategy allows residents and visitors to move upwards to safety in man-made structures (buildings, towers, or berms) and is particularly important on peninsulas where traditional evacuation measures are not viable options for life safety. In 2008, FEMA collaborated with the National Oceanic and Atmospheric Association and published engineering guidance entitled "*Guidelines for Design of Structures for Vertical Evacuation from Tsunamis*" to promote the planning and development of life safety refuges in the United States (FEMA P646). In 2011, the vertical evacuation concept was tested to its fullest extent and successfully saved thousands of lives in Japan during the March 11, 2011 tsunami. Within Washington State, Grays Harbor County was successful in constructing our nation's first vertical evacuation at the Ocosta School – Project Safe Haven. This project was followed by the Shoalwater Tribe in Pacific County, Washington, who erected a Tsunami evacuation in 2022 – the first Federally funded tower of its type nationwide. Presently, the city of West Port, Washington (Grays Harbor County), is also in the process of constructing an evacuation tower, having received FEMA grant funding in support of the project.

The arrival time and duration of flooding are key factors to be considered in evacuation strategies. For some locations on Washington's outer coast, the first wave crest is generally predicted to arrive within 10 minutes after the earthquake (Gica, 2014, WA-DNR Tsunami modeling 2022). However, significant flooding can occur before the first crest arrives because a Cascadia Subduction Zone earthquake is expected to lower the ground surface along the coastlines, as well as within the Cities of Everett, Seattle and Tacoma. This will effectively render evacuation times short not only for people on the beach areas, but also along coastal roadways, including major transportation corridors such as I-5 and others.

Deep-Ocean Assessment and Reporting of Tsunamis

NOAA's Deep-ocean Assessment and Reporting of Tsunamis system (see Figure 9-6) collects data that is relayed to the Pacific Tsunami Warning Center. These units generate computer models that predict tsunami arrival, usually within minutes of the arrival time. This information is relayed in real time. This system is not considered to be as effective for communities close to the tsunami because the first wave would arrive before the data were processed and analyzed. In this case, strong ground shaking would provide the first warning of a potential tsunami.

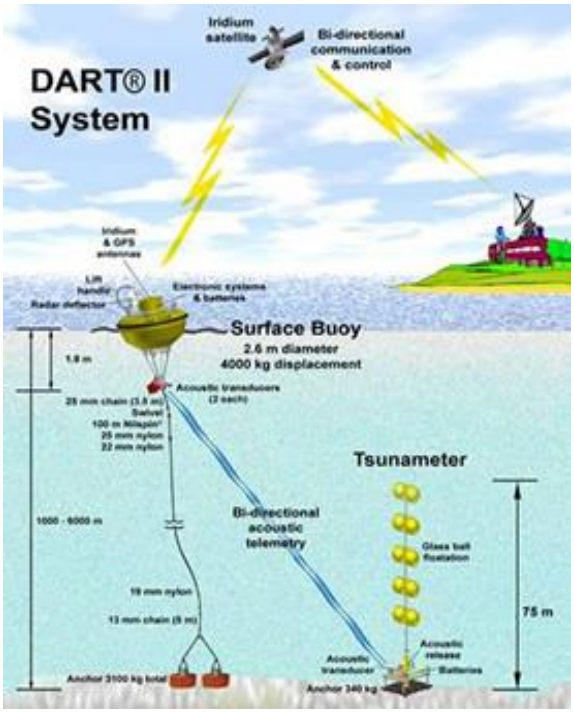


Figure 9-6 Deep-Ocean Assessment and Reporting of Tsunamis System (DART)

Pacific Tsunami Warning System

The Pacific Tsunami Warning System evolved from a program initiated in 1946. It is a cooperative effort involving 26 countries along with numerous seismic stations, water level stations and information distribution centers. The National Weather Service operates two regional information distribution centers. One is located in Ewa Beach, Hawaii, and the other is in Palmer, Alaska. The Ewa Beach center also serves as an administrative hub for the system. When a Pacific basin earthquake of magnitude 6.5 or greater occurs, the following sequence of actions begins:

- Data is interpolated to determine epicenter and magnitude of the event.
- If the event is magnitude 7.5 or greater and located at sea, a TSUNAMI WATCH is issued.
- Participating tide stations in the earthquake area are requested to monitor their gauges. If unusual tide levels are noted, the tsunami watch is upgraded to a TSUNAMI WARNING.
- Tsunami travel times are calculated, and the warning is transmitted to the disseminating agencies and thus relayed to the public.
- The Ewa Beach center will cancel the watch or warning if reports from the stations indicate that no tsunami was generated or that the tsunami was inconsequential.

9.3.2 Impact on Life, Health, and Safety

Several factors are considered when determining the impact to the population from the tsunami hazard. The arrival time and duration of flooding are key factors to be considered in evacuation strategies. For a Seattle Fault Zone tsunami, the first wave crest is generally predicted to arrive at Jetty Island within 30 minutes after the earthquake. Maximum flooding depth, velocity, and extent will depend on tide height at the time of tsunami arrival, but it is important for readers to evacuate

to higher ground immediately after the ground stops shaking. Review of inundation data from WA DNR's two models utilized in this assessment reveals no single-family residential structures are exposed as a result of either a Cascadia or a SFZ tsunami. With the Cascadia event, two apartment buildings along the waterfront may be impacted, with an anticipated wave height of eight foot based on the L1 (Cascadia) scenario utilized.

The populations most vulnerable to the tsunami hazard are the elderly, disabled and very young who reside near beaches and shorelines, low-lying coastal areas, deltas, tidal flats and river deltas that empty into ocean-going waters. In the event of a local tsunami generated in or near the planning area, there would be limited warning time (there are two tsunami sirens on the Port of Everett) so more of the population would be vulnerable. Comparatively, the city has a higher population of young residents, with a lower percentage of elderly than other areas of the county or state; however, they do have a higher percentage of residents under 65 with disabilities than the county. Total population of disabled individuals is 11.44 percent, which is higher than Snohomish County's disabled population.

The degree of vulnerability of the population exposed to the tsunami hazard event is based on a number of factors:

- Is there a warning system?
- What is the lead time of the warning?
- What is the method of warning dissemination?
- Will the people evacuate when warned?

Also for consideration within Everett is the high number of employees working in the Port, and the population of tourists visiting the wharf and waterfront area, which not only traverse the area en route for other destinations, but also who stay in local hotel and motels and other types of temporary lodging in area. Those population numbers should also be factored into the potential population impacted.

9.3.3 Impact on Property

All structures along low-lying coastal areas, tidal flats, ports, and river deltas could be potentially vulnerable to a tsunami given the type and location of the event, especially in an event with little or no warning time. The impact of the waves and the scouring associated with debris that may be carried in the water could be damaging to structures in the tsunami's path. Those that would be most vulnerable are those located in the front line of tsunami impact and those that are structurally unsound. The city is home to the Port of Everett, the waterfront, which maintains several businesses, and structures which store or use chemicals. The impact from stored chemicals could render property unusable based on the type of chemical, while also increasing the level of damage. Based on review of data, there are approximately 443 parcels at risk as a result of the Cascadia Subduction

Zone Tsunami, representing in excess of $658 million in value.[54] For the Seattle Fault, the results are similar.

9.3.4 Impact on Critical Facilities and Infrastructure

Roads or railroads that are blocked or damaged can prevent access and can isolate residents and emergency service providers needing to get to vulnerable populations or to make repairs. Bridges washed out or blocked by tsunami inundation or debris from flood flows also can cause isolation. Water and sewer systems can be flooded or backed up, causing further health problems. Underground utilities can also be damaged during flood events.

With respect to the critical facilities identified by the Planning Team during this update cycle, only one structure, the Port Gardner Stormwater Storage Facility owned by the City of Everett, is at risk from a Cascadia-related event. Replacement value for that structure is estimated at $27 million.

Roads

Roads are the primary resource for evacuation to higher ground before and during a tsunami event. For low depth, low velocity flood events, roads can act as levees or berms and divert or contain flood flows. Several major transportation corridors will be impacted by tsunami events, due to its proximity to the coastline along much of the county as a whole. Likewise, bridges will also be impacted. These factors are of significant concern for evacuation purposes as these are the only thoroughfares out of the area and to higher ground. Impact to I-5 within the planning region will be significant as a result of a Cascadia, South Whidbey, or Seattle Fault zone earthquake, which causes a tsunami. Such impact will restrict evacuation significantly in the city.

Docks

Docks exposed to tsunami events can be extremely vulnerable due to forces transmitted by the wave run-up and by the impact of debris carried by the wave action. While the Port of Everett has done a significant amount of work on mitigating risk factors, there may remain docks that are older or with unstable pilings. During an earthquake, there is a high probability that such structures could collapse or be severely weakened. Any ensuing tsunami would collapse the dock through the force of the water. The debris from the collapsed dock would then be pushed ashore, potentially injuring individuals and damaging structures and facilities. The Port of Everett, Naval Station Everett, Boeing and other private businesses operate marine terminals, marinas, airports and business parks in various areas throughout the city (and county), all of which would sustain some impact from a Tsunami event.

[54] This includes all parcels that intersected the tsunami inundation area with a summarized market values and improvements for all types of structures and systems (e.g., primary structures, garages, sheds, septic systems, wells, etc.).

Water/Sewer/Utilities

Water and sewer systems can be affected by the flooding associated with tsunami events. Floodwaters can back up drainage systems, causing localized flooding. Culverts can be blocked by debris from flood events, also causing localized urban flooding. Floodwaters can get into drinking water supplies, causing contamination. Sewer systems can be backed up, causing wastes to spill into homes, neighborhoods, rivers and streams. The forces of tsunami waves can impact above-ground utilities by knocking down power lines and radio/cellular communication towers. Power generation facilities can be severely impacted by both the impact of the wave action and the inundation of floodwaters. Impact could be sustained from inundated areas outside of the city, which would then also impact facilities that are outside of the actual tsunami inundation area.

9.3.5 Impact on Economy

Port facilities, marinas, waterfronts, and public utilities are often the backbone of the economy of the affected areas, and these are the resources that generally receive the most severe damage. The Port of Everet, Naval Station Everett, and the Everett waterfront are major economic hubs not only to the city, but the region as a whole. As a global market contributor, impact to the Port would be significant, particularly given its ability to support U.S. Coast Guard and Navy operations, if needed. Until debris can be cleared, wharves and piers rebuilt, utilities restored, and other economic hubs reconstituted, communities may find themselves without fuel, food and employment. Wherever water transportation is a vital means of supply for both import and export as it is in Washington, disruption of systems caused by tsunamis can have far-reaching economic effects. In addition, with the major fuel pipelines in the area, economies outside of the planning area would also be impacted.

Many businesses in the city and impacted areas are related to tourism and are highly dependent on the millions of visitors to the area annually. Depending on the season, large numbers of visitors and tourists may be in the area, increasing response requirements. Those visitors and tourists will require some type of educational outreach with respect to what to do and where to go if an earthquake and tsunami occur. A tsunami would also damage economically important natural resources, such as crab, clams, salmon and other fish, and outdoor recreation areas.

When considering the total area of the city, the inundation zone is fairly limited, but the impact nonetheless would have a significant impact on the planning region's economy. Ingress and egress to the area would be impacted, restricting access, as well as first-responder response and access to medical and other facilities. Loss of tax base, destruction of government facilities, destruction of private businesses, loss of land-base, loss of marine vessels, among other items, all would be significant impacts to overcome to allow the economy to sustain itself. In addition to the city/county impact, all of Washington would be impacted as a result of the loss of connectivity with Canada and other parts of the United States, as well as the impact on major highways, the Port system, and the travel time associated with loss of the transportation infrastructure.

9.3.6 Impact on Environment

The vulnerability of agricultural and aquatic habit and associated ecosystems would be highest in low-lying areas close to the coastline. Areas near gas stations, industrial areas and Tier II facilities would be vulnerable due to potential contamination from hazardous materials.

Tsunami waves can carry destructive debris and pollutants that can have devastating impacts on all facets of the environment. Millions of dollars spent on habitat restoration and conservation in the planning area could be wiped out by one significant tsunami. There are currently no tools available to measure these impacts. However, it is conceivable that the potential financial impact of a tsunami event on the environment could equal or exceed the impact on property. Community planners and emergency managers should take this into account when preparing for the tsunami hazard.

9.3.7 Impact from Climate Change Tsunami

The impacts of climate change on the frequency and severity of tsunami events could be significant in regions with vulnerable coastline. Global sea-level rise will affect all coastal societies, especially densely populated low-lying coastal areas. Sea level rise has two effects on low-lying coastal regions: any structures located below the new level of the sea will be flooded; and the rise in sea level may lead to coastal erosion that can further threaten coastal structures.

9.4 FUTURE DEVELOPMENT TRENDS

As population in the city continues to grow and expand, more people, property and critical facilities may be exposed to the tsunami hazard zone. This will increase the potential for human and economic loss. The city does address velocity with respect to wave force in their Comprehensive Land Use Plan and Floodplain ordinance based on storm surge. Of additional concern is the potential for erosion and bluff washout as a result of tsunami waves. The planning area does have some bluffs and steep hillsides. While the direct impact may not be from the wave flooding a structure, the direct influence of the wave on the shoreline could cause additional landslide and erosion (particularly on Jetty Island), causing structures to slide which otherwise would not be negatively impacted by tsunami waves. This would also increase impact on people within those structures. While Jetty Island is uninhabited with no structures, the island is a major tourist attraction.

9.5 ISSUES

The worst-case scenario for the planning area is a local tsunami event triggered by a seismic event off the coast, the SWIF, or the Seattle Fault Zone. Portions of city (and county) residents can expect waves to reach their boundaries within approximately 30 minutes depending on the type of earthquake triggering the tsunami. This could result in loss of life due to residents' inability to evacuate quickly enough. This can also cause severe economic and environmental impacts.

The planning team has identified the following issues related to the tsunami hazard for the planning area:

- The science and technology in this field are emerging. For tsunami hazard mitigation programs to be effective, probabilistic tsunami mapping will need to be a key component, with continued updates occurring as new data emerges. Regular updates should continue to occur.
- As tsunami warning technologies evolve, the tsunami warning capability within the planning area will need to be enhanced to provide the highest degree of warning to individuals in the area. The city (and county) have already taken proactive measures with the installation of the All Hazards Alert Broadcast (AHAB) system. Funding for weather radios, additional sirens,

or notification systems which will be strategically located will allow for advanced warning in areas of concern.

- Additional elevated tsunami evacuation points throughout the area of inundation need to be constructed, which will require additional funding sources.
- With the possibility of climate change, the issue of sea level rise may become an important consideration as probable tsunami inundation areas are identified through future studies.
- Special attention will need to be focused on the vulnerable communities in the tsunami zone and on hazard mitigation through public education and outreach.

9.6 RESULTS

Based on review and analysis of the data, the Planning Team has determined that the probability for impact from tsunami throughout the area is limited in nature with respect to geographic extent, but the risk to lives does increase its severity. There has been one recorded event within Snohomish County. However, due to the fact that we are within the timeline suggested by scientists for a Cascadia type earthquake event to occur, which undoubtedly will generate a tsunami within the region (from Canada to California), the probability of occurrence is possible. The Planning Team also factored in the potential for a SWIF and Seattle Fault event. Economic impact as a result of the tsunami would reach well beyond that of the inundation zone and would have impact statewide. A tsunami would also be a more sudden-impact event, with evacuation times varying depending on where the earthquake occurred. Implementation of mitigation strategies for vertical evacuation sites will help protect some lives, but not all. Based on the potential impact, the Planning Team determined the CPRI score to be 2.3, with overall vulnerability determined to be a medium level.

CHAPTER 10.
WILDFIRE

A wildfire is any uncontrolled fire occurring on undeveloped land that requires fire suppression. Wildfires can be ignited by lightning or by human activity such as smoking, campfires, equipment use, and arson. The wildfire season in Washington usually begins in April, picks up in early July, and generally ends in October; however, wildfires have occurred every month of the year throughout the state. Drought, snow pack, and local weather conditions can expand the length of the fire season.

People start most wildfires; major causes include arson, recreational fires that get out of control, smoker carelessness, debris burning, and children playing with fire. Wildfires started by lightning burn more state-protected acreage than any other cause. Fires during the early and late shoulders of the fire season usually are associated with human-caused fires; fires during the peak period of July, August and early September often are related to thunderstorms and lightning strikes.

10.1 GENERAL BACKGROUND

Wildland-Urban Interface Areas

In 2001, Congress mandated the establishment of a Federal Register which identifies all urban wildland interface communities within the vicinity of Federal lands, including Indian trust and restricted lands that are at high-risk from wildfire. The list assimilated information provided from States and Tribes, and was intended to identify communities considered at risk.[55]

The wildland urban-interface (WUI) is the area where development meets wildland areas. This can be structures built in or near natural forests, or areas next to active timber and rangelands. The federal definition of a WUI community is an area where development densities are at least three residential, business, or public building structures per acre. For less developed areas, the wildland-intermix community has development densities of at least one structure per 40 acres (see Figure 10-1).[56]

When identifying areas of fire concern, in addition to the Federal Register, the Washington Department of Natural Resources and its federal partners, the U.S. Forest Service, U.S. Department of Agriculture, and others also determine communities at risk based on fire behavior potential, fire protection capability, and risk to social, cultural and community resources. These risk factors include areas with fire history, the type and density of vegetative fuels, extreme weather conditions, topography, number and density of structures and their distance from fuels, location of municipal

[55] https://www.federalregister.gov/documents/2001/01/04/01-52/urban-wildland-interface-communities-within-the-vicinity-of-federal-lands-that-are-at-high-risk-from

[56] Washington State Department of Natural Resources. Wildland Urban Interface (WUI). (2023). Accessed 6 Nov. 2023. Available online at: WA State's Wildland Urban Interface (WUI) (arcgis.com)

watersheds, and likely loss of housing or business. Based on these criteria, the wildfire risk to the City of Everett as determined by Wildfire Risks to Communities is illustrated in Figure 10-2.[57]

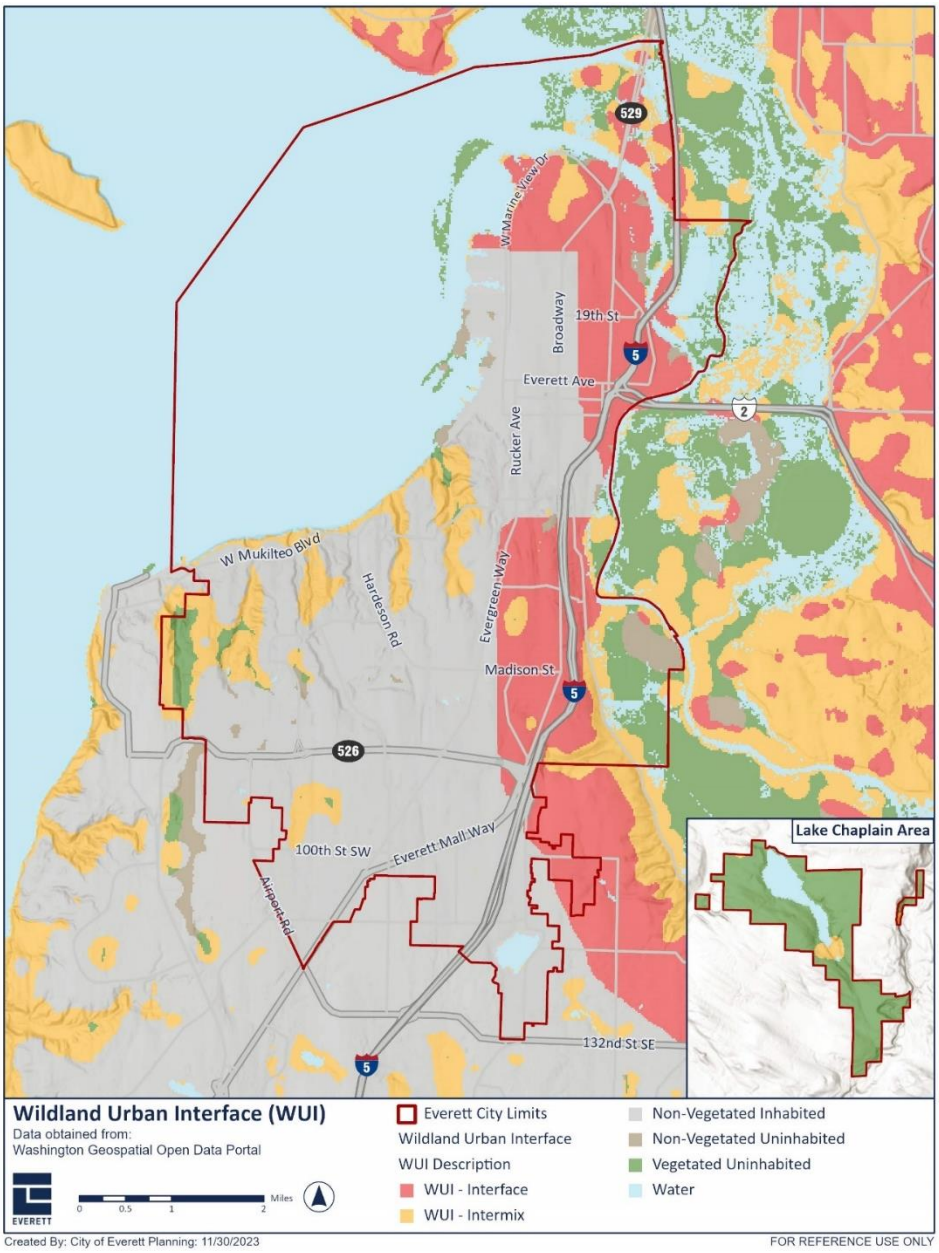


Figure 10-1 WUI Area Defined by WA-DNR (2023)

[57] USDA. USFS. Wildfire Risk to Communities. Accessed 6 Nov. 2023. Available online at: About - Wildfire Risk to Communities and Wildfire Risk to Communities

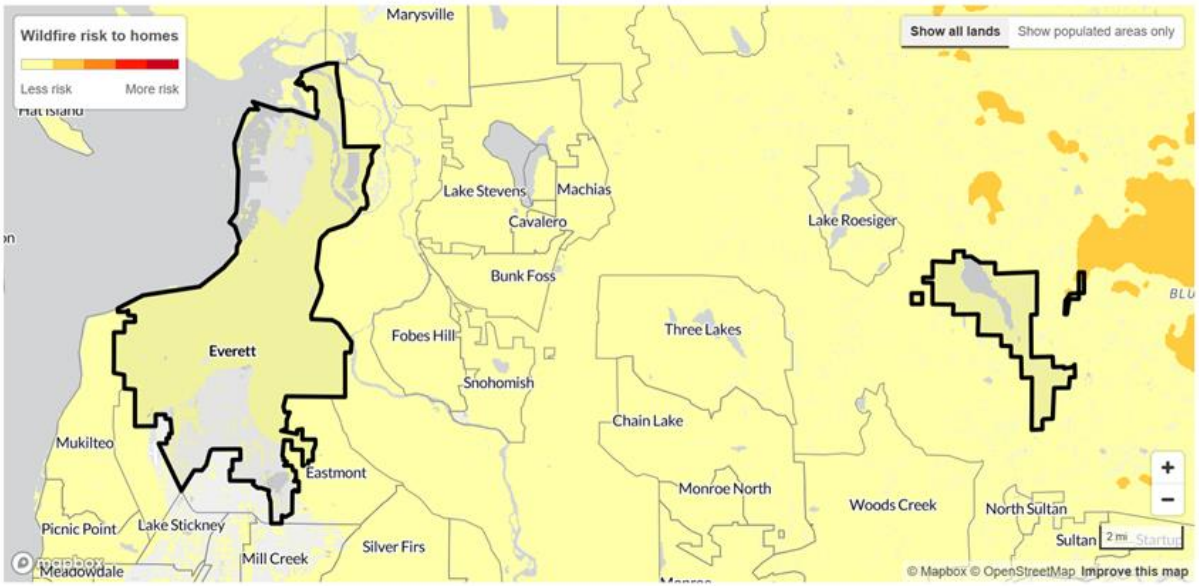


Figure 10-2 Wildfire Hazard Potential (USFS, 2023)

The wildfire triangle (see Figure 10-3; DeSisto et al., 2009) is a simple graphic used in wildland firefighter training courses to illustrate how the environment affects fire behavior. Each point of the triangle represents one of three main factors that drive wildfire behavior: weather, vegetation type (which firefighters refer to as "fuels"), and topography. The sides represent the interplay between the factors. For example, drier and warmer weather combined with dense fuel loads (e.g., logging slash) and steeper slopes will cause more hazardous fire behavior than light fuels (e.g., short grass fields) on flat ground.

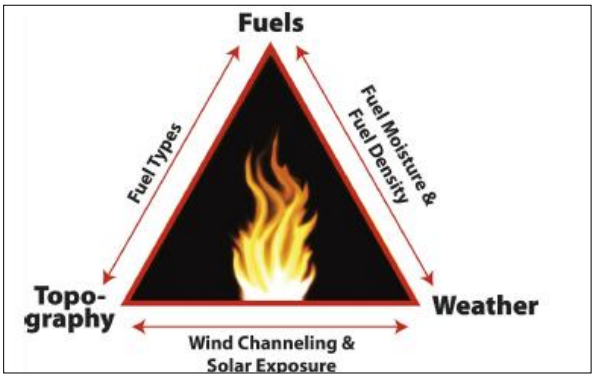


Figure 10-3 Wildfire Behavior Triangle

The following are key factors affecting wildfire behavior:

- **Fuel**—Lighter fuels such as grasses, leaves and needles quickly expel moisture and burn rapidly, while heavier fuels such as tree branches, logs and trunks take longer to warm and ignite. Snags and hazard trees—those that are diseased, dying, or dead—are larger but less prolific west of the Cascades than east of the Cascades. In 2002, about 1.8 million acres of the state's 21 million acres of forestland contained trees killed or defoliated by forest insects and diseases.

- **Weather**— Relevant weather conditions include temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount and duration, and the stability of the atmosphere. Of particular importance for wildfire activity are wind and thunderstorms:
  - Strong, dry winds produce extreme fire conditions. Such winds generally reach peak velocities during the night and early morning hours. East wind events can persist up to 48 hours, with wind speed reaching 60 miles per hour. Being a coastal community, the county experiences significant winds on a fairly regular basis during all times of the year.
  - The thunderstorm season typically begins in June with wet storms, and turns dry with little or no precipitation reaching the ground as the season progresses into July and August.
- **Topography—**Topography includes slope, elevation and aspect. The topography of a region influences the amount and moisture of fuel; the impact of weather conditions such as temperature and wind; potential barriers to fire spread, such as highways and lakes; and elevation and slope of land forms (fire spreads more easily uphill than downhill).
- **Time of Day**—A fire's peak burning period generally is between 1 p.m. and 6 p.m.
- **Forest Practices—**In densely forested areas, stands of mixed conifer and hardwood stands that have experienced thinning or clear-cut provide an opportunity for rapidly spreading, high-intensity fires that are sustained until a break in fuel is encountered.

Fires can be categorized by their fuel types as follows:

- **Smoldering**—Involves the slow combustion of surface fuels without generating flame, spreading slowly and steadily. Smoldering fires can linger for days or weeks after flaring has ceased, resulting in potential large quantities of fuel consumed. They heat the duff and mineral layers, affecting the roots, seeds, and plant stems in the ground. These are most common in peat bogs, but are not exclusive to that vegetation.
- **Crawling**—Surface fires that consume low-lying grass, forest litter and debris.
- **Ladder**—Fires that consume material between low-level vegetation or forest floor debris and tree canopies, such as small trees, low branches, vines, and invasive plants.
- **Crown**—Fires that consume low-level surface fuels, transition to ladder fuels, and also consume suspended materials at the canopy level. These fires can spread rapidly through the top of a forest canopy, burning entire trees, and can be extremely dangerous (sometimes referred to as a "Firestorm").

Wildfires may spread by jumping or spotting, as burning materials are carried by wind or firestorm conditions. Burning materials can also jump over roadways, rivers, or even firebreaks and start distant fires. Updraft caused by large wildfire events draws air from surrounding area, and these self-generated winds can also lead to the phenomenon known as a firestorm.

10.1.1 Wildfire Impact

Short-term loss caused by a wildfire can include the destruction of timber, wildlife habitat, scenic vistas, and watersheds. Long-term effects include smaller timber harvests, reduced access to affected

recreational areas, and destruction of cultural and economic resources and community infrastructure. Vulnerability to flooding increases due to the destruction of watersheds. The potential for significant damage to life and property exists in WUI areas, where development is adjacent to densely vegetated areas (DeSisto et al., 2009).

Forestlands in the planning area are susceptible to disturbances such as (logging) slash accumulation, forest debris due to weather damage, and periods of drought and high temperature. Forest debris from western red cedar, western hemlock, and Sitka spruce can be especially problematic and at risk to wildfires when slash is accumulated on the forest floor, because such debris resists deterioration. When ignited, these fuels can be explosive and serve as ladder fuels carrying fire from the surface to the canopy.

10.1.2 Identifying Wildfire Risk

Risk to communities is generally determined by the number, size and types of wildfires that have historically affected an area; topography; fuel and weather; suppression capability of local and regional resources; where and what types of structures are in the WUI; and what types of pre-fire mitigation activities have been completed. Identifying areas most at risk to fire or predicting the course a fire will take requires precise science. The following data sets are most useful in assessing risk in the area:

- **Topography (slope and aspect) and Vegetation (fire fuels)**—These are two of the most important factors driving wildfire behavior.
- **Weather**—Regional and microclimate variations can strongly influence wildfire behavior. Because of unique geographic features, weather can vary from one neighborhood to another, leading to very different wildfire behavior.
- **Critical Facilities/Asset Location**—A spatial inventory of assets—including homes, roads, fire stations, and natural resources that need protection—in relation to wildfire hazard helps prioritize protection and mitigation efforts.

10.1.3 Secondary Hazards

Wildfires can generate a range of secondary effects, which in some cases may cause more widespread and prolonged damage than the fire itself. Fires can cause direct economic losses in the reduction of harvestable timber and indirect economic losses in reduced tourism. Wildfires cause the contamination of reservoirs, destroy transmission lines and contribute to flooding. They strip slopes of vegetation, exposing them to greater amounts of runoff. This in turn can weaken soils and cause failures on slopes. Major landslides can occur several years after a wildfire. Most wildfires burn hot and for long durations that can bake soils, especially those high in clay content, thus increasing the imperviousness of the ground. This increases the runoff generated by storm events, thus increasing the chance of flooding.

10.2 HAZARD PROFILE

10.2.1 Extent and Location

Everett has not sustained any damages as a result of a fire-related federally-declared disaster declaration occurring within Snohomish County, including for the 2022 wildfire event which was a

declared event occurring in the county. The city is primarily an urbanized area, with limited rural areas – minimizing the potential increase of incident risk from wildland fires, although with parks and open space, the chance for ignition does exist in those areas. The city does have steep ravines filled with natural growth that are adjacent to extensive residential and commercial properties. Everett also contains industrial and manufacturing areas, which may increase the potential of an urban fire. Both of these land use types have a greater exposure to fire hazard than most other areas in the city. The city also own lands in the Spada Lake and the Lake Chaplain areas, which are more rural in nature with no residential structures. The development occurring in the rural areas of the city can be managed with land use and building codes, and effective enforcement of these codes.

10.2.2 Previous Occurrences

Wildfires have been a common occurrence throughout Washington as a whole for thousands of years. Evidence from tree rings or fire-scarred trees indicates cycles of prehistoric fires burned in many locations in both Eastern and Western Washington. Natural fire occurrence is directly related, but not proportional, to lightning incidence levels. It is rare for a summer to pass without at least one period of lightning activity. Lightning incidence is greatest during July and August, though storms capable of igniting fires have occurred from early spring to mid-October. Lightning storms generally track across the park in a southwest to northeast direction. At a national level, lightning starts over 4,000 house fires each year, which can ignite wildland fires through ember ignition and as a result of proximity to wildland areas. Lightning-caused fires cause over 10 times more acreage damage than human-caused fires, requiring great resource allocation.

Within Washington, lightning storms are typically followed by light to moderate amounts of precipitation. The rainfall may extinguish the fires, while high fuel moisture inhibits spread. However, prolonged periods of warm, dry weather, especially in combination with east winds, often reveal numerous latent "sleepers." While most lightning fires are less than a quarter acre in size, occasional large fires during dry periods account for most of the burned acreage.

As indicated, Everett has never experienced a wildfire. Historically, fires in Everett have been characterized as mill-related incidents, and have had localized impacts in the highly urbanized areas typical of Everett (Everett HIVA, 2018).

During the time period 1970-2019, the county experienced six wildland fires of more than 100 acres (Snohomish County HMP, 2019). Since 2019, the county experienced one declared disaster event for a wildfire, which occurred in 2022. That fire did not occur within the City of Everett. Figure 10-4 identifies the likelihood of a wildfire occurring based on the USFS Communities at Risk data.[58]

[58] Wildfire Likelihood. Accessed 12 Feb. 2024. Available online at: Wildfire Risk to Communities

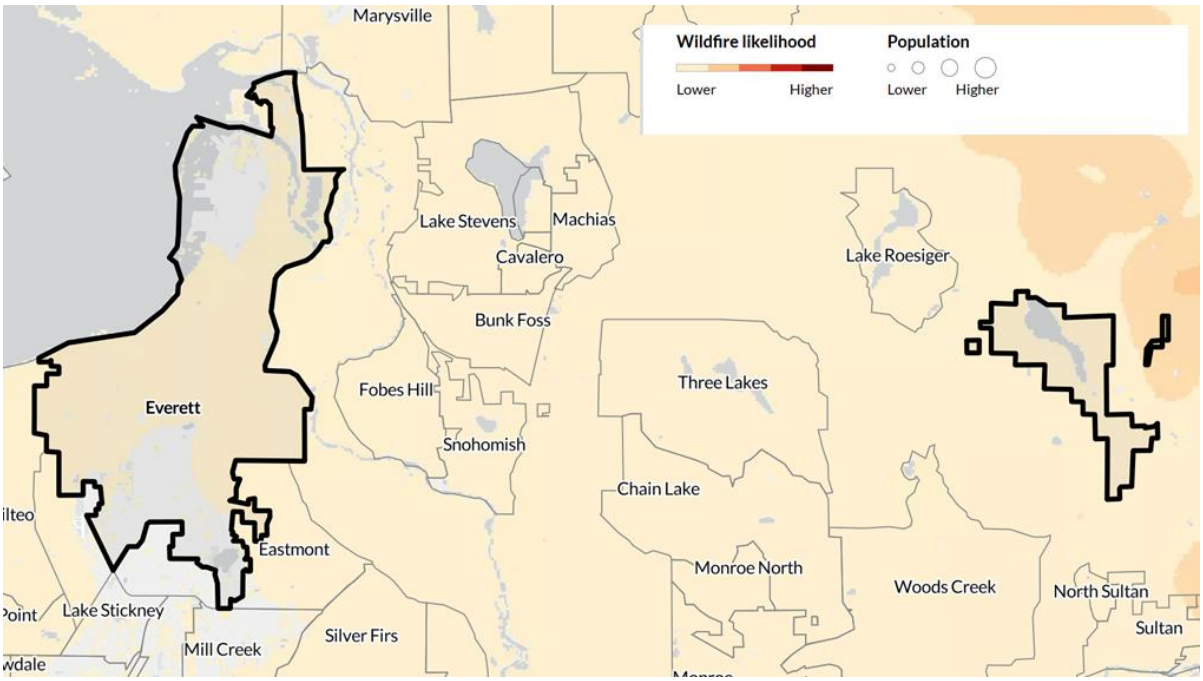


Figure 10-4 Probability of Wildfire Burning in Any Given Year

10.2.3 Severity

Potential losses from wildfire include human life, structures and other improvements, and natural resources. Smoke and air pollution from wildfires can be a health hazard, especially for sensitive populations such as children, the elderly and those with respiratory and cardiovascular diseases. Wildfire may also threaten the health and safety of those fighting the fires. Wildfire can lead to ancillary impacts such as landslides in steep ravine areas and flooding due to the impacts of silt in local watersheds. The destruction of forestlands can have a significant impact on salmon rearing for generations.

Due to years of fire suppression, logging, and other human activities, the forests and rangelands have changed. Areas that historically experienced frequent, low-severity wildfires now burn with much greater intensity due to the build-up of understory brush and trees. At times, this equates to fires which are larger and more severe, killing the trees and vegetation at all levels. The combination of steep slopes, canyons, open rangeland, and fuel type have a history and potential for fast moving and fast spreading wildfires.

The city, as most communities, is vulnerable to wind-driven fires whose embers could ignite grasses and weeds, and cause spot fires in populated areas. Typical summer conditions could prove to be problematic due to a fire moving uphill from a structure fire on a lower slope, or from a wildland fire pushing upslope through the trees on a windy day, endangering multiple homes simultaneously in a very short period of time. Residents would have very short notice of an approaching fire.

