# The City of Olympia's Annex to the Natural Hazards Mitigation Plan for the Thurston Region

January 29, 2024

# Table of Contents

U.S. Department of Homeland Security
FEMA Region 10
130 228th Street, SW
Bothell, WA 98021-8627

FEMA

February 26, 2024

The Honorable Tye Menser
Chair, Board of Thurston County Commissioners
3000 Pacific Avenue, S.E.
Olympia, WA 98501

Dear Chair, Menser:

On February 15, 2024, the United States Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Thurston County Multi-Jurisdiction Hazard Mitigation Plan as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance grants projects through February 14, 2029, through your state:

| | |
|---|---|
| City of Olympia | Public Utility District One |

FEMA individually evaluates all application requests for funding according to the specific eligibility requirements of the applicable program. Though a specific mitigation activity or project identified in the plan may meet the eligibility requirements, it may not automatically receive approval for FEMA funding under any of the programs. Approved mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System. For additional information regarding the Community Rating System, please visit: www.fema.gov/national-flood-insurance-program-community-rating-system or contact your local floodplain manager.

Over the next five years, we encourage your communities to follow the plan's schedule for monitoring and updating, and to develop further mitigation actions. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Kevin Zerbe, State Mitigation Strategist with Washington Emergency Management Division, at (253) 512-7467, who coordinates and administers these efforts for local entities.

Sincerely,

Kristen Meyers, Director
Mitigation Division

Enclosures

cc: Tim Cook, Washington Emergency Management Division

**RESOLUTION NO.** M-2503

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF OLYMPIA, WASHINGTON, APPROVING AND ADOPTING THE HAZARDS MITIGATION PLAN FOR THE THURSTON COUNTY REGION AND THE OLYMPIA ANNEX THERETO**

**WHEREAS**, the fourth edition of the Hazards Mitigation Plan for the Thurston Region is the result of a multi-jurisdictional process to development a mitigation strategy to reduce the risks of the most destructive hazards that threaten the region, and

**WHEREAS,** the Hazards Mitigation Plan for the Thurston Region specifically addresses communities and special districts within Thurston County and provides for a regional cooperative approach that has provide a comprehensive document at minimal cost to the participating regional partners, and

**WHEREAS**, the Olympia Annex describes the City's planning process and expands upon the regional plan by identifying unique characteristics of the jurisdiction, detailing the City's Risk Rating for all appropriate hazards, cataloging the City's past, current, and proposed Mitigation Initiatives, and documenting the City's participation in the National Flood Insurance Program, and

**WHEREAS,** the projects, known as mitigation initiatives, were developed by the Emergency Management Committee based on input from each City department that the Emergency Management Committee represents, and including representatives from Olympia's Community Planning and Development and Climate Program, and

**WHEREAS**, the Olympia Annex is a supplementary document to the City's Comprehensive Emergency Management Plan and the City must have a current Hazards Mitigation Plan and Comprehensive Emergency Management plans in order to apply for certain types of state and federal grants for the City, and

**WHEREAS**, the Hazards Mitigation Plan for the Thurston Region and the Olympia Annex has been submitted for state and federal approval and approval;

**NOW, THEREFORE, THE OLYMPIA CITY COUNCIL DOES HEREBY RESOLVE** as follows:

1. The Olympia City Council approves the Hazards Mitigation Plan for the Thurston Region and Olympia Annex to said plan. While content related to Olympia may require revisions to meet the plan approval requirements, changes occurring after adoption will not require Olympia to re-adopt any further iterations of the Hazards Mitigation Plan for the Thurston Region and Olympia Annex.

2. The City Manager is directed and authorized to execute any and all documents necessary for the Hazards Mitigation Plan for the Thurston Region and the Olympia Annex to said plan as may be required, and to make any minor modifications to said documents that are consistent with the intent of the authority conferred herein, including authority to correct any scrivener's errors.

**PASSED BY THE OLYMPIA CITY COUNCIL** this 13th day of February 2024.

MAYOR

ATTEST:

Sean Krier
CITY CLERK

APPROVED AS TO FORM:

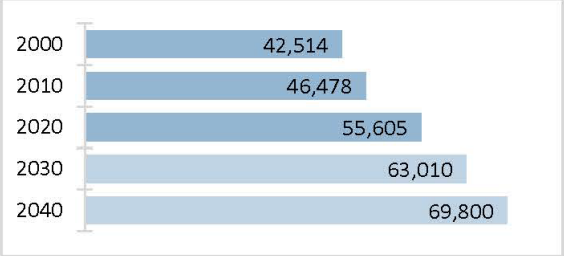
DEPUTY CITY ATTORNEY

# Community Profile

## Olympia — 2022 Statistical Profile

## Demographics

**Population – Estimates & Projections**



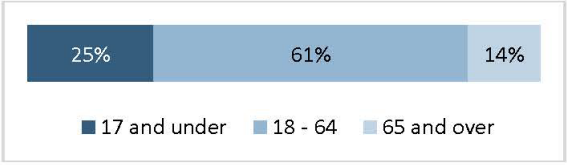

**Average Annual Population Growth**

| | |
|---|---|
| 2000-2010: | 0.9% per year |
| 2010-2020: | 1.8% per year |

**Language Spoken at Home (2016-2020)***

| | |
|---|---|
| English Only | 86.0% |
| Spanish | 4.4% |
| Korean | 1.0% |
| Chinese | 0.7% |
| Vietnamese | 2.1% |
| Tagalog | 0.6% |
| Other Language | 5.2% |
| **TOTAL** | **100.0%** |