10.2.4 Frequency

As previously indicated, one disaster event occurred since completion of Snohomish County's 2019 Hazard Mitigation Plan. Prior to that, during the period of 1970-2019, six wildfires occurred in Snohomish County which burned more than 100 acres; none were declared disaster incidents. None of the wildfire events occurred in Everett.

Fires historically burn on a regular cycle, recycling carbon and nutrients stored in the ecosystem, and strongly affecting species within the ecosystem.

Historic Fire Regime and Mean Fire Return Intervals

Many ecosystems are adapted to historical patterns of fire. These patterns, called "fire regimes," include temporal attributes (e.g., frequency and seasonality), spatial attributes (e.g., size and spatial complexity), and magnitude attributes (e.g., intensity and severity), each of which have ranges of natural variability. A fire regime refers to the frequency and intensity of natural fires occurring in various ecosystem types. Alterations of historical fire regimes and vegetation dynamics have occurred in many landscapes in the U.S., including within Snohomish County through the combined influence of land management practices, fire exclusion, insect and disease outbreaks, climate change, and the invasion of non-native plant species. Anthropogenic influences on wildfire occurrence have been witnessed through arson, incidental ignition from industry (e.g., logging, railroad, sporting activities), and other factors. Likewise, wildfire abatement practices have reduced the spread of wildfires after ignition. This has reduced the risk to both the ecosystem and the urban populations living in or near forestlands, such as Everett. Figure 10-5 identifies the various Fire Regime Groups in Everett.

The LANDFIRE Project produces maps of simulated historical fire regimes and vegetation conditions using the LANDSUM landscape succession and disturbance dynamics model (see LANDFIRE at LANDFIRE Program: Home for additional information). The LANDFIRE Project also produces maps of vegetation and measurements of vegetation departure from simulated historical reference conditions, although in some instances, the data is older in nature. These maps have been used to support fire and landscape management planning outlined in the goals of the National Fire Plan, Federal Wildland Fire Management Policy, and the Healthy Forests Restoration Act.

The simulated historical Mean Fire Return Interval (MFRI) data layer quantifies the average number of years between fires under the presumed historical fire regime as illustrated in Figure 10-6 for Everett. Table 10-1 identifies the number of acres and critical facilities in the various Mean Fire Return Intervals. It should be noted that not all fire regime groups are present within the planning area. (While the historical fire regimes and the other data sets are not a predictive model and should not be utilized for life safety measures, information presented can be used for reference and planning purposes but should be limited in nature as the variables existing with respect to predictive wildfire planning continually change.) The various Fire Regime Groups and Mean Fire Return Intervals based on those groups are as follows:

- I-A Percent replacement fire less than 66.7%, fire return interval 0-5 years
- I-B Percent replacement fire less than 66.7%, fire return interval 6-15 years
- I-C Percent replacement fire less than 66.7%, fire return interval 16-35 years
- II-A Percent replacement fire greater than 66.7%, fire return interval 0-5 years

- II-B Percent replacement fire greater than 66.7%, fire return interval 6-15 years
- II-C Percent replacement fire greater than 66.7%, fire return interval 16-35 years
- III-A Percent replacement fire less than 80%, fire return interval 36-100 years
- III-B Percent replacement fire less than 66.7%, fire return interval 101-200 years
- IV-A Percent replacement fire greater than 80%, fire return interval 36-100 years
- IV-B Percent replacement fire greater than 66.7%, fire return interval 101-200 years
- V-A Any severity, fire return interval 201-500 years
- V-B Any severity, fire return interval 501 or more year

Further defining the LANDFIRE analysis:

- Replacement severity is defined as greater than 75 percent average top-kill within a typical fire perimeter for a given vegetation type
- Low severity is defined as less than 25 percent average top-kill within a typical fire perimeter for a given vegetation type
- Mixed severity is defined as between 25 and 75 percent average top-kill within a typical fire perimeter for a given vegetation type

Table 10-1
LANDFIRE – Acres and Critical Facilities in Various Mean Fire Return Intervals

Return Interval	*Acres*	*Critical Facilities Structure Count*
Indeterminate Fire Return Interval Characteristics	11068.7159	17
10 years (Group I-B)	4.644267	1
80 years (Group III-A)	2534.593918	5
304 years	42.210754	(Land only, no structures)
404 years (Group V-A)	12820.61639	69
657 years (Group V-B)	826.150629	8
749 years (Group V-B)	4215.66675	42

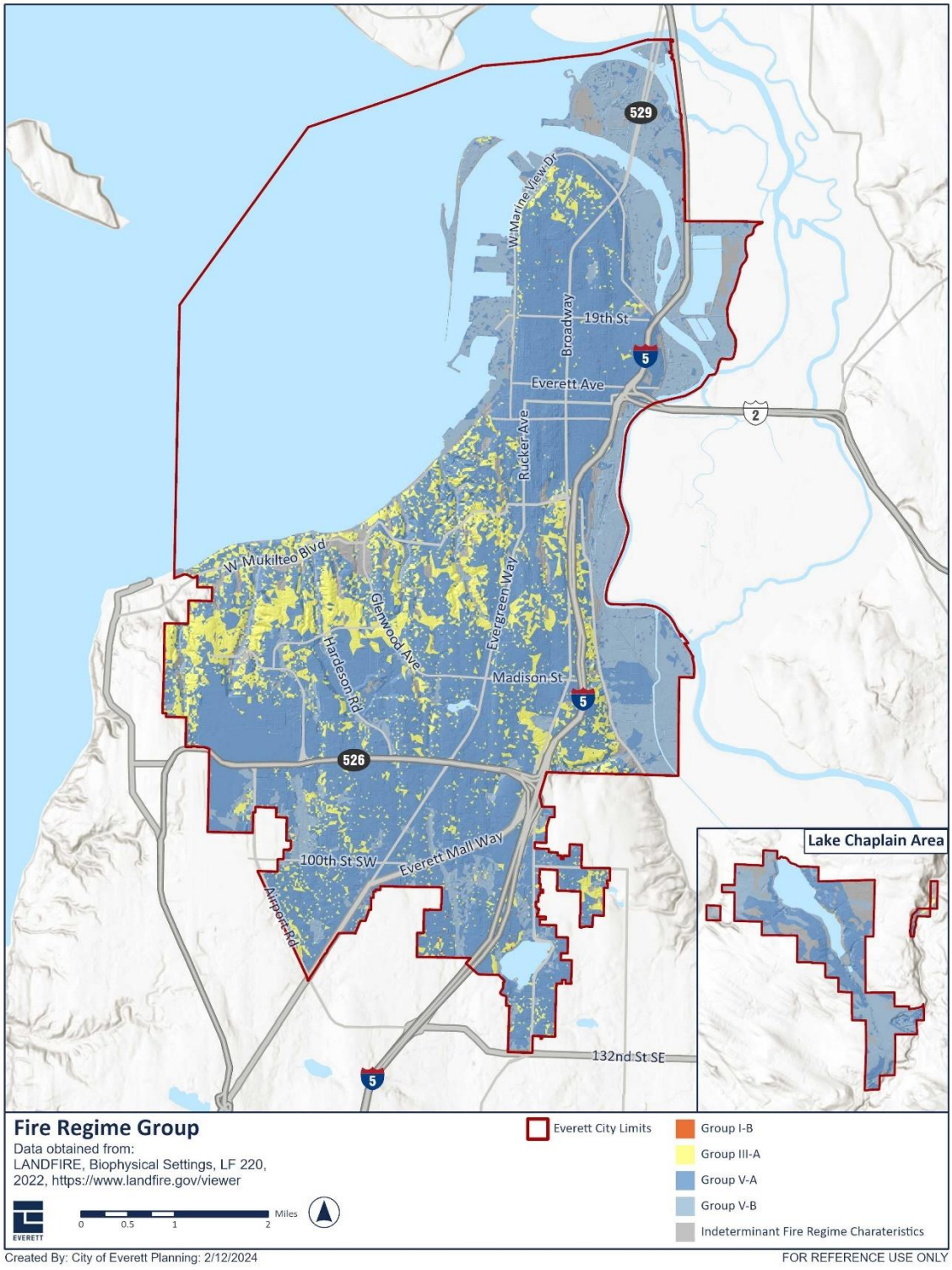


Figure 10-5 Fire Regime Group

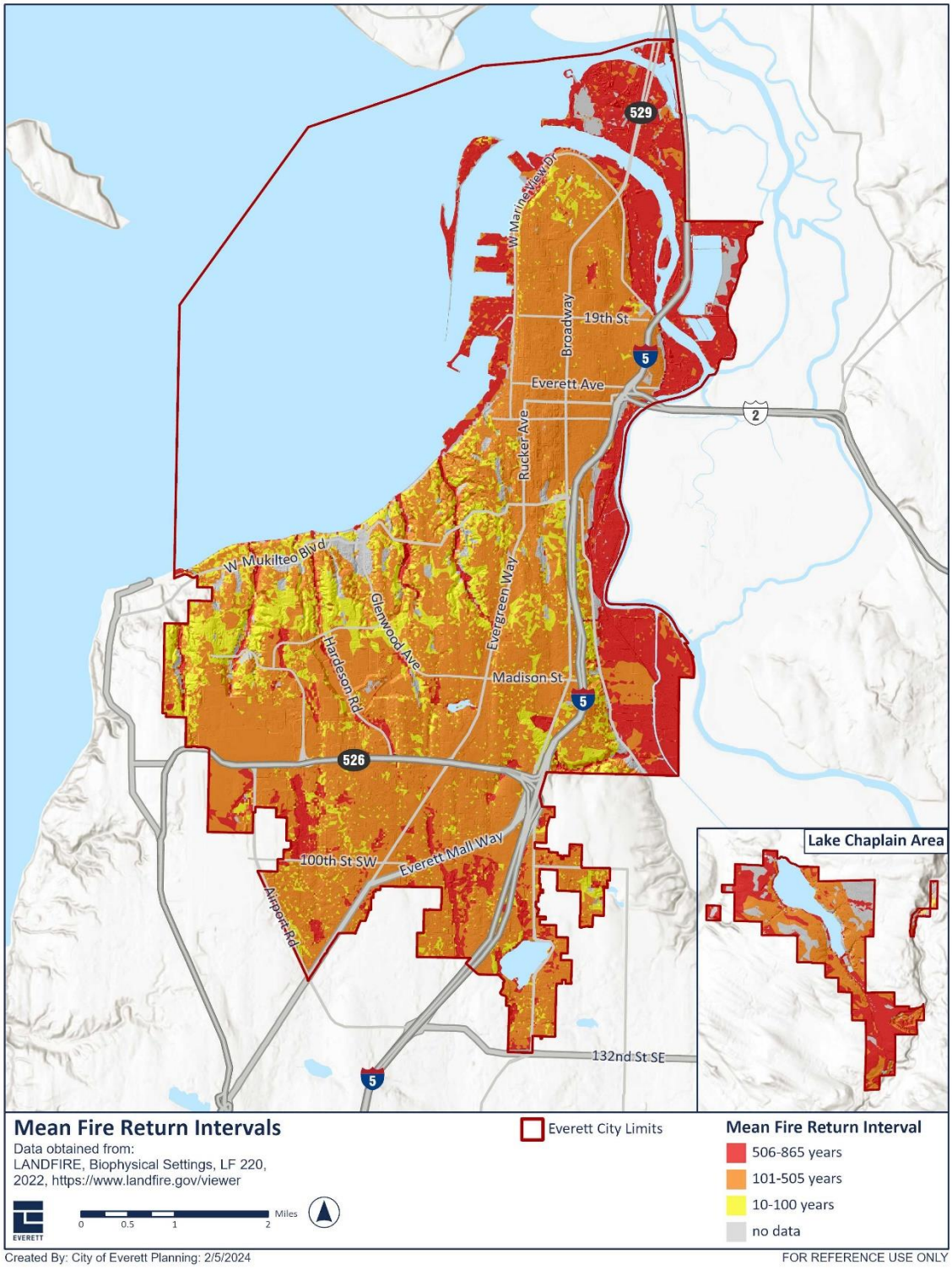


Figure 10-6 Mean Fire Return Intervals

10.3 VULNERABILITY ASSESSMENT

10.3.1 Overview

Structures, above-ground infrastructure, critical facilities and natural environments are all vulnerable to the wildfire hazard. Understanding the relationship between weather, potential fire activity, and geographical features enhances the ability to prepare for the potential of wildfire events. This knowledge, when paired with emergency planning and appropriate mitigation measures, creates a safer environment.

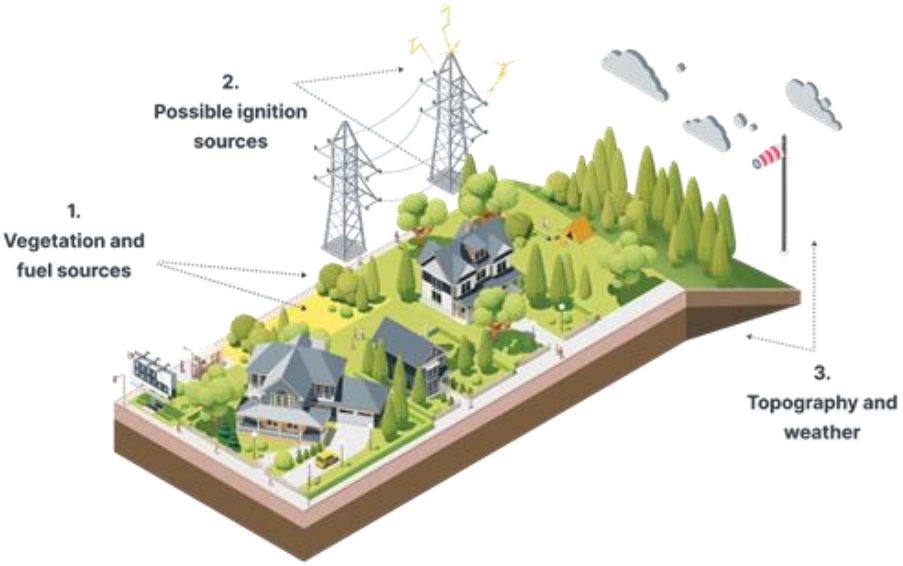


Figure 10-7 Potential Wildfire Factors

Wildfire studies can analyze weather data to assist firefighters in understanding the relationship between weather patterns and potential fire behavior. Fire forecasting examines similarities between historical fire weather and existing weather and climate values. These studies have determined that any combination of two of the following factors can create more intense and potentially destructive fire behavior, known as extreme fire behavior:

- Sustained winds from the east
- Relative humidity less than 40 percent
- Temperature greater than 72º Fahrenheit
- Periods without precipitation greater than 14 days in duration
- 1,000-hour fuel moisture less than 17 percent.

If a fire breaks out and spreads rapidly, residents may need to evacuate within a short timeframe. A fire's peak burning period generally is between 1 p.m. and 6 p.m. In normal situations, fire alerting would commence quickly, helping to reduce the risk. However, in more remote locations, or in areas where cell phone services are sporadic at times, warning time and calls for assistance may be reduced.

Warning Time

Wildfires are often caused by humans, intentionally or accidentally. There is no way to predict when one might break out. Since fireworks often cause brush fires, extra diligence is warranted around the Fourth of July when the use of fireworks is highest. Dry seasons and droughts are factors that greatly increase fire likelihood. Dry lightning may trigger wildfires. Severe weather can be predicted, so special attention can be paid during weather events that may include lightning. Reliable National

Weather Service lightning warnings are available on average 24 to 48 hours prior to a significant electrical storm.

10.3.2 Impact on Life Health & Safety

While there are no recorded fatalities from wildfire in the planning area, a statistical number of the population vulnerable to impact from fire is impossible to determine with any accuracy due to the high number of variables that impact fire scenarios, as well as the landscape of structures. The maps used in the analysis show areas of relative importance in determining fire risk, though they do not provide sufficient data for a statistical estimation of exposed population. Total residential structures which intersect the various MFRIs are in excess of 27,500 structures, many of which are multi-family (stacked) structures, so precise numbers associated with population at risk cannot be determined with any accuracy.

The population at risk must also take into consideration tourists given the city's proximity to the parklands, Paine Field, and other Washington high-tourist destinations. With its relatively high tourism rate, especially during summer months, there is an increase in the population vulnerability to fire particularly when considering the summer months are customarily when fire danger is at its greatest.

Smoke and air pollution from wildfires can be a severe health hazard, especially for sensitive populations, including children, the elderly and those with respiratory and cardiovascular diseases. When reviewing U.S. Census data, the City of Everett is a younger community compared to the county and State of Washington, with approximately 13.5 percent of its population 65 years and over compared to 15.0 percent at the county level and ~17 percent at the state level. The median age in Everett is 35.9 years, compared to 38.2 in Washington.

Children under 5 are particularly vulnerable to disasters because of their dependence on others for basic necessities. Very young children are additionally vulnerable to injury or sickness; this vulnerability can be worsened during a natural disaster because they may not understand the measures that need to be taken to protect themselves. Approximately 5 percent of the population is 5 years and under. Approximately 20.2 percent of county residents are younger than 18.

Smoke generated by wildfire consists of visible and invisible emissions that contain particulate matter (soot, tar, water vapor, and minerals), gases (carbon monoxide, carbon dioxide, nitrogen oxides), and toxics (formaldehyde, benzene). Emissions from wildfires depend on the type of fuel, the moisture content of the fuel, the efficiency (or temperature) of combustion, and the weather. Public health impacts associated with wildfire include difficulty in breathing, odor, and reduction in visibility. Wildfire also threatens the health and safety of those fighting fires. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke.

10.3.3 Impact on Property

Property damage from wildfires can be severe and can significantly alter entire communities. The potential exposure of the structures in the city is more limited in nature; however, all areas have some degree of exposure to wildfire hazards due to the fact that many structures are of wood construction, and are on smaller lot sizes, allowing for fire spread.

Density and the age of building stock are contributing factors in assessing property vulnerability to wildfire. As many of the buildings in the planning area are of significant age, most do not have sprinkler systems.

Structural vulnerability to fire hazards is also based in part on steepness of slopes, the density and moisture content of the fuel load, construction materials, and the proximity of neighboring wooden structures. Fires can spread to homes or businesses, and also block roads or other lifelines. This type of hazard can create significant economic and environmental damage if fuel loads and vegetation are not properly maintained.

Many buildings in the north end are wooden structures. Wood homes in close proximity to each other are especially vulnerable to fires. In downtown and the north end of Everett, there is a concentration of wood homes on lots smaller than 5,000 square feet. Throughout the city there are many wood structures on lots smaller than 10,000 square feet. Smaller lot zones are at greater risk of fire spreading rapidly through the neighborhood, especially during windy conditions. Many of the new "view homes" on high slopes were built on larger lots and should be less vulnerable to fire. The availability of water to fight fires is another potential vulnerability. Fortunately, in Everett there is a good distribution of water lines and fire hydrants. In the case of fire as a result of earthquake, the fire-fighting capability may be diminished by a ruptured water line.

Table 10-2 identifies the acres within each fire regime group which contain structures. Not all regimes fall within the city. Potential dollar losses for all structures within all of the applicable fire regime groups combined exceed $9.8 billion (not inclusive of land values).

Table 10-2
LANDFIRE – Acres in Various Fire Regime Group with Structures

Regime Group	*Acres*
Group 1-B	4.644267
Group III-A	2532.713538
Group V-A	12862.73783
Group V-B	5046.035949
Indeterminate Fire Regime Characteristics	11066.46701

10.3.4 Impact on Critical Facilities and Infrastructure

Critical facilities of wood frame construction are especially vulnerable during wildfire events. In the event of wildfire, there would likely be little damage to most infrastructure. Most roads and railroads would be without damage except in the worst scenarios. Fueling stations could be significantly impacted, as could other structures maintaining hazardous materials. During a wildfire event, hazardous material storage containers could rupture due to excessive heat and act as fuel for the fire, causing rapid spreading and escalating the fire to unmanageable levels. In addition the materials could leak into surrounding areas, saturating soils and seeping into surface waters, having a

disastrous effect on the environment. Power lines are also significantly at risk from wildfire because most poles are made of wood and susceptible to burning. Fires can create conditions that block or prevent access and can isolate residents and emergency service providers. Wildfire could also impact wood-structured bridges, peers, and docks, which are utilized to moor watercraft, launch search and rescue vessels, dam safety inspections, fishing vessels, or other industry associated with tourism. Table 10-3 identifies critical facilities exposed to the wildfire hazard by the fire regime groups which are within the city.

Table 10-3
Critical Facilities and Infrastructure Exposed to Fire Regime Areas

	Indeterminate	Regime V-A	Regime V-B	Regime I-B	Regime III-A	**Total**
Medical and Health Services	0	0	0	0	0	**0**
Government Function	0	7	4	0	0	**11**
Protective Function	0	14	1	0	1	**16**
Hazmat	1	0	2	0	0	**3**
Natural Resources	0	3	2	0	0	**5**
Water	11	20	12	0	0	**43**
Wastewater	5	13	28	0	4	**50**
Cultural	0	2	0	0	0	**2**
Commercial	0	5	0	1	0	**6**
Transportation	1	5	0	0	0	**6**
Total	**18**	**69**	**49**	**1**	**5**	**142**

Protective = Shelter, Fire, Police

10.3.5 Impact on Economy

Wildfire impact on the economy can be far reaching, ranging from damage to transportation routes to non-use of park facilities impacting tourism, to loss of structures influencing tax base from lost revenue. Disruption of major thoroughfares in the area could impact distribution of goods statewide. Secondary hazards associated with wildfire, such as environmental impact, or increased landslides and flooding potential, would further impact the economy.

10.3.6 Impact on Environment

Fire is a natural and critical ecosystem process in most terrestrial ecosystems, dictating in part the types, structure, and spatial extent of native vegetation. However, wildfires can cause severe environmental impacts:

- Damaged Fisheries—Critical fisheries can suffer from increased water temperatures, sedimentation, and changes in water quality.
- Soil Erosion—The protective covering provided by foliage and dead organic matter is removed, leaving the soil fully exposed to wind and water erosion. Accelerated soil erosion occurs, causing landslides and threatening aquatic habitats.

- Spread of Invasive Plant Species—Non-native woody plant species frequently invade burned areas. When weeds become established, they can dominate the plant cover over broad landscapes, and become difficult and costly to control.
- Disease and Insect Infestations—Unless diseased or insect-infested trees are swiftly removed, infestations and disease can spread to healthy forests and private lands. Timely active management actions are needed to remove diseased or infested trees.
- Destroyed Endangered Species Habitat—Catastrophic fires can have devastating consequences for endangered species.
- Soil Sterilization—Topsoil exposed to extreme heat can become water repellant, and soil nutrients may be lost. It can take decades or even centuries for ecosystems to recover from a fire. Some fires burn so hot that they can sterilize the soil.

10.3.7 Impacts from Climate Change

Fire in western ecosystems is determined by climate variability, local topography, and human intervention. Climate change has the potential to affect multiple elements of the wildfire system: fire behavior, ignitions, fire management, and vegetation fuels. Hot dry spells create the highest fire risk. Increased temperatures may intensify wildfire danger by warming and drying out vegetation. When climate alters fuel loads and fuel moisture, forest susceptibility to wildfires changes. Climate change also may increase winds that spread fires. Faster fires are harder to contain, and thus are more likely to expand into residential neighborhoods.

Historically, drought patterns in the West are related to large-scale climate patterns in the Pacific and Atlantic oceans. The El Niño–Southern Oscillation in the Pacific varies on a 5- to 7-year cycle, the Pacific Decadal Oscillation varies on a 20- to 30-year cycle, and the Atlantic Multidecadal Oscillation varies on a 65- to 80-year cycle. As these large-scale ocean climate patterns vary in relation to each other, drought conditions in the U.S. shift from region to region. El Niño years bring drier conditions to the Pacific Northwest and more fires.

Climate scenarios project summer temperature increases between 2ºC and 5°C and precipitation decreases of up to 15 percent. Such conditions would exacerbate summer drought and further promote high-elevation wildfires, releasing stores of carbon and further contributing to the buildup of greenhouse gases. Forest response to increased atmospheric carbon dioxide—the so-called "fertilization effect"—could also contribute to more tree growth and, thus, more fuel for fires, but the effects of carbon dioxide on mature forests are still largely unknown. High carbon dioxide levels should enhance tree recovery after fire and young forest regrowth, as long as sufficient nutrients and soil moisture are available, although the latter is in question for many parts of the western United States because of climate change.

10.4 FUTURE DEVELOPMENT TRENDS

The city is optimistic that increased population growth will continue to occur throughout the area. As areas of the city continue to grow, the potential exists that the fire risk may increase as urbanization tends to alter the natural fire regime, and the population growth will expand the urbanized areas into undeveloped wildland areas, increasing exposure to people, property, the environment, and the economy. However, the city feels that this expansion of the wildland-urban interface can be managed with strong land use and building codes.

A growing body of research suggests that "the only effective home protection treatment is treatment in, on, and around the house (see Figure 10-88); homeowners must be responsible for protecting that property" (Nowicki 2001, p. 1:3). U.S. Forest Service research scientist, Jack Cohen has stated that "home ignitions are not likely unless flames and firebrand ignitions occur within 40 meters [131 feet] of the structure; the WUI fire loss problem primarily depends on the home and its immediate site."

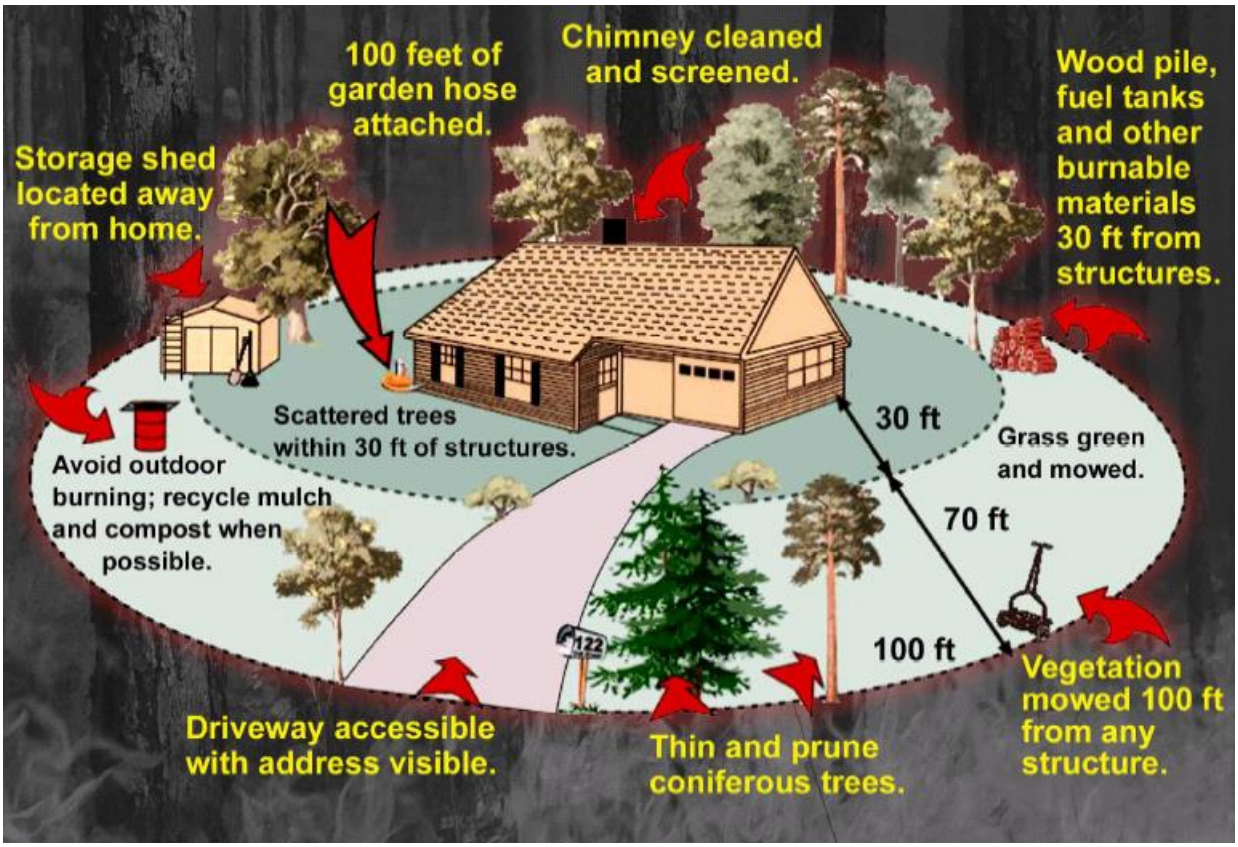


Figure 10-8 Measures to Protect Homes from Wildfire

10.5 ISSUES

The major issues for wildfire in the City of Everett are the following:

- Public education and outreach to people living in or near the fire hazard zones should include information about and assistance with mitigation activities such as defensible space, and advance identification of evacuation routes and safe zones.
- Wildfires could cause landslides as a secondary natural hazard.
- Climate change will affect the wildfire hazard.
- Future growth into interface areas should continue to be managed.
- Vegetation management activities should include enhancement through expansion of target areas as well as additional resources.

- Building code standards need to be enhanced, including items such as residential sprinkler requirements and prohibitive combustible roof standards.

A worst-case scenario would include an active fire season throughout the American west, spreading resources thin. Firefighting teams would be exhausted or unavailable. Many federal assets would be responding to other fires that started earlier in the season. While local fire agencies would be extremely useful in the urban interface areas, they have limited wildfire capabilities or experience, and they would have a difficult time responding to the ignition zones. Even though the existence and spread of the fire is known, it may not be possible to respond to it adequately, so an initially manageable fire can become out of control before resources are dispatched.

To further complicate the problem, heavy rains could follow, causing flooding and landslides and releasing tons of sediment into rivers, permanently changing floodplains and damaging sensitive habitat and riparian areas. Such a fire followed by rain could release millions of cubic yards of sediment into streams for years, creating new floodplains and changing existing ones. With the forests removed from the watershed, stream flows could easily double. Flood that could be expected every 50 years may occur every couple of years. With the streambeds unable to carry the increased discharge because of increased sediment, the floodplains and the flood elevations would increase.

10.6 RESULTS

Based on review and analysis of the data, the Planning Team has determined that the probability for impact from Wildfire throughout the area is limited with respect to geographic extent. The city has never experienced a wildfire or ignition of structures/lands within the city as a result of embers traveling from other areas of the county or surrounding region. On a regional perspective, the area experiences some level of wildfire impact almost annually with smoke from fires in other areas being carried into the city.

Construction into the wildfire hazard areas undoubtedly will continue to expand, thereby increasing the risk of fires. Implementation of mitigation strategies which help reduce wildfire risk, such as landscaping regulations and mandatory sprinkler systems, could potentially help reduce the number of structures at risk. Based on the potential impact, the Planning Team determined the CPRI score to be 2.30, with overall vulnerability determined to be a Medium level.

CHAPTER 11.
HAZARD RANKING

11.1 CALCULATED PRIORITY RISK INDEX

In ranking the hazards, the Planning Team completed a Calculated Priority Risk Index (CPRI) worksheet for each hazard identified below. This is a different process than utilized for the 2018 HMP. The index examines five criteria for each hazard as discussed in Chapter 4 (probability, magnitude/severity, extent/location, warning time, and duration), defines a risk index for each according to four levels, then applies a weighting factor. The result is a score that has been used to rank the hazards for the city. This process will also allow the city to utilize the same indices as it updates its non-natural and manmade hazards, allowing the integration of additional hazards of concern. Table 11-1 presents the results of the CPRI scoring for the natural hazards. Table 11-2 illustrates the hazard ranking for the 2011, 2018, and 2024 plan. While the methodology for the risk ranking changed somewhat for the 2024 edition, the ranking of the hazards remained within consistent boundaries to allow for the hazards to be ranked in order of priority.

Table 11-1
City of Everett Calculated Priority Risk Index Ranking Scores

Hazard	Probability	Magnitude and/or Severity	Extent and Location	Warning Time	Duration	Calculated Priority Risk Index Score
Climate Change	3	2	2	1	4	2.35
Earthquake	4	4	4	4	1	3.85
Flood	4	3	2	1	2	2.85
Landslide	2	2	2	4	3	2.35
Severe Weather	4	2	3	1	2	2.85
Tsunami	2	2	2	4	2	2.3
Wildfire	2	2	2	4	2	2.3

The CPRI scoring method has a range from 0 to 4. "0" being the least hazardous and "4" being the highest.

Table 11-2
HAZARD RISK RANKING

	2011	2017 (HIVA)	**2024 (HMP)**	**2024**
Hazard	Ranking	Ranking	Ranking	Ordinal Rank
Earthquakes	1	1	1	High
Flooding	6	2	2	High
Severe Storms	2	3	2	High
Landslide	8	4	3	High
Climate Change	4	5	4	Medium
Fire (Wild)	5	6	5	Medium
Hazardous Materials	7	6	NR Separately	Medium
Volcanic Eruptions	10	7	NR	NR
Cyber Attacks	NR	8	HIVA	NR
Pandemics	3	6	HIVA	NR
Tsunami & Seiche	9	9	6	Medium

Grouping of hazards varied by year of ranking. Not all hazards were included in each years' assessment.
NR = Not Ranked.
2024 HMP focused on natural hazards only, with HIVA addressing non-natural hazards; Hazardous Materials were incorporated within each hazard profile, not assessed as a separate hazard.

11.1.1 Calculated Priority Rate Index

CPRI Category	Degree of Risk			Assigned Weighting Factor
	Impact/ Level ID	Description	Impact Factor	
Probability	Unlikely	• Rare with no documented history of occurrences or events. • Annual probability of less than 1% (~100 years or more).	1	40%
	Possible	• Infrequent occurrences; at least one documented or anecdotal historic event. • Annual probability that is between 1% and 10% (~10 years or more).	2	
	Likely	• Frequent occurrences with at least two or more documented historic events. • Annual probability that is between 10% and 90% (~10 years or less).	3	
	Highly Likely	• Common events with a well-documented history of occurrence. • Annual probability of occurring. (1% chance or 100% Annually).	4	
Magnitude/ Severity	Negligible	• People – Injuries and illnesses are treatable with first aid; minimal hospital impact; no deaths. Negligible impact to quality of life. • Property – Less than 5% of critical facilities and infrastructure impacted and only for a short duration (less than 24-36 hours such as for a snow event); no loss of facilities, with only very minor damage/clean-up. • Economy – Negligible economic impact. • Continuity of government operating at 90% of normal operations with only slight modifications due to diversion of normal work for short-term response activity. Disruption lasts no more than 24-36 hours. • Special Purpose Districts: No Functional Downtime.	1	25%
	Limited	• People – Injuries or illness predominantly minor in nature and do not result in permanent disability; some increased calls for service at hospitals; no deaths; 14% or less of the population impacted. Moderate impact to quality of life. • Property – Slight property damage -greater than 5% and less than 25% of critical and non-critical facilities and infrastructure. • Economy – Impact associated with loss property tax base limited; impact results primarily from lost revenue/tax base from businesses shut down during duration of event and short-term cleanup; increased calls for emergency services result in increased wages. • Continuity of government impacted slightly; 80% of normal operations; most essential services being provided. Disruption lasts >36 hours, but <1 week. • Special Purpose Districts: Functional downtime 179 days or less.	2	
	Critical	• People – Injuries or illness results in some permanent disability or significant injury; hospital calls for service increased significantly; no deaths. 25% to 49% of the population impacted. • Property – Moderate property damages (greater than 25% and less than 50% of critical and non-critical facilities and infrastructure). • Economy - Moderate impact as a result of critical and non-critical facilities and infrastructure impact, loss of revenue associated with tax base, lost income. • Continuity of government ~50% operational capacity; limited delivery of essential services. Services interrupted for more than 1 week, but <1 month. • Special Purpose Districts: Functional downtime 180-364 days.	3	
	Catastrophic	• People - Injuries or illnesses result in permanent disability and death to a significant amount of the population exposed to a hazard. >50% of the population impacted. • Property – Severe property damage >50% of critical facilities and non-critical facilities and infrastructure impacted. • Economy – Significant impact - loss of buildings /content, inventory, lost revenue, lost income. • Continuity of government significantly impacted; limited services provided (life safety and mandated measures only). Services disrupted for > than 1 month. • Special Purpose Districts: Functional Downtime 365 days or more.	4	
Geographic Extent and Location	Limited	Less than 10% of area impacted.	1	20%
	Moderate	10%-24% of area impacted.	2	
	Significant	25%-49% of area impacted.	3	
	Extensive	50% or more of area impacted.	4	
Warning Time / Speed of Onset	<6 hours	Self-explanatory.	4	10%
	6 to 12 hours	Self-explanatory.	3	
	12 to 24 hours	Self-explanatory.	2	
	> 24 hours	Self-explanatory.	1	
Duration	< 6 hours	Self-explanatory.	1	5%
	< 24 hours	Self-explanatory.	2	
	<1 week	Self-explanatory.	3	
	>1 week	Self-explanatory.	4	

11.2 SOCIAL VULNERABILITY

Once the hazard ranking was completed, the Planning Team then conducted a Social Vulnerability Assessment for those hazards identified in Table 11-1. Several different assessments were completed with respect to social vulnerability to identify potential areas of social inequity, including data contained within the Community Profile section (Chapter 3), FEMA's Resilience Analysis & Planning Tool (RAPT), data within each hazard profile, the information within the various tables in this section, and a qualitative assignment based on the CPRI analysis.

When determining risk, it is significant to remember that risk is measured by not only the hazard, but also on how resilient a population is, or will be during the hazard. Resilience is influenced by many factors, including: age or income; available social networks, and neighborhood characteristics, all of which can be used to measure the social vulnerability of the area and its citizens. Factors that contribute to the level of vulnerability of a population are associated with four areas of impact, which, in part, are utilized within this assessment with a few modifications to the original study, as indicated:

- Socioeconomic status:
  - Below Poverty Level
  - Employment Status
  - Income level
  - No High School Diploma
- Household composition:
  - Age 65 or older
  - Age 5 or younger (the North Carolina study references age 17 or younger)
  - Disability (the North Carolina study referenced "Older than Age 5 with a Disability")
  - Single Parent Households
- Minority Status and Language:
  - Minority – race or ethnicity
  - Language barrier (Speak English "Less than Well")
- Housing/transportation:
  - Multi-Unit Structures, including Group Quarters
  - Mobile Homes
  - Crowding
  - No Vehicle

The purpose of the classifications is to better understand whose needs are not being addressed through traditional service providers or who cannot safely access and use the standard resources offered for disaster preparedness, relief and recovery. Special focus on these groups during emergency situations is crucial because not only are they more likely to be impacted by an event, but they are many times also less likely to recover. As this planning process expands over the next five

years, the city intends to expand this section to include data for additional vulnerable classifications that it may identify.

11.2.1 Classifications

Socioeconomic status considers things such as income, poverty, employment status, and education level. Those who are economically disadvantaged will be affected by an event more significantly. The monetary value of their possessions may be less, but they represent a larger proportion of total household assets. These groups are less likely to have renters or homeowner's insurance, so their possession will be costlier to replace, and individuals are less likely to evacuate in order to ensure the protection of their belongings. In the event of injury or death, those who are unemployed will not have the benefits or the income to assist with costs for recovery. In addition, in most cases, the poor lack the assets and the resources to prepare for a disaster in advance, and once impacted, to recover.

Household composition and disability grouping is comprised of age (under the age of 5 and above 65), single parent homes, and any disability. These groups are more likely to need financial support, transportation, medical care, or assistance with daily activities during disasters. The elderly and the younger children often lack resources, knowledge, or life experiences to effectively address the situation and cannot protect themselves. Elderly living alone, and people with physical, sensory, or cognitive challenges are vulnerable during an incident. These groups often need a higher level of assistance than others, and may have caretakers who are less able to assist during a crisis if those caretakers have families of their own. This places a heavier burden on medical and first responders.

Minority status and language includes race, ethnicity, and proficiency of the English language. The social and economic marginalization of certain racial and ethnic groups have made these populations more likely to be vulnerable at all stages, and are automatically associated with a higher vulnerability rate. Many citizens are not fluent in English, which makes providing them with real time information difficult. Because Spanish is the most prominent second language, there are often translators available, and many times emergency notifications are provided in Spanish; however, those who speak other languages are at greater risk if notifications are not provided in the appropriate languages. These groups often rely on family, friends, neighbors and social media for information.

Housing and transportation considers the structure of the home (e.g., building codes, age of structure), crowding, and access to vehicles or public transportation. The quality of the housing is crucial when calculating vulnerability. Economically disadvantaged often live in poorly constructed houses or mobile homes which may not be designed to withstand storms events, ice/snow loads, wind, earthquakes, or flooding. Mobile homes are often located in places without easy access to transportation, are in cluster communities, and many times not secured to a foundation, all of which increase vulnerability. Multi-unit housing in densely populated areas are difficult to evacuate due to limited amounts of space and crowding. Urban areas often have a lower automobile ownership rate, especially in the lower income areas, which make evacuations more challenging. Despite the lower proportion of people with vehicles, urban areas often have to deal with congestion on highways and major roads because of crowding. Group quarters are another housing situation that cause concern during evacuations, especially nursing homes and long-term care facilities because many institutions are unprepared to quickly remove staff and residents, and as with private group/independent living homes, the data that such facilities exist is not publicly known and/or identified.

All of these factors contribute to a community's social vulnerability which impacts all phases of emergency management, and should be taken into consideration in various planning efforts. Table 11-3 identifies those factors and classifications which contribute to a community's social vulnerability identified by the percent of special population within the city utilizing U.S. Census data, augmented with county-specific data where available.

Review of Washington State Department of Health's website also identifies social vulnerability throughout Snohomish County based on the same indices utilized by the planning team, which was originally developed by the CDC. The intent of the data is to provide information to emergency management groups for use during emergency situations, including response planning of emergencies. The data, when applied, allows a more accurate response based on the demographics and vulnerabilities of a specific community. Figure 11-1 identifies the various ranking for Snohomish County (no data specific to the City of Everett is available) as identified by DOH or FEMA's RAPT tool. Reviewers wishing more information can access the data at: Information by Location | Washington Tracking Network (WTN)

Table 11-3
Vulnerable Populations

Population Group	Percent of Total Population
Households Children 5 and Under	5.4
Population 18 years and Younger	20.2
Populations 65 and Older	13.5
Population with a Disability	11.4
Population In Poverty	7.3
Language Other Than English*	28.2
Population without High School Diploma	7.14
With a disability under age 65	10.5
Single Parent Households	16.76
Households No Vehicles	4.6
Households No Smartphone	8.76
Housing Units Mobile Homes	4.7
Housing Owner-Occupied	64.95

*The city has interpretation services, which are available to assist with translation of emergency notifications and information.

Sources: Based on 2020 US Census and Washington State Office of Financial Management Data; WA DOH Data, or FEMA RAPT data.

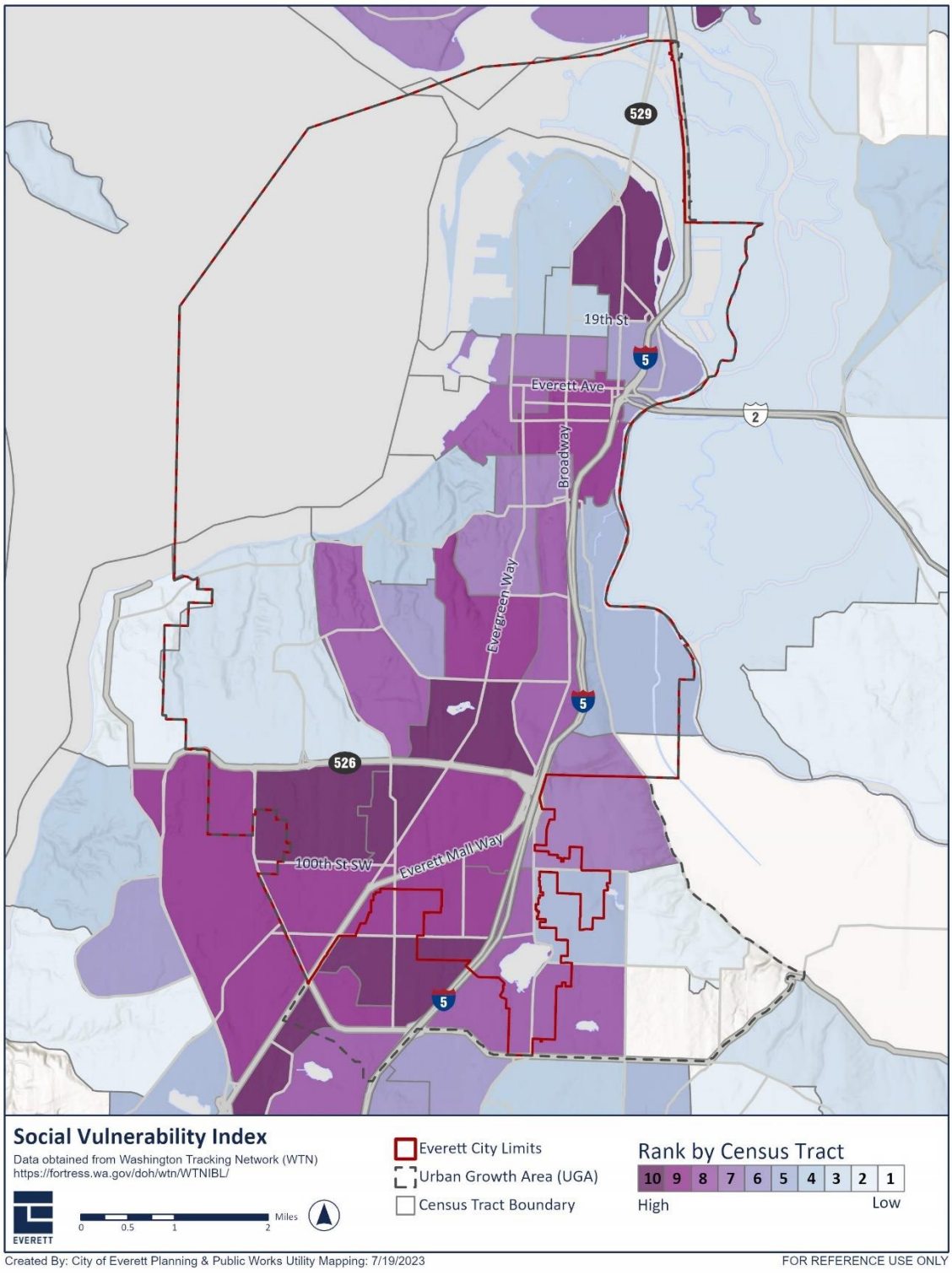


Figure 11-1 Washington State DOH Social Vulneability Index Results

Based on the classifications identified, the Planning Team performed its assessment to help identify issues and concerns, conducting a qualitative assessment combining the value of the CPRI, and summarizing the potential impact based on past occurrences, spatial extent, and subjective damage and casualty potential. Those items were categorized into the following levels:

- Extremely Low—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- Low—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- Medium—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- High—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- Extremely High—Very widespread with catastrophic impact.

Table 11-4 identifies the results of this assessment.

Table 11-4
Vulnerability Overview

Hazard	Synopsis of Potential Impact	Population Groups Impacted (By Group Type): Business	Children	Disabled	Elders	Families	Low Income	Language	Level of Impact High, Medium, Low	Summarized Extent and Location
Climate Change	Climate change is measured in terms of impact on other hazards. Impact varies, but can include physical drought conditions, water shortage, increased flood incidents, or increased wildfire danger.	X	X	X	X	X	X	X	Medium	Climate change itself customarily does not impact structures; however, the entire population and natural resources of the area will be impacted by climate change.
Drought	Drought is typically measured in terms of water availability in a geographic area, and is not a sudden-onset hazard, allowing some preparation. Socioeconomic droughts occur when physical water shortage begins to affect people, individually and collectively. Social impacts involve public safety, health, reduced quality of life, and inequities in the distribution of impacts and disaster relief. Many impacts identified as economic and/or environmental also have a social component. During warm seasons, water suppliers are often faced with more demand for water than they are able to distribute. This may lead to rationing and curtailment, with businesses that rely heavily on water usage suffering financially. Most socioeconomic definitions of drought associate it with supply, demand, and economic goods.	X	X	X	X	X	X	X	Medium	Drought customarily does not impact structures, but would adversely impact people, resources, and aqua- and agri-cultural businesses (among others) within the area. Therefore, all populations would be susceptible, although the degree would be determined by the severity of the drought in place, the availability of water, increased fire danger and response times, and the economic impact from water-dependent industries.

Table 11-4
Vulnerability Overview

Hazard	Synopsis of Potential Impact	Population Groups Impacted (By Group Type): Business	Children	Disabled	Elders	Families	Low Income	Language	Level of Impact High, Medium, Low	Summarized Extent and Location
Earthquake	Older structures (pre ~1970) have high probability of collapse due to building code standards; Non-English speakers may have issues gaining hazard information for preparedness. Low-income individuals may not be able to stockpile supplies or medications. Elderly populations are vulnerable due to health issues, the lack of physical strength to extricate themselves, etc. Businesses many times do not carry insurance which will help them recover from losses.	X	X	X	X	X	X	X	High	Many structures in the area were built pre-1970, when lower codes were in place, making the structures more vulnerable to collapse, increasing the potential for injury. The city did have a URM analysis conducted, which identified structures at risk, many within the downtown core. Also of concern with earthquake are landslides and slope stability. Stability in the area could be significantly undermined. The majority of the entire area is susceptible to the impacts from an earthquake to some degree. Older structures would be more susceptible to collapse during shaking, increasing the number and degree of injuries. Elderly and young would be susceptible because of the decreased ability to survive injury, and the decreased ability to physically extract themselves from debris if buried beneath collapsed structures. The city does have CERT members who have been trained to some degree to assist during an earthquake.

Table 11-4
Vulnerability Overview

Hazard	Synopsis of Potential Impact	Population Groups Impacted (By Group Type)							Level of Impact High, Medium, Low	Summarized Extent and Location
		Business	Children	Disabled	Elders	Families	Low Income	Language		
Landslide	The probability for impact from landslide is more limited with respect to geographic extent. The area experiences some level of landslides almost annually. The city does have areas with identifiable landslide risk. While there are areas where no landslide risk exists, landslides can occur on fairly low slopes, and areas with no slopes can be impacted by slides at a distance. Construction in critical areas, which includes geologically sensitive areas such as landslide areas, is regulated; however, beyond the structural impact, secondary impact to infrastructure causing isolation or commodity shortages also has the potential to impact the region.	X	X	X	X	X	X	X	High	Portions of the planning area has some level of susceptibility to landslides, especially along the major roadways, particularly in the county and along BNSF tracks. As such, evacuation in the area could be impacted by a landslide event. With the increased risk factor during the rainy season, a landslide could occur in any location where soils can become saturated. This could impact the ability of citizens to leave areas where flooding occurs, or evacuate after a major earthquake if a landslide has blocked major arterials. This could also impact responders accessing areas. Vulnerable populations would be less likely to be able to evacuate, increasing their risk.

Table 11-4
Vulnerability Overview

Hazard	Synopsis of Potential Impact	Population Groups Impacted (By Group Type): Business	Children	Disabled	Elders	Families	Low Income	Language	Level of Impact High, Medium, Low	Summarized Extent and Location
Flood	Year of construction will influence the building code and the height to which the structures were built when compared to the Base Flood Elevation. In most instances, weather patterns which cause flooding are identified in advance, allowing pre-planning for evacuation, thereby potentially reducing the individuals at risk. Individuals without homeowner's insurance which covers flooding may suffer extreme financial risk. The city has a fairly low number of NFIP policies as of 2023, with 57 flood policies in place. Businesses impacted many times do not carry insurance which will help them recover from losses. In many instances, those businesses do not return to the area because they cannot overcome the financial loss.	X	X	X	X	X	X	X	High	Flooding in the area has impacted transportation, causing roadways to be blocked, and causing landslides which also block major arterials. This has caused issues with evacuation in certain areas. All areas within the floodplain would be vulnerable. The city, based on Census data, is considered to have a younger community compared to other surrounding areas, including the county. The city has increased populations from visitors who frequent tourism destinations in the area, the Navy Station, Paine Field, and the Port, all of which represent major economic hubs to the region as a whole. For planning purposes, a significant increase in the seasonal population in the area as well as various sporting events should be considered for those traveling the I-5 corridor, which may become trapped in the area, increasing the transient population in the city and taxing emergency resources.

Table 11-4
Vulnerability Overview

Hazard	Synopsis of Potential Impact	Population Groups Impacted (By Group Type)							Level of Impact High, Medium, Low	Summarized Extent and Location
		Business	Children	Disabled	Elders	Families	Low Income	Language		
Severe Weather – inclusive of heat, cold, wind, snow, ice, hail, Thunder-storm, lightening	Severe weather occurs regularly throughout the planning area. In most instances, weather patterns are forecasted in advance, allowing for preparation. Individuals with lower income may not have the ability to stock supplies, nor afford the cost of increased energy costs for both heating or cooling, depending on the weather event. In snow or ice conditions, secondary impacts from driving or shoveling snow increases the risk of impact. Elderly and young children are especially susceptible to ice and heat conditions. Lighting strikes also occur, although in a limited capacity. In densely wooded areas, fires could go unnoticed for a period of time, allowing the fire to gain strength and severity, especially during drought situations. Lightning risk also increases due to the waterbodies in the area, and the time it takes for boaters to get to safety.	X	X	X	X	X	X	X	High	The entire region is susceptible to severe weather incidents, including impact to people, property, the economy, and the environment. Incidents of some nature and degree occur annually. Depending on the type of event, road/railways may be impassible, sea/airports may be shut down for some types of events. Significant power outages do not occur often, and do not customarily last for a long period of time. However, when coupled with cold conditions, the impact to vulnerable populations increases. With extreme heat events, physical manifestation on the young and elderly rise. In addition, as with the extreme heat events occurring the last three years, the increased fire danger impacts the entire area, if for no other reason than with increased smoke in distant areas that are blown into the region. The city and county do have heating and cooling shelters which become operational when needed.

Table 11-4
Vulnerability Overview

Hazard	Synopsis of Potential Impact	Population Groups Impacted (By Group Type)							Level of Impact High, Medium, Low	Summarized Extent and Location
		Business	Children	Disabled	Elders	Families	Low Income	Language		
Wildfire	Impact from wildfires has increased over time due to effective suppression tactics. This has now caused fires to burn with greater intensity, with the traditional fire regimes being modified. Embers from wildfires can be carried significant distances (miles). With climate change impacting drought conditions, the potential for wildfire increases as moisture content is depleted. Lightning strikes and people are the major causes of wildfires, which can spread very quickly, leaving little to no time to evacuate. Individuals with access and functional needs, the young and elderly are at greater risk due to their potential dependence on others to assist with evacuation. Individuals, including the young and elderly with health concerns are impacted significantly by smoke. Increased rates of death due to smoke is not uncommon.	X	X	X	X	X	X	X	Medium	Wildfire danger can impact the entire planning area; however, there has been limited impact to date. The various Fire Regimes do identify areas of higher levels of risk, although wildfires can occur in any area with vegetation. Not all Fire Regimes exist in the area. Due to the wind patterns in the area, including the shift of winds during afternoon hours, embers have the potential to travel great distances (miles) and ignite fires in areas which are densely wooded. In some instances, these fires can burn for periods of time, going unnoticed until ignition consumes a large area, making containment difficult. Elderly, young and individuals with breathing/health issues are more vulnerable due to smoke and particulates. Language may also be a barrier for non-English speaking populations due to the inability to understand evacuation orders, which can be very short-notice. The city does maintain the ability to translate emergency notifications into the various languages spoken in the area.

CHAPTER 12.
MITIGATION STRATEGY

The development of a mitigation strategy allows the community to create a vision for preventing future disasters. This is accomplished by establishing a common set of mitigation goals and objectives, a common method to prioritize actions, and evaluation of the success of such actions. Specific mitigation goals, objectives and projects were developed for the City of Everett by the Planning Team in their attempt to establish an overall mitigation strategy by which the jurisdictions would enhance resiliency of the planning area.

12.1 HAZARD MITIGATION GOALS AND OBJECTIVES

During the Kick-Off Meeting, the Planning Team reviewed the 2018 existing goals. For the 2024 update, the planning team used the existing goals as written, with slight modifications. The planning team felt that the goals as written support the city's effort of enhanced capabilities which support resilience through protection of life, property, the economy and the environment. The goals as written accurately describe the overall direction that the City of Everett can take to work towards mitigating risk from natural hazards and avoid long-term vulnerabilities to the hazards of concern.

12.1.1 Goals

Goals for the 2024 Hazard Mitigation Plan are as follows:

1. Protect public health, welfare, and public safety.
2. Ensure continuity of critical facilities and infrastructure, corresponding operations of local government, and a vital economy.
3. Foster coordination and communication amongst public and private organizations.
4. Protect the quality of the natural environment.
5. Minimize losses to existing and future properties.
6. Increase initial post-event self-reliance.

12.1.2 Objectives

During the Kick-Off Meeting, the planning team developed the objectives for the 2024 Hazard Mitigation Plan as presented in Table 12-1.

Table 12-1
Objectives 2023

Objective Number	Objective Statement	Applicable Goals
O-1	Acquire (purchase), retrofit, or relocate structures in high hazard areas.	1, 2, 3, 4, 5, 6
O-2	Use best available data, science, and technologies to improve understanding of location and potential impacts of hazards, and to promote disaster resilient communities that minimize risk.	1, 2, 3, 4, 5, 6

Table 12-1
Objectives 2023

Objective Number	Objective Statement	Applicable Goals
O-3	Consider the impacts of natural hazards in all planning mechanisms that address current and future land use.	1, 2, 3, 4, 5
O-4	Increase resilience of identified critical facilities throughout the city, placing an emphasis on Community Lifelines.	1, 2, 3, 5
O-5	Continue to improve coordination and partnerships among all sectors to mitigate hazards and enhance recovery, including government, local businesses, stakeholders, and citizens.	1, 2, 3, 5, 6
O-6	Enhance community capabilities to prepare for, protect from, respond to, recover from, and mitigate the impact of hazards.	1, 2, 3, 4, 5, 6
O-7	Develop or improve emergency warning notifications; response and recovery operations; communication systems, and evacuation procedures.	1, 2, 3, 4, 5, 6
O-8	Provide/improve mitigation activities and integration through various means, including things such as: public education and outreach activities; programmatic-level initiatives; and structural and environmental projects.	1, 2, 3, 4, 6
0-9	Encourage hazard mitigation measures that result in the least adverse effect on the natural environment, and that use natural processes, while preserving and maintaining the environmental elements of the planning area.	1, 2, 3, 4, 5, 6

12.2 IDENTIFICATION AND ANALYSIS OF MITIGATION ACTION ITEMS

After the goals were established, the planning team developed specific mitigation initiatives / action items to further increase resilience. FEMA defines mitigation initiatives as sustained measures, which if enacted, will reduce or eliminate the long-term risk from hazards. Whether by preparing citizens for disasters, training responders, or structural infrastructure protection, the actions ultimately should help protect our citizens, and enhance social and economic recovery during such times when disasters do strike.

FEMA identifies four categories of actions that constitute natural hazard mitigation, which become the core competencies for developing an effective mitigation program. Those categories, divided further into hard or soft mitigation initiatives, include:

1) Local planning and regulations (soft mitigation);
2) Education and awareness programs (soft mitigation);
3) Structural or infrastructure projects (hard mitigation); and
4) Natural systems protection (hard mitigation).

These competencies allow organizations to assess mitigation efforts, and where lacking, develop processes, programs, rules, regulations, and standards on which to enhance resilience when considering the hazards of concern, and their potential impact on a community. In an effort to help develop sound mitigation initiatives for this update, FEMA's 2013 catalog of *Mitigation Ideas* was presented to the planning team. This document includes a broad range of alternatives to be

considered for use in the planning area, in compliance with 44 CFR (Section 201.6.c.3.ii), and can be applied to both existing structures and new construction. The catalog provides a baseline of mitigation alternatives that are backed by a planning process, are consistent with the planning team's goals, and are within the capabilities of the City of Everett to implement. It presents alternatives that are categorized in two ways:

- By what the alternative would do:
  - Manipulate a hazard
  - Reduce exposure to a hazard
  - Reduce vulnerability to a hazard
  - Increase the ability to respond to or be prepared for a hazard
- By who would have responsibility for implementation:
  - Individuals
  - Businesses
  - Government

Hazard mitigation initiatives recommended in this plan were selected from among the alternatives presented in the catalogs, as well as projects identified by the planning team members, and interested stakeholders. Some were carried over from the previous plan. Some may not be feasible based on the selection criteria identified for this plan, but are included nonetheless as the planning team felt they are viable actions to be taken to reduce hazard influence in some manner.

12.3 MITIGATION INITIATIVES

For the 2024 update, particular attention was again given to new and existing buildings and infrastructure in developing appropriate mitigation strategies. Capital Improvement Plans, the city's Comprehensive Land Use Plan, various reports, assessments, and studies completed since the 2018 HMP, as well as other documents were utilized to help identify potential strategies, projects, and initiatives. Table 12-2 identifies the mitigation strategies for this update.

A comprehensive review of the 2018 action plan was also performed by the Planning Team, which is indicated in Table 12-2 within the *2024 Status section*. In some instances, the strategies were modified slightly, as indicated within the table. Each previous strategy was reviewed to determine the current status based on the following:

- Those which were completed (indicated by C);
- Whose which were on-going or continual in nature (indicated by OG);
- Those which should carry forward into the 2024 plan (indicated by CF);
- Those which should carry forward into the 2024 with some modifications (indicated by M);
- Those which should be removed, determined to be no longer feasible or relevant (indicated by R); or
- A combination, such as completed for this update, but still relevant and carried forward (indicated by C, CF).

Based on review of the 2018 strategies, all strategies were carried forward or are continuing in nature with the exception of number 35, which was a Port-related activity that was determined to be no longer relevant. All remaining projects remain effective, helping to ensure resilience of the city.

12.4 ANALYSIS OF MITIGATION INITIATIVES

In addition to identifying potential funding sources available for each project, the Planning Team also developed strategies/action items that are categorized and assessed in several ways:

- By what the alternative would impact – new or existing structures, to include efforts which:
  - Manipulate/mitigate a hazard
  - Reduce exposure to a hazard
  - Reduce vulnerability to a hazard
- By who would have responsibility for implementation:
  - Individuals
  - Businesses
  - Government (Tribal, County, Local, State and/or Federal)
- By the timeline associated with completion of the project, based on the following parameters:
  - Short Term = to be completed in 1 to 5 years
  - Long Term = to be completed in greater than 5 years
  - Ongoing = currently being funded and implemented under existing programs
- By who benefits from the initiative, as follows:
  - A specific structure or facility
  - A local community
  - County-level efforts
  - Regional level benefits

- By the Community Lifeline they support:[59]
  - **Safety and Security** – Law Enforcement/Security, Fire Services, Search and Rescue, Government Service, Community Safety
  - **Food, Hydration, Shelter** – Food, Hydration, Shelter, Agriculture
  - **Health and Medical** – Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
  - **Energy** – Power Grid, Fuel
  - **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
  - **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
  - **Hazardous Materials** – Facilities, HAZMAT, Pollutants, Contaminants
  - **Water Systems** – Potable Water Infrastructure, Wastewater Management

12.5 CRS ANALYSIS OF MITIGATION INITIATIVES

The city further reviewed its recommended initiatives to classify them based on the hazard it addresses and the type of mitigation it involves. This analysis incorporated, among others, the Community Rating System scale, identifying each mitigation action item by type. Mitigation types used for this categorization are as follows.

- **Prevention** – Government, administrative or regulatory actions that influence the way land and buildings are developed to reduce hazard losses. This includes planning and zoning, floodplain laws, capital improvement programs, open space preservation, and stormwater management regulations.
- **Public Information and Education** – Public information campaigns or activities which inform citizens and elected officials about hazards and ways to mitigate them – a public education or awareness campaign, including efforts such as: real estate disclosure, hazard information centers, and school-age and adult education, all of which bring awareness of the hazards of concern.

[59] FEMA created Community Lifelines to reframe incident information, understand and communicate incident impacts using plain language, and promote unity of effort across the whole community to prioritize efforts to stabilize the lifelines during incident response. While lifelines were developed to support response planning and operations, the concept can be applied across the entire preparedness cycle. Efforts to protect lifelines, prevent and mitigate potential impacts to them, and building back stronger and smarter during recovery will drive overall resilience of the nation.

- **Structural Projects** —Efforts taken to secure against acts of terrorism, manmade, or natural disasters. Types of projects include levees, reservoirs, channel improvements, or barricades which stop vehicles from approaching structures to protect.
- **Property Protection** – Actions taken that protect the properties. Types of efforts include structural retrofit, property acquisition, elevation, relocation, insurance, storm shutters, shatter-resistant glass, sediment and erosion control, stream corridor restoration, etc. Protection can be at the individual homeowner level, or a service provided by police, fire, emergency management, or other public safety entities.
- **Emergency Services / Response** —Actions that protect people and property during and immediately after a hazard event. Includes warning systems, emergency response services, and the protection of essential facilities (e.g., sandbagging).
- **Natural Resource Protection** – Wetlands and floodplain protection, natural and beneficial uses of the floodplain, and best management practices. These include actions that preserve or restore the functions of natural systems. Includes sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Recovery** —Actions that involve the construction or re-construction of structures in such a way as to reduce the impact of a hazard, or that assist in rebuilding or re-establishing a community after a disaster incident. It also includes advance planning to address recovery efforts which will take place after a disaster. Efforts are focused on re-establishing the planning region in such a way to as enhance resiliency and reduce impacts to future incidents. Recovery differs from response, which occurs during, or immediately after an incident. Recovery views long-range, sustainable efforts.

Table 12-2
City of Everett Hazard Mitigation Initiatives and 2024 Status

New or Existing Assets	Hazards Mitigated	Objectives Met	Lead Agency*	Cost	Funding Sources	Timeline	In Previous Plan?	CRS Initiative Type / Supports Community Lifelines Sector(s) Impacted	Who Benefits?	2024 Status Carried Forward (CF), On-going (OG), Removed (R), Completed (C) Modified (M)
CW-1 Implement an Earthquake early warning system in key locations throughout the city.										
New/ Existing	EQ	1, 2, 4, 5, 6, 7, 8	OEM, PW	High	EQ/T Program EMPG, BRIC, HMGP, General Funds	Ongoing	Yes	Protection, Public Information & Education, Emergency Services / All	Local	CF
2024 Status: 1. Two advanced seismic devices from ShakeAlert® were purchased. One was installed and tied into the Service Center PA system. Some issues were encountered, and work continues. The second device is pending installation at the Water Filtration Plant, but we are facing a loss of interest due to available phone apps. 2. Two AHAB sirens were installed near the Port of Everett.										
CW-2 Support efforts to improve the resiliency of major transportation corridors I-5, US 2, and SR 529.										
New/ Existing	All	1, 2, 3, 4, 5, 6, 7, 8, 9	OEM, Fire, PW, WADOT, WDOE	High	Transportation Grants/ Funds, HLS / EMPG	Long-Term	Yes	Prevention, Public Info/ Education, Natural Resource Protection, Emergency Services/ Response / Transportation	Regional	CF
2024 Status: Public Works has begun a planning study on the I-5/US-2 Interchange Improvements, which piggyback on the recent Westbound Trestle Replacement Study done by WSDOT.										
CW-3 Set up dedicated city funding for intermediate sized bridge repair projects.										
New and Existing	All	1, 2, 3, 4, 5, 6, 7, 8, 9	PW	High	General Funds, Bonds,	Long-Term	Yes	Emergency Services / Response, Recovery / Transportation	Regional	CF
2024 Status: No action taken.										

Table 12-2
City of Everett Hazard Mitigation Initiatives and 2024 Status

New or Existing Assets	Hazards Mitigated	Objectives Met	Lead Agency*	Cost	Funding Sources	Timeline	In Previous Plan?	CRS Initiative Type / Supports Community Lifelines Sector(s) Impacted	Who Benefits?	2024 Status Carried Forward (CF), On-going (OG), Removed (R), Completed (C) Modified (M)
CW-4 Complete an assessment on post-earthquake response to repairing the in-city water system. As grant funding becomes available, consider pursuing grants.										
Existing	EQ	1, 3, 4, 5, 6, 8, 9	OEM, PW	High	EQ Program, BRIC, WDOE	Long-Term	Yes	Emergency Services / Response, Recovery, Structural / Water Systems	Com-munity Level	CF, M
2023 Status: Vulnerability Assessment including the city's water supply and distribution system is planned for 2023-2024. SERA License. Fracta software was utilized for three years. It identified areas of concern in the water distribution system during normal conditions, giving the city the ability prioritize the risk of failure. The city is prioritizing hardening these areas by utilizing earthquake resistant ductile iron pipe when the watermain replacement coincides with the identified backbone system.										
CW-5 Implement recommendations from the forthcoming Water Supply Resiliency Study.										
New and Existing	All	All	PW	Medium	General Fund, HMGP, Stafford Act Grants	Short-Term	Yes	Structural Projects, Property Protection, Recovery / Water Systems	County and Local	C, CF
2024 Status: Reservoir 2 replacement project has been completed. Reservoir 3 replacement project is underway with construction scheduled Fall 2026. Priority distribution mains are being replaced with earthquake resistant pipe. Several segments of the backbone earthquake resistant distribution have been completed. New segments are included in distribution system replacement projects as opportunity arises. Various components of the Water Filtration Plant are being hardened. Two new backup generators went online the end of 2023.										

Table 12-2
City of Everett Hazard Mitigation Initiatives and 2024 Status

New or Existing Assets	Hazards Mitigated	Objectives Met	Lead Agency*	Cost	Funding Sources	Timeline	In Previous Plan?	CRS Initiative Type / Supports Community Lifelines Sector(s) Impacted	Who Benefits?	2024 Status Carried Forward (CF), On-going (OG), Removed (R), Completed (C) Modified (M)
CW-6 Assess the need for backup generators at water pump sites and get funding for generator gaps.										
New/ Existing	EQ, F, LS, SW	All	OEM	Medium	EQ and Tsunami Program, HMGP, BRIC, HUD, DOT, EPA	Long-Term	Yes	Structural Projects, Property Protection, Natural Resource Protection / Water Systems, Food, Hydration, Shelter	Facility Specific	CF
2024 Status: The Public Works Department received a FEMA Hazard Mitigation Grant to procure and install a 1.0 MW permanent generator at Evergreen Pump Station. The generator is scheduled for delivery in November 2024. Evergreen Pump Station is in the process of receiving electrical and controls upgrades that will enable the station to be powered by a generator. This project will be completed in early 2024.										
CW-7 Complete an assessment of the city's fueling infrastructure with recommendations for improvements. Once identified, seek grant funding to implement recommendations.										
New/ Existing	All	1, 2, 3, 4, 5, 6, 7, 8, 9	MVD, Fire, PW, OEM	Medium	HMGP, DOE, HUD, SAFER	Long-Term	Yes	Property Protection, Emergency Services/ Response / Energy, Safety, Hazardous Materials	Local and County-wide	CF, M
2024 Status: Assessments and reviews conducted in 2018. Resources and financial support committed in 2023 with procurement and purchasing started. Installation and site refurbishment scheduled for 2024 with 10 fueling sites to include new pumps, dispensers, site controllers, card readers, management software, tank monitors.										

Table 12-2
City of Everett Hazard Mitigation Initiatives and 2024 Status

New or Existing Assets	Hazards Mitigated	Objectives Met	Lead Agency*	Cost	Funding Sources	Timeline	In Previous Plan?	CRS Initiative Type / Supports Community Lifelines Sector(s) Impacted	Who Benefits?	2024 Status Carried Forward (CF), On-going (OG), Removed (R), Completed (C) Modified (M)
CW-8 Build a fiber communication and data loop connecting city EOC.										
New/ Existing	All	2, 4, 5, 6, 7, 8	IT	Medium	EMPG, General Fund	Ongoing	Yes	Response, Recovery, Prevention, Public Info/ Education / Communi-cations	Local	CF
2024 Status: Project is seeking funding.										
CW-9 Complete an assessment of the earthquake response of the Regional Wastewater Treatment Plant building and siphons.										
New/ Existing	EQ	1, 2, 4, 6, 7, 8	PW	Medium	General Funds, EMPG, DOE	Ongoing	Yes	Prevention, Emergency Services, Response, Recovery / Safety & Security, Water	Local	C, CF
2024 Status: A capital facility plan for the Water Pollution Control Facility (WPCF) was completed in 2021. This plan briefly touches on the seismic reliability of particular WPCF structures and recommends that a more in-depth review of the plant be completed. As a more in-depth review of the plant was recommended, this project is carried forward.										
CW-10 Complete an assessment of critical sewer pipelines with recommendations for improvements.										
New and Existing	EQ, F, LS, SW, T	1, 2, 3, 4, 5, 6, 7, 8, 9	PW	Medium	General Fund, EPA, BRIC, DOE grants.	Long-Term	Yes	Prevention, Response, Recovery / Water	Local	CF
2024 Status: The city was unable to make any progress on this strategy since completion of the last plan, but does feel that the strategy still holds value, and as such, this item will be carried forward in the 2024 update.										