**Age (2010)**




Median Age: 38

**Race & Ethnicity (2020)**

Race

| | |
|---|---|
| White | 74% |
| Black & African American | 3% |
| American Indian & Alaska Native | 1% |
| Asian | 7% |
| Native Hawaiian & Other Pacific Islander | 1% |
| Other Race | 3% |
| Two or More Races | 11% |
| **TOTAL** | **100%** |

Ethnicity

| | |
|---|---|
| Hispanic or Latino | 9% |
| Not Hispanic or Latino | 91% |
| **TOTAL** | **100%** |

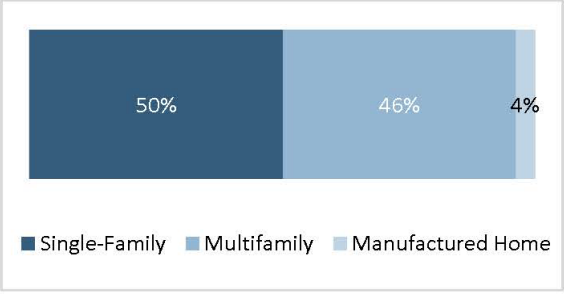
## Households & Housing

**Households (2020)**

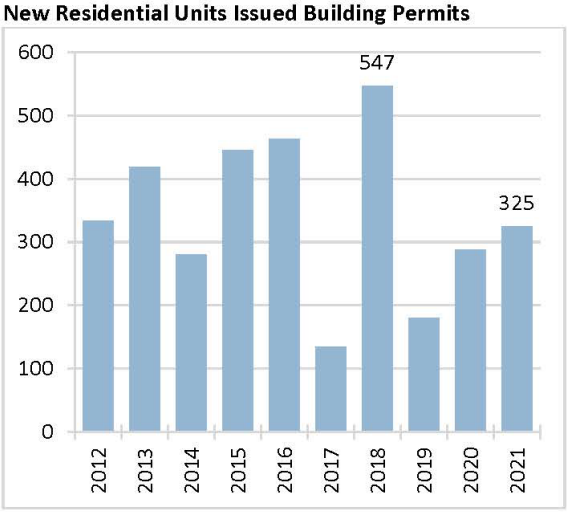
| | |
|---|---|
| Total Households: | 24,393 |
| Average Household Size: | 2.21 |

**Median Home Sale Price (2021):** $470,000

**Existing Housing Units (2022)**




**New Residential Units Issued Building Permits**



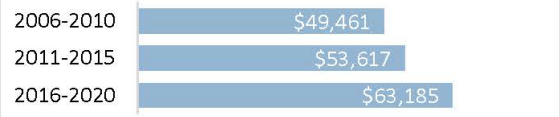

**Estimates based on survey data and may have a large margin of error.*

*Updated Nov. 2022*

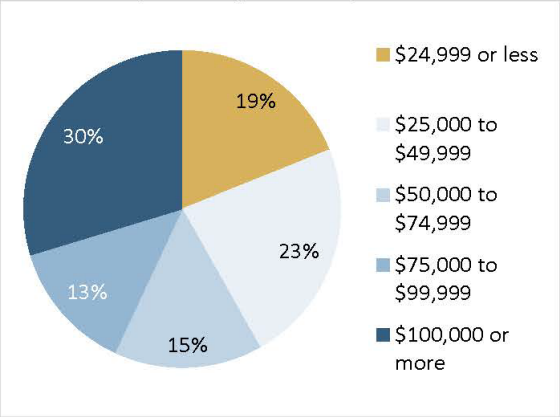
# Olympia — 2022 Statistical Profile

## Employment & Income

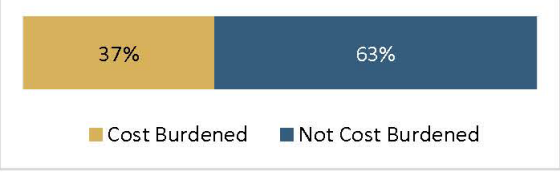
**Median Household Income***




**Households by Income (2016-2020)***



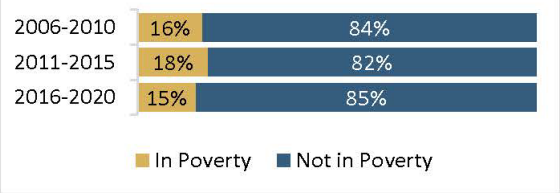

**Cost Burdened Households (2016-2020)***




| | |
|---|---|
| Cost Burdened | 8,582 |
| *Severely Cost Burdened*** | *4,055* |
| Not Cost Burdened | 14,449 |
| **TOTAL Households** | **23,031** |