Table 12-2
City of Everett Hazard Mitigation Initiatives and 2024 Status

New or Existing Assets	Hazards Mitigated	Objectives Met	Lead Agency*	Cost	Funding Sources	Timeline	In Previous Plan?	CRS Initiative Type / Supports Community Lifelines Sector(s) Impacted	Who Benefits?	2024 Status Carried Forward (CF), On-going (OG), Removed (R), Completed (C) Modified (M)
CW-11 Acquire Port Gardner Wet Weather Facilities to provide additional combined sewer and stormwater capacity.										
Existing	All	All	PW	High	General Funds, BRIC, HMGP	Long-Term	Yes	Emergency Services/ Response, Prevention, Recovery / Water	Local	CF
2024 Status: Acquired but not yet built – demo to start in spring 2024 and construction to start in 2025, will be complete by December 2027.										
CW-12 Plan to build a backup transmission line to provide redundant water supply to Reservoir #3.										
New	All	1, 5, 6, 9, 11	PW	High	BRIC, HMGP, General Funds	Short-Term	Yes	Prevention, Emergency Services/ Response, Recovery / Food/ Hydration, Shelter, Water	Regional	CF
2024 Status: The NASR Line is in the current CIP and scheduled for 2028 - 2030 construction.										
CW-13 Construct a backup water supply source for Providence Regional Medical Center Everett.										
New/ Existing	EQ, F, LS, SW, WF	1, 2, 3, 4, 6, 7	Community Planning and Economic Develop-ment, PW	Medium	BRIC, HMGP, General Funds	Long-Term	Yes	Structural Projects, Property Protection / Health & Medical	Local and County	CF
2024 Status: Several options have been discussed with the Hospital for this service. However, Providence hospital needs to finance the project. The city was unable to make any progress on this strategy since completion of the last plan, but does feel that the strategy still holds value, and as such, this item will be carried forward in the 2024 update.										

Table 12-2
City of Everett Hazard Mitigation Initiatives and 2024 Status

New or Existing Assets	Hazards Mitigated	Objectives Met	Lead Agency*	Cost	Funding Sources	Timeline	In Previous Plan?	CRS Initiative Type / Supports Community Lifelines Sector(s) Impacted	Who Benefits?	2024 Status Carried Forward (CF), On-going (OG), Removed (R), Completed (C) Modified (M)
CW-14 Complete an assessment on unreinforced masonry (URMs) buildings and options for protecting public safety.										
New/ Existing	All	2, 3, 4, 6, 8	PH, OEM PW	Medium	EQ and Tsunami Program Grant Funds, BRIC, HMGP	Ongoing	Yes	Response, Recovery, Prevention, Property Protection / Safety & Security; Food, Water, Shelter	County and Local	OG, CF
2024 Status: Some URM buildings identified. University of Washington has completed additional URM assessments in Everett. Strategy holds value as it is recognized these buildings are more susceptible in a seismic event.										
CW-15 Seismically retrofit or rebuild critical city facilities including the Public Works building.										
New/ Existing	EQ	1, 4, 5, 6, 7, 8, 9	PW	High	BRIC, HMGP	Ongoing	Yes	Property Protection, Natural Resource Protection, Prevention / Safety	Local	CF
2024 Status: Administrative staff will be moved to Everett Municipal Building by approximately 2025. Remaining staff to be moved to new EPIC site. This project will remain in place until such time as all employees are moved, at which point the strategy will be removed due to building relocation plans for Public Works staff.										
CW-16 Implement cross-departmental Post-Disaster Building Safety Assessment Training on a repeating cycle.										
New/ Existing	All	5, 6, 9	OEM, PW	Medium	EMPG Funds, General Funds	Long-Term	Yes	Recovery / All	Local	CF
2024 Status: Capital projects team has completed training to assess buildings post disaster to determine if city buildings are structurally sound. Ongoing meetings re: disaster preparedness – e.g., Animal Shelter, Library. Disaster response supplies stockpiled for facility maintenance teams as funding allows.										

Table 12-2
City of Everett Hazard Mitigation Initiatives and 2024 Status

New or Existing Assets	Hazards Mitigated	Objectives Met	Lead Agency*	Cost	Funding Sources	Timeline	In Previous Plan?	CRS Initiative Type / Supports Community Lifelines Sector(s) Impacted	Who Benefits?	2024 Status Carried Forward (CF), On-going (OG), Removed (R), Completed (C) Modified (M)
CW-17 Create an Earthquake Home Foundation Retrofit Program for homes not secured to their foundations. Seek out grant funding to provide tools and information necessary for homeowners to secure their foundations, as appropriate.										
New	EQ, LS	1, 5, 6, 8, 9	OEM	Medium	EMPG and General Funds	Short-Term	Yes	Emergency Services/ Response, Recovery / Yes (Food, Hydration, Shelter)	Local	CF, M
2024 Status: No action taken. Carried forward.										
CW-18 Implement non-structural mitigation measures in city facilities.										
New/ Existing	All	1, 5, 6, 8, 9	OEM, PW	Medium	General Funds	Long-Term	Yes	Emergency Services/ Response, Recovery / All	Regional	CF
2024 Status: No action taken. Carried forward.										
CW-19 Improve Fire Department emergency response capabilities on the Waterfront to address the Port's plans for housing, public attractions and businesses.										
New/ Existing	EQ, SW, LS, T, WF	2, 3, 4, 5, 6, 7, 8,	Fire	Medium	General Funds, Grant Opportunities as they arise, e.g., SAFER, HLS	Long-Term	Yes	Prevention, Public Information and Education, Emergency Services/ Response, Recovery / All	Local	OG, CF
2024 Status: New fire department training site located by waterfront planned for 2024.										

Table 12-2
City of Everett Hazard Mitigation Initiatives and 2024 Status

New or Existing Assets	Hazards Mitigated	Objectives Met	Lead Agency*	Cost	Funding Sources	Timeline	In Previous Plan?	CRS Initiative Type / Supports Community Lifelines Sector(s) Impacted	Who Benefits?	2024 Status Carried Forward (CF), On-going (OG), Removed (R), Completed (C) Modified (M)
CW-20 Train and encourage existing volunteers and community groups to do outreach and participate in community preparedness planning.										
New/ Existing	All	2, 5, 6, 7, 8	OEM	Medium	General Funds	Long-Term	Yes	Emergency Services/ Response, Recovery / Safety	Local	OG, CF
2024 Status: CERT classes – two to three in 2018 and 2019 – one in November 2022.										
CW-21 Develop a City of Everett Continuity of Operations Plan (COOP) program that assesses each department's status and encourages next steps.										
Existing	All	All	OEM	Low	General Funds	Ongoing	Yes	Prevention, Emergency Services/ Response, Recovery / Safety	County and Local	C, CF
2024 Status: Planning and departmental liaison meetings conducted in 2019 for departments interested in completing a COOP – partial completion by some departments.										
CW-22 Assist local businesses and non-profits about business continuity planning and exercises.										
New and Existing	All	4, 5, 6, 7, 8	OEM	Medium	EMPG, DOJ Grants, Fire Training Grants, EMPG	Long-Term	Yes	Emergency Services/ Response, Recovery / Safety, Communica-tions	Local	OG, CF
2024 Status: Smith Island disaster response workshop held in 2018. The event included businesses and residents with interests and assets in an area with unique response and recovery challenges.										

Table 12-2
City of Everett Hazard Mitigation Initiatives and 2024 Status

New or Existing Assets	Hazards Mitigated	Objectives Met	Lead Agency*	Cost	Funding Sources	Timeline	In Previous Plan?	CRS Initiative Type / Supports Community Lifelines Sector(s) Impacted	Who Benefits?	2024 Status Carried Forward (CF), On-going (OG), Removed (R), Completed (C) Modified (M)
CW-23 Identify more Emergency Cooling Centers and get the word out to the public.										
New and Existing	SW	1, 2, 3, 4, 5, 6, 7, 8	OEM, Communi-cations, Community Planning & Economic Develop-ment	Low	FEMA Stafford Act Grants	Short-Term	Yes	Prevention, Emergency Services, Planning, Response, Recovery / Food, Hydration, Shelter	Local and County	C, CF
2024 Status: City has partnered with Snohomish County community services in developing cooling center outreach to include participation in the online Snohomish County Public Safety Hub which provides details and mitigation actions for hazards including extreme heat. The Everett Library is a city cooling center resource. Snohomish County cooling center locations identified. The city will continue to work with Snohomish County on this project as new locations are identified.										
CW-24 Perform a Smith Island Exercise.										
New	All	4, 5, 6	OEM	Medium	General Funds	Ongoing	Yes	Emergency Services/ Response, Recovery / Safety, Communica-tions	Local	C, CF, M
2024 Status: Office of Emergency Management completed a workshop on Smith Island in 2018. The workshop entailed risk assessment, continuity planning, capability and resources, needs and vulnerabilities, and disaster planning. With completion of this HMP, information will again be made available to ensure previous planning efforts remain accurate and consistent with the areas identified in the hazards of concern.										
CW-25 Create a basic Post-Disaster Recovery Framework.										
New/ Existing	All	All	Community, Planning & Economic Develop-ment, OEM	Medium	General Funds	Ongoing	Yes	Emergency Services/ Response, Recovery / Food, Water, Shelter; Energy	Local	CF
2024 Status:. No action taken to date though the city sees value in creating post-disaster recovery plans.										

Table 12-2
City of Everett Hazard Mitigation Initiatives and 2024 Status

New or Existing Assets	Hazards Mitigated	Objectives Met	Lead Agency*	Cost	Funding Sources	Timeline	In Previous Plan?	CRS Initiative Type / Supports Community Lifelines Sector(s) Impacted	Who Benefits?	2024 Status Carried Forward (CF), On-going (OG), Removed (R), Completed (C) Modified (M)
CW-26 All long-range plans should include a recovery framework and a review of potential hazards.										
New/ Existing	All	All	Community, Planning & Economic Develop-ment	Low	General Funds	Ongoing	Yes	Emergency Services/ Response, Recovery / Food, Water, Shelter; Energy	Local	OG, CF
2024 Status: The Comprehensive Plan has a review of potential hazards but not a recovery framework.										
CW-27 Continue to embed hazards into the Comprehensive Plan and related codes and ordinances.										
New/ Existing	All	2, 3, 4, 5, 6, 7, 8,	Community, Planning & Economic Develop-ment	High	General Fund or CPED budget as allocations for COMP plan provide.	Long-Term	Yes	Recovery / Yes Transpor-tation, Health and Medical, Food, Water, Shelter; Safety and Security	County and Local	OG, CF, M
2024 Status: Hazards are embedded in the Comprehensive Plan and code. As hazards become known, they are provided to Public Works for geo technical analysis. The city is currently in the process of updating its COMP plan. As appropriate, data from this HMP will be utilized to support that effort. Information from the COMP plan will also be incorporated into the HMP on its next review cycle.										
CW-28 Develop a proposal for a gravel, gated emergency-use-only access ramp from Smith Island to I-5.										
New/ Existing	All	All	Community, Planning & Economic Develop-ment, PW, OEM	Medium	General Funds	Ongoing	Yes	Emergency Services/ Response, Recovery / Yes Transporta-tion	Local	CF
2023 Status: Location for emergency access has been identified, but no agreement is currently in place.										
CW-29 Identify potential emergency access routes to neighborhoods and determine what is required to implement them.										

Table 12-2
City of Everett Hazard Mitigation Initiatives and 2024 Status

New or Existing Assets	Hazards Mitigated	Objectives Met	Lead Agency*	Cost	Funding Sources	Timeline	In Previous Plan?	CRS Initiative Type / Supports Community Lifelines Sector(s) Impacted	Who Benefits?	2024 Status Carried Forward (CF), On-going (OG), Removed (R), Completed (C) Modified (M)
New/ Existing	All	2, 4, 5, 6, 7	Community, Planning & Economic Develop-ment, OEM	Medium	General Funds	Ongoing	Yes	Emergency Services/ Response, Recovery / Transporta-tion, Communi-cations	County and Local	OG, CF
2024 Status: Several neighborhoods have been identified by Public Works as potential isolated neighborhoods. Some emergency access routes have been identified, but no official documentation or needs for access have been developed.										
CW-30 Explore the potential of small commercial hubs in neighborhoods without such hubs.										
New/ Existing	All	2, 3, 4, 5, 6, 7, 8	Community, Planning & Economic Develop-ment	Low	General Funds	Ongoing	Yes	Emergency Services/ Response, Recovery / Communi-cation	Local	C, OG, CF
2024 Status: City has increased this concept in all neighborhoods since 2018 to include expanded business hubs providing localized accessibility and walkability in neighborhoods. As growth opportunities continue, the city will continue developing this concept into new areas.										
CW-31 Fund increased systems connections to existing large capacity backup generator.										
New/ Existing	All	1, 2, 3, 4, 5, 6, 7, 8,	Facilities	Low	General Funds	Ongoing	Yes	Emergency Services/ Response, Recovery / All	County and Local	C, OG, CF
2024 Status: Backup generators installed at several city locations – Everett Municipal Building, 3 fire stations, Everett Police Department north precinct. City sees value in continuing to invest in generator projects.										
CW-32 Create a Waterfront Climate Change Plan for long-term adaptation of critical functions.										
New/ Existing	All	2, 3, 4, 5, 6	Community, Planning & Economic Develop-ment	Medium	General Funds	Ongoing	Yes	Emergency Services/ Response, Recovery / All	County and Local	OG, CF

Table 12-2
City of Everett Hazard Mitigation Initiatives and 2024 Status

New or Existing Assets	Hazards Mitigated	Objectives Met	Lead Agency*	Cost	Funding Sources	Timeline	In Previous Plan?	CRS Initiative Type / Supports Community Lifelines Sector(s) Impacted	Who Benefits?	2024 Status Carried Forward (CF), On-going (OG), Removed (R), Completed (C) Modified (M)
2024 Status: While a Waterfront Climate Change Plan has not been created, sea level rise and flood plain management have been incorporated into planning efforts. Continuous evaluation of FEMA flood regulations.										
CW-33 Identify Temporary Outdoor Gathering Areas										
New/ Existing	All	3, 4, 5, 6, 7, 8	Port, OEM	Low	General Funds	Ongoing	Yes	Emergency Services/ Response, Recovery / Communi-cation	County and Local	CF
2024 Status: No action taken due to staffing.										
CW-34 Complete an assessment of the potential for tsunami gathering areas on Jetty Island.										
New/ Existing	T	3, 4, 5, 6, 7, 8	Port, OEM	Low	General Funds	Ongoing	Yes	Emergency Services/ Response, Recovery / Communi-cation	County and Local	CF
2024 Status: The Port of Everett has indicated a desire to add limited commercial use activities on Jetty Island. Doing so would potentially add vertical evacuation capabilities on the island. As such, this strategy will remain in place to allow further information and fact-finding to support this effort.										
~~CW-35 Work with BNSF Railway to open Bond Street for emergency access to the Port.~~										
New/ Existing	All	4, 5, 6, 7		Low	General Funds	Ongoing	Yes	Emergency Services/ Response, Recovery / Transporta-tion	Local	R
2024 Status: No action has been taken on this item. The Bond Street access to the Port remains permanently closed. This project will be removed from the listed items during the next update cycle to allow for 2024 project status reporting.										
*OEM= Emergency Management; LE=Law Enforcement; PH=Public Health; PW=Public Works; MVD=Motor Vehicle Division; IT=Information Technology; WSDOT=Washington State Dept. of Transportation; WDOH=Washington State Dept. of Health; WA-DNR=Washington State Dept. of Natural Resources; WDOE=Washington Dept. of Ecology.										

12.6 BENEFIT/COST REVIEW

Once the general analysis was completed for each mitigation initiative, 44 CFR requires the prioritization of the initiatives or action items according to a benefit/cost analysis of the proposed projects and their associated costs (Section 201.6.c.3iii). The benefit/cost analysis conducted during this planning process is not of the detailed variety required by FEMA for project grant eligibility under the Hazard Mitigation Grant Program (HMGP) and Building Resilient Infrastructure and Communities (BRIC) (previously Pre-Disaster Mitigation (PDM)) grant program. Rather, parameters were established for assigning subjective ratings (high, medium, and low) to the costs and benefits of these projects. Cost ratings were defined as follows:

- **High** —Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).
- **Medium**—The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
- **Low**—The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.

Benefit ratings were defined as follows:

- **High—**Project will provide an immediate reduction of risk exposure for life and property.
- **Medium—**Project will have a long-term impact on the reduction of risk exposure for life and property, or project will provide an immediate reduction in the risk exposure for property.
- **Low—**Long-term benefits of the project are difficult to quantify in the short term.

Using this approach, projects with positive benefit versus cost ratios (such as high over high, high over medium, medium over low, etc.) are considered cost-beneficial and are prioritized accordingly. Prioritization of the projects in such a manner serves as a guide for choosing and funding projects.

12.7 PRIORITIZATION OF INITIATIVES

The method for prioritizing initiatives for the 2024 was modified from the method used for the previous mitigation initiatives. The factors involved in the ranking identified a category or level (high/medium/low) assigned with those identified factors to ensure consistency. Table 12-3 lists the priority of each initiative. A qualitative benefit-cost review as described above was performed for each of these initiatives.

Table 12-3.
Prioritization of City of Everett Hazard Mitigation Initiatives

Initiative #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is Project Grant Eligible?	Can Project Be Funded under Existing Programs/ Budgets?	Priority (High, Med., Low)
1	7	H	M	Y	Y	N	H
2	9	H	H	Y	Y	N	H
3	9	H	H	Y	N	N	H
4	7	H	M	Y	Y	N	H
5	9	H	H	Y	Y	N	H
6	9	H	M	Y	Y	Y	M
7	9	M	M	Y	Y	Y	M
8	6	H	L	Y	Y	Y	H
9	6	H	M	Y	Y	Y	H
10	9	H	M	Y	Y	Y	H
11	9	H	H	Y	Y	Y	H
12	5	H	H	Y	Y	Y	H
13	6	H	M	Y	Y	N	M
14	5	H	M	Y	Y	N	M
15	7	H	H	Y	Y	Y	H
16	3	M	M	Y	Y	Y	M
17	5	H	L	Y	Y	Y	M
18	5	H	L	Y	N	Y	H
19	7	M	M	Y	N	Y	M
20	5	H	L	Y	N	Y	M
21	9	M	L	Y	N	Y	M
22	5	M	M	Y	Y	Y	M
23	8	H	M	Y	N	Y	L
24	3	M	M	Y	Y	Y	M
25	9	H	M	Y	Y	Y	H
26	9	H	L	Y	N	Y	H
27	7	H	L	Y	N	Y	H
28	9	M	M	Y	Y	N	L
29	5	M	L	Y	N	Y	M
30	7	M	L	Y	N	Y	M
31	8	M	M	Y	Y	Y	M
32	5	H	M	Y	Y	Y	M

Table 12-3.
Prioritization of City of Everett Hazard Mitigation Initiatives

Initiative #	# of Objectives Met	Benefits	Costs	Do Benefits Equal or Exceed Costs?	Is Project Grant Eligible?	Can Project Be Funded under Existing Programs/ Budgets?	Priority (High, Med., Low)
33	6	M	L	Y	N	Y	L
34	6	M	M	Y	N	Y	L
~~35 To be removed~~	~~4~~	~~M~~	~~L~~	~~Y~~	~~N~~	~~N~~	~~L~~

The priorities are defined as follows:

- **High Priority**—A project that meets multiple objectives (i.e., multiple hazards), has benefits that exceed cost, has funding secured or is an ongoing project and meets eligibility requirements for the HMGP or BRIC grant program. High priority projects can be completed in the short term (1 to 5 years).
- **Medium Priority**—A project that meets goals and objectives, that has benefits that exceed costs, and for which funding has not been secured but that is grant eligible under HMGP, BRIC or other grant programs. Project can be completed in the short term, once funding is secured. Medium priority projects will become high priority projects once funding is secured.
- **Low Priority**—A project that will mitigate the risk of a hazard, that has benefits that do not exceed the costs or are difficult to quantify, for which funding has not been secured, that is not eligible for HMGP or BRIC grant funding, and for which the time line for completion is long term (1 to 10 years). Low priority projects may be eligible for other sources of grant funding from other programs.

For many of the strategies identified in this action plan, the city may seek financial assistance under the HMGP or BRIC programs, both of which require detailed benefit/cost analyses. These analyses will be performed on projects at the time of application using the FEMA benefit-cost model. For projects not seeking financial assistance from grant programs that require detailed analysis, the planning team reserved the right to define "benefits" according to parameters that meet the goals and objectives of this plan.

Funding to complete any initiative will likely be acquired from a variety of sources, with the lack of funding alone preventing an initiative from being implemented. As such, the less formal approach used during this process is more appropriate because some projects may not be implemented for up to 10 years, and associated costs and benefits could change dramatically in that time.

The method of prioritization utilized also allows for the inclusion of new projects throughout the life cycle of this plan without having to numerically re-value each of the projects based on an assigned value of 1, 2, 3, etc. Further, it supports the plan maintenance strategy for review, addition, and reprioritization of initiatives on an annual basis, reducing the level of effort involved in a numeric system of ranking, and enhancing the likelihood that the annual review will occur as a reduced level of effort will be required.

12.8 ADDITIONAL MITIGATION ACTIVITIES:

In addition to the projects identified above, the City of Everett has made positive progress in building resilience. The more mitigation activities are integrated with the routine tasks of organizations, the greater the chance of implementation. Additional efforts completed by the City of Everett include:

- Summer 2021 two All Hazard Alert and Broadcasting sirens were installed at the Port of Everett to provide alerts to people near the area in the event of a tsunami.
- The City of Marysville, City of Everett and Port of Everett are working on a *Connecting Washington* funded project with WSDOT. The project called the I-5 / SR 529 Freeway Interchange project was awarded in April 2022.
- 2018 Identified Initiative: *By 2020, the over 100 year-old Reservoir #2 will be replaced with a new reservoir. Semi-automatic shut-off valves are being explored.* 2024 update: This project was completed in Fall 2023. Reservoir 2 replacement | Everett, WA - Official Website (everettwa.gov)
- A new cross-tie connecting the northern and southern transmission lines planned for 2021-22 was completed. This project is part of Public Work's 2020 Water Comprehensive Plan with project construction scheduled for 2026 – 2030, after completion of Reservoir 3, Phase 2. In addition, the project replaces Reservoir 3, a critical part of the City's drinking water system. The existing 100-year-old in-ground reservoir will be replaced with one eight-million-gallon and one 12-million-gallon cylindrical pre-stressed concrete reservoir. Reservoir 3 replacement | Everett, WA - Official Website (everettwa.gov)

12.9 FUNDING OPPORTUNITIES

Although a number of the mitigation projects listed may not be eligible for FEMA funding, the City of Everett may secure alternate funding sources to implement these projects in the future including federal and state grant programs, and funds made available through the general funds of Everett. In some cases, the general funds or specific department budgets may not be available to fund projects the year that this HMP was updated but may be available during future fiscal years. As such, some projects when prioritized may indicate that funds are not available at the time of the HMP writing. As budgets are determined annually, with some years potentially having a surplus which may fund projects, specific department budgets are not identified within Table 12-3. In order to be eligible for some of those grant funds, completion of a hazard mitigation plan may be required. Table 12-4 identifies some of those grant requirements. Additional funding sources identified in Table 12-5 are also available which support various types of mitigation efforts.

At present, the city has utilized the Stafford Act funding available as a result of a disaster declaration such as the public assistance (all categories as applicable) and individual assistance (when approved), as well as other grant opportunities which may become available.

Table 12-4
Grant Opportunities

Program	Enabling Legislation	Funding Authorization	Hazard Mitigation Plan Requirement	
			Grantee	Sub-Grantee
Public Assistance, Categories A-B (e.g., debris removal, emergency protective measures)	Stafford Act	Presidential Disaster Declaration	☑	☑
Public Assistance, Categories C-G (e.g., repair of damaged infrastructure, publicly owned buildings)	Stafford Act	Presidential Disaster Declaration	☑	☑
Individual Assistance (IA)	Stafford Act	Presidential Disaster Declaration	☑	☑
Fire Management Assistance Grants	Stafford Act	Fire Management Assistance Declaration	☑	□
Hazard Mitigation Grant Program (HMGP) Planning Grant	Stafford Act	Presidential Disaster Declaration	☑	□
HMGP Project Grant	Stafford Act	Presidential Disaster Declaration	☑	☑
Building Resilient Infrastructure and Communities (BRIC) (Pre-Disaster Mitigation (PDM) Planning Grant)	Stafford Act	Annual Appropriation	☑	☑
Flood Mitigation Assistance (FMA)	National Flood Insurance Act	Annual Appropriation	☑	☑
Severe Repetitive Loss (SRL)	National Flood Insurance Act	Annual Appropriation	☑	☑
Repetitive Flood Claims (RFC)	National Flood Insurance Act	Annual Appropriation	☑	□
Washington State Department of Ecology Watershed Plan Implementation and Flow Grants	Washington State	As funded by State of Washington	Not Required	
Homeland Security	Dept. of Homeland Security	Annual Appropriation	☑	□

☑ = Hazard Mitigation Plan Required
□ = No Hazard Mitigation Plan Required

Table 12-5
Fiscal Capabilities Which Support Mitigation Planning Efforts

Financial Resources	Accessible or Eligible to Use?
Community Development Block Grants	Y
Capital Improvements Project Funding	Y
Authority to Levy Taxes for Specific Purposes	Y
User Fees for Water, Sewer, Gas or Electric Service	N
Incur Debt through General Obligation Bonds	Y
Incur Debt through Special Tax Bonds	Y
Incur Debt through Private Activity Bonds	Y
Withhold Public Expenditures in Hazard-Prone Areas	N
State Sponsored Grant Programs	Y
Development Impact Fees for Homebuyers or Developers	Y

CHAPTER 13.
CAPABILITY ASSESSMENT

13.1 LAWS AND ORDINANCES

Existing laws, ordinances and plans at the federal, state and local level can support or impact hazard mitigation initiatives identified in this plan. Hazard mitigation plans are required by 44 CFR to include a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information as part of the planning process (Section 201.6.b(3)). Pertinent federal and state laws are described below.

Plan Integration

This capability assessment not only identifies the capabilities of the city, but it also demonstrates an integration of planning efforts between federal, state and local agencies, as many times the capability also requires an associated plan or regulatory actions for enforcement.

13.1.1 Federal

Disaster Mitigation Act (DMA)

The DMA is the current federal legislation addressing hazard mitigation planning. It emphasizes planning for disasters before they occur. It specifically addresses planning at the local level, requiring plans to be in place before Hazard Mitigation Grant Program funds are available to communities. This plan is designed to meet the requirements of the DMA, improving the city's eligibility for future hazard mitigation funds.

Endangered Species Act

The 1973 Endangered Species Act (ESA) was enacted to conserve species facing depletion or extinction and the ecosystems that support them. The act sets forth a process for determining which species are threatened and endangered and requires the conservation of the critical habitat in which those species live. The ESA provides broad protection for species of fish, wildlife and plants that are listed as threatened or endangered. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat. The ESA outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species. It is the enabling legislation for the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Criminal and civil penalties are provided for violations of the ESA and the Convention. Federal agencies must seek to conserve endangered and threatened species. The ESA defines three fundamental terms:

- **Endangered** means that a species of fish, animal or plant is "in danger of extinction throughout all or a significant portion of its range." (For salmon and other vertebrate species, this may include subspecies and distinct population segments.)
- **Threatened** means that a species "is likely to become endangered within the foreseeable future." Regulations may be less restrictive than for endangered species.

- **Critical habitat** means "specific geographical areas that are…essential for the conservation and management of a listed species, whether occupied by the species or not."

National Landslide Preparedness Act

On January 5, 2021, the National Landslide Preparedness Act (P.L. 116-323) was signed into law authorizing a national landslide hazards reduction program and a 3D elevation program within the USGS. This broadened the already existing Landslide Hazards Program under the Natural Hazards Mission Area, and the 3D Elevation Program under the National Geospatial Program and required additional coordination with other federal agencies.

Coastal Zone Management Act

All states with federally approved coastal programs delineate a coastal zone consistent with the general standards act set forth in the Coastal Zone Management Act of 1972 (CZMA). According to the CZMA, the coastal zone area should encompass all important coastal resources including transitional and intertidal areas, salt marshes, beaches, coastal waters, and adjacent shorelines where activities could have the potential to impact the coastal waters. Federal land is excluded from the state coastal zone by the CZMA. Washington State has established the Washington State Coastal Zone Management Program, which was approved by the federal government in 1976, making it the first to be approved, applying to 15 coastal counties which front on salt water.

The Clean Water Act

The federal Clean Water Act (CWA) employs regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, finance municipal wastewater treatment facilities, and manage polluted runoff. These tools are employed to achieve the broader goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's surface waters so that they can support "the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water."

Evolution of CWA programs over the last decade has included a shift from a program-by-program, source-by-source, and pollutant-by-pollutant approach to more holistic watershed-based strategies. Under the watershed approach, equal emphasis is placed on protecting healthy waters and restoring impaired ones. A full array of issues are addressed, not just those subject to CWA regulatory authority. Involvement of stakeholder groups in the development and implementation of strategies for achieving and maintaining water quality and other environmental goals is a hallmark of this approach.

Presidential Disaster Declarations

Presidentially declared disasters are disaster events that cause more damage than state and local governments/resources can handle without federal assistance. A Presidential Major Disaster Declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, and designed to help disaster victims, businesses, and public entities. A Presidential Emergency Declaration can also be declared, but assistance is limited to specific emergency needs.

13.1.2 State-Level Planning Initiatives

Washington State Enhanced Mitigation Plan

The Washington State Enhanced Hazard Mitigation Plan approved by FEMA provides guidance for hazard mitigation throughout Washington. The plan identifies hazard mitigation goals, objectives, actions and initiatives for state government to reduce injury and damage from natural hazards. By meeting federal requirements for an enhanced state plan (44 CFR parts 201.4 and 201.5), the plan allows the state to seek significantly higher funding from the Hazard Mitigation Grant Program following presidential declared disasters (20 percent of federal disaster expenditures versus 15 percent with a standard plan).

Growth Management Act

The 1990 Washington State Growth Management Act (Revised Code of Washington (RCW) Chapter 36.70A) mandates that local jurisdictions adopt land use ordinances which protect the following critical areas:

- Wetlands
- Critical aquifer recharge areas
- Fish and wildlife habitat conservation areas
- Frequently flooded areas
- Geologically hazardous areas.

The Growth Management Act (GMA) regulates development in these areas, and therefore has the potential to affect hazard vulnerability and exposure at the local level.

Coastal Zone Management Program

Washington State has established the Washington State Coastal Zone Management Program in conjunction with the federal Coastal Zone Management Act, which was approved by the federal government in 1976, making it the first to be approved, applying to 15 coastal counties which front on salt water.

Shoreline Management Act

The 1971 Shoreline Management Act (RCW 90.58) was enacted to manage and protect the shorelines of the state by regulating development in the shoreline area. A major goal of the act is to prevent the "inherent harm in an uncoordinated and piecemeal development of the state's shorelines." Its jurisdiction includes the Pacific Ocean shoreline and the shorelines of Puget Sound, the Strait of Juan de Fuca, and rivers, streams and lakes above a certain size. It also regulates wetlands associated with these shorelines.

Washington State Building Code

The Washington State Building Code Council annually adopts the current editions of national model codes. The Council also adopts changes to the Washington State Energy Code and Ventilation and

Indoor Air Quality Code. Washington's state-developed codes are mandatory statewide for residential and commercial buildings.

Comprehensive Emergency Management Planning

Washington's Comprehensive Emergency Management Planning law (RCW 38.52) establishes parameters to ensure that preparations of the state will be adequate to deal with disasters, to ensure the administration of state and federal programs providing disaster relief to individuals, to ensure adequate support for search and rescue operations, to protect the public peace, health and safety, and to preserve the lives and property of the people of the state.

Washington State Floodplain Management Law

Washington's floodplain management law (RCW 86.16, implemented through WAC 173-158) states that prevention of flood damage is a matter of statewide public concern and places regulatory control with the Department of Ecology. RCW 86.16 is cited in floodplain management literature, including FEMA's national assessment, as one of the first and strongest in the nation. RCW Chapter 86.12 (Flood Control by Counties) authorizes county governments to levy taxes, condemn properties and undertake flood control activities directed toward a public purpose.

Flood Control Assistance Account Program

Washington's first flood control maintenance program was passed in 1951, and was called the Flood Control Maintenance Program (FCMP). In 1984, RCW 86.26 (State Participation in Flood Control Maintenance) established the Flood Control Assistance Account Program (FCAAP), which provides funding for local flood hazard management. FCAAP rules are found in WAC 173-145. Ecology distributes FCAAP matching grants to cities, counties and other special districts responsible for flood control. This is one of the few state programs in the U.S. that provides grant funding to local governments for floodplain management. Local jurisdictions must participate in the NFIP and be a member in good standing to qualify for an FCAAP grant.

13.1.3 Local Programs

The following sections present additional regulatory information that applies to the City of Everett.

Puget Sound Regional Catastrophic Disaster Coordination Plan

The Regional Catastrophic Planning Team was formed to guide and manage the Puget Sound Regional Catastrophic Preparedness Grant Program funded by FEMA. Supporting the coordination of regional all-hazard planning for catastrophic events that may impact the region, the effort includes the development of integrated planning communities, plans, protocols, and procedures to manage a catastrophic event. The Regional Catastrophic Planning Team consists of representatives from designated emergency management interests across an eight-county area (see Figure 13-1), including Snohomish County, and the City of Everett.

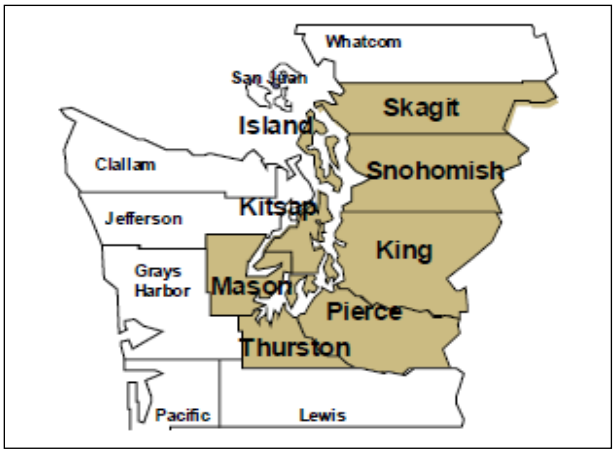


Figure 13-1 Counties in Puget Sound Regional Catastrophic Planning Region

As of this 2024 update, the existing Catastrophic Plan is currently in the update phase, with a specific emphasis on the Cascadia Subduction Zone Earthquake and emphasizes a closer relationship with supply chain issues and logistics.

Comprehensive Land Use Plans

Comprehensive plans are long-range in nature and serve as policy guides for how a jurisdiction plans to manage growth and development with respect to the natural environment and available resources. Washington State law (36.70A.040 RCW) requires that jurisdictions operating under the Growth Management Act develop comprehensive plans and development regulations that are consistent with the comprehensive plans and implement them (36.70A RCW). The city's plan is currently under review and update, with a December 2024 anticipated completion date.

13.2 MITIGATION-RELATED REGULATORY AUTHORITY

Hazard mitigation builds on a community's existing capabilities in place, including financial, regulatory, programmatic and planning capabilities. The city's capabilities to implement mitigation projects include community planners, engineers, floodplain managers, GIS personnel, emergency managers, and financial, legal and regulatory requirements (zoning, building codes, subdivision regulations, and floodplain management ordinances). These resources have the responsibility to provide overview of past, current, and ongoing pre- and post-disaster mitigation planning projects, including capital improvement programs, wildfire mitigation programs, stormwater management programs, and NFIP compliance projects. The following information and tables identify Everett's capabilities with respect to (mitigation) efforts of varying types.

Regulatory, Technical, Community Organizations, Programs and Social Systems

Regulatory capabilities currently available are summarized in Table 13-1. In addition to the financial and regulatory capabilities summarized in Table 13-2, there are other programs available, some of which provide incentives for citizens. Such programs further enhance resiliency throughout the city.

Two such programs include the National Flood Insurance Program, and the Community Rating System, both of which are discussed in detail in Chapter 6- Flood.

Social systems can be defined as community organizations and programs that provide social and community-based services, such as health care or housing assistance, to the public. In planning for natural hazard mitigation, it is important to know what social systems exist within the community because of their existing connections to the public. Such knowledge helps ensure social equity in addressing potential gaps that may be identified through the planning process.

Often, actions identified by the plan involve communicating with the public or specific subgroups within the population (e.g. elderly, children, low income). The city can use existing social systems as resources for implementing such communication-related activities because these service providers already work directly with the public on a number of issues, one of which could be natural hazard preparedness and mitigation. Table 13-3 identifies several of the ongoing efforts which assist in notification and social service programs, further enhancing the resilience of the City of Everett.