*****Severely cost burdened households are a subset of cost burdened households.*

**Poverty Rate***

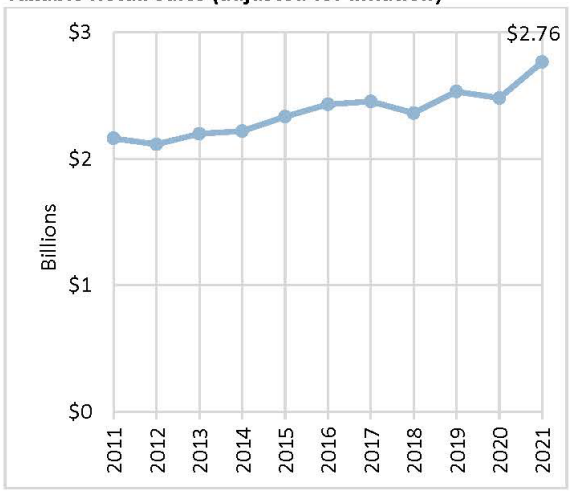



**Jobs (2017 Estimate)**

| | |
|---|---|
| Resource, Construction, Utilities | 1,860 |
| Manufacturing, Wholesale Trade | 2,090 |
| Retail, Accommodation, Food | 10,910 |
| Transportation, Warehousing | 620 |
| Services | 22,370 |
| Finance, Insurance, Real Estate | 4,090 |
| Government | 18,690 |
| **Total Jobs**** | **60,630** |

*****Numbers may not add due to rounding.*

**Taxable Retail Sales (adjusted for inflation)**




**LEARN MORE** about statistics, trends, analyses and comparisons for Thurston County and its jurisdictions at The Profile: www.trpc.org/theprofile.

Thurston Regional Planning Council
2411 Chandler Ct SW
Olympia, WA 98502
info@trpc.org
Ph: 360-956-7575

*Estimates based on survey data and may have a large margin of error.

*Updated Nov. 2022*

# Summary and Adoption

The fourth edition of the Natural Hazards Mitigation Plan for the Thurston Region, referred to here as the Regional Plan, is the result of a multi-jurisdictional process to develop a mitigation strategy to reduce the risks of the most destructive hazards that threaten the region. This plan specifically addresses communities and special districts within Thurston County. This regional cooperative approach, led by Paul Brewster at Thurston Regional Planning Council (TRPC), has provided a comprehensive document at minimal cost to the participating regional partners.

Thurston County jurisdictions, including special purpose districts, have the option of developing their own more jurisdiction-specific hazard mitigation plans, referred to as an "annex". The City of Olympia has elected to once again update its Olympia Annex.

The Board of County Commissioners will adopt the Regional Plan and the Thurston County specific annex. Other jurisdictions will review the document and adopt the Regional Plan and their specific annex. In adopting the Olympia Annex, the City of Olympia also adopts the Regional Plan which describes the overarching regional approach to hazard mitigation. Throughout this document, the term "Hazard Mitigation Plan" will mean the Regional Plan as well as the Olympia Annex. Taken together, the Regional Plan and the Olympia Annex provide the City with a comprehensive mitigation strategy.

The Olympia Annex describes the City's planning process and expands upon the Regional Plan by identifying unique characteristics of the jurisdiction, detailing the City's Risk Rating for all appropriate hazards, cataloging the City's past, current, and proposed Mitigation Initiatives, and documenting the City's participation in the National Flood Insurance Program. The Olympia Annex identifies potential City specific projects, designed to mitigate the impacts of those hazards that could be undertaken in the future depending on funding, direction, and need. The projects, known as mitigation initiatives, are developed by the City's Emergency Management Committee and are based on input from each City department. The Olympia Annex has been reviewed by Olympia Community Planning and Development to ensure that it does not conflict with the Comprehensive Plan or create potential conflicts with other City work. The public has also been given opportunities to comment on the Regional Plan and the Olympia Annex.

The Olympia Annex is a supplementary document to the City's Comprehensive Emergency Management Plan and the basis upon which the City's Hazard Identification and Vulnerability Analysis is derived. In order to apply for certain types of state and federal grants the City must have current Hazards Mitigation and Comprehensive Emergency Management plans in place.

# City of Olympia Plan Development Process

## Hazard Mitigation Plan Development Staff

The City of Olympia Emergency Management Coordinator, Mike Buchanan attended the Regional Natural Hazards Workgroup meetings on behalf of the City of Olympia and coordinated local planning efforts with city staff and the City Council. To assist the Emergency Management Coordinator with the update of the Olympia Annex, an Olympia Annex Update Team consisting of representatives from the Public Works Department (Susan Clark, Engineering and Planning Supervisor, and Patrick Knouff, Engineering Project Coordinator) and the City's Climate Program (Rich Hoey, Assistant City Manager and Dr. Pamela Braff, Climate Program Director) was formed. In addition to members of the Olympia Annex Update Team, a representative from Community Planning and Development (Joyce Phillips, Principal Planner) assisted with the "Community Capability Assessment" located in Appendix A, and Olympia's Flood plain Administrator, Erik Jensen, assisted with the "NFIP Capability Assessment" also located in Appendix A.