Table 13-1
City of Everett Legal and Regulatory Capability

	Local Authority	Other Jurisdictional Authority	State Mandated	Comments
Codes, Ordinances & Requirements				
Building Code Version Year	Yes	Yes	Yes	International Building Code as required by the State
Zoning Ordinance	Yes		Yes	
Subdivision Ordinance	Yes		Yes	
Floodplain Ordinance	Yes	Yes	Yes	FEMA Requirement to be part of the NFIP
Stormwater Management	Yes			
Post Disaster Recovery	No			
Real Estate Disclosure	No	No	Yes	
Growth Management	Yes		Yes	Comprehensive Plan (update underway with completion scheduled for December 2024)
Site Plan Review	Yes			
Public Health and Safety	Yes	Yes	Yes	
Coastal Zone Management	Yes	Yes	Yes	
Climate Change Adaptation	Yes			Some plans have begun to address this issue.
Shoreline Master Program	Yes			Adopted RCW 90.58 (2021 update)
Natural Hazard Specific Ordinance (stormwater, steep slope, wildfire, etc.)	Yes		Yes	Resource Ordinance
Environmental Protection	Yes	Yes	Yes	
Planning Documents				
Comprehensive Land Use Plan	Yes		Yes	2024 update in progress.
Is the plan equipped to provide linkage to this mitigation plan? Yes				
Floodplain or Basin Plan				
Stormwater Plan	Yes			
Capital Improvement Plan	Yes		Yes	
Parks, Recreation and Open Space Plan, including Habitat Conservation	Yes			Designates the extent of land uses, including open space land, wildlife habitat and connection of critical areas (Feb. 2022).
Economic Development Plan	Yes		Yes	

Table 13-1
City of Everett Legal and Regulatory Capability

	Local Authority	Other Jurisdictional Authority	State Mandated	Comments
Shoreline Management Plan	Yes		Yes	
Community Wildfire Protection Plan (CWPP)	Yes		No	As of 2024 update, the fire services for the county have applied for funding to develop a countywide CWPP.
Transportation Plan	Yes		Yes	
Response/Recovery Planning				
Comprehensive Emergency Management Plan	Yes		Yes	
Threat and Hazard Identification and Risk Assessment	Yes		No	Homeland Security Region Plan.
Terrorism Plan				
Post-Disaster Recovery Plan				
Continuity of Operations Plan	Yes			Some city departments such as public works and IT possess COOP plans.
Public Health Plans	Yes			Various public health plans are in place both through the Health Department and through the hospital districts.
Administration, Boards and Commission				
Planning Commission	Yes		Yes	
Mitigation Planning Committee	Yes			Established for the 2024 update.
Watershed Restoration and Enhancement Committee	Yes	Yes	Yes	RCW 90.94.030
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems, chipping, etc.)	Yes			Various programs in place, including tree trimming, drainage systems, etc.
Mutual Aid Agreements / Memorandums of Understanding	Yes			Various documents in place which support city government, and for which city government provides services.

Table 13-2
Administrative and Technical Capability

Staff/Personnel Resources	Available?	Department/Agency/Position
Planners or engineers with knowledge of land development and land management practices	Y	Community, Planning & Economic Development Department
Professionals trained in building or infrastructure construction practices (building officials, fire inspectors, etc.)	Y	Community, Planning & Economic Development Department
Engineers specializing in construction practices?	Y	Facilities and Community, Planning & Economic Development Department
Planners or engineers with an understanding of natural hazards	Y	Facilities, Public Works and Community, Planning & Economic Development Department
Staff with training in grant writing or benefit/cost analysis	Y	Various departments seek grants directly, and have staff trained in various forms of BCA
Surveyors	Y	Public Works and Community, Planning & Economic Development Department
Personnel skilled or trained in GIS applications	Y	GIS and Community, Planning & Economic Development Department
Scientist familiar with natural hazards in local area	Y	The city has hazard-specific subject matter experts on staff in various departments, available via contracting mechanisms, and available through state resources.
Emergency Manager	Y	Office of Emergency Management with trained personnel and volunteers.
Warning Systems/Services (Reverse 9-1-1, outdoor warning signs or signals, flood or fire warning program, etc.?)	Y	The city maintains the AlertSense notification system for primarily department and internal notifications. WEA public alerts may be issued through 911, Snohomish County DEM, or Everett OEM. Reverse 9-1-1 is available through Snohomish County 911. Two AHAB tsunami sires are located near the Everett waterfront. Public Works signage available as needed. EAS notifications are managed through Snohomish County DEM.
Hazard data and information available to public	Y	Emergency Management with assistance from IT and Public Information Officers
Maintain Elevation Certificates	Y	Through Community, Planning & Economic Development Department.

Table 13-3
Education and Outreach

Program/Organization	Available?	Department/Agency/Position and Brief Description
Local citizen groups or non-profit organizations focused on emergency preparedness?	Y	The city maintains CERT and Auxiliary Communications Service (ACS) programs. Snohomish County Health Department maintains a Medical Reserve Corps (MRC) program. Snohomish County Volunteer Search and Rescue (SCVSAR) is a volunteer rescue resource under the Snohomish County Sheriff.
Local citizen groups or non-profit organizations focused on environmental protection?	Y	Snohomish County Conservation District
Organization focused on individuals with access and functional needs populations	Y	Everett Transit operates a paratransit service for people who are unable to use a fixed-route bus because of a condition or disability. The City of Everett/ Everett Transit maintain a Limited English Proficiency (LEP) plan. Catholic Community Services volunteers serve low-income elders and adults with disabilities. Volunteers of America provides several programs throughout the city to include personal support services focused on developmental and intellectual disabilities.
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	Various agencies at the city (as well as county and state) levels which promote educational efforts such as Firewise, Forestland-Urban Interface Fire Protection Act, and Fire Adapted Communities from the National Cohesive Wildfire Strategy.
Natural disaster or safety related school programs?	Y	Pursuant to the RCW, schools are required to develop and exercise hazard-specific response plans.
Public-private partnership initiatives addressing disaster-related issues?	Y	Various public education outreach; provide information and presentations; NFIP insurance; outreach for Continuity Planning.
Multi-seasonal public awareness program?	Y	The city maintains information on its website to address specific hazards at issue; also, as situations arise, the website, email lists and local area broadcasting provides public service announcements and information. The city also regularly utilizes a newsletter to distribute information.

13.3 WASHINGTON STATE RATING BUREAU LEVELS OF SERVICE

In Washington, the Washington State Rating Bureau (WSRB) helps determine standards on which insurance rates are set. WSRB, like most other states, utilizes the Insurance Service Office, Inc. (ISO) to determine levels of protection based on a prescribed level of service. Two such levels of services assessed are the Public Protection Classification Program and the Building Code Effectiveness Grading Schedule.

13.3.1 Public Protection Classification Program

The Public Protection Classification (PPC) program recognizes the efforts of communities to provide fire protection services for citizens and property owners. A community's investment in fire mitigation is a proven and reliable predicator of future fire losses. Insurance companies use PPC information to help establish fair premiums for fire insurance — generally offering lower premiums in communities with better protection. By offering economic benefits for communities that invest in their firefighting services, the program provides an additional incentive for improving and maintaining public fire protection.

In order to establish appropriate fire insurance premiums for residential and commercial properties, insurance companies utilize up-to-date information about the community's fire-protection services. Through analysis of relevant data, communities are able to evaluate their public fire-protection services, and secure lower fire insurance premiums for communities with better protection. This program provides incentives and rewards in those areas with improved firefighting services. This program has gathered extensive information on more than 46,000 fire-response jurisdictions. Once all of the data is reviewed and analyzed, communities are assigned a PPC from 1 to 10. Class 1 generally represents superior property fire protection, while Class 10 indicates that the area's fire-suppression program is not as robust.

The most significant benefit of the PPC program is its effect on losses. Statistical data on insurance losses bears out the relationship between excellent fire protection — as measured by the PPC program — and low fire losses. PPC helps communities prepare to fight fires effectively. The program also provides help for fire departments and other public officials as they plan, budget for, and justify improvements.

Table 13-4 identifies Public Protection Classifications for the City of Everett as of November 2023.

Table 13-4
City of Everett Public Protection Classification

Community	Protection Class Grade
City of Everett	3

13.3.2 Building Code Effectiveness Grading Schedule

The Building Code Effectiveness Grading Schedule (BCEGS) assesses building codes and amendments adopted in a community and evaluates that community's commitment to enforce them. The concept is simple: Municipalities with well-enforced, up-to-date codes should demonstrate better loss

experience, and insurance rates can reflect that. The prospect of reducing damage and ultimately lowering insurance costs provides an incentive for communities to enforce their building codes rigorously. Table 13-5 identifies the BCEGS for the City of Everett as of November 2023.

Table 13-5
Building Code Effectiveness Grading

Community	Commercial	Dwelling
City of Everett	4	4

13.3.3 Public Safety Programs

City of Everett Office of Emergency Management

One of the most important roles of local government is to protect their citizens from harm, including helping people prepare for and respond to emergencies. Making local government emergency preparedness and response programs accessible to people with special needs is a critical part of this responsibility. City of Everett Office of Emergency Management (OEM) has the mission to assess and plan for hazards and emergencies and work with other public safety and local government agencies to ensure public welfare.

The City of Everett Office of Emergency Management has several programs in place to assist citizens' resilience to disaster events. This includes CERT training and advanced preparedness by promoting the Two Weeks Everett Ready program, assisting citizens in identifying self-preparedness efforts.

Fire Department

The purpose of City of Everett Fire Department is the provision of fire prevention services, fire suppression services, emergency medical services, and for the protection of life and property.

City of Everett StormReady

City of Everett is also a recognized StormReady Community under the National Weather Service Program. Achieving such status requires a significant level of effort. Being part of a Weather Ready Nation is about preparing for your community's increasing vulnerability to extreme weather and water events. The StormReady program helps arm America's communities with the communication and safety skills needed to save lives and property--before, during and after the event. StormReady helps community leaders and emergency managers strengthen local safety programs.

CHAPTER 14.
PLAN MAINTENANCE STRATEGY

In accordance with 44 CFR 201.6(c)(4), a hazard mitigation plan must present a plan maintenance process that includes the following:

- A section describing the method and schedule of monitoring, evaluating and updating the mitigation plan over its five year life-cycle;
- A process by which local governments incorporate the requirements of mitigation plans into other planning mechanisms, such as comprehensive land use plans (as appropriate); and
- A discussion on how the community will continue to engage public participation in mitigation planning `efforts.

This section of the plan is focused on the plan maintenance strategy, and details the formal process that will ensure that the City of Everett Hazard Mitigation Plan remains an active and relevant document, maintaining their eligibility for applicable funding sources. The maintenance process identified for the City of Everett includes a schedule for monitoring and evaluating the plan and producing a plan revision every five years. This chapter also describes how public participation will be integrated throughout the plan maintenance and implementation process. It also explains how the mitigation strategies outlined in this plan will be incorporated into existing planning mechanisms and programs, such as comprehensive land-use planning processes, capital improvement planning, and building code enforcement and implementation. The plan's format allows sections to be reviewed and updated when new data becomes available, resulting in a plan that will remain current and relevant.

The Everett Emergency Management Director will maintain lead responsibility for overseeing the plan implementation and maintenance strategy. Plan implementation and evaluation will be a shared responsibility among all planning team members and departments/agencies identified as lead agencies in the mitigation action plan.

14.1 MONITORING, EVALUATION AND UPDATING THE PLAN

The 2018 Hazard Mitigation Plan identified a maintenance strategy which included regular reviews during the life cycle of the plan; however, due to lack of staffing and transition of emergency management personnel, the plan was not reviewed as originally intended. While the plan review did not occur as intended, the city was effective in completing several of the strategies and action items identified in the plan as discussed in Chapter 12.

14.1.1 Plan Implementation and Maintenance

The effectiveness of the hazard mitigation plan depends on its implementation and incorporation of its action items into partner jurisdictions' existing plans, policies and programs. Together, the action items in the plan provide a framework for activities that can be implement over the next 5 years. The

city has established goals and objectives and has prioritized mitigation actions that will be implemented through existing plans, policies, and programs.

44 CFR requires that local hazard mitigation plans be reviewed, revised if appropriate, and resubmitted for approval in order to remain eligible for benefits under the DMA (Section 201.6.d.3). The City of Everett intends to update the hazard mitigation plan on a 5-year cycle from the date of initial plan adoption. This cycle may be accelerated to less than 5 years based on the following triggers:

- A presidential disaster declaration that impacts the planning area.
- A hazard event that causes loss of life.
- A comprehensive update of the City of Everett's Comprehensive Plan.

It will not be the intent of future updates to develop a complete new hazard mitigation plan for the City of Everett. The update will, at a minimum, include the following elements:

- The update process will be convened through a planning team.
- The hazard risk assessment will be reviewed and, if necessary, updated using best available information and technologies.
- The action plan will be reviewed and revised to account for any initiatives completed, dropped, or changed and to account for changes in the risk assessment or new partnership policies identified under other planning mechanisms (such as the comprehensive plan).
- The draft update will be sent to appropriate agencies and organizations for comment.
- The public will be given an opportunity to comment on the update prior to adoption.
- The Everett City Council will adopt the updated plan.

The hazard mitigation plan will be reviewed annually and a progress report prepared. These reviews may be more or less frequent, as deemed necessary by the Emergency Management Director, but there will be a minimum of one review per year. The minimum task will be the evaluation of the progress of its action plan during a 12-month performance period. This review will include the following:

- Summary of any hazard events that occurred during the performance period and the impact these events had on the planning area.
- Review of mitigation success stories.
- Review of continuing public involvement.
- Brief discussion about why targeted strategies were not completed.
- Re-evaluation of the action plan to determine if the timeline for identified projects needs to be amended (such as changing a long-term project to a short-term one because of new funding).
- Recommendations for new projects.
- Changes in or potential for new funding options (grant opportunities).
- Impact of any other planning programs or initiatives that involve hazard mitigation.

A template to guide the city in preparing a progress report has been created as part of this planning process (see Appendix C). The Emergency Management Director will then prepare a formal annual report on the progress of the plan. This report should be used as follows:

- Posted on the city's website page dedicated to the hazard mitigation plan.
- Provided to the local media through a press release.
- Presented to the city's planning team to inform them of the progress of actions implemented during the reporting period.

Use of the progress report will be at the discretion of the City. Annual progress reporting is not a requirement specified under 44 CFR. However, it may enhance the City's opportunities for funding. While failure to implement this component of the plan maintenance strategy will not jeopardize compliance under the DMA, completion of the annual review will reduce the level of effort involved in future plan updates and is highly encouraged by FEMA.

In addition to the annual review, three years after adoption of the hazard mitigation plan, the Director may decide to apply for a planning grant through FEMA to start the 2029 update. Upon receipt of funding, the city will solicit bids under applicable contracting procedures and hire a contractor to assist with the project. The proposed schedule for completion of the plan update is one year from award of a contract, to coincide with the five-year adoption date of the 2024 hazard mitigation plan update.

The Director (or his designee) will be responsible for the plan update. Before the end of the five-year period, the updated plan will be submitted to FEMA for approval. When concurrence is received that the updated plan complies with FEMA requirements, it will be submitted to the Everett City Council for adoption. The city will send an e-mail to individuals and organizations on the stakeholder list to inform them that the updated plan is available on the city's website.

14.2 IMPLEMENTATION THROUGH EXISTING PROGRAMS

The City of Everett will have the opportunity to implement hazard mitigation projects through existing programs and procedures through plan revisions or amendments. The hazard mitigation plan will be incorporated into the plans, regulations and ordinances as they are updated in the future or when new plans are developed.

The City of Everett's Comprehensive Land Use Plan is considered to be an integral part of this plan. The city, through adoption of comprehensive plans and zoning ordinances, has planned for the impact of natural hazards. The plan development process provided the city with the opportunity to review and expand on policies contained within these planning mechanisms. The city has utilized its comprehensive plan and the hazard mitigation plan as complementary documents that work together to achieve the goal of reducing risk exposure to the citizens of the city. An update to a comprehensive plan may trigger an update to the hazard mitigation plan.

The city is committed to creating a linkage between the hazard mitigation plan and its comprehensive and other plans by identifying a mitigation initiative to do so and giving that initiative a high priority. Other planning processes and programs to be coordinated with the recommendations of the hazard mitigation plan include the following:

- Emergency response plans

- Capital improvement programs
- Municipal codes
- Building codes
- Climate Change adaptation and resilience
- Critical areas regulation
- Growth management
- Community design guidelines
- Water-efficient landscape design guidelines
- Stormwater management programs
- Water system vulnerability assessments
- Master fire protection plans
- Landslide reports and planning
- Evacuation planning
- Transportation planning

Hazard mitigation for new construction is an integrated process for the City of Everett. This ensures that relevant city departments are included. At the planning meetings, each department outlines requirements that the applicant must meet to proceed with their proposal. This process ensures that the applicable codes, ordinances, and rules are enforced in all new projects. In addition, after adoption of the 2018 HMP, the city committed to the Community, Planning & Economic Development Department continuing to conduct periodic reviews of the city's Comprehensive Plan and land use policies to determine potential amendments. Action items identified within the 2018 plan supported this aim. As of this HMP update, the city is in the process of updating its Comprehensive Land Use Plan, and is again committed to incorporating data from the risk assessment into the plan as appropriate.

Some action items do not need to be implemented through regulation. Instead, these items can be implemented through the creation of new educational programs, continued interagency coordination, or improved public participation. As information becomes available from other planning mechanisms that can enhance this plan, that information will be incorporated via the update process.

14.3 CONTINUED PUBLIC INVOLVEMENT

The City of Everett is dedicated to involving the public directly in review and updates of the hazard mitigation plan. The public will continue to be apprised of the plan's progress through the city's website and the annual progress report that will be provided to the media.

The city's Office of Emergency Management will maintain the hazard mitigation plan website. This site will not only house the final plan, it will become the one-stop shop for information regarding the plan, city partnerships, and plan implementation. Upon initiation of future update processes, a new public involvement strategy will be initiated. This strategy will be based on the needs and capabilities

in place at the time of the update. At a minimum, this strategy will include the use of social media and local media outlets within the planning area.

REFERENCES

Central Washington University Pacific Northwest Geodetic Array (PANGA). 2023. PANGA website accessed online at http://www.panga.org

Climate Impacts Group. 2023. Climate Impacts Group website. Accessed online at http://cses.washington.edu/cig/res/res.shtml

CoreLogic. Lightning Risk Score. Accessed online at http://www.corelogic.com/downloadable-docs/1_lightning-risk-score_1308_01-screen.pdf

Federal Emergency Management Agency (FEMA). 2023. FEMA Disaster Declaration Summary – Open Government Dataset. Spreadsheet Data: Disaster Declarations for States and Counties | FEMA.gov

Federal Emergency Management Agency (FEMA). (2013). Mitigation Ideas. A Resource for Reducing Risk to Natural Hazards.

Keuler, R.F. 1988. Coastal erosion, sediment supply, and longshore transport in the Port Townsend 30-by 60-minute quadrangle, Puget Sound region, Washington. U.S. Geologic Survey Miscellaneous Investigations.

National Oceanic and Atmospheric Administration. (2023). National Climatic Data Center website. Search | Climate Data Online (CDO) | National Climatic Data Center (NCDC) (noaa.gov)

Noson, Linda Lawrance, Anthony Qamar and Gerald Thornsen. (1988) Washington State Earthquake Hazards. Washington State Department of Natural Resources -Division of Geology and Earth Resources Information Circular. Available on line at: http://file.dnr.wa.gov/publications/ger_ic85_earthquake_hazards_wa.pdf

Olympic Rain Shadow. 2015. Olympic Rain Shadow Information and Resources website. Accessed online at http://www.olympicrainshadow.com/olympicrainshadowmap.html

Oregon Climate Service. 2023. Oregon Climate Service Storm King website. Accessed online at Oregon Climate Service (oregonstate.edu)

Pacific Northwest Seismic Network (PNSN). 2015. Cascadia Historic Earthquake Catalog, 1793-1929 Covering Washington, Oregon and Southern British Columbia. Accessed online at http://assets.pnsn.org/CASCAT2006/Index_152_216.html

Schuster, R. L. and Highland, L. (2001). Socioeconmic and Environmental Impacts of Landslides in the Western Hemisphere. U.S. Geological Survey, Washington, DC, Open File Report 01-0276. Available at: http://pubs.usgs.gov/of/2001/ofr-01-0276/

Schuster, R.L., Nieto, A.S., O'Rourke, T.D., Crespo, E. and Plaza-Nieto, G. (1996) Mass wasting triggered by the 5 March 1987 Ecuador earthquakes, *Engrg. Geol.,* Vol. 42, No. 1, p. 1-23.

Sarikhan, Isabelle Y.; Walsh, Timothy J.; Cakir, Recep, 2007, Morphology of the Alderwood landslide--A probable origin for tsunami in Lynch Cove, Puget Sound, Washington [abstract]: Geological Society of America Abstracts with Programs, v. 39, no. 4, p. 31.

Spatial Hazard Events and Losses Database for the United States (SHELDUS). Maintained by the Arizona State University Center for Emergency Management and Homeland Security. Spatial Hazard Events and Losses Database for the United States | Center for Emergency Management and Homeland Security (asu.edu)

Spiker, E.C. and Gori, P.L., 2000, National landslide hazards mitigation strategy – A framework for loss reduction: U.S. Geological Survey Open-File Report 00-450, U.S. Geological Survey, Washington, DC.

Spiker, E.C. and Gori, P.L., 2003, National landslide hazards mitigation strategy – A framework for loss reduction: U.S. Geological Survey Circular 1244, U.S. Geological Survey, Washington, DC.

U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (2023). Washington D.C.

U.S. Census Bureau. 2023. State and County QuickFacts. https://www.census.gov/quickfacts/fact/table/everettcitywashington,WA/PST045222

U.S. Census Bureau. 2023. American Community Survey. Accessed various dates (2023): DP05: ACS Demographic and ... - Census Bureau Table

U.S. Department of Agriculture (USDA). 2023 Census of Agriculture; Washington Highlights. Prepared by U.S. Department of Agriculture National Agricultural Statistics Service.

U.S. Geological Survey (USGS). 2000. National Assessment of Coastal Vulnerability to Sea-Level Rise: Preliminary Results for the U.S. Pacific Coast.

U.S. Geological Survey (USGS). Quaternary fault and fold database for the United States. Accessed January 2023 from USGS web site: http//earthquake.usgs.gov/hazards/qfaults

Vaisala. Lightning Fatalities by State and Lightning Fatalities Weighted by Population by State.

Walsh, Timothy J.; Logan, Robert L., 2007, Field data for a trench on the Canyon River fault, southeast Olympic Mountains, Washington: Washington Division of Geology and Earth Resources Open File Report 2007-1, 1 plate.

Washington Department of Ecology. Climate Change Adaptation web page. Accessed online at Responding to climate change - Washington State Department of Ecology

Washington State Department of Commerce (2023). *Choose Washington*. Accessed 18 July 2023. Available online at: Snohomish County, Washington - Information & Data for Site Selectors (choosewashingtonstate.com)

Washington Department of Ecology, Inventory of Dams in the State of WA.

Washington Department of Ecology. Landslide Reconnaissance Following the Storm Event of December 1-3, 2007, in Western Washington, by I. Y. Sarikhan, K. D. Stanton, T. A. Contreras, Michael Polenz, Jack Powell, T. J. Walsh, and R. L. Logan.

Washington Department of Natural Resources. Landslide Hazard. Data available online at Landslides | WA - DNR

Washington Emergency Management Division (EMD). Washington State Enhanced Hazard Mitigation Plan, 2010, 2013, 2018.

Washington Employment Security Department (ESD). 2023. Local Unemployment Statistics. Olympia, WA. Available: ESDWAGOV - Snohomish County profile

Washington Office of Financial Management (OFM). 2023. http://ofm.wa.gov/pop/gma/default.asp

Washington State Department of Archeology and Historic Preservation (WSDAHP). 2015. Hanukkah Eve Wind Storm ravages Western Washington on December 14 and 15, 2006. HistoryLink File #8402.

Washington State Department of Transportation (WSDOT). 2011. Climate Impacts Vulnerability Assessment.

Witter, R. C.; Zhang, Yinglong; Wang, Kelin; Priest, G. R.; Goldfinger, Chris; Stimely, L. L.; English, J.T.; Ferro, P. A., 2011, Simulating tsunami inundation at Bandon, Coos County, Oregon, using hypothetical Cascadia and Alaska earthquake scenarios: Oregon Department of Geology and Mineral Industries Special Paper 43, 57 p.

Wood, Nathan and Christopher Soulard. 2008. Variations in Community Exposure and Sensitivity to Tsunami Hazards on the Open-Ocean and Strait of Juan de Fuca Coasts of Washington (p. 2).

Zhang, K., Douglas, B. C., and Leatherman, S. P. 1997. East coast storm surges provide unique climate record; Eos, vol. 78, no. 37, p. 389ff.

APPENDIX A
ACRONYMS AND DEFINITIONS

APPENDIX A
ACRONYMS AND DEFINITIONS

ACRONYMS

ASHRAE—American Society of Heating, Refrigerating, and Air-Conditioning Engineers
BOR—U.S. Bureau of Reclamation
BRIC- Building Resilient Infrastructure and Communities
CFR—Code of Federal Regulations
cfs—cubic feet per second
CIP—Capital Improvement Plan
CRS—Community Rating System
DFIRM—Digital Flood Insurance Rate Maps
DHS—Department of Homeland Security
DMA —Disaster Mitigation Act
DSO—Dam Safety Office
EAP—Emergency Action Plan
EPA—U.S. Environmental Protection Agency
ESA—Endangered Species Act
FCAAP—Flood Control Assistance Account Program
FCMP—Flood Control Maintenance Program
FEMA—Federal Emergency Management Agency
FERC—Federal Energy Regulatory Commission
FIRM—Flood Insurance Rate Map
FIS—Flood Insurance Study
GIS—Geographic Information System
GMA—Growth Management Act
Hazus-MH—Hazards, United States-Multi Hazard
HMGP—Hazard Mitigation Grant Program
IBC—International Building Code
IRC—International Residential Code
MM—Modified Mercalli Scale
NEHRP—National Earthquake Hazards Reduction Program
NFIP—National Flood Insurance Program
NFPA—National Fire Protection Association
NFR—Natural fire rotation
NOAA—National Oceanic and Atmospheric Administration
NWS—National Weather Service
PDM—Pre-Disaster Mitigation Grant Program
PDI—Palmer Drought Index
PGA—Peak Ground Acceleration
PHDI—Palmer Hydrological Drought Index
RCW—Revised Code of Washington

SCS—U.S. Department of Agriculture Soil Conservation Service
SFHA—Special Flood Hazard Area
SHELDUS—Special Hazard Events and Losses Database for the US
SPI—Standardized Precipitation Index
THIRA – Threat Hazard Identification and Risk Assessment
USGS—U.S. Geological Survey
WAC—Washington Administrative Code
WDFW—Washington Department of Fish and Wildlife
WUI— Wildland Urban Interface

DEFINITIONS

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

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

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

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

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

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

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

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

Capability Assessment: A capability assessment provides a description and analysis of a community's current capacity to address threats associated with hazards. The assessment includes two components: an inventory of an agency's mission, programs, and policies, and an analysis of its capacity to carry them out. A capability assessment is an integral part of the planning process in which a community's actions to reduce losses are identified, reviewed, and analyzed, and the framework for implementation is identified. The following capabilities were reviewed under this assessment:

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

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

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

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

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

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

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

Dam Failure: Dam failure refers to a partial or complete breach in a dam (or levee) that impacts its integrity. Dam failures occur for a number of reasons, such as flash flooding, inadequate spillway size,

mechanical failure of valves or other equipment, freezing and thawing cycles, earthquakes, and intentional destruction.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Local Government: Any county, municipality, city, town, township, public authority, school district, special district, intrastate district, council of governments (regardless of whether the council of governments is incorporated as a nonprofit corporation under State law), regional or interstate government entity, or agency or instrumentality of a local government; any Indian tribe or authorized tribal organization, or Alaska Native village or organization; and any rural community, unincorporated town or village, or other public entity.

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

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

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

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

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

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

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

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

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

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

- Four or more paid flood losses in excess of $1000.00; or
- Two paid flood losses in excess of $1000.00 within any 10-year period since 1978 or

- Three or more paid losses that equal or exceed the current value of the insured property.

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

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

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

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

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

Risk Ranking = Probability + Impact (people + property + economy)

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

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

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

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

Stream Bank Erosion: Stream bank erosion is common along rivers, streams and drains where banks have been eroded, sloughed or undercut. However, it is important to remember that a stream is a dynamic and constantly changing system. It is natural for a stream to want to meander, so not all eroding banks are "bad" and in need of repair. Generally, stream bank erosion becomes a problem where development has limited the meandering nature of streams, where streams have been channelized, or where stream bank structures (like bridges, culverts, etc.) are located in places where

they can actually cause damage to downstream areas. Stabilizing these areas can help protect watercourses from continued sedimentation, damage to adjacent land uses, control unwanted meander, and improvement of habitat for fish and wildlife.

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

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

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

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

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

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

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

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

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

APPENDIX B
EVERETT ADOPTION RESOLUTION AND FEMA APPROVAL LETTER

APPENDIX B
CITY OF EVERETT ADOPTION RESOLUTION AND FEMA PLAN APPROVAL LETTER

APPENDIX C
EXAMPLE TEMPLATE FOR FUTURE PROGRESS REPORTS

APPENDIX C
EXAMPLE TEMPLATE FOR FUTURE PROGRESS REPORTS

City of Everett
Hazard Mitigation Plan
Annual Progress Report

Reporting Period: (Insert reporting period)

Background: The City of Everett Planning Team developed a hazard mitigation plan to reduce risk from all hazards by identifying resources, information, and strategies for risk reduction. The federal Disaster Mitigation Act requires state and local governments to develop hazard mitigation plans as a condition for federal disaster grant assistance. To prepare the plan, the city organized resources, assessed risks from natural hazards within the city, developed planning goals and objectives, reviewed mitigation alternatives, and developed an action plan to address probable impacts from natural hazards. By completing this process, the city maintained compliance with the Disaster Mitigation Act, achieving eligibility for mitigation grant funding opportunities afforded under the Robert T. Stafford Act. The plan can be viewed on-line at:

Insert web address

Summary Overview of the Plan's Progress: The performance period for the hazard mitigation plan became effective on ____, 2024, with the final approval of the plan by FEMA. The initial performance period for this plan will be 5 years, with an anticipated update to the plan to occur before _____, 2029. As of this reporting period, the performance period for this plan is considered to be __ percent complete. The hazard mitigation plan has targeted __ hazard mitigation initiatives to be pursued during the 5-year performance period. As of the reporting period, the following overall progress can be reported:

- __ out of __ initiatives (__%) reported ongoing action toward completion.
- __ out of __ initiatives (__%) were reported as being complete.
- __ out of __ initiatives (___%) reported no action taken.

Purpose: The purpose of this report is to provide an annual update on the implementation of the action plan identified in the City of Everett Hazard Mitigation Plan. The objective is to ensure that there is a continuing and responsive planning process that will keep the hazard mitigation plan dynamic and responsive to the needs and capabilities of the jurisdiction. This report discusses the following:

- Natural hazard events that have occurred within the last year
- Changes in risk exposure within the planning area
- Mitigation success stories
- Review of the action plan
- Changes in capabilities that could impact plan implementation

- Recommendations for changes/enhancement.

The Hazard Mitigation Planning Team: The Hazard Mitigation Planning Team, made up of planning team members and stakeholders within the city and the planning area, reviewed and approved this progress report at its annual meeting held on _____, 2025. It was determined through the plan's development process that a planning team would remain in service to oversee maintenance of the plan. At a minimum, the planning team will provide technical review and oversight on the development of the annual progress report. It is anticipated that there will be turnover in the membership annually, which will be documented in the progress reports. For this reporting period, the planning team membership is as indicated in Table 1.

TABLE 1
PLANNING TEAM MEMBERS

Name	Title	Jurisdiction/Agency

Natural Hazard Events within the Planning Area: During the reporting period, there were __ natural hazard events in the planning area that had a measurable impact on people or property. A summary of these events is as follows:

- _____
- _____

Changes in Risk Exposure in the Planning Area: *(Insert brief overview of any natural hazard event in the planning area that changed the probability of occurrence or ranking of risk for the hazards addressed in the hazard mitigation plan)*

Mitigation Success Stories: *(Insert brief overview of mitigation accomplishments during the reporting period)*

Review of the Action Plan: Table 2 reviews the action plan, reporting the status of each initiative. Reviewers of this report should refer to the hazard mitigation plan for more detailed descriptions of each initiative and the prioritization process.

Address the following in the "status" column of the following table:

- *Was any element of the initiative carried out during the reporting period?*

- *If no action was completed, why?*
- *Is the timeline for implementation for the initiative still appropriate?*
- *If the initiative was completed, does it need to be changed or removed from the action plan?*

TABLE 2
ACTION PLAN MATRIX

Action Taken? (Yes or No)	Time Line	Priority	Status	Status (X, O,✓)
Initiative #__—_____[description]				
Initiative #__—_____[description]				
Initiative #__—_____[description]				
Initiative #__—_____[description]				
Initiative #__—_____[description]				
Initiative #__—_____[description]				
Initiative #__—_____[description]				
Initiative #__—_____[description]				
Initiative #__—_____[description]				
Initiative #__—_____[description]				

Completion status legend:
✓= Project Completed
O = Action ongoing toward completion
X = No progress at this time

Changes That May Impact Implementation of the Plan: *(Insert brief overview of any significant changes in the planning area that would have a profound impact on the implementation of the plan. Specify any changes in technical, regulatory and financial capabilities identified during the plan's development)*

Recommendations for Changes or Enhancements: Based on the review of this report by the Hazard Mitigation Planning Team, the following recommendations will be noted for future updates or revisions to the plan:

- _____
- _____

- _____
- _____
- _____

Public review notice: The contents of this report are considered to be public knowledge and have been prepared for total public disclosure. Copies of the report have been provided to the City Council and to local media outlets and the report is posted on the City of Everett Hazard Mitigation Plan website. Any questions or comments regarding the contents of this report should be directed to Jim Sande, Emergency Management Director, City of Everett, at JSande@everettwa.gov

U.S. Department of Homeland Security
FEMA Region 10
130 – 228th Street, SW
Bothell, Washington 98021

FEMA

September 16, 2024

Mr. Tim Cook
State Hazard Mitigation Officer
Washington State Emergency Management Division
Building 20, MS TA-20
Camp Murray, Washington 98430-5122

Dear Mr. Cook:

The Federal Emergency Management Agency (FEMA) Region 10 completed a pre-adoption review of the draft City of Everett Hazard Mitigation Plan. The attached Mitigation Plan Review Tool documents the Region's review and compliance with all required elements of 44 CFR Part 201.6, as well as identifies the jurisdictions participating in the planning process. This letter serves as Region 10's commitment to approve the plan upon receiving documentation of its adoption by participating jurisdictions.

Formal adoption documentation must be submitted to FEMA Region 10 within one calendar year of the date of this letter, or the entire plan must be updated and resubmitted for review. Once FEMA approves the plan, the jurisdictions are eligible to apply for FEMA Hazard Mitigation Assistance grants.

Please contact our Regional Mitigation Planning Program Manager, Joseph Green, at (816) 225-9927 or joseph.green@fema.dhs.gov with any questions.