Finally, the City of Olympia, Emergency Management Committee (EMC) also assisted in the update of the Olympia Annex.

The EMC is made up of members from every department in the City. Most members are lead workers or above, up to and including some department directors. The EMC manages the City's Comprehensive Emergency Management Plan and staffs the City's Emergency Operations Center (EOC) when activated. The EOC coordinates the City response to disasters and interfaces the response with the City Council via the City Manager. In the event of policy direction needs, the EOC requests the seating of the Policy Group made up of the City Manager and the City Council. The following personnel comprise the EMC:

| Representative | Title |
|---|---|
| **Sullivan, Debbie** | Assistant City Manager |
| **Adams, Jeremy** | Service Desk Administrator |
| **Baker, Mike** | Outdoor Program Coordinator |
| **Watts, Carl** | Senior HR Analyst |
| **Braseth, Kellie** | Strategic Communications Director |
| **Buchanan, Mike** | Interim Deputy Chief |
| **Clark, Susan** | Engineering and Planning Supervisor |
| **Orozco, Salvador** | Safety Coordinator |
| **Parker, Shelby** | Deputy Chief |
| **Finch, Jeff** | Deputy Building Official |
| **Carson, Todd** | Interim Fire Chief |

| | |
|---|---|
| **Keehan, Laura** | Engineering and Planning Supervisor |
| **Knouff, Patrick** | Project Coordinator |
| **Lindsay, John** | Transportation Data Coordinator |
| **River, Scott** | Director of Recreation and Facilities |
| | |
| **Niehuser, Sylvana** | Director of Parks Planning and Maintenance |

## Hazard Mitigation Plan Development

During each Hazard Mitigation Plan update cycle presentations are made to the Olympia City Council during their regular meetings. The presentations include an overview of the planning process, a review of the previous plan including progress made, and a discussion of the upcoming work. New mitigation initiatives and the status of the past initiatives and their ranking are also covered during these meetings. The following activities support this ongoing process:

| Date | Location | Meeting | Action |
|---|---|---|---|
| | | | |
| March 21, 2023 | Olympia City Hall | Study Session – 2022 Comprehensive Emergency Management Plan (CEMP) Review | Presentation to Council on the status of the City of Olympia Emergency Management Program, the updated CEMP, and the Thurston County Hazard Mitigation Plan (HMP) to include Olympia's Annex to the HMP. |
| March 29, 2023 | Olympia City Hall | Plan Development | Olympia staff met to coordinate the development of the Olympia Annex. |
| April 25, 2023 | Olympia City Hall | Plan Development | Olympia staff met to coordinate the development of the Olympia Annex. |
| May 8, 2023 | Thurston Regional Planning Council | Regional Initiative Prioritization | Olympia staff participated in the process of prioritizing the regional mitigation initiatives. |
| June 8, 2023 | Olympia Fire Department | Olympia Emergency Management Committee | Provided a briefing on the Hazard Mitigation Plan. |
| June 21, 2023 | Olympia City Hall | Initiative Prioritization | City staff prioritized Olympia's proposed mitigation initiatives for incorporation into the Olympia Annex. |
| July 13, 2023 | Olympia City Hall | Capability Assessment | City staff completed the required Capability Assessment for Appendix A of the Olympia Annex. |
| July 21 -August 25, 2023 | Virtual | Public Outreach | Hazard Mitigation Plan Virtual Open House. Participants were given the opportunity to provide input on the proposed regional and Olympia-specific mitigation measures. |
| July 26-August 8, 2023 | Thurston County Fair | Public Outreach | Fair attendees were given the opportunity to learn about the Hazard Mitigation Plan and the Plan's Virtual Open House. |

| | | | |
|---|---|---|---|
| July 27 & August 7, 2023 | Social Media | Public Outreach | The Hazard Mitigation Plan Virtual Open House and Thurston County Fair News Story was announced through social media. |
| August 8, 2023 | Olympia E-News Letter | Public Outreach | The Hazard Mitigation Plan Virtual Open House was announced, and the public was encouraged to review and comment. |
| August 10, 2023 | Olympia Fire Department | Olympia Emergency Management Committee | Provided a briefing on the Hazard Mitigation Plan. |
| September 14, 2023 | Olympia Fire Department | Olympia Emergency Management Committee | Provided a briefing on the Hazard Mitigation Plan. |
| September 23, 2023 | Peter G Schmidt ES | Public Outreach | Emergency Preparedness Expo. |
| November 3 to November 17, 2023 | Olympia E-News and social media | Public Outreach | Announcement of the final draft Hazard Mitigation Plan availability for public review and comment via on-line story map |
| TBA | Olympia E-News Letter and social media | Public Outreach | Announcement of the availability of the Olympia Annex and review process. |
| TBA | Olympia City Hall | Olympia City Council | Review the 2023 Draft of the Hazard Mitigation Plan. |
| TBA | Olympia City Hall | Olympia City Council | Adopt the Hazard Mitigation Plan. |

## Opportunities for Public Participation

To inform the Hazard Mitigation Plan update process, a Thurston County Communities Natural Hazard and Resiliency Survey was released by the Thurston Regional Planning Council from June 6 to July 31, 2022. The survey included 12 questions about perceived risks and preferred mitigation actions to take to address the perceived risks. The survey was taken by 668 individuals, with 187 respondents from the City of Olympia. Olympia residents were most concerned about climate change, earthquakes, and extreme heat following close behind. Like other communities, landslides and tsunamis rank of least concern.

To seek input on the proposed regional and Olympia-specific mitigation initiatives, a virtual “open house” was available from July 21, 2023, through August 25, 2023. Olympia helped advertise this community input opportunity through social media and e-newsletters. The Thurston Regional Planning Council also coordinated the advertisement of the virtual open house, including during the Thurston County Fair.

To ensure transparency and inclusivity, the final draft Hazard Mitigation Plan underwent a public review and comment period from November 3 to November 17, 2023. The Olympia Annex was included in this outreach effort. Additional details on the public review process can be found in Chapter 6 of the Regional Plan and the comments specific to the Olympia Annex received during this review period can be found in the Public Summary Section of this Olympia Annex.

In addition to providing participants with information about the natural hazards facing the Thurston County region, the virtual open house asked participants to select which three of the 13 Olympia-specific proposed mitigation initiatives they would prioritize the highest and also offered the opportunity for

feedback on other actions that should be taken to address natural hazards. The results of the survey can be found in Appendix B.

## Future Public Participation

Presentations will be made to the Olympia City Council. The draft Olympia Annex will be advertised through the City's various social media accounts and made available for public comment. In addition, as mitigation initiatives move forward, the public will have the opportunity to provide feedback on specific projects and project deliverables. Special emphasis will be placed on gaining participation from property owners, residents, tenants, neighborhood associations, etc. who will experience the greatest potential impacts from a given project, i.e. those in the immediate vicinity of a project.

## Integration in Plans, Policies, and Planning Mechanisms

The Hazard Mitigation Plan, particularly the Olympia Annex, is closely integrated with the City's Comprehensive Plan, Comprehensive Emergency Management Plan, Olympia Sea Level Response Plan, and Shoreline Master Program as well as master plans prepared by the Drinking Water, Wastewater, and Storm and Surface Water utilities. The Comprehensive Plan describes the City's long-term visions and goals and outlines the City's policies for Land Use, Housing, Capital Facilities, Utilities, Transportation, Economic Development, and Parks and Recreation. The Capital Facilities Plan, a component of the comprehensive plan, is the mechanism by which the City schedules the timing, location, projected cost, and revenue sources for the capital improvements identified for implementation. These capital improvements often reflect mitigation initiatives identified in the Hazard Mitigation Plan. The 6-year finance plan for capital projects is amended annually and is open to public comment. Olympia is currently undergoing a periodic update of its Comprehensive Plan. The Hazard Mitigation Plan, particularly the Olympia Annex, will serve as a source of background material during the update process.

The Hazard Mitigation Plan is foundational to the Comprehensive Emergency Management Plan as it identifies the City's most likely hazards and most vulnerable areas. This identification impacts how the City plans and prepares for emergencies and disasters. Planning and preparedness are key elements of the Comprehensive Emergency Management Plan. The Hazard Mitigation Plan also shapes department level emergency response plans, which are components of the City's Emergency Management program.

The Olympia Sea Level Response Plan and Shore Line Master Program are both influenced by the findings in the Hazard Mitigation Plan, especially the Olympia Annex, specifically as it relates to the hazards of severe weather, flooding, and climate change. The Olympia Sea Level Response Plan and Shore Line Master Program reinforce city policies and regulations that directly impact building standards in the downtown and waterfront portions of the City.

The City of Olympia is conducting a Climate Risk and Vulnerability Assessment (CRVA) to identify and evaluate the potential impacts of climate change on populations, systems, assets, and services in

Olympia. The results of the CRVA will inform future climate resilience planning efforts and be integrated into the City's Comprehensive Plan and future updates to the Olympia Annex.

Finally, the City of Olympia will consider the findings of the Community Capability Assessment and the NFIP (National Flood Insurance Program) Capability Assessment completed for this Annex Update as other City of Olympia plans, policies, and regulations are updated. See Appendix A and the Community Capability Assessment and National Flood Insurance Program Capability Assessment section of this Olympia Annex for additional information.