Sincerely,

WENDY L SHAW
Digitally signed by WENDY L SHAW
Date: 2024.09.16 21:11:57 -07'00'

Wendy Shaw, P.E.
Risk Analysis Branch Chief
Mitigation Division

JG:vl

2024 Hazard Mitigation Plan Update

October 23, 2024

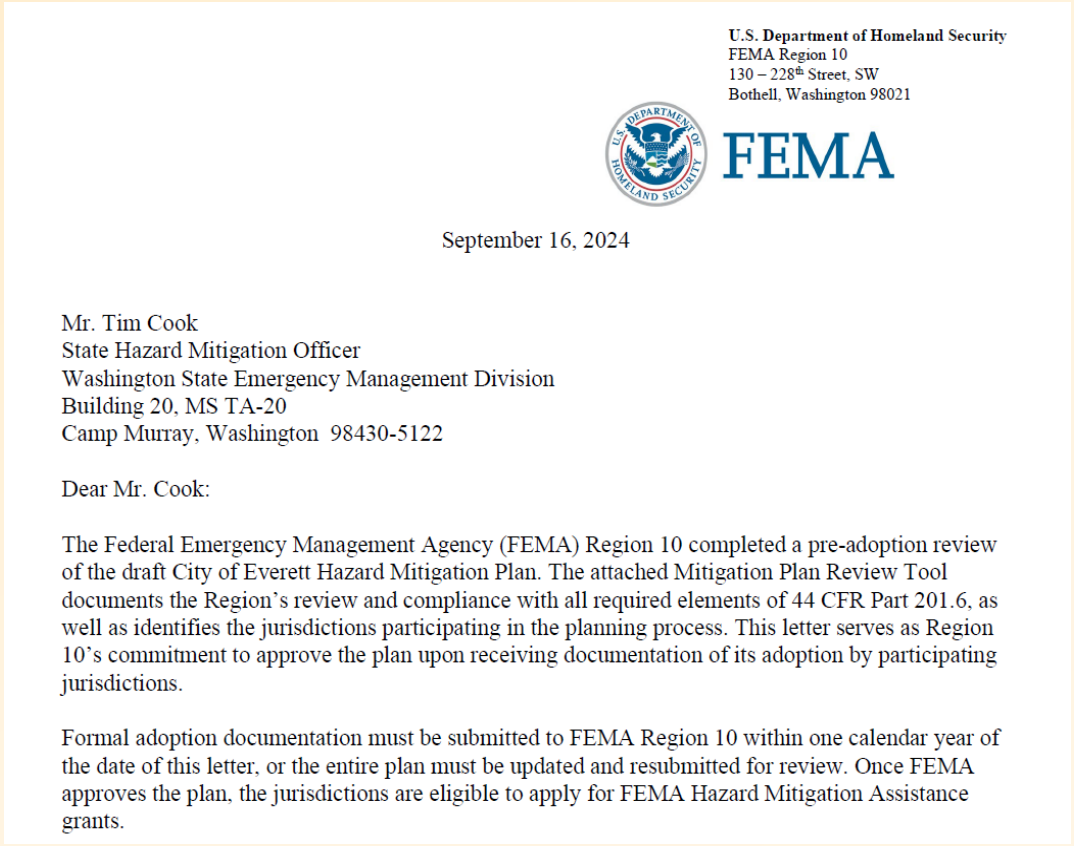
EVERETT
WASHINGTON

Plan Scope

- Long-term strategy for reducing risk and impacts from natural disasters
- Focuses on resilience by identifying hazards
- Develops strategies to mitigate potential impacts
- Identifies actions to reduce losses from hazards

Framework

- Intent is for communities to understand and reduce their vulnerability to natural hazards
- Required for certain grant and federal disaster funding
- City adoption required
  - Update good for 5 years



U.S. Department of Homeland Security
FEMA Region 10
130 – 228th Street, SW
Bothell, Washington 98021

FEMA

September 16, 2024

Mr. Tim Cook
State Hazard Mitigation Officer
Washington State Emergency Management Division
Building 20, MS TA-20
Camp Murray, Washington 98430-5122

Dear Mr. Cook:

The Federal Emergency Management Agency (FEMA) Region 10 completed a pre-adoption review of the draft City of Everett Hazard Mitigation Plan. The attached Mitigation Plan Review Tool documents the Region's review and compliance with all required elements of 44 CFR Part 201.6, as well as identifies the jurisdictions participating in the planning process. This letter serves as Region 10's commitment to approve the plan upon receiving documentation of its adoption by participating jurisdictions.

Formal adoption documentation must be submitted to FEMA Region 10 within one calendar year of the date of this letter, or the entire plan must be updated and resubmitted for review. Once FEMA approves the plan, the jurisdictions are eligible to apply for FEMA Hazard Mitigation Assistance grants.

Background

- June 2023: update begins with team kick-off in September
  - 60+ member planning team and stakeholders
- March 2024: draft completed, available for public review and comment
- April: submitted for state and FEMA review
- May: state review complete
- September: FEMA approved plan pending adoption

2024 Plan Goals

- Protect public health, welfare, natural environment, and public safety
- Ensure continuity of critical infrastructure, government, and economy
- Foster coordination among public and private organizations
- Minimize losses and increase post event self-reliance

Community Outreach

- Meetings
  - Council of Neighborhoods
  - Safe Community Committee
  - CERT
- Survey
- Website
- Newsletter
- Press releases
- Social media

Figure 2-5 Council of Neighborhoods Meeting February 26, 2024

Risk and Vulnerability

- Develop hazard profiles – impact to people, property, economy, environment
- Vulnerability assessment – critical facilities identification and evaluation, population at risk, determine loss
- Risk analysis – probability, severity, extent and location, duration, warning time

Hazards Assessed

- Earthquake
- Flood
- Severe Weather
- Landslide
- Climate Change
- Wildfire
- Tsunami
- Hazardous Materials

Mitigation Strategies

- Developed objectives to reduce future disaster impacts
- City initiatives
  - Assess backup generator needs at water pump sites
  - Implement water resiliency study recommendations
  - Build a fiber communication and data loop
  - Train volunteers in disaster preparedness
  - Improve waterfront public safety response capabilities

THANK YOU

EVERETT City Council Agenda Item Cover Sheet

Project title: Ordinance amending the zoning map for 1301 Lombard Avenue, rezoning the property from R-2 to NB zoning to facilitate middle housing development.

Council Bill # *interoffice use*
CB 2409-24

Agenda dates requested:

Briefing:	10/9/24
Proposed action	10/16/24
Consent	
Action	10/23/24
Ordinance	X
Public hearing:	10/16/24
Yes	X No

Budget amendment:
Yes X No

PowerPoint presentation:
Yes X No

Attachments:
Staff memo
Ordinance

Department(s) involved:
Administration
Planning

Contact person:
Yorik Stevens-Wajda

Phone number:
425-257-8725

Email:
ystevens@everettwa.gov

Initialed by:
YSW
Department head

Administration

Council President

Project:	1301 Lombard Avenue Rezone
Partner/Supplier:	N/A
Location:	1301 Lombard Ave
Preceding action:	N/A
Fund:	N/A

Fiscal summary statement:

The affected property is city owned; this rezone would likely increase the value of the property. Upon sale of the property funds will be returned to CIP 4.

Project summary statement:

The City is proposing to rezone 0.55 acres at 1301 Lombard Avenue from R-2 (Single-Family Detached Medium Density) Zoning with a 28' maximum building height to NB (Neighborhood Business) Zoning with a 3 floor maximum building height.

A future fee simple townhome development in the NB zone may yield between 14 to 16 three-story fee simple townhome units. Fee simple townhome development on the site would create middle housing that offers achievable homeownership opportunities. Further, three story townhome development would still be at a scale that better resembles the character of the existing residential neighborhood and serve as a transition between traditional single-family residences and the abutting Mixed Use zone that currently allows 4-6 story development along Broadway Avenue.

This is a quasi-judicial decision by the City Council following a recommendation from the Hearing Examiner. On September 5, 2024, the Hearing Examiner, after hearing from the public and deliberating, made a recommendation to grant the rezone of 1301 Lombard. City staff reviewed the proposal under provisions of the State Environmental Policy Act, completed an environmental checklist, and issued a Determination of Non-Significance on September 13, 2024.

This proposal is in alignment with established vision and direction from the City Council. On October 6, 2021, the Everett City Council adopted Resolution 7700, known as the Rethink Housing Action Plan, which set a vision that included increasing middle housing and the variety of housing options in the city. The rezone of 1301 Lombard Avenue allows the City to facilitate private construction of middle housing home types in this neighborhood.

In addition, in 2023, the State Legislature adopted HB 1110 which mandates cities, including Everett, to allow middle housing development in areas previously zoned for single-family detached homes. The Planning department is currently in the process of updating the City's Comprehensive Plan to allow middle housing types in more neighborhoods, scheduled for Council consideration in early 2025.

Once the rezone is approved, staff anticipates selling the property to a private developer. A resolution to approve that action is set to be presented on October 23, in conjunction with the third reading for this ordinance.

Recommendation (exact action requested of Council):

Adopt an Ordinance amending the Zoning Map for 1301 Lombard Avenue.

CITY OF EVERETT
Planning

STAFF MEMORANDUM

TO: Everett City Council
FROM: Yorik Stevens-Wajda, Planning Director
DATE: September 20, 2024
SUBJECT: 1301 Lombard (Waits) Rezone

INTRODUCTION

An application has been submitted by the City of Everett to rezone 0.55 acres from R-2 (Single-Family Detached Medium Density) Zoning with a 28' maximum building height to NB (Neighborhood Business) Zoning with a 3 floor maximum building height.

A future fee simple townhome development in the NB zone may yield between 14 to 16 three-story fee simple townhome units. Fee simple townhome development on the site would create middle housing that offers achievable homeownership opportunities. Further, three story townhome development would still be at a scale that better resembles the character of the existing residential neighborhood and serve as a transition between traditional single-family residences and the abutting Mixed Use zone that currently allows 4-6 story development along Broadway Avenue.

BACKGROUND

Acquisition of Snohomish County Parcel No. 29051700301400, locally known as the Waits Motel, was recently completed through condemnation because of the property's blight on the surrounding neighborhood. Now that the city owns the site, it is in the best interest of the neighborhood and the city to fully ameliorate the blighted status of the property as quickly as possible and advance the site into productive use.

PROPOSAL

The city seeks the following objectives in this rezone:

1. Remedy the blighted condition of the site in a timely manner.
2. Position the property to be marketed for timely redevelopment by the private sector.
3. Ensure that future redevelopment respects the character of the existing neighborhood.
4. Promote new homeownership opportunities

Review process IIIB
According to EMC 15.03.300(B)(1) and (2), a site-specific rezone is a proposal to change the zoning classification of one or more specific properties, which process can be initiated by a private party ***or the city.*** EMC 15.03.300(B)(3)(b) further establishes that where a site-specific rezone ***does not*** require an

amendment to the comprehensive plan, it shall be processed under the REV III B procedures in EMC 15.02.

The subject rezone from R-2 to NB is for a single site is being proposed by the city and the proposal does not require a comprehensive plan amendment because the NB zone is an implementing zone of the existing Single Family land use designation per Table 9 of the Land Use Element of the Everett comprehensive plan.

Therefore, the rezone is a REV III B action under EMC 15.02, which includes an open record hearing and recommendation by the Hearing Examiner with a final decision by the City Council at a closed record hearing.

PUBLIC NOTICE AND COMMENTS

This is a quasi-judicial decision made by the City Council after the Hearing Examiner issues a recommendation. The planning department has circulated notice of the proposal via the following methods and will provide comments received to the city council.

- Planning department webpage
- Planning commission agenda mailing list
- State Environmental Policy Act mailing list
- Publishing notice of planning commission and city council public hearings in the Everett Herald

ENVIRONMENTAL REVIEW

The Planning Director issued a Determination of Nonsignificance under the State Environmental Policy Act. A copy of the SEPA Checklist can be viewed online in the Active Land Use Project Portal under Project Number REVIII24-009.

EVERETT
WASHINGTON

ORDINANCE NO. _____

An ORDINANCE AMENDING the Zoning Map for 1301 Lombard Avenue.

WHEREAS,

A. This amendment to the zoning map is considered under Review Process III under EMC 15.02.080(B)(2).

B. The Hearing Examiner reviewed the amendments contained in this ordinance and held a public hearing on September 5, 2024; and-

C. The Hearing Examiner after hearing from the public and deliberating, made a recommendation to the city council city council to approve the amendments contained in this ordinance,

D. City staff reviewed the proposal under provisions of the State Environmental Policy Act, completed an environmental checklist, and issued a Determination of Non-Significance on September 13, 2024; and

E. On _____, the Everett City Council held a public hearing, after proper notice, and considered public comment, the Hearing Examiner's recommendation and the entire record related to the code amendment contained in this ordinance; and

F. The amendments contained in this ordinance maintain consistency with the GMA and are consistent with the GMA planning goals; and

G. The amendments contained in this ordinance are consistent with and supportive of goals, objectives, and policies in the city's comprehensive plan; and

H. The City Council finds that the proposed amendments to the city's development regulations (unified development code) contained in this ordinance are consistent with the Everett comprehensive plan, bears a substantial relation to public health, safety and welfare, and promotes the best long-term interests of the Everett community.

NOW, THEREFORE, THE CITY OF EVERETT DOES ORDAIN THE FOLLOWING ACTIONS:

Section 1. Amend the City of Everett Zoning Map from R-2 (Single Family Detached Medium Density) to NB (Neighborhood Business) for the property located at 1301 Lombard Avenue and consistent with this legal description: SEC 17 TWP 29 RGE 05ALL TH PTN OF NW1/4 SW1/4 DAF- BEG AT 1/4 COR BTW SECS 17 & 18-29-05 TH ELY ON C/L OF SD SEC 17 966.57FT TO WLN OF ALLEY BTW BROADWAY & LOMBARD

TH ANG R 90*36 28.29FT TO TPB TH CONT IN SDSTRT LN 200FT TH ANG R 90* 120FT TH ANG R 90* 200FT TH ANG R 90* 120FT TO TPB, Parcel No. 29051700301400, and including adjoining portions of the public right of way north and east to the respective centerlines as indicated in Exhibit 1.

Section 2. Amend the City of Everett Building and Structure Height Map from 28' to 3 floors for the property located at 1301 Lombard Avenue, and consistent with this legal description: SEC 17 TWP 29 RGE 05ALL TH PTN OF NW1/4 SW1/4 DAF- BEG AT 1/4 COR BTW SECS 17 & 18-29-05 TH ELY ON C/L OF SD SEC 17 966.57FT TO WLN OF ALLEY BTW BROADWAY & LOMBARD TH ANG R 90*36 28.29FT TO TPB TH CONT IN SDSTRT LN 200FT TH ANG R 90* 120FT TH ANG R 90* 200FT TH ANG R 90* 120FT TO TPB, Parcel No. 29051700301400, and including adjoining portions of the public right of way north and east to the respective centerlines as indicated in Exhibit 2.

Section 3. The City Clerk and the codifiers of this Ordinance are authorized to make necessary corrections to this Ordinance including, but not limited to, the correction of scrivener's/clerical errors, references and ordinance numbering.

Section 4. The City Council hereby declares that should any section, paragraph, sentence, clause or phrase of this ordinance be declared invalid for any reason, it is the intent of the City Council that it would have passed all portions of this Ordinance independent of the elimination of any such portion as may be declared invalid.

Section 5. The enactment of this Ordinance shall not affect any case, proceeding, appeal or other matter currently pending in any court or in any way modify any right or liability, civil or criminal, which may be in existence on the effective date of this Ordinance.

_____
Cassie Franklin, Mayor

ATTEST:

_____
Marista Jorve, City Clerk

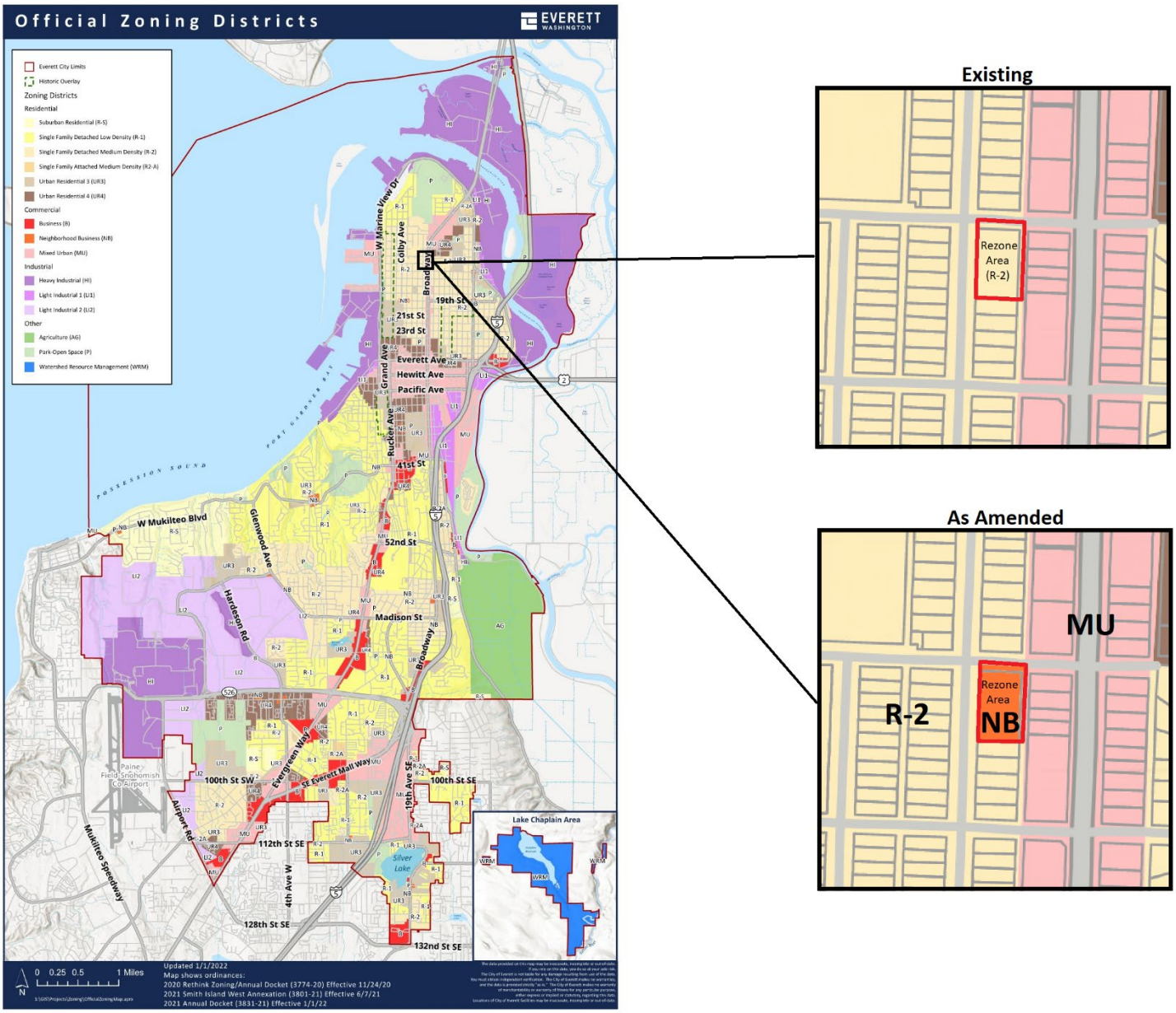
PASSED: _____

VALID: _____

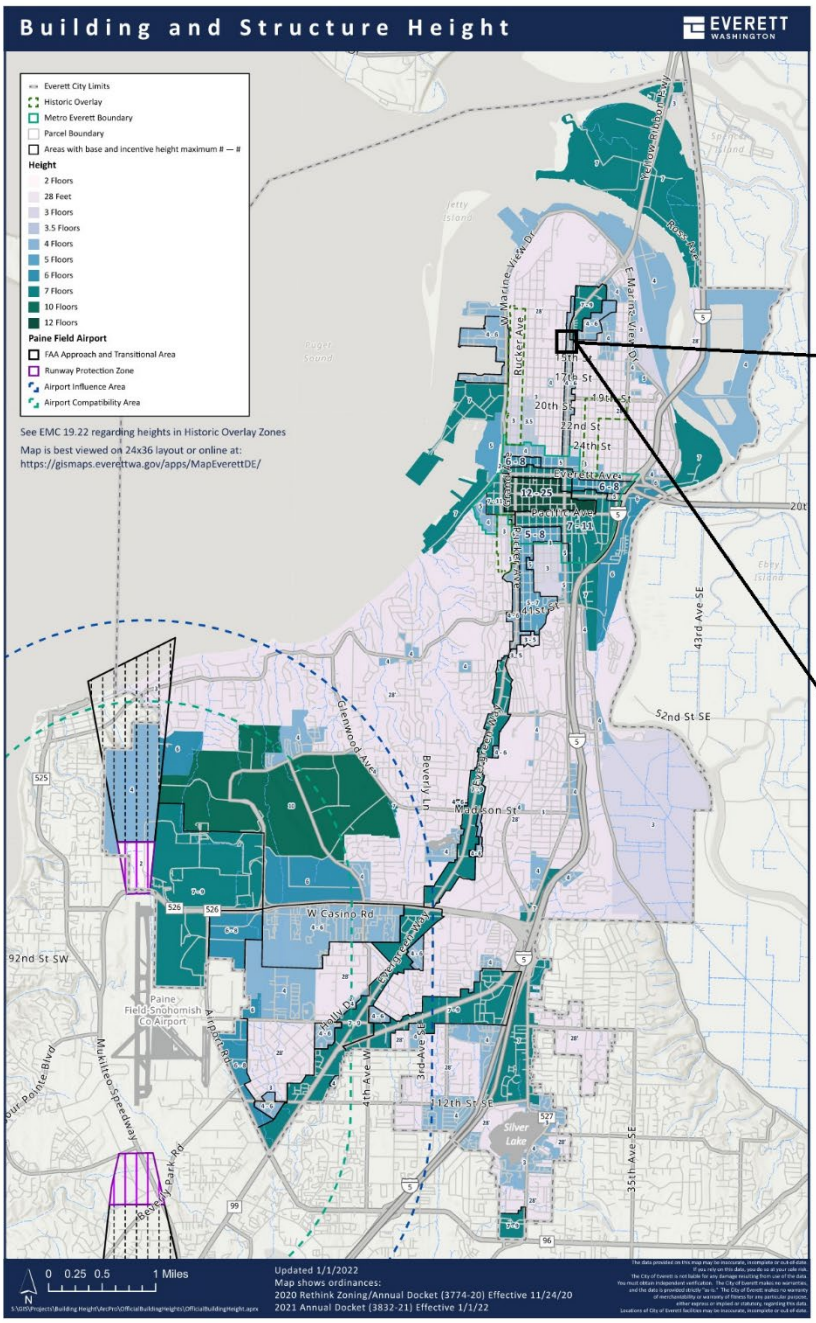
PUBLISHED: _____

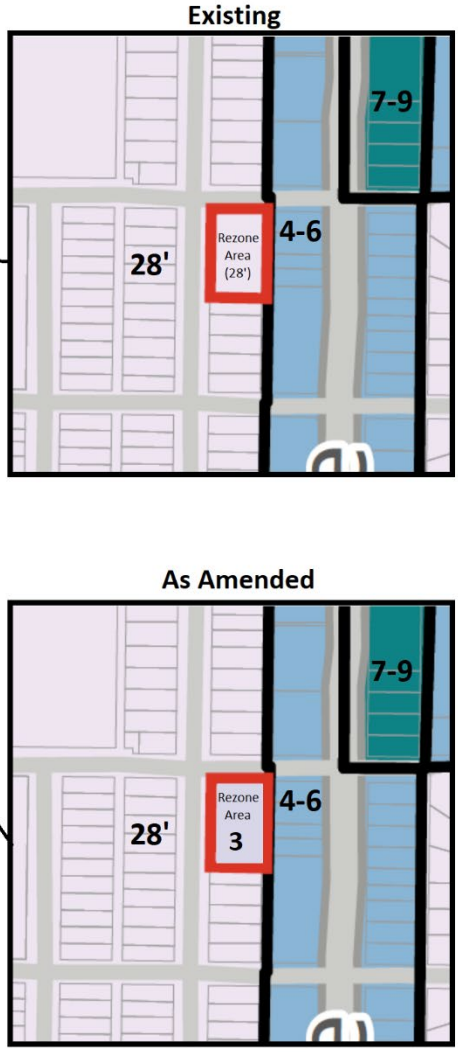
EFFECTIVE DATE: _____

1301 Lombard Avenue
Proposed Rezone
Exhibit 1



1301 Lombard Avenue
Proposed Rezone
Exhibit 2





EVERETT | **City Council Agenda Item Cover Sheet**

Project title: An Ordinance creating a Special Improvement Project entitled "Dorn Avenue Drainage Improvements" Fund 336, Program 043.

Council Bill #
CB 2409-25

Agenda dates requested:

Briefing
Proposed action
1st Reading 10/09/24
2nd Reading 10/16/24
Consent
Action 10/23/24
Ordinance X
Public hearing
Yes X No

Budget amendment:
Yes X No

PowerPoint presentation:
Yes X No

Attachments:
Proposed Ordinance

Department(s) involved:
Public Works, Admin

Contact person:
Tom Hood

Phone number:
(425) 257-8809

Email:
THood@everettwa.gov

Initialed by:
RLS
Department head

Administration

Council President

Consideration:	Plans & Systems Ordinance
Project:	Dorn Avenue Drainage Improvements
Partner/Supplier:	
Location:	Dorn Avenue
Preceding action:	None
Fund:	336-Water & Sewer System Improvements Fund

Fiscal summary statement:

The funding source for this project will be Fund 401 Water and Sewer Utility Fund. The programmed available funding for this project is $900,000.

Project summary statement:

This project is for design to address persistent flooding on Evergreen Way in the vicinity of the intersection with Holly Drive. Work will consist of design efforts to replace and improve the storm drain system.

This project contains the work issues identified in the Surface Water Comprehensive Plan (SWCP) NC-7. A study performed by Otak Inc. identified improvements to address flooding issues on Dorn Avenue.

After completion of this design work, an updated Plans & Systems Ordinance will be developed and presented to Council to authorize construction funding.

Recommendation (exact action requested of Council):

Adopt an Ordinance creating a Special Improvement Project entitled "Dorn Avenue Drainage Improvements" Fund 336, Program 043.

EVERETT
WASHINGTON

ORDINANCE NO. _____

An ORDINANCE creating a special improvement project entitled "Dorn Avenue Drainage Improvements" Fund 336, Program 043, to accumulate all costs for the improvement.

WHEREAS,

A. The City of Everett is committed to a planned stormwater system infrastructure maintenance improvement and replacement program.

B. The City of Everett has identified the need and obtained funds to construct new facilities to increase capacity and reduce maintenance demands.

NOW, THEREFORE, THE CITY OF EVERETT DOES ORDAIN:

Section 1. A special improvement project is hereby established as Fund 336, Program 043, entitled "Marilyn Avenue Drainage Improvements" to accumulate all costs for the improvement. Authorization is hereby given to accumulate costs and distribute payments for the improvement project.

Section 2. Authorization is hereby granted for the "Public Works Director" or "City Engineer" under the direction of the Mayor, to assume full and complete responsibility for conducting all tasks and doing all things to accomplish the actions authorized in this ordinance.

Section 3. The sum of $900,000 is hereby appropriated to Fund 336, Program 043, "Dorn Avenue Drainage Improvements" as follows:

A. Estimated Project Design Costs	$900,000
B. Source of Funds	
Fund 401 – Water/Sewer Utility Fund	$900,000

Section 4. The City Clerk and the codifiers of this Ordinance are authorized to make necessary corrections to this Ordinance including, but not limited to, the correction of scrivener's/clerical errors, references, ordinance numbering, section/subsection numbers, and any internal references.

Section 5. The City Council hereby declares that should any section, paragraph, sentence, clause,

or phrase of this ordinance be declared invalid for any reason, it is the intent of the City Council that it would have passed all portions of this ordinance independent of the elimination of any such portion as may be declared invalid.

Section 6. The enactment of this Ordinance shall not affect any case, proceeding, appeal or other matter currently pending in any court or in any way modify any right or liability, civil or criminal, which may be in existence on the effective date of this Ordinance.

Section 7. It is expressly the purpose of this Ordinance to provide for and promote the health, safety, and welfare of the general public and not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefited by the terms of this Ordinance. It is the specific intent of this Ordinance that no provision or any term used in this Ordinance is intended to impose any duty whatsoever upon the City or any of its officers or employees. Nothing contained in this Ordinance is intended nor shall be construed to create or form the basis of any liability on the part of the City, or its officers, employees, or agents, for any injury or damage resulting from any action or inaction on the part of the City related in any manner to the enforcement of this Ordinance by its officers, employees, or agents.

_____

Cassie Franklin, Mayor

ATTEST:

_____

Sharon Fuller, City Clerk

PASSED: _____

VALID: _____

PUBLISHED: _____

EFFECTIVE DATE: _____

EVERETT | **City Council Agenda Item Cover Sheet**

Project title: An Ordinance creating a Special Improvement Project entitled "Marilyn Avenue Drainage Improvements" Fund 336, Program 044.

Council Bill #
CB 2409-26

Agenda dates requested:

Briefing	
Proposed action	
1st Reading	10/09/24
2nd Reading	10/16/24
Consent	
Action	10/23/24
Ordinance	X
Public hearing	
Yes	X No

Budget amendment:
Yes X No

PowerPoint presentation:
Yes X No

Attachments:
Proposed Ordinance

Department(s) involved:
Public Works, Admin

Contact person:
Tom Hood

Phone number:
(425) 257-8809

Email:
THood@everettwa.gov

Initialed by:
RLS
Department head

Administration

Council President

Consideration:	Plans & Systems Ordinance
Project:	Marilyn Avenue Drainage Improvements
Partner/Supplier:	
Location:	Marilyn Avenue
Preceding action:	None
Fund:	336-Water & Sewer System Improvements Fund

Fiscal summary statement:

The funding source for this project will be Fund 401 Water and Sewer Utility Fund. The programmed available funding for this project is $1,100,000.

Project summary statement:

This project is for design to address persistent flooding on Marilyn Avenue and W. Intercity Avenue. Work will consist of design efforts to replace and improve the storm drain system, such as culvert replacement, stream regrading/restoration, and storm drainpipe upsizing.

This project contains the work issues identified in the Surface Water Comprehensive Plan (SWCP) NC-7. A study performed by Otak Inc. identified improvements to address flooding issues on Marilyn Avenue.

After completion of this design work, an updated Plans & Systems Ordinance will be developed and presented to Council to authorize construction funding.

Recommendation (exact action requested of Council):

Adopt an Ordinance creating a Special Improvement Project entitled "Marilyn Avenue Drainage Improvements" Fund 336, Program 044.

EVERETT
WASHINGTON

ORDINANCE NO. _____

An ORDINANCE creating a special improvement project entitled "Marilyn Avenue Drainage Improvements" Fund 336, Program 044, to accumulate all costs for the improvement.

WHEREAS,

A. The City of Everett is committed to a planned stormwater system infrastructure maintenance improvement and replacement program.

B. The City of Everett has identified the need and obtained funds to construct new facilities to increase capacity and reduce maintenance demands.

NOW, THEREFORE, THE CITY OF EVERETT DOES ORDAIN:

Section 1. A special improvement project is hereby established as Fund 336, Program 044, entitled "Marilyn Avenue Drainage Improvements" to accumulate all costs for the improvement. Authorization is hereby given to accumulate costs and distribute payments for the improvement project.

Section 2. Authorization is hereby granted for the "Public Works Director" or "City Engineer" under the direction of the Mayor, to assume full and complete responsibility for conducting all tasks and doing all things to accomplish the actions authorized in this ordinance.

Section 3. The sum of $1,100,000 is hereby appropriated to Fund 336, Program 044, "Marilyn Avenue Drainage Improvements" as follows:

A. Estimated Project Design Costs	$1,100,000
B. Source of Funds	
Fund 401 – Water/Sewer Utility Fund	$1,100,000

Section 4. The City Clerk and the codifiers of this Ordinance are authorized to make necessary corrections to this Ordinance including, but not limited to, the correction of scrivener's/clerical errors, references, ordinance numbering, section/subsection numbers, and any internal references.

Section 5. The City Council hereby declares that should any section, paragraph, sentence, clause,

or phrase of this ordinance be declared invalid for any reason, it is the intent of the City Council that it would have passed all portions of this ordinance independent of the elimination of any such portion as may be declared invalid.

Section 6. The enactment of this Ordinance shall not affect any case, proceeding, appeal or other matter currently pending in any court or in any way modify any right or liability, civil or criminal, which may be in existence on the effective date of this Ordinance.

Section 7. It is expressly the purpose of this Ordinance to provide for and promote the health, safety, and welfare of the general public and not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefited by the terms of this Ordinance. It is the specific intent of this Ordinance that no provision or any term used in this Ordinance is intended to impose any duty whatsoever upon the City or any of its officers or employees. Nothing contained in this Ordinance is intended nor shall be construed to create or form the basis of any liability on the part of the City, or its officers, employees, or agents, for any injury or damage resulting from any action or inaction on the part of the City related in any manner to the enforcement of this Ordinance by its officers, employees, or agents.

_____

Cassie Franklin, Mayor

ATTEST:

_____

Sharon Fuller, City Clerk

PASSED: _____

VALID: _____

PUBLISHED: _____

EFFECTIVE DATE: _____

EVERETT | **City Council Agenda Item Cover Sheet**

Project title: An Ordinance creating a Special Improvement Project entitled "Olympic Boulevard Fish Barrier at Pigeon Creek No. 2" Fund 336, Program 045.

Council Bill #
CB 2409-27

Agenda dates requested:

Briefing	
Proposed action	
1st Reading	10/09/2024
2nd Reading	10/16/2024
Consent	
Action	10/23/2024
Ordinance	X
Public hearing	
Yes	X No

Budget amendment:
Yes X No

PowerPoint presentation:
Yes X No

Attachments:
Proposed Ordinance

Department(s) involved:
Public Works, Admin

Contact person:
Tom Hood

Phone number:
(425) 257-8809

Email:
THood@everettwa.gov

Initialed by:
RLS
Department head

Administration

Council President

Consideration:	Plans & Systems Ordinance
Project:	Olympic Boulevard Fish Barrier at Pigeon Creek No. 2
Partner/Supplier:	Washington State Department of Transportation (WSDOT)
Location:	Olympic Boulevard
Preceding action:	None
Fund:	336-Water & Sewer System Improvements Fund

Fiscal summary statement:

The funding source for this project will be $2,140,000 in awarded federal PROTECT funding from WSDOT, and $860,000 in local match funds from Fund 401 Water and Sewer Utility Fund. The total programmed available funding for this project is $3,000,000.

Project summary statement:

The culvert at Olympic Boulevard is identified as being capacity deficient with a history of flooding which has threatened the roadway and destabilized adjacent steep slopes.

This project will replace the existing culvert at Olympic Boulevard with a fish passable structure and regrade the stream channel immediately downstream of the culvert to restore fish migration in the stream.

This project will be completed in conjunction with efforts by the Tulalip Tribes, and partnership with BNSF Railway. This will also support recent work completed by Snohomish County and partners to improve these environments including the Howarth Park Beach Restoration project.

Recommendation (exact action requested of Council):
Adopt an Ordinance creating a Special Improvement Project entitled "Olympic Boulevard Fish Barrier at Pigeon Creek No. 2" Fund 336, Program 045.

EVERETT
WASHINGTON

ORDINANCE NO. _____

An ORDINANCE creating a special improvement project entitled "Olympic Boulevard Fish Barrier at Pigeon Creek No. 2" Fund 336, Program 045, to accumulate all costs for the improvement.

WHEREAS,

A. The City of Everett is committed to a planned stormwater system infrastructure maintenance improvement and replacement program.

B. The City of Everett has identified the need and obtained funds to construct new facilities to increase capacity, reduce maintenance demands, and expedite habitat restoration.

NOW, THEREFORE, THE CITY OF EVERETT DOES ORDAIN:

Section 1. A special improvement project is hereby established as Fund 336, Program 045, entitled "Olympic Boulevard Fish Barrier at Pigeon Creek No. 2" to accumulate all costs for the improvement. Authorization is hereby given to accumulate costs and distribute payments for the improvement project.

Section 2. Authorization is hereby granted for the "Public Works Director" or "City Engineer" under the direction of the Mayor, to assume full and complete responsibility for conducting all tasks and doing all things to accomplish the actions authorized in this ordinance.

Section 3. The sum of $3,000,000 is hereby appropriated to Fund 336, Program 045, "Olympic Boulevard Fish Barrier at Pigeon Creek No. 2" as follows:

A. Estimated Project Costs	$3,000,000
B. Source of Funds	
PROTECT Grant – Federal Funds	$2,140,000
Fund 401 – Water/Sewer Utility Fund	860,000
Total Funds	$3,000,000

Section 4. The City Clerk and the codifiers of this Ordinance are authorized to make necessary corrections to this Ordinance including, but not limited to, the correction of scrivener's/clerical errors, references, ordinance numbering, section/subsection numbers, and any internal references.

Section 5. The City Council hereby declares that should any section, paragraph, sentence, clause or phrase of this ordinance be declared invalid for any reason, it is the intent of the City Council that it would have passed all portions of this ordinance independent of the elimination of any such portion as may be declared invalid.

Section 6. The enactment of this Ordinance shall not affect any case, proceeding, appeal or other matter currently pending in any court or in any way modify any right or liability, civil or criminal, which may be in existence on the effective date of this Ordinance.

Section 7. It is expressly the purpose of this Ordinance to provide for and promote the health, safety and welfare of the general public and not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefited by the terms of this Ordinance. It is the specific intent of this Ordinance that no provision or any term used in this Ordinance is intended to impose any duty whatsoever upon the City or any of its officers or employees. Nothing contained in this Ordinance is intended nor shall be construed to create or form the basis of any liability on the part of the City, or its officers, employees or agents, for any injury or damage resulting from any action or inaction on the part of the City related in any manner to the enforcement of this Ordinance by its officers, employees or agents.

_____
Cassie Franklin, Mayor

ATTEST:

_____
Sharon Fuller, City Clerk

PASSED: _____

VALID: _____

PUBLISHED: _____

EFFECTIVE DATE: _____

From: Paula Rhyne
To: Angela Ely; Ramsey Ramerman
Subject: Fw: [EXTERNAL] Waits Motel Resolution
Date: Tuesday, October 22, 2024 11:24:43 AM

Category 2: Sensitive information

For the public record.

I emailed a number of folks on the 5th to let them know about the upcoming vote. Lmk if I bet to forward those emails.

Paula Rhyne
Everett City Councilmember, District 2

Sent from my phone - please excuse brevity and awkward autocorrections. This email is a public record.

Category 2: For official use only / disclosure permissible by law.