## Community Growth and Development

Each of the aforementioned plans and the City's Municipal Codes are revised and amended as the City develops. OMC 16.04 and 16.70 address flood plain management in several ways including but not limited to limiting development that will impact natural flood plain systems or unnaturally divert floodwaters and requiring new construction projects to use techniques to protect against flooding. OMC 17.80 addresses sea level rise by establishing the City's lands that are at risk to sea level rise and by establishing new provisions and standards in those identified areas. Provisions include elevation of the lowest floor, construction materials and methods, utilities, and review of building permits. Standards are established for residential and nonresidential construction. OMC 16.04 and 16.05 address seismic resiliency by establishing design and inspection standards. OMC 9.48 mitigates fire hazards by banning the sale and discharge of fireworks within the City. OMC 16.04, 16.05, 16.40, and 16.32 mitigate fire hazards by establishing sprinkler systems requirements for residential and commercial buildings, both existing and new construction.

Since the City of Olympia last adopted the Hazards Mitigation Plan for the Thurston Region in 2016, the city's population has reached 55,605 (2020 data), an increase of 4,005 people. The Hazards Mitigation Plan for the Thurston Region provides detailed information on population, housing, demographics, employment, income, and land use characteristics. In addition, the hazard profiles in the Regional Plan chapters 4.1 through 4.9 provide hazard exposure or vulnerability data for area, population, housing, employment, and essential facilities data with additional Olympia-specific information contained in this Olympia Annex.

## Updates

City staff will brief the Olympia City Council as progress is made on mitigation initiatives. As initiatives are completed, the City Council will be closely involved in the review, revision, and execution of the remaining initiatives. The agendas and notices for these meetings are posted on the City's website. These meetings are open to the public and allow for additional public comment on the Hazard Mitigation Plan. The City will also work with Thurston County and Thurston Regional Planning Council on subsequent updates to the plan.

## Mitigation Initiative Prioritization Process

The Olympia EMC was involved in developing the mitigation initiatives for both the 2003 plan and the 2009, and 2016 updates while the Olympia Annex Update Team primarily assisted with the 2024 update. During all plan updates, the previous mitigation initiatives were reviewed for current status and relevance. After this was completed, new mitigation initiatives were considered. This process included a review of emerging hazards and initiatives from the other jurisdictions' earlier plans to see if there were items that would also benefit the City of Olympia. For the 2024 update, several new ideas were selected and crafted into new Mitigation Initiatives for Olympia.

After receiving input from other City of Olympia staff representatives, a subcommittee of the Olympia Annex Update Team discussed the benefits and costs of each initiative recommended for inclusion in the 2024 update. Members of the subcommittee provided input based on their experience with an understanding of past disaster events and the ability of the mitigation initiatives to protect public and private property. The subcommittee of the Olympia Annex Update Team weighed the significance of

the initiatives using the criteria established for the regional planning process. The final scoring of the initiatives against the regional criteria shown below occurred through an iterative, consensus-based process.

- **Hazard Risk Rating.** Does the mitigation initiative address a high, medium, or low-risk hazard?
- **Project Cost.** Is the implementation of the mitigation initiative expected to cost less than $100K, between $100K to $500K, or more than $500K?
- **Hazard Mitigation Plan Goals and Objectives.** Does the mitigation initiative strongly support at least four policies, at least two policies, or one policy?
- **Social Vulnerability.** Will the action produce a significant and direct benefit for socially vulnerable or underserved communities, or will the action produce a benefit for socially vulnerable or underserved communities, or will the action have minimal benefit?
- **Changes in Development.** Does the action include measures that strongly account for changes in development, or does the action include some measures that account for changes in development, or does the action include minimal measures?
- **Climate Change.** Does the action strongly account for the effects of climate change, or does the action account for the effect of climate change, or does the action minimally account for the effects of climate change?
- **Geographic Impact.** Does the action address hazard risks for the entire affected area of the community, across at least half of the affected area or a very limited portion of the affected area? The order of implementation may vary from the identified scoring due to changing hazard conditions or the criteria of available city funds and grants. The city will pursue funding for projects that stand the greatest chance of competing for limited state and federal mitigation grant programs. The results of the scoring exercise completed by a subcommittee of the Olympia Annex Update Team appears below:

| Jurisdiction/District/Agency Name: | City of Olympia | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Required Criteria | | | | | | | | Optional | | | | |
| Mitigation Project | 1. Hazard Risk Rating | 2. Project Cost | 3. HMP Goals and Objectives | 4. Life/Safety | 5. Social Vulnerability | 6. Changes in Development | 7. Climate Change | 8. Geographic Impact | 9. Capacity Building | 10. Other Strategic Plan Goals | 11. Co-Benefits | 12. Grant Eligibility | Total Score |
| Critical Facilities Replacement/Retrofit | | | | | | | | | | | | | |
| **OLY-EH 1** Conduct seismic assessments and complete retrofit of critical facilities and infrastructure | 5 | 3 | 5 | 5 | 3 | 3 | 0 | 5 | | | | | 29 |
| **OLY-EH 2** Construct a new Maintenance Center | 5 | 1 | 3 | 3 | 3 | 3 | 0 | 5 | | | | | 23 |
| **OLY-MH 7** Designate McAllister Wellfield as a sole source aquifer | 3 | 5 | 3 | 3 | 3 | 3 | 0 | 5 | | | | | 26 |
| **OLY-MH 8** Assess and install seismic valves on the McAllister Wellfield Transmission Main | 5 | 1 | 5 | 3 | 3 | 3 | 0 | 5 | | | | | 25 |
| **OLY-MH 9** Replacement of the sewer and water mains located on the Percival Creek Utility Bridge | 5 | 1 | 5 | 3 | 3 | 1 | 1 | 3 | | | | | 23 |
| **OLY-MH 3** Add backup generators to critical facilities | 5 | 3 | 5 | 5 | 5 | 1 | 3 | 5 | | | | | 27 |
| **OLY-SH 1** Replace the existing overhead utility lines throughout the City of Olympia | 5 | 0 | 1 | 1 | 3 | 1 | 3 | 5 | | | | | 19 |
| Plan Coordination and Implementation | | | | | | | | | | | | | |
| **OLY-FH1** Continue to plan, identify, and implement strategies to mitigate the adverse effects of sea level rise | 3 | 3 | 5 | 3 | 3 | 5 | 5 | 5 | | | | | 32 |
| Hazard Preparedness | | | | | | | | | | | | | |
| **OLY-MH 1** Add infrastructure to facilitate multiple radio channels for the Public Works department | 5 | 3 | 5 | 3 | 3 | 0 | 3 | 5 | | | | | 27 |
| **OLY-MH 10** Develop and Adopt a Climate Resilience Plan | 3 | 3 | 5 | 3 | 5 | 5 | 5 | 5 | | | | | 34 |
| **OLY-MH 11** Develop a Resilience Hub Strategy | 3 | 3 | 5 | 3 | 5 | 3 | 5 | 3 | | | | | 30 |
| Hazard Damage Reduction | | | | | | | | | | | | | |
| **OLY FH 4** Design and construct stormwater conveyance systems | 3 | 1 | 3 | 1 | 1 | 1 | 3 | 1 | | | | | 14 |
| **OLY FH 5** Protect Heritage Park and downtown corridor from seasonal flooding | 3 | 3 | 5 | 3 | 3 | 5 | 5 | 5 | | | | | 32 |

Benefit points: High=5; Medium=3; Low=1; No benefit=0

## Community Capability Assessment and National Flood Insurance Program Capability Assessment

To effectively develop and implement the City's mitigation strategy, city staff, stakeholders, and the public must understand what tools are in their hazard mitigation toolbox. For example, it is important to understand if a community has the authorities, regulations, plans, financing, and technical capabilities to understand their risks, vulnerabilities, and capabilities to become more disaster resilient.

Additionally, communities across the country build their flood management capabilities by participating in the National Flood Insurance Program (NFIP). The NFIP supports flood risk reduction before and after disasters. The NFIP allows property owners and renters in participating communities to purchase federal flood insurance policies to recover financial losses after a flood. To participate, communities adopt and enforce floodplain management policies to reduce the effects of flooding. The NFIP is a key capability for plan participants.

In March 2023, fifteen agencies and stakeholders from the Thurston Hazard Mitigation Planning Workgroup participated in an online strengths, weaknesses, obstacles, and opportunities (SWOO) assessment to gauge the region's ability to support the regional mitigation strategy. The key findings of that assessment can be found in the Regional Plan Chapter 3.1.

In July 2023 the members of the Olympia Annex Update Team plus a representative from Community Planning and Development, completed a series of detailed capability assessment worksheets to highlight the City's capabilities, strengths, and gaps in the City's ability to implement mitigation strategies. This "Community Capability Assessment" can be found in Appendix A. Additionally, Olympia's Floodplain Administrator assisted the Olympia Annex Update Team by preparing the "NFIP Capability Assessment" which is also available in Appendix A.

City staff will use the results of the Community Capability Assessment and the NFIP Capability Assessment as the implementation of the Olympia Annex occurs and as changes to the plans, policies, and planning mechanisms discussed earlier are contemplated. Additionally, both assessments will also inform the update of the City of Olympia Comprehensive Plan during the currently occurring periodic update.

# City of Olympia Risk Assessment

## Introduction

The risk assessment provides information about the hazards that threaten the City of Olympia. This information provides the factual basis to identify and support a strategy that can effectively mitigate the effects of the hazards that threaten this jurisdiction's safety and challenge its ability to perform essential functions.

The explanation of the methodology used to develop the risk assessment can be found in the Regional Plan Chapter 4.0.

## Local Risk Assessment

A comprehensive risk assessment of the major natural hazards that threaten the City of Olympia was developed for this Olympia Annex through the regional risk assessment process described in Chapter 4.0 of the Regional Plan. The regional risk assessment and its hazard profiles serve as the foundation for Olympia's risk assessment. A list of all of the potential natural hazards that could impact Olympia is located in Chapter 4.0 of the Regional Plan. Chapter 4.0 includes natural hazard profiles for the following nine hazards: dam failure, earthquake, flood, landslide, sea level rise, severe weather, volcanic activity, and wildland fire. Each profile defines the hazard and describes its effects, severity, impacts, probability of occurrence, and historical occurrences. The regional profiles describe Olympia's vulnerabilities in terms of the portion of the jurisdiction's land base or service area, population, employment, dwelling units, jurisdiction-owned assets, and critical facilities that are within each hazard zone.