From: jeanne wohl <jeannewohl8170@hotmail.com>
Sent: Tuesday, October 22, 2024 11:17 AM
To: Paula Rhyne <PRhyne@everettwa.gov>
Subject: Re: [EXTERNAL] Waits Motel Resolution

Thank you very much for the heads up. We will be at the meeting on Wednesday for the vote on the rezone. We hope the rezone passes and we can finally put this chapter behind us.

Bob and Jeanne

From: Paula Rhyne <PRhyne@everettwa.gov>
Sent: Saturday, October 5, 2024 1:50 PM
To: jeanne wohl <jeannewohl8170@hotmail.com>
Subject: RE: [EXTERNAL] Waits Motel Resolution

Category 2: Sensitive information

Hi Robert and Jeanne:

I am writing to provide an update to the property located at 1301 Lombard – formerly known as the Waits Motel.

At this Wednesday's Council Meeting, Agenda Item #16 is an Ordinance to re-zone the property of the former Waits Motel. This is the first of three readings with a possible vote on 10/23. The rezone would go from R-2 Zoning to Neighborhood Business Zoning with a 3-floor maximum height. The city plans to sell the property but only under strict stipulations for townhomes that resemble existing characteristics of the neighborhood. Please see the link above for more specifics.

As a neighbor who has been following this closely, I wanted to make sure that you were aware so that you could provide any input if you haven't already.

In service,
Paula

Paula Rhyne, MPA *(she/her)*
Everett City Councilmember, District 2
425.257.8703 | 2930 Wetmore, Suite 9-A, Everett, WA 98201
www.everettwa.gov | Facebook | Twitter

Register to Vote

From: jeanne wohl <jeannewohl8170@hotmail.com>
Sent: Monday, July 31, 2023 7:54 AM
To: DL-Council <Council@everettwa.gov>
Subject: [EXTERNAL] Waits Motel Resolution

Dear Members of the Everett City Council,

We are asking for your support to pass the resolution to condemn the Waits Motel. We do not think that the recent lack of police calls for the motel makes up for all of the assaults, drive by shootings, overdoses, stolen vehicles and weapons and a huge amount of drugs seized there over a 12 month period. The official police compilation of criminal activity is shocking but also does not take into account the additional illegal activity witnessed by neighbors of the motel. Of course it is quiet there now since the occupancy rate is so low and the motel is under a microscope. Promises of a better future for the motel are hollow since we have seen too many previous owners and managers come and go and the criminal activity always surges

once again. How did this process even turn into a question of possible new ownership of the motel? Are we to totally ignore thirty years of history there?

Please do not ignore the statement by our Chief of Policer Dan Templeman that based on all the evidence he submitted "the Waits Motel constitutes a threat to the public health, safety, and welfare and has been associated with illegal drug activity during the previous twelve months." Are you going to put your trust in your own police chief or a manager who is an employee of the current owner who is ultimately responsible for this mess.

We understand what a huge decision this is for you but we also know how much we would like you to think about protecting our public safety and restore our peace of mind, quiet and quality of life. Thank you for your consideration,

Robert and Jeanne Wohl
425-239-7650

From:	Elizabeth Vogeli
To:	DL-Clerk/Treasurer; Ramsey Ramerman
Cc:	Angela Ely
Subject:	FW: Waits Relocation Plans
Date:	Tuesday, October 22, 2024 5:27:15 PM
Attachments:	image001.png image003.png

Category 2: Sensitive information

Please add this to the record for the rezone of 1301 Lombard.

Liz Vogeli, **Councilmember**
District 4 | City of Everett
425.257. 8703 | 2930 Wetmore Ave., Suite 9-A Everett, WA 98201
everettwa.gov | Facebook | Twitter

Category 2: For official use only / disclosure permissible by law.

From: Paula Rhyne <PRhyne@everettwa.gov>
Sent: Monday, August 7, 2023 11:33 AM
To: Elizabeth Vogeli <EVogeli@everettwa.gov>
Subject: RE: Waits Relocation Plans

Category 2: Sensitive information

Thank you for your work and watchdog-ness on this!! I think this analysis is great. My questions is in line with yours about where is it required that the city provide relocation services for people living in a motel. By nature, the motel's purpose is for people to stay in the short-term, not permanently live. So at what point is a person technically living there? Is it a minimum number of days? Or the fact that they don't have anywhere else to go? I see a difference in Rosemary's living situation and a tourist just staying to visit, so where is that line?

Paula Rhyne, MPA *(she/her)*
Everett City Councilmember, District 2
425.257.8703 | 2930 Wetmore, Suite 9-A, Everett, WA 98201
www.everettwa.gov | Facebook | Twitter

Register to Vote

From: Elizabeth Vogeli <EVogeli@everettwa.gov>

Sent: Monday, August 7, 2023 8:52 AM
To: Paula Rhyne <PRhyne@everettwa.gov>
Subject: Waits Relocation Plans

Category 2: Sensitive information

HiPaula,
Wanna check my work? I feel like I finally got to the lawyers desired effect. Ie. We are lawfully obligated to pay for relocation services.
Liz

Greetings,

I have looked into the Federal and State relocation laws that were provided to me and the rest of the council. I have also read a few articles written by Kinnon Williams. I have not yet found where the City of Everett, or any jurisdiction, is required to utilize the laws provided if not involved in a federally-assisted project.
Kinnon Williams looks to be the penultimate lawyer on condemnation. I believe he knows his stuff very well considering he helped write the book on it.
Please guide me to the law or case law that will require the City of Everett to provide relocation services to the 12 people currently residing at the Waits Motel.

A few notes:

- **Federal Relocation Assistance Program**

Despite the broad name, there is limited eligibility for the Federal Relocation Assistance Program. Managed by the U.S. Department of Housing and Urban Development (HUD), this program offers financial assistance or housing assistance to anyone displaced "as the direct result of a federally-assisted project involving acquisition, rehabilitation or demolition." Eligible people must submit a claim for housing or moving costs through the HUD website.

- **WAC 468-100-002:**
- (9) **Displaced person**:

(a) General: Means any person who moves from the real property or moves his or her personal property from the real property. This includes a person who occupies the real property prior to its acquisition, but who does not meet the length of occupancy requirements of the Uniform Act:
(i) As a direct result of the agency's acquisition of, or the initiation of negotiation for, or the acquisition of, such real property in whole or in part for a project;

- (13) **Federal financial assistance:** Means any grant, loan, or contribution, except a federal guarantee or insurance.
- (22) **Program or project**: The phrase program or project means any activity or series of activities undertaken by a federal agency or with federal financial assistance received or anticipated in any phase of any undertaking in accordance with the federal funding agency guidelines.

Chapter 8.26 RCW: RELOCATION ASSISTANCE—REAL PROPERTY ACQUISITION POLICY (wa.gov)

- **Purposes—Applicability.**

1. The purposes of this chapter are:

(a) To establish a uniform policy for the fair and equitable treatment of persons displaced as a direct result of public works programs of the state and local governments in order that such persons shall not suffer disproportionate injuries as a result of programs designed for the benefit of the public as a whole and to minimize the hardship of displacement on such persons;

And Yet:

- (4)(a) The term "displaced person" means, except as provided in (c) of this subsection, any person who moves from real property, or moves his or her personal property from real property:

(i) As a direct result of a written notice of intent to acquire, or the acquisition of, such real property in whole or in part for a program or project undertaken by a displacing agency; or
(ii) On which the person is a residential tenant or conducts a small business, a farm operation, or a business defined in this section, as a direct result of rehabilitation, demolition, or such other displacing activity as the lead agency may prescribe, under a program or project undertaken by a displacing agency in any case in which the displacing agency determines that the displacement is permanent.

- (9) The term "displacing agency" means the state agency, local public agency, or any person carrying out a program or project, with federal or state financial assistance, that causes a person to be a displaced person.

Kinnon W. Williams: Foster Garvey PC: Law Firm - Attorneys Kinnon is co-author of the 2010 Washington State Bar Association Real Property Deskbook Chapter on eminent domain. In 2017, he led a successful effort to amend the Relocation Assistance provisions in Washington state law to protect small business owners impacted by government projects. He is a frequent lecturer on eminent domain and inverse condemnation topics for continuing legal education and trade association seminars.
Seattle Daily Journal of Commerce (djc.com) Eminent domain law requires property owners be compensated at fair market value, even blighted property. This is done with taxpayer dollars. Government can then keep or sell the property. If the property is sold, Washington law allows counties, cities and towns to restrict in perpetuity how the property is used to protect the community's interest and prevent reoccurring blight.

I do know that law is open to interpretation. Perhaps there is an extra comma in the "displacing agency" definition?
If council had only been given the source for relocation as the RCW and WAC I may have not been so receptive to the term "federal or state financial assistance". However, we were given the "Federal Relocation Assistance Program" as *the* program the City would be utilizing and clearly the FRAP is not binding to this project.
In the RCW:
Purposes—Applicability.
(1) The purposes of this chapter are:

(a) To establish a uniform policy for the fair and equitable treatment of persons displaced as a direct result of public works programs of the state and local governments in order that such persons shall not suffer disproportionate injuries as a result of programs designed for the benefit of the public as a whole and to minimize the hardship of displacement on such persons;
"Public work" means all work, construction, alteration, repair, or improvement other than ordinary maintenance, executed at the cost of the state or of any municipality, or which is by law a lien or charge on any property therein. (ok, fine, maybe the city is required to pay relocation assistance)

Category 2: For official use only / disclosure permissible by law.

From: Shelley Whitkop
To: DL-Council
Subject: [EXTERNAL] Wait"s Hotel
Date: Wednesday, October 23, 2024 3:59:38 PM

Dear Council,

Forgive me for this late email!

The NW Neighborhood has struggled with the property where the Waits Motel was for over 20 years. As the neighborhood chair from 2010-2016, I regularly called the police and met with neighbors concerning the property and the chaos it was to the neighbors on Lombard.

Finally, the city was able to get rid of this blight property and the Lombard neighbors have been relieved of the violence, property damage, not to mention the reduced property values they endured because of these continual issues.

The city has kept the NW Neighborhood abreast of what they envisioned for this location with the blessing of the Lombard neighbors. The specific design standards the Mayor and staff have established have been applauded by everyone that's been affected by this property.

I believe that the property clearly falls within the agreement that was promised to our neighborhood and I would ask you to please vote to adopt the Ordinance amending the Zoning Map for 1301 Lombard Avenue.

Thank you,

Shelley Whitkop
1501 Rucker Avenue
Everett 98201

From: Danielle Marshall
To: Angela Ely
Subject: FW: [EXTERNAL] Rezone of 1301 Lombard Ave
Date: Wednesday, October 23, 2024 3:30:23 PM
Attachments: image001.png

Category 2: Sensitive information

Hello Angela,

I received public comment yesterday regarding the Waits Rezone (REVIII24-009). I am forwarding to make part of the public record.

Please let me know if I can provide any additional information.

Thank you,

Danielle Marshall
Assistant Planner | Community, Planning and Economic Development
425-257-7174 | 2930 Wetmore Ave, Suite 8C, Everett, WA 98201
everettwa.gov | Facebook | Twitter

Category 2: For official use only / disclosure permissible by law.

From: Rob Larson <letsrunalong1@gmail.com>
Sent: Tuesday, October 22, 2024 8:51 AM
To: Danielle Marshall <DMarshall@everettwa.gov>
Subject: [EXTERNAL] Rezone of 1301 Lombard Ave

I live at 1306 Lombard Ave, across the street from the property involved in the proposed redone. I would like to see that all parking associated with any business there be on site parking. Lombard is already heavily used for parking by the food bank, the hospital, and the college and at times has limited parking for the residents. We don't need additional parking pressure from a new business located there.
I would also like to see a two story maximum height limitation the keep the new building in character with the surrounding neighborhood.
Thank you.

Rob Larson
1306 Lombard Ave

From: Holly James
To: DL-Council
Subject: [EXTERNAL] Zoning Changes to Waits Motel Property
Date: Wednesday, October 23, 2024 12:38:35 PM

Dear Council,
I would like you to support this change and implement the suggested specific design standards the mayor and staff have established.

This area of our neighborhood went through a major transition from 2007- 2011. We went into agreement for development with the hospital and absorbed a 12 story 680,000 sq ft medical tower
2 parking garages, a cancer center, a 37,00 sq. ft. Children's Hospital, a utilities building and 3 ground level parking lots.

As the agreement states we lost 11 homes and 11 were moved. As a neighborhood at the time of negotiation we gained the Donovan District design standards to reflect that.

The property under review clearly falls within that agreements intent as it was what we were promised in future development after losing parts of our neighborhood.

Thank you
Holly James
1220 Colby Ave
Everett Wa 98201

From: Kari Quaas <kari.quaas@gmail.com>
Sent: Wednesday, October 23, 2024 8:06 AM
To: DL-Council; Cassie Franklin; Holly James
Subject: [EXTERNAL] Waits Motel

Hello Council and Mayor,

As a former Northwest Neighborhood Association chair, and longtime resident, I am grateful for the city's work to resolve the issue of the Waits. Once upon a time, it was a lovely little motel where my uncle used to stay when he visited us in the 1980s. It hasn't been that cute motel for some time.

I am grateful for the mayor taking action to shut it down after continual reports by nearby neighbors and for the city's community development team for supporting the displaced residents.

We now sit at a unique precipice to add the opportunity for home ownership. I encourage you to vote yes for the rezone and let our neighborhood move forward.

Respectfully,

Kari Quaas
Everett, WA

From: Angela Di Filippo <adifilipp22@gmail.com>
Sent: Tuesday, October 22, 2024 8:28 PM
To: Angela Ely
Subject: [EXTERNAL] Public Comment for City Council Meeting (10/23)
Attachments: ECC Comment 10_23.docx

Hello Angela!

Attached is a public comment for the City Council Meeting. It is related to item 7 (CB 2409-24) on the agenda.

Thank you and have a good one!
Angela Di Filippo

Hello Council,

My comments are regarding Item 7 on tonight's agenda, CB 2409-24.

When the City bought the Wait's Motel, the Lombard property in question, there was a good faith pledge that this site would be developed with committee input, community discussion, and ample outreach to those who lost their homes when the City purchased the property. There was also assurance that those that were losing their housing would be placed in homes that were safe. This did not happen and people have died due to the City and Council's negligence and/or short-sightedness throughout this process. Additionally, the City is now, in many ways, forcing Council's hand by making this a quasi-judicial process (so no discussion can take place between Council members and staff) and by not exploring any other potential options that may also compliment that area of our city.

We do need housing in our city, not just because of HB 1110, but also due to our growth and the very simple fact that Council's short-sightedness costs people their lives, both in this situation and in general how housing has been treated in our city. This lack of foresight is responsible for this initiative's poor planning as well as the City's inability to work with the community and committees. Additionally, this short-sightedness is expressed in many Council members' commitments to failed strategies and refusals to be proactive, which has led to or worsened the issues that Everett is facing.

You continue to take actions and invest in failed strategies that destroy the trust this community could have in you. At the time of the City's purchase, Emily Simpson and her team had made Wait's Motel a safe place for those living there and in the surrounding neighborhood, and even afterwards there was still hope that the City would honor its word to collaborate. This did not happen and so now why should we, as a community, trust that what the City wants to build would actually support our housing needs? How do we know it won't be another project that sits half empty due to exorbitant HOA fees or private equity buy-ups? How can we be assured that the right thing will be done when time and time again, that has not been the case?

Thank you for your time,
Angela Di Filippo
11401 3rd Ave SE
Everett, WA

From: jeanne wohl
To: DL-Council
Subject: [EXTERNAL] Rezone of 1301 Lombard
Date: Tuesday, October 22, 2024 11:08:49 AM

Dear Members of the Everett City Council,

We have lived on the 1300 block of Lombard since 1979. We and our neighbors were affected by the serious problems surrounding the old Waits Motel for more than thirty years. However it is undeniable that peace has returned to our neighborhood since the demolition of the motel!

Now we have the next step which is the rezone of that property. We urge you to please vote in favor of the rezone. How wonderful it would be to have owner occupied town homes with some design standards that fit our historical neighborhood. We look forward to having new neighbors who are as invested in our community as we have been all these years.

Thank you so much for your consideration,

Bob and Jeanne Wohl
1325 Lombard
425-239-7650

From: noreply@civicplus.com
Sent: Monday, October 21, 2024 8:37 PM
To: Angela Ely
Subject: [EXTERNAL] Online Form Submittal: Contact Us

Follow Up Flag: Follow up
Flag Status: Completed

Contact Us

We welcome your feedback and suggestions.

To submit a question or comment by email, please complete the fields below.
Required fields are marked with an asterisk (*).

Please note, requests for trip itineraries will be responded to within 1 working day.
Please be as specific as possible with your request.

First Name	Allis
Last Name	Alexander
Your Email	allislaexander252@gmail.com
Subject	Waits property
Your Message	I want the Wait property development to go for low income housing. I know too many people who work in Everett, and live in Everett who are strapped by the high cost of rent. Low income housing is needed to make the city of Everett viable for many peoople. Townhouses are not needed.

From: rspev1228 <rspev1228@frontier.com>
Sent: Monday, October 21, 2024 5:22 PM
To: Angela Ely
Subject: Re: [EXTERNAL] Discussion regarding 1310 Lombard Ave.

Follow Up Flag: Follow up
Flag Status: Completed

I am a resident of Everett, WA.

Kent Peverly

From: Angela Ely <AEly@everettwa.gov>
Sent: Monday, October 21, 2024 12:41 PM
To: rspev1228 <rspev1228@frontier.com>
Cc: DL-Council <Council@everettwa.gov>
Subject: RE: [EXTERNAL] Discussion regarding 1310 Lombard Ave.

Category 2: Sensitive information

Thank you for submitting your email to Council.

If you are wanting your email to be submitted as written comment for the record at the October 23 Council meeting, I would need your city of residence.

The written comment process consists of your email being shared with the city clerk, legal, and administration. The city clerk would include it in the online packet that they post and would become a permanent record. We typically submit written communication pertaining to a current agenda item as written comment, but it is not required.

If your purpose was mainly to share your thoughts with Council, then there is no additional information needed from you.

Sincerely,

Angela Ely
Executive Assistant | Everett City Council
425.257.8703| 2930 Wetmore Ave, Ste 9A, Everett, WA 98201
EVERETT everettwa.gov | Facebook | Twitter

Category 2: For official use only / disclosure permissible by law.

From: rspev1228 <rspev1228@frontier.com>
Sent: Monday, October 21, 2024 11:57 AM
To: DL-Council <Council@everettwa.gov>; rspev1228@frontier.com
Subject: [EXTERNAL] Discussion regarding 1310 Lombard Ave.

I am writing to your concerning item 5 of the October 16, 2024 meeting agenda, the rezone of 1301 Lombard Ave

and the discussion surrounding the topic.

I was saddened to see a valuable public council meeting time taken by very pointed dialogue regarding “process” that gave the appearance of a trial or a legislative hearing with the administration on the “stand”. It also became evident that a breakdown in interpersonal communication is driving this line of questioning, presenting the appearance of distrust. That situation is best resolved between the individuals involved and not in the public eye during an official business meeting.

One of the sentiments expressed in that discussion centered around transparency and a perceived promised involving the Council in exploring viable options for use of the property in the future. Whether that promise was adhered to is not the subject at hand.

The proposed action before the Council is only a proposed zoning change. This is to facilitate the potential best use of the property. According to the agenda cover sheet, a resolution regarding the actual disposition of the property is to be presented upon approval of this re-zone. That is when all possible use options should be argued.

As the final decision-making body, as re-iterated by the mayor, it is my opinion that there are several options regarding this proposed action:

1. Pass the proposal as presented.
2. Reject the proposal with direction to the administration to come back with different zoning options, if needed, for a different use.
3. Table the proposal for consideration of other zoning and use options such that the Council may make the best selection. (This means the Council must be prepared to direct what other possibilities are to be considered or studied.)
4. Perhaps options 2 or 3 should be re-introduced after being presented to the appropriate committee first. Then the new proposed action comes back with a committee recommendation in addition to being presented by administration.

On a different subject, my opinion of the Council’s process regarding “Public Hearing” is that it is a mockery of the image of soliciting meaningful public input on any specific subject. In my years of observing the proceeding of this body. I do not recall having ever seen that "hearing comments" changed the outcome of any proposed action. At the very least, “public hearings” should be scheduled in sufficient advance time frame to allow for any suggestions to be incorporated into the proposed action. If hearings cannot be held on the second reading of proposed actions, then perhaps there needs to be four readings involved in the process.

Regards

Kent Peverly

From: luplarson <luplarson@gmail.com>
Sent: Monday, October 21, 2024 4:06 PM
To: Angela Ely
Subject: RE: [EXTERNAL]

Yes!
My residence address is 18611 92nd St SE
Snohomish, WA 98290

Family home Address is
1306 Lombard Ave
Everett, WA 98201

Sent via the Samsung Galaxy S23 5G, an AT&T 5G smartphone

-------- Original message --------
From: Angela Ely <AEly@everettwa.gov>
Date: 10/21/24 3:55 PM (GMT-08:00)
To: luplarson <luplarson@gmail.com>
Subject: RE: [EXTERNAL]

Category 2: Sensitive information

Hi Stephanie,

Could you please confirm your city of residence to make this as written comment for the record?

Thank you,
Angela

Angela Ely
Executive Assistant | Everett City Council
425.257.8703| 2930 Wetmore Ave, Ste 9A, Everett, WA 98201
everettwa.gov | Facebook | Twitter

Category 2: For official use only / disclosure permissible by law.

From: luplarson <luplarson@gmail.com>
Sent: Monday, October 21, 2024 1:51 PM
To: DL-Council <Council@everettwa.gov>; Cassie Franklin <CFranklin@everettwa.gov>; EverettCityAttorney <CityAttorney@everettwa.gov>
Subject: [EXTERNAL]

This is in regards to Wednesday night's final reading on CB 2409-24, Zoning map for 1301 Lombard Avenue. Please enter this

note to the record.

Mayor Franklin, City Council and others,

This is, what I hope will be, my last letter regarding the property at 1301 Lombard, site of the former Waits Motel. It still warms my heart that you took the neighbors words, obvious proof of Waits Motel's effect on N. Everett, and followed through on its condemnation and demolition. The neighborhood had it's first peaceful Summer in decades recently. At the time of the decision in 2023, it was said often that "the neighborhood had suffered plenty". Now is the time to rezone the land. Many rumors are flying, from the land accommodating a homeless shelter to a many storied high rise. This goes back to "the neighborhood has suffered plenty". How about owner occupied townhouses, a building that would fit in somewhat with the Historic Donovan homes, with on-site management? The streets/infrastructure can no way accommodate much more. Any one who has been on 13th street at Providence shift change can testify to that.
The Donovan neighborhood has been more than patient and caring, while trusting the City would keep the homeowners best interests at heart. Please don't let us down at this point.

Sincerely,
Stephanie Larson
425-387-8033

From: Kummer, Sarah <Sarah.Kummer2@T-Mobile.com>
Sent: Monday, October 21, 2024 3:32 PM
To: DL-Council
Cc: Cassie Franklin
Subject: [EXTERNAL] Supporting the Townhome Recommendation for the Waits Motel Site

I'm writing as a resident of the Northwest Neighborhood with a request regarding the future of the former Waits Motel site. The proposed townhomes are a thoughtful solution, and I am expressing my full support for this recommendation.

As someone with young adult children searching for affordable housing and aging parents who would love to stay in the neighborhood while moving into a more manageable home, I can see how these townhomes would provide an opportunity for families like mine. They extend the sense of community and character of our charming little corner of Everett.

While I support the expansion of our rental options in North Everett, I am concerned about the possibility of a nine-story apartment complex in that location. Given the limited public transportation options, I worry about its impact on parking and how it could make it more challenging for those who commute outside the city. The townhomes are the right fit for our neighborhood, one that honors its history and future.

Thank you so much for taking the time to read my thoughts. I appreciate all you do for our community and trust your choice will be in everyone's best interest and the long-term interest of the city and its distinct neighborhoods.

Warm regards,

Sarah Kummer (She/Her/Hers)
Senior Recruiting Manager – Consumer Group
T-Mobile
Direct 425.931.1366 | sarah.kummer2@t-mobile.com
https://careers.t-mobile.com/ Follow T-Mobile Careers on LinkedIn, Twitter, Facebook and Instagram

From: Nancy Hecht <hecht1963@yahoo.com>
Sent: Monday, October 21, 2024 3:21 PM
To: DL-Council; Cassie Franklin
Cc: hecht1963@yahoo.com
Subject: [EXTERNAL] Waits Motel Property Re-Zone

Dear City of Everett Mayor Franklin and City Council Members,

I would first like to express my gratitude for the attention and efforts you have dedicated to addressing the long-standing issues surrounding the Waits Motel property. I am confident that your continued support and actions will significantly improve the neighborhood by transforming an eyesore and a source of frustration into a positive community asset.

As a long-time resident of the Northwest Neighborhood featuring quaint Donovan bungalows, I am deeply invested in maintaining its unique character and charm. I am writing to encourage careful consideration when re-zoning this property. Limiting the development of this property to no more than 16 townhomes presents a unique opportunity to maintain the integrity of my cherished neighborhood while appealing to a diverse group of individuals seeking home ownership.

I believe this is the most responsible approach to redevelopment. It will attract a variety of residents, including young families, professionals, and retirees, fostering a vibrant and inclusive community. This option provides the best opportunity to support those looking to invest in home ownership and become long-term, contributing members of my neighborhood.

The Waits Motel property has been a nuisance for our neighborhood and residents for many years. I urge you to consider the redevelopment preferences of the homeowners and neighbors who have been most impacted by these difficulties.

Thank you for your time and consideration.

Nancy Hecht
Northwest Neighborhood
1300 block of Lombard

From: krista.thoreson@gmail.com
Sent: Monday, October 21, 2024 1:58 PM
To: DL-Council
Cc: Cassie Franklin
Subject: [EXTERNAL] Townhomes options in Everett
Attachments: Everett City Council Letter.pdf

Please see the attached letter regarding the rezoning options for the building of townhomes.

Thank you,

Krista Thoreson
423 Rockefeller Ave
Everett, WA 98201

October 21, 2024

Everett City Council
2930 Wetmore Ave, Suite 9-A
Everett, WA 98201

Subject: Future of Townhomes in My Neighborhood

Dear City Council Members & Mayor,

I hope this message finds you well. My husband and I are residents of North Everett, where we own a 2400 sq ft. home. We have truly fallen in love with this neighborhood and plan to retire here in the next 5-6 years.

As much as we cherish our current home, we are looking to downsize to a townhome when the time comes. However, we have noticed a significant lack of options for townhomes in our area. We believe that increasing the availability of townhomes would benefit many residents who wish to remain in the community while enjoying the advantages of a more manageable living space.

We hope the City Council will consider rezoning certain areas to allow for more townhome developments. This would not only provide more options for residents like us but also enhance the diversity and vibrancy of our neighborhood.

Thank you for your attention to this matter. We appreciate your efforts in making North Everett a wonderful place to live.

Thank you,

Krista Thoreson
423 Rockefeller Ave
Everett, WA 98201
425-417-9013

From: Comcast <jasonschaller@comcast.net>
Sent: Monday, October 21, 2024 11:59 AM
To: DL-Council; Cassie Franklin
Subject: [EXTERNAL] 1301 Lombard rezone proposal

Dear President Schwab and Council Members,

I am writing to express my support for the rezone application for 1301 Lombard. As a lifelong resident of Everett, including the past 20 years in the northwest neighborhood, I have seen a growing shortage of homeownership opportunities, particularly for townhomes.

As a single man who works long hours, I am eager to own a home in my neighborhood. However, the maintenance of a single-family residence is not feasible for me. The prospect of townhome ownership would allow me to stay in the community I love while avoiding the upkeep of a yard.

Thank you for considering my perspective.

Sincerely,

Jason Schaller

1901 Grand Ave#6

Everett Wa. 98201

From: TOM MAGGERISE <tom_maggerise@yahoo.com>
Sent: Sunday, October 20, 2024 4:45 PM
To: DL-Council
Cc: Cassie Franklin
Subject: [EXTERNAL] Rezone

Dear Everett City Council Members,

Having grown up on 12th and Lombard, the idea of returning to my hometown has always been close to my heart. I would love to come back and live in my old neighborhood, but owning an older home feels overwhelming. The concept of townhouses is appealing and might just be the incentive I need to make my way back to Everett.

Thank you for your consideration

Tom Maggerise

Sent from my iPhone

From: Emily Simpson <simpsonemily99@gmail.com>
Sent: Friday, October 18, 2024 11:04 AM
To: DL-Council
Subject: [EXTERNAL] Everyone must come to the Table

Estimated Total Costs (so far):

Property Acquisition: $1.85 million Demolition:$50,000 - $100,000
Asbestos/Meth Testing : $15,000 - $55,000
Relocation of Residents: $70,000 - $120,000
Utilities for 6 Months: $6,000 - $15,000
Maintenance (lawn cutting for 4 Months):$1,500 - $4,000
Rat Extermination: $2,000 - $5,000
Boarding up Rooms and Call Backs to Deboard for Access:$4,000 - $10,000
Disposal of 30 Refrigerators: $2,500 - $5,000
Garbage Removal: $3,000 - $7,000
Small Area of Pressure Washing:$500 - $1,500
Governmental Administrative Fees: $10,000 - $30,000

Estimated Total: $2,014,500 - $2,202,500

This estimate provided is highly conservative, as most of the costs have been underestimated and averaged. Without access to the city's budget, only you truly know the full extent of the expenditures. The money spent—much of it unnecessary—served no meaningful purpose beyond creating harm. What has transpired here is nothing short of dehumanization against a marginalized community.

It is essential to remember that, before utilizing blight as a tool to seize land, there was an existing business agreement and contract between Native Americans and the landowner. Historically, the government has repeatedly interfered with or dishonored such agreements with Native peoples. In this situation, you are no different from the founders of Everett who committed genocide and forced Native communities onto reservations.

Your condemnation of this property was a slap in the face to any possibility of equity that was on the horizon. The mayor claimed she wouldn't just hurry to sell to the highest bidder, but now that seems to have been a lie. Initially, you all praised me for securing the site, thanked me, and even asked if I'd like to be part of the future plans for it. Legally, the city can only sell the site for its land value, which will be far less than what has been spent thus far.

I would have kept all my experience ams the truth to myself, but when the bullying began, I decided it was time to speak up. Moving forward, I hope that all the people who originally lived in the area will benefit from its future—not just the well-off. That includes vulnerable individuals, like my mother, who struggled with addiction. I also hope the environmental impact is taken into consideration and that you will fight for space that benefits Native Americans and people of Indigenous descent.

2024 Hazard Mitigation Plan Update

October 23, 2024

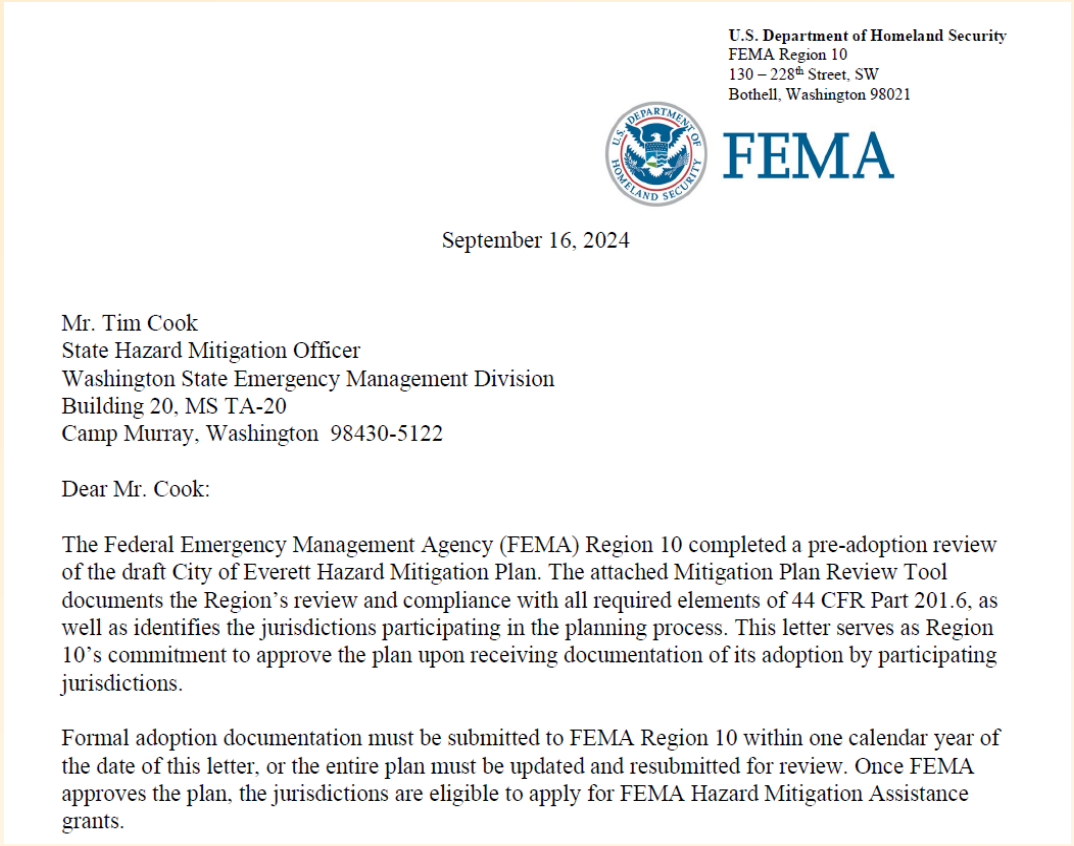
EVERETT
WASHINGTON

Plan Scope

- Long-term strategy for reducing risk and impacts from natural disasters
- Focuses on resilience by identifying hazards
- Develops strategies to mitigate potential impacts
- Identifies actions to reduce losses from hazards

Framework

- Intent is for communities to understand and reduce their vulnerability to natural hazards
- Required for certain grant and federal disaster funding
- City adoption required
  - Update good for 5 years



U.S. Department of Homeland Security
FEMA Region 10
130 – 228th Street, SW
Bothell, Washington 98021

FEMA

September 16, 2024

Mr. Tim Cook
State Hazard Mitigation Officer
Washington State Emergency Management Division
Building 20, MS TA-20
Camp Murray, Washington 98430-5122

Dear Mr. Cook:

The Federal Emergency Management Agency (FEMA) Region 10 completed a pre-adoption review of the draft City of Everett Hazard Mitigation Plan. The attached Mitigation Plan Review Tool documents the Region's review and compliance with all required elements of 44 CFR Part 201.6, as well as identifies the jurisdictions participating in the planning process. This letter serves as Region 10's commitment to approve the plan upon receiving documentation of its adoption by participating jurisdictions.

Formal adoption documentation must be submitted to FEMA Region 10 within one calendar year of the date of this letter, or the entire plan must be updated and resubmitted for review. Once FEMA approves the plan, the jurisdictions are eligible to apply for FEMA Hazard Mitigation Assistance grants.

Background

- June 2023: update begins with team kick-off in September
  - 60+ member planning team and stakeholders
- March 2024: draft completed, available for public review and comment
- April: submitted for state and FEMA review
- May: state review complete
- September: FEMA approved plan pending adoption

2024 Plan Goals

- Protect public health, welfare, natural environment, and public safety
- Ensure continuity of critical infrastructure, government, and economy
- Foster coordination among public and private organizations
- Minimize losses and increase post event self-reliance

Community Outreach

- Meetings
  - Council of Neighborhoods
  - Safe Community Committee
  - CERT
- Survey
- Website
- Newsletter
- Press releases
- Social media

Figure 2-5 Council of Neighborhoods Meeting February 26, 2024

Risk and Vulnerability

- Develop hazard profiles – impact to people, property, economy, environment
- Vulnerability assessment – critical facilities identification and evaluation, population at risk, determine loss
- Risk analysis – probability, severity, extent and location, duration, warning time

Hazards Assessed

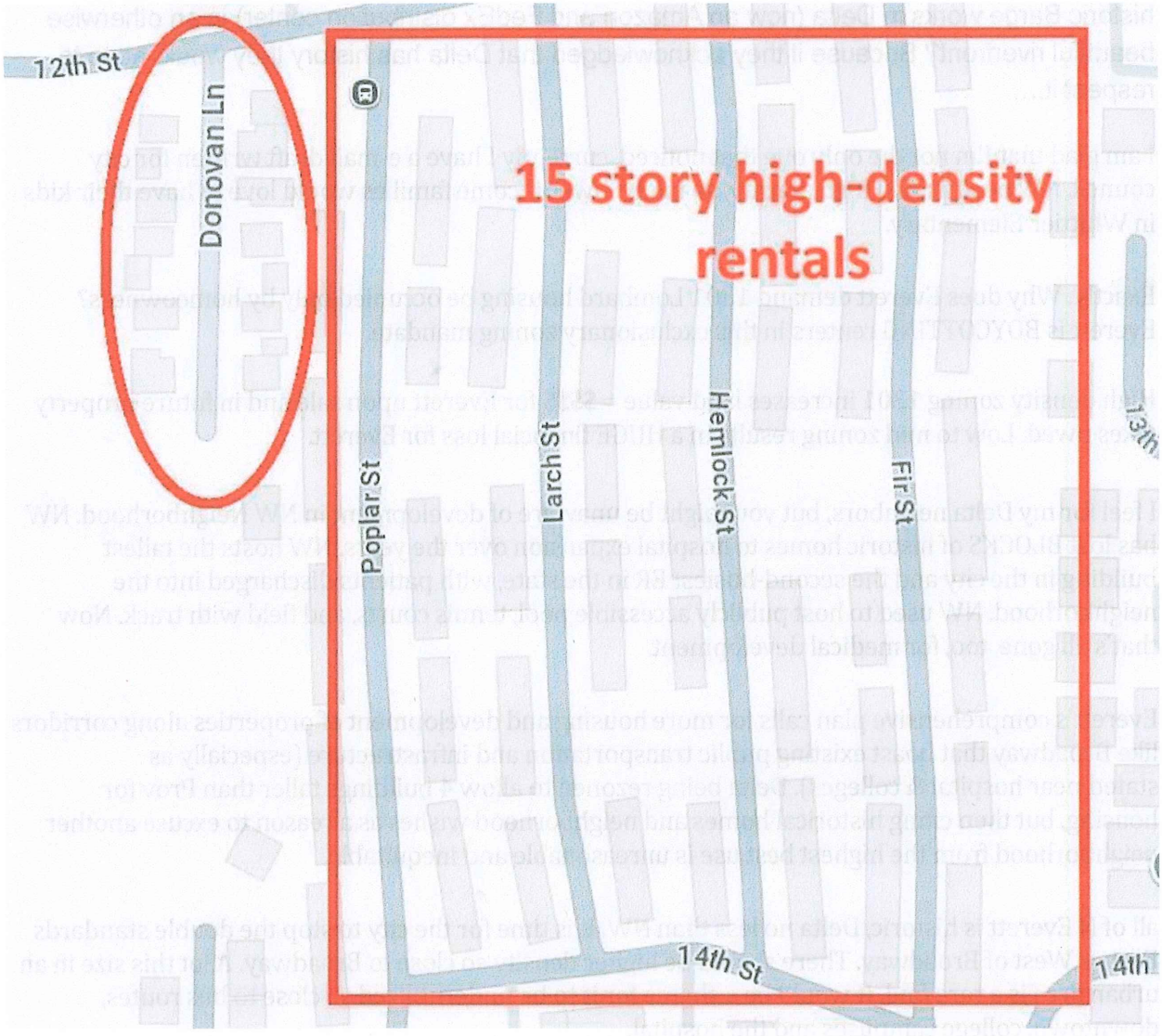
- Earthquake
- Flood
- Severe Weather
- Landslide
- Climate Change
- Wildfire
- Tsunami
- Hazardous Materials

Mitigation Strategies

- Developed objectives to reduce future disaster impacts
- City initiatives
  - Assess backup generator needs at water pump sites
  - Implement water resiliency study recommendations
  - Build a fiber communication and data loop
  - Train volunteers in disaster preparedness
  - Improve waterfront public safety response capabilities

THANK YOU

Delta vs NW zoning prejudice Everett wants to rezone 1301 Lombard into low-medium density housing for home ownership townhomes. City stated NW zone should be lower due to historic Donovan homes. Hello! In Delta, Donovan Lane literally borders the park district with historic Donovan homes, which did not stop City Council passing 15 story rezoning for a new high-density Everett Housing Authority development. These neighborhoods, only separated by Broadway, are treated unequally and it is clear City of Everett zoning is biased & prejudiced. These projects are maybe 0.5 mile apart. https://www.youtube.com/watch?v=DQqlckP8Od8 conversation starts about 1 hour in Edited to add photo



Funny how that works. Big money didn't want it in their back yard, so we got it. I wouldn't care if it were 3 or 4 story, but 15!? And where exactly are all these people going to park? I'd love to say this was just an ill-conceived idea, but I think it was a fully intentional show of how little Delta matters to the city.…

___ now is the time to call out the hypocrisy. The "historic" waits motel had 24 units, is located right next to Broadway, Providence Hospital, WSU, EVCC. It should be at least as tall as the hospital with at least as many units of supportive housing that were demolished. This would be great as workforce (medical and student) accessible housing.

The City of Everett is absolutely historically and still to this day biased and prejudiced in virtually all departments and policies. West of Broadway it's always an excuse to "preserve history" but in Historic Delta it's ok to tear it down. Ever wondered why the City and Port of Everett ignore the historic Barge works in Delta (now an Amazon and FedEx distribution center) in an otherwise beautiful riverfront? Because if they acknowledged that Delta has history they would have to respect it....

I am glad that I'm not the only one that noticed, currently I have a e-mail draft written for city council. NW needs some high density, so many lower income families would love to have their kids in Whittier Elementary.

Exactly. Why does Everett demand 1301 Lombard housing be occupied only by homeowners? Everett is BOYCOTTING renters in this exclusionary zoning mandate.

High density zoning 1301 increases land value = $$$$ for Everett upon sale and in future property taxes owed. Low to mid zoning results in a HUGE financial loss for Everett.

I feel for my Delta neighbors, but you might be unaware of development in NW Neighborhood. NW has lost BLOCKS of historic homes to hospital expansion over the years. NW hosts the tallest building in the city and the second-busiest ER in the state, with patients discharged into the neighborhood. NW used to host publicly accessible pool, tennis courts, and field with track. Now that's all gone, too, for medical development.

Everett's comprehensive plan calls for more housing and development of properties along corridors like Broadway that boast existing public transportation and infrastructure (especially as stated near hospital & colleges). Delta being rezoned to allow 4 buildings taller than Prov for housing, but then citing historical homes and neighborhood wishes as a reason to excuse another neighborhood from the highest best use is unreasonable and inequitable.

all of N Everett is historic, Delta no less than NW. It is time for the city to stop the double standards East vs West of Broadway. There should be higher density so close to Broadway. A lot this size in an urban area is a rare find. It would be a shame for it to be underutilized so close to bus routes, downtown, college campuses and the hospital.

Seems that way ... money ALWAYS TALKS AND HAS MORE PULL... unfortunately it's the American way and probably world wide 😔

If you watch the video they bring up the project around minute 48

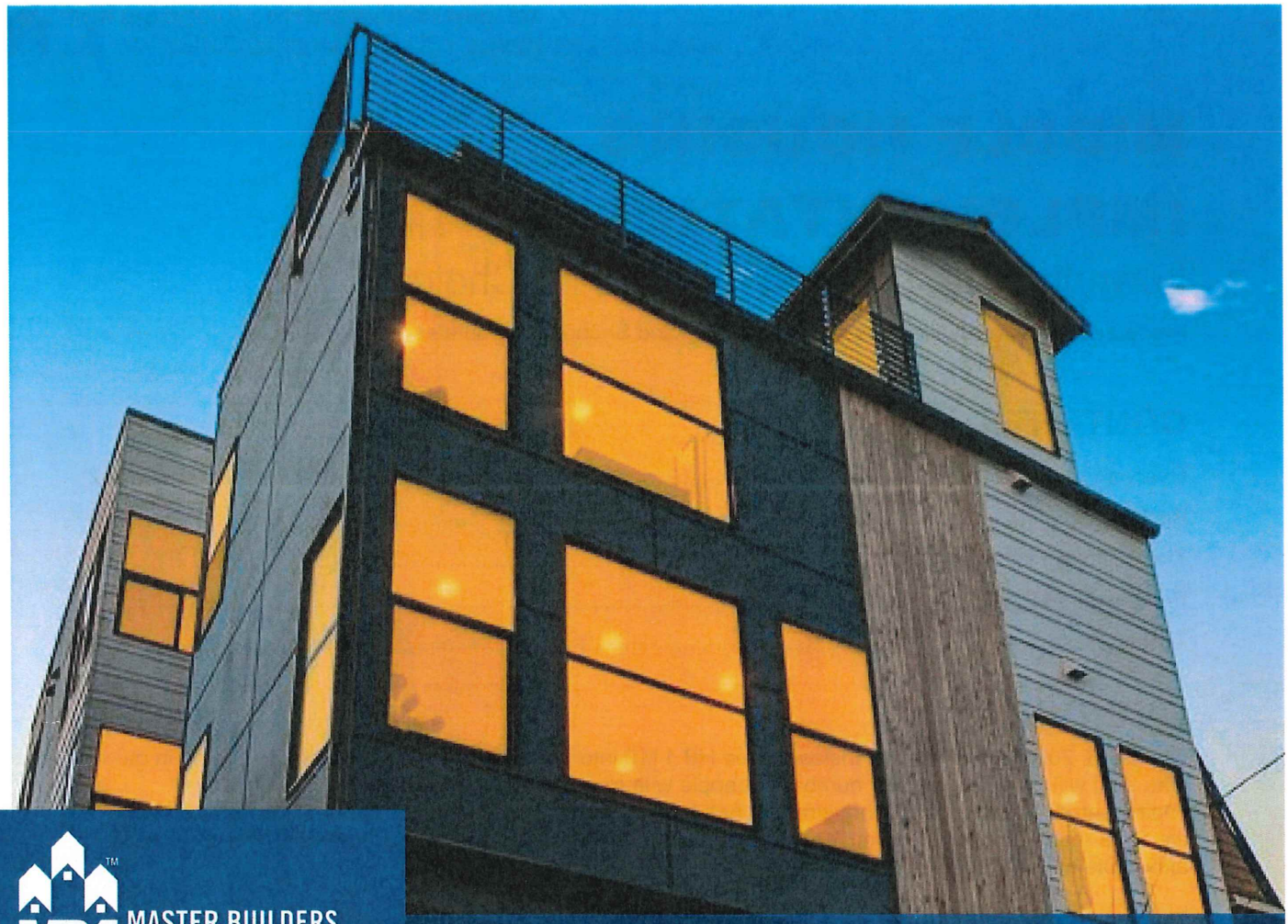
I am not going to lie, they (our neighbors in the nw neighborhood) allowed it happen in delta (they didn't help us push back against it) I low key hope it happens... In all seriousness though it is a much smaller plot of land and it wouldn't likely be a viable project for higher density even if it is a better location than that of the parks district. But if they were to acquire the 7-11 that would change the game it would be enough land for at least one big building.

Okay townhomes would work good there. It all really is up to whoever the land owner becomes though

Everett leadership is pushing 3 stories max to protect NW from the comprehensive building codes applicable to every other neighborhood. With 15 story zoning, the developer can build as many units the lot will bare (some commercial space would be a nice addition). Rezoning in Delta was specifically applied city-wide to avoid the look of preferential treatment towards the EHA.

Everett is also stipulating 16 units max. Everett leadership should absolutely purchase 7/11 and redevelop that entire area into high-density mixed use.

https://www.snoco.org/proptax/(S(2pgheaozkqypehsrvuz2qy2p))/ParcelInfo.aspx?parcel_number=00547425003100



MASTER BUILDERS ASSOCIATION of King and Snohomish Counties

MIDDLE HOUSING IMPLEMENTATION PLAN

Lowering Barriers to More Housing Choices

Prepared by Master Builders of King and Snohomish Counties

Last updated October 2024

MIDDLE HOUSING IMPLEMENTATION PLAN

Lowering Barriers to More Housing Choices

Prepared by Master Builders Association of King and Snohomish Counties

CONTENTS

OVERVIEW

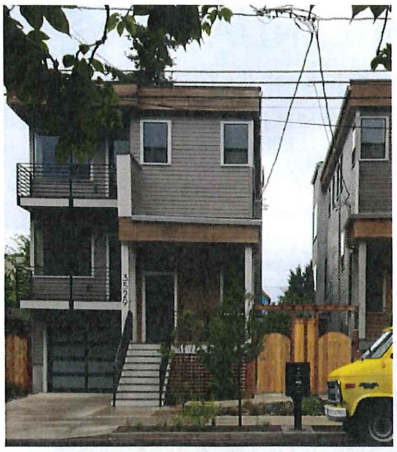
On May 8, 2023, Governor Jay Inslee signed HB 1110 into law, which is a major reform to zoning in our state that will provide a greater number of people with more diverse housing choices. If properly implemented, this new middle housing law has the potential to add much needed housing supply to help the state reach its goal of adding 1 million new homes by 2044 while at the same time providing more affordable housing options.

The new law requires cities of certain sizes and locations to allow multiple dwelling units per lot that are middle housing types. HB 1110 defines "Middle housing" as *"buildings that are compatible in scale, form, and character with single-family houses and contain two or more attached, stacked, or clustered homes including duplexes, triplexes, fourplexes, fiveplexes, sixplexes, townhouses, stacked flats, courtyard apartments, and cottage housing."*

Cities subject to HB 1110 must implement its requirements no later than six months after the next periodic update to their comprehensive plans required under the Growth Management Act. For cities in the central Puget Sound region (within King, Kitsap, Pierce, and Snohomish counites), these updates are due by December 31, 2024. Therefore, they must implement HB 1110 by June 30, 2025.

Many people who want to live in our cities are finding it harder and harder to find a home that fits their lives and budget. Allowing more "middle" home choices, such as duplexes and triplexes, in addition to single-family detached homes, can create more housing choices for Washington families in neighborhoods close to jobs, transit, schools, parks, and other amenities.

Allowing middle home types is not a new idea—HB 1110 simply authorizes housing types that were previously allowed without question. One of the concerns often raised regarding middle housing is that it will negatively impact neighborhood character. However, the premise of HB 1110 is that the types of housing considered to be "middle housing" are of the size and scale that can blend into existing single-family neighborhoods.



Quadplex via Sightline Institute

BACKGROUND

Since the 1940s, many municipal zoning codes, ordinances, and regulations across the United States have prioritized detached single-family homes and mid- to high-rise apartment buildings. Excluding certain housing types was frequently done for a specific purpose: prioritizing single-family neighborhoods was a way for cities and towns to legally segregate communities. Because of this zoning, there was simply not enough housing to meet demand as cities grew, so prices rose. This resulted in those who were less affluent, often people of color, being excluded or pushed farther away from high-opportunity neighborhoods.

In the Puget Sound region, the demand for housing has continued to outpace supply, thanks in part to strong job growth. By 2050, the region is projected to grow by more than 1.8 million residents and 1.2 million jobs according to the Puget Sound Regional Council (PSRC). We need to build more affordable homes close to job centers and transit; the status quo is not sustainable when we consider both our region's climate change mitigation objectives and housing affordability goals. Middle housing is a more affordable homeownership and rental option for families and individuals looking to live in our urban areas.

TRADE OFFS & FINDING BALANCE

Infill and middle housing contribute to the diversity of housing options and provide many benefits, highlighted below. This type of housing also comes with tradeoffs. For example, lots with middle housing cannot accommodate the same number of off-street parking spaces or trees as a typical single-family home. Cities must balance the need for more housing choices with the desire to have adequate parking and grow their tree canopy. This means adopting flexible policies, for example, that allow for the right trees in the right place. Cities can also leverage a neighborhood's proximity to transit to offset any reductions in off-street parking spaces.

For every $1,000 increase in the median price of a home in the Seattle/Bellevue/Tacoma market, 856 people are priced out.

National Association of Home Builders Priced-Out Estimates for 2023

Lowering barriers to middle housing will enable cities to better plan for a spectrum of housing choices so that current residents, newcomers, and future generations may find a home that best fits their lives.

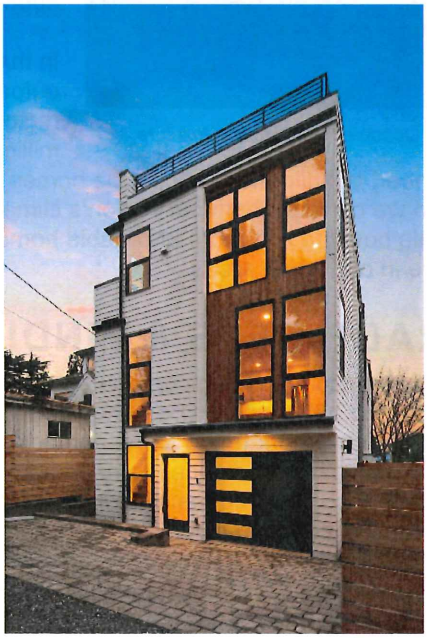
- Duplexes, triplexes, fourplexes, sixplexes, stacked flats, townhomes, and courtyard apartments are more affordable than detached, single-family houses because land costs, which account for a significant portion of a home's value, can be shared across several households.
- Construction costs for "plexes," stacked flats, townhomes and courtyard apartments are lower per square foot than taller apartment buildings.
- Because middle housing helps preserve wilderness areas and reduce vehicle miles traveled, it's an important strategy for reducing carbon emissions.

PROCESS AND MODEL CODE RECOMMENDATIONS

MBAKS' overarching suggestions for cities to implement middle housing is to keep it simple. The easier and more cost-effective it is to build middle housing, the more likely it is to be built, and the more attainable it will be for those looking for a place to call home. With the goal of facilitating more housing choices in mind, MBAKS recommends implementing local codes with the following features to streamline the review process:

PROCESS REFORMS TO STREAMLINE PERMITTING OF MIDDLE HOUSING

- Provide a streamlined review process that includes allowing concurrent review of construction/engineering plans with the proposed preliminary plat.
- Adopt a model home building permit ordinance allowing up to 13 building permit applications to be submitted and issued prior to final plat recording, or at a minimum, allow up to 13 building permit applications to be submitted and processed (but not issued) prior to final plat recording.
- Implement SEPA and planning-related actions[1] to facilitate housing supply, including middle housing.
- Reduce costs to create middle housing by waiving or greatly reducing permit fees and impact fees, utility connection fees, and street improvement requirements.
- Do not require design review for middle housing. If a city already has design review in place, ensure design review is based on meeting clear and objective standards, as required by state law, within the shortest timeframe possible.
- Allow middle housing units to be independently metered by utilities.



[1] Where appropriate, adopt a subarea plan pursuant to RCW 43.21C.420 together with a planned action pursuant to RCW 43.21C.440(1)(b)(ii); Adopt a categorical exemption pursuant to RCW 43.21C.229(2) for infill residential or mixed-use development; Adopt the maximum allowable exemption levels pursuant to WAC 197-11-800(1) for "minor new construction"

REGULATORY CHANGES TO FACILITATE MIDDLE HOUSING

- Allow middle housing on all lots zoned predominantly for residential use and rename single-family zones to "neighborhood residential" (or something similar) without reference to "single-family."
- Cities with a population greater than 25,000 should allow all middle housing types, among those identified in House Bill 1110, that are authorized on lots zoned predominantly for residential use.[2]
- Do not require undergrounding of utilities when doing so makes project financially infeasible.
- Adopt financial and/or regulatory incentives for property owners to renovate and convert existing single-family homes into middle housing.
- Adopt provisions allowing middle housing to be created for ownership through methods in addition to a condominium.

- Allow up to 12 units per lot and provide other incentives for condominium and townhome development. This would help leverage newly passed condo bills, which among other things, exclude buildings with 12 or fewer units that are no more than three stories[3] from the definition of "multiunit residential building."
- To incentivize development of cottage housing, allow: at least a two-for-one density bonus; cottages up to 1,750 square feet of net floor area, excluding attached garages; and reduced sideyard setbacks.
- Either eliminate mandated minimum parking requirements or significantly reduce parking requirements, especially near transit or in areas with available street parking.
- Allow greater use of private drive access without placing limits on number of homes that can be served by them, to increase flexibility for site layouts, to reduce costs, and to help facilitate more housing choices.
- Authorize an expedited process for dividing an existing lot into two separate parcels.

[2] This includes duplexes, triplexes, and fourplexes; fiveplexes and sixplexes; townhouses; stacked flats; cottage housing; and courtyard apartments.

[3] As authorized under Senate Bill 5792

- Allow reduced private driveway widths of 10 feet.[4]
- Simplify design standards and architectural treatment requirements.
- Ensure that regulations and design standards are updated to facilitate, not inhibit, development of middle housing.
- Provide flexibility to manage the scale of projects through lot coverage and floor area ratio (FAR).[5]
- For cities with a population greater than 25,000, adopt setbacks recommended in model ordinance.[6]
- Exclude items from the calculation of interior floor area as recommended in the model ordinance guidance.[7]
- Allow a maximum building height of 35 feet for middle housing.
- Consider adopting a form-based development code.
- Update local building codes to allow middle housing types with up to 6 units to be built under the International Residential Code.
- Adopt tree regulations based on a "canopy" approach as is used in Snohomish County rather than those based on retention of "significant" trees and replacement ratios for trees that are removed. This approach provides more certainty and objectivity in its application and has been demonstrated to be successful over the last 10 years in increasing tree canopy and retention of existing canopy.
- Ensure local codes and design standards for tree retention/replacement do not preclude development of middle housing on a lot or reduce the number of middle housing units that could be developed

TOOLS & RESOURCES

PLANNING INSIGHTS: PRACTICAL TOOLS

MBAKS: Housing Toolkit	mbaks.com/docs/default-source/documents/advocacy/issue-briefs/mbaks-housing-toolkit.pdf

[4] While the model ordinance recommends private driveways shall not be required to be wider than 12 feet, some jurisdictions, such as Seattle and Kirkland, currently allow for 10 feet.

[5] Allow the following FAR at a minimum:

Unit density on the lot	Minimum floor area ratio (FAR)
1	0.6
2	0.8
3	1.0
4	1.2
5	1.4
6	1.6

[6] Street or front: 15 feet, except 10 feet for lots with a unit density of three or more; Street or front, garage door (where accessed from a street): 20 feet; Side street: Five feet; Side interior: Five feet, and zero feet for attached units internal to the development

[7] Exclude the following from calculation of interior floor area: Cottage housing developments meeting the standards of Section 8 of the model ordinance for cities with a population greater than 25,000; Unoccupied accessory structures, up to a maximum equal to 250 square feet per middle housing unit; Basements, as defined by the city's development regulations; Unenclosed spaces such as carports, porches, balconies, and rooftop decks

Department of Commerce: Middle Housing in Washington Resources	https://www.commerce.wa.gov/serving-communities/growth-management/growth-management-topics/planning-for-middle-housing/
Department of Commerce: User Guide for Middle Housing Model Ordinances	https://deptofcommerce.box.com/s/dip01jnz8i0o2eeuy9v8n39kcm1uc4mk
MRSC: Missing Middle Housing	https://mrsc.org/explore-topics/housing-homelessness/housing/middle-housing
PSRC: Housing Innovation Program	psrc.org/hip
Spokane, WA: Building Opportunity for Housing	https://my.spokanecity.org/projects/shaping-spokane-housing/building-opportunity-for-housing/
Bothell, WA: Middle Housing Update	https://www.bothellwa.gov/2018/Middle-Housing
Kirkland, WA: Cottage, Carriage, and Two/Three-Unit Homes Code	codepublishing.com/WA/Kirkland/html/KirklandZ113/KirklandZ113.html
Portland, OR: Residential Infill Project	portland.gov/bps/rip

HOUSING SHORTAGE RESOURCES

Department of Commerce: Washington state will need more than 1 million homes in next 20 years	https://www.commerce.wa.gov/news/washington-state-will-need-more-than-1-million-homes-in-next-20-years/
Up for Growth: 2023 Housing Underproduction in United States	https://upforgrowth.org/apply-the-vision/2023-housing-underproduction/

COMMUNITY ENGAGMENT TOOLS

Get community buy-in for a range of housing types, affordability, and diverse neighbors.

Sightline Messaging Memos: How to talk about housing in your community	sightline.org/series/flashcards
Coalition for More Housing Choices Local Housing Snapshots	https://www.morehousingchoices.org/housing-snapshot
Opticos: Puget Sound Regional Missing Middle Zoning Toolkit & Resources	https://opticosdesign.com/work/regional-missing-middle-zoning-toolkit-educational-resources/

MIDDLE HOUSING IN THE MEDIA

Sightline Institute: How the Washington Legislature Burst the Housing Abundance Dam	https://www.sightline.org/2023/05/08/how-the-washington-legislature-burst-the-housing-abundance-dam/
The Spokesman-Review: Spokane permanently relaxes regulations allowing more multiplexes and development flexibility	https://www.spokesman.com/stories/2023/nov/22/spokane-permanently-relaxes-regulations-allowing-m/
KUOW: Townhomes Are Making Seattle More Affordable, New Study Finds	kuow.org/stories/redfin-study-shows-townhomes-are-making-seattle-more-affordable

New York Times: Whatever Happened to the Starter Home?	https://www.nytimes.com/2022/09/25/upshot/starter-home-prices.html
New York Times: Why Housing Policy Is Climate Policy	nytimes.com/2019/03/25/opinion/california-home-prices-climate.html

HOUSING CHOICES FOR EVERYONE VIDEO SERIES

Full video series	youtube.com/playlist?list=PL9FDzjJcR6pWI1PacvKGBLMJFS7b28fLO
Backyard Cottages video	youtu.be/k2eoCtfGFmM
Microhousing video	youtu.be/n6fWvtvz5NE
Mixed-Use Apartments Video	youtu.be/NyjzgOPQzoE
Modest Condos video	youtu.be/pUY515N3oYw

LOOK BOOK: MIDDLE HOUSING IMAGES

Sightline Institute: Missing Middle Homes Photo Library	flickr.com/photos/sightline_middle_housing
Missing Middle Housing: The Types Gallery	missingmiddlehousing.com/types
AARP Missing Middle Housing Types Photo Gallery	aarp.org/livable-communities/housing/info-2020/slideshow-missing-middle-housing.html

CITY OF EVERETT
Planning

STAFF MEMORANDUM

TO: Everett City Council
FROM: Yorik Stevens-Wajda, Planning Director
DATE: September 20, 2024
SUBJECT: 1301 Lombard (Waits) Rezone

INTRODUCTION

An application has been submitted by the City of Everett to rezone 0.55 acres from R-2 (Single-Family Detached Medium Density) Zoning with a 28' maximum building height to NB (Neighborhood Business) Zoning with a 3 floor maximum building height.

A future fee simple townhome development in the NB zone may yield between 14 to 16 three-story fee simple townhome units. Fee simple townhome development on the site would create middle housing that offers achievable homeownership opportunities. Further, three story townhome development would still be at a scale that better resembles the character of the existing residential neighborhood and serve as a transition between traditional single-family residences and the abutting Mixed Use zone that currently allows 4-6 story development along Broadway Avenue.

BACKGROUND

Acquisition of Snohomish County Parcel No. 29051700301400, locally known as the Waits Motel, was recently completed through condemnation because of the property's blight on the surrounding neighborhood. Now that the city owns the site, it is in the best interest of the neighborhood and the city to fully ameliorate the blighted status of the property as quickly as possible and advance the site into productive use.

PROPOSAL

The city seeks the following objectives in this rezone:

1. Remedy the blighted condition of the site in a timely manner.
2. Position the property to be marketed for timely redevelopment by the private sector.
3. Ensure that future redevelopment respects the character of the existing neighborhood.
4. Promote new homeownership opportunities

Review process IIIB
According to EMC 15.03.300(B)(1) and (2), a site-specific rezone is a proposal to change the zoning classification of one or more specific properties, which process can be initiated by a private party ***or the city.*** EMC 15.03.300(B)(3)(b) further establishes that where a site-specific rezone ***does not*** require an

amendment to the comprehensive plan, it shall be processed under the REV III B procedures in EMC 15.02.

The subject rezone from R-2 to NB is for a single site is being proposed by the city and the proposal does not require a comprehensive plan amendment because the NB zone is an implementing zone of the existing Single Family land use designation per Table 9 of the Land Use Element of the Everett comprehensive plan.

Therefore, the rezone is a REV III B action under EMC 15.02, which includes an open record hearing and recommendation by the Hearing Examiner with a final decision by the City Council at a closed record hearing.

PUBLIC NOTICE AND COMMENTS

This is a quasi-judicial decision made by the City Council after the Hearing Examiner issues a recommendation. The planning department has circulated notice of the proposal via the following methods and will provide comments received to the city council.

- Planning department webpage
- Planning commission agenda mailing list
- State Environmental Policy Act mailing list
- Publishing notice of planning commission and city council public hearings in the Everett Herald

ENVIRONMENTAL REVIEW

The Planning Director issued a Determination of Nonsignificance under the State Environmental Policy Act. A copy of the SEPA Checklist can be viewed online in the Active Land Use Project Portal under Project Number REVIII24-009.

EVERETT
WASHINGTON

EVERETT CITY COUNCIL
Public Comment Form

Thank you for being here today. Please fill out this form to speak at the council meeting.

State your name and city of residence when you begin speaking. Each person is asked to limit comments to three minutes. This allows everyone a fair opportunity to speak. Return this form to the council administrator before the meeting begins.

All comments must be relevant and delivered to the Council as a whole in a respectful manner. The following comments are not allowed:

- Comments on any kind of campaigning, whether for or against ballot measures or candidates running for office
- Comments advertising any product
- Comments focused on personal matters that are unrelated to City business

You can also submit a comment and attend meetings online at **everettwa.gov/city council**. Click on "Council meeting public comment sign up form." This must be done at least 30 minutes prior to the meeting. Additional instructions are available on the web page.

City staff may wish to contact you for follow up, therefore, your contact information is appreciated.

DATE: 10/23/24

NAME (required): Leo Lange

CITY (required): _____ ZIP (required): _____

EMAIL (optional): _____ PHONE (optional): _____

DISTRICT (circle one): 1 2 3 4 5 Not sure Don't live in city

When would you like to deliver your comments: Is your topic on today's agenda?

☐ During the comment period that will follow the agenda item
AGENDA ITEM #: _____

☑ During the general public comment. Please state the topic you would like to speak on: _____

_____

Public Comment forms are public records and are subject to disclosure pursuant to the Public Records Act (RCW 42.56) and may be posted online with City archived records.

EVERETT
WASHINGTON

EVERETT CITY COUNCIL
Public Comment Form

Thank you for being here today. Please fill out this form to speak at the council meeting.

State your name and city of residence when you begin speaking. Each person is asked to limit comments to three minutes. This allows everyone a fair opportunity to speak. Return this form to the council administrator before the meeting begins.

All comments must be relevant and delivered to the Council as a whole in a respectful manner. The following comments are not allowed:

- Comments on any kind of campaigning, whether for or against ballot measures or candidates running for office
- Comments advertising any product
- Comments focused on personal matters that are unrelated to City business

You can also submit a comment and attend meetings online at **everettwa.gov/city council**. Click on "Council meeting public comment sign up form." This must be done at least 30 minutes prior to the meeting. Additional instructions are available on the web page.

City staff may wish to contact you for follow up, therefore, your contact information is appreciated.

DATE: 10/23/24

NAME (required): Russell Joe

CITY (required): Bellevue ZIP (required): 98005

EMAIL (optional): rjoe@MBAKC.com PHONE (optional): _____

DISTRICT (circle one): 1 2 3 4 5 Not sure (Don't live in city)

When would you like to deliver your comments: Is your topic on today's agenda?

☐ During the comment period that will follow the agenda item
AGENDA ITEM #: _____

☒ During the general public comment. Please state the topic you would like to speak on: Housing + comp Plan

Public Comment forms are public records and are subject to disclosure pursuant to the Public Records Act (RCW 42.56) and may be posted online with City archived records.

EVERETT
WASHINGTON

EVERETT CITY COUNCIL
Public Comment Form

Thank you for being here today. Please fill out this form to speak at the council meeting.

State your name and city of residence when you begin speaking. Each person is asked to limit comments to three minutes. This allows everyone a fair opportunity to speak. Return this form to the council administrator before the meeting begins.

All comments must be relevant and delivered to the Council as a whole in a respectful manner. The following comments are not allowed:

- Comments on any kind of campaigning, whether for or against ballot measures or candidates running for office
- Comments advertising any product
- Comments focused on personal matters that are unrelated to City business

You can also submit a comment and attend meetings online at **everettwa.gov/city council**. Click on "Council meeting public comment sign up form." This must be done at least 30 minutes prior to the meeting. Additional instructions are available on the web page.

City staff may wish to contact you for follow up, therefore, your contact information is appreciated.

DATE: 10/23/2024

NAME (required): John Peeples

CITY (required): Everett ZIP (required): 98208

EMAIL (optional): _____ PHONE (optional): _____

DISTRICT (circle one): 1 2 3 4 (5)? Not sure Don't live in city

When would you like to deliver your comments: Is your topic on today's agenda?

☐ During the comment period that will follow the agenda item
AGENDA ITEM #: _____

☑ During the general public comment. Please state the topic you would like to speak on: Snohomish Co. local voter pamplet content

_____

Public Comment forms are public records and are subject to disclosure pursuant to the Public Records Act (RCW 42.56) and may be posted online with City archived records.

EVERETT
WASHINGTON

EVERETT CITY COUNCIL
Public Comment Form

Thank you for being here today. Please fill out this form to speak at the council meeting.

State your name and city of residence when you begin speaking. Each person is asked to limit comments to three minutes. This allows everyone a fair opportunity to speak. Return this form to the council administrator before the meeting begins.

All comments must be relevant and delivered to the Council as a whole in a respectful manner. The following comments are not allowed:

- Comments on any kind of campaigning, whether for or against ballot measures or candidates running for office
- Comments advertising any product
- Comments focused on personal matters that are unrelated to City business

You can also submit a comment and attend meetings online at **everettwa.gov/city council**. Click on "Council meeting public comment sign up form." This must be done at least 30 minutes prior to the meeting. Additional instructions are available on the web page.

City staff may wish to contact you for follow up, therefore, your contact information is appreciated.

DATE: 10/23/24

NAME (required): Ethan Pfahl

CITY (required): GRANITE FALLS ZIP (required): 98252

EMAIL (optional): _____ PHONE (optional): _____

DISTRICT (circle one): 1 2 3 4 5 Not sure Don't live in city

When would you like to deliver your comments: Is your topic on today's agenda?

☐ During the comment period that will follow the agenda item
AGENDA ITEM #: _____

☑ During the general public comment. Please state the topic you would like to speak on: Stadium AquaSox

_____

Public Comment forms are public records and are subject to disclosure pursuant to the Public Records Act (RCW 42.56) and may be posted online with City archived records.

EVERETT
WASHINGTON

EVERETT CITY COUNCIL
Public Comment Form

Thank you for being here today. Please fill out this form to speak at the council meeting.

State your name and city of residence when you begin speaking. Each person is asked to limit comments to three minutes. This allows everyone a fair opportunity to speak. Return this form to the council administrator before the meeting begins.

All comments must be relevant and delivered to the Council as a whole in a respectful manner. The following comments are not allowed:

- Comments on any kind of campaigning, whether for or against ballot measures or candidates running for office
- Comments advertising any product
- Comments focused on personal matters that are unrelated to City business

You can also submit a comment and attend meetings online at **everettwa.gov/city council**. Click on "Council meeting public comment sign up form." This must be done at least 30 minutes prior to the meeting. Additional instructions are available on the web page.

City staff may wish to contact you for follow up, therefore, your contact information is appreciated.

DATE: 10/23/24

NAME (required): Alexis Boies

CITY (required): everett ZIP (required): 98201

EMAIL (optional): _____ PHONE (optional): _____

DISTRICT (circle one): 1 (2) 3 4 5 Not sure Don't live in city

When would you like to deliver your comments: Is your topic on today's agenda?

☐ During the comment period that will follow the agenda item
AGENDA ITEM #: _____

☒ During the general public comment. Please state the topic you would like to speak on: buffer zone / compass

_____

Public Comment forms are public records and are subject to disclosure pursuant to the Public Records Act (RCW 42.56) and may be posted online with City archived records.

EVERETT
WASHINGTON

EVERETT CITY COUNCIL
Public Comment Form

Thank you for being here today. Please fill out this form to speak at the council meeting.

State your name and city of residence when you begin speaking. Each person is asked to limit comments to three minutes. This allows everyone a fair opportunity to speak. Return this form to the council administrator before the meeting begins.

All comments must be relevant and delivered to the Council as a whole in a respectful manner. The following comments are not allowed:

- Comments on any kind of campaigning, whether for or against ballot measures or candidates running for office
- Comments advertising any product
- Comments focused on personal matters that are unrelated to City business

You can also submit a comment and attend meetings online at **everettwa.gov/city council**. Click on "Council meeting public comment sign up form." This must be done at least 30 minutes prior to the meeting. Additional instructions are available on the web page.

City staff may wish to contact you for follow up, therefore, your contact information is appreciated.

DATE: 10/23/24

NAME (required): Bob Wohl

CITY (required): Everett ZIP (required): 98201

EMAIL (optional): _____ PHONE (optional): 425-299-0827

DISTRICT (circle one): 1 2 3 4 5 Not sure Don't live in city

When would you like to deliver your comments: Is your topic on today's agenda?

☒ During the comment period that will follow the agenda item
AGENDA ITEM #: 7

☐ During the general public comment. Please state the topic you would like to speak on: _____

_____

Public Comment forms are public records and are subject to disclosure pursuant to the Public Records Act (RCW 42.56) and may be posted online with City archived records.