This section of the Olympia Annex provides additional details or explains differences where Olympia's risks for each hazard vary from the risks facing the entire planning area. In other words, this section of the Olympia Annex must be reviewed in concert with Chapters 4.0 through 4.9 of the Regional Plan in order to obtain a complete picture of the risks facing the City of Olympia and its residents from natural hazards. Maps of the hazards that affect the City of Olympia are scaled to local boundaries and are included in this section. (Note: Because the City of Olympia is not facing impacts from a dam failure, a dam failure risk assessment has not been included in the Olympia Annex.)

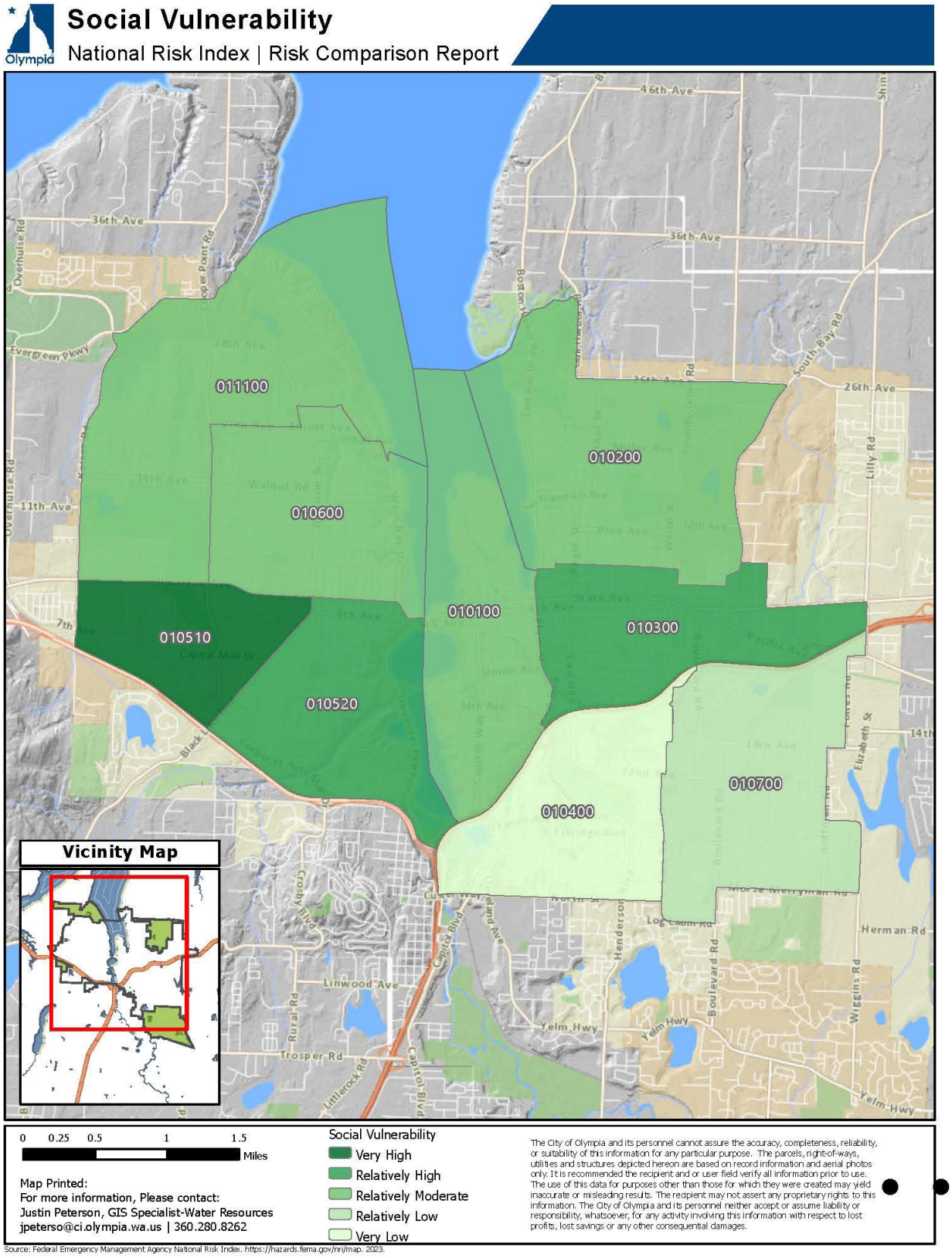
## Social Vulnerability Rating and National Risk Index

Social vulnerability is the susceptibility of social groups to the adverse impacts of natural hazards, including disproportional death, injury, loss, or disruption of livelihood. The Federal Emergency Management Agency (FEMA) has developed an online tool – the National Risk Index - which allows communities to compare the relative level of a community's social vulnerability compared to all other communities at the same level. The City of Olympia's social vulnerability score by census tract can be seen on the included "Social Vulnerability" map. According to the National Risk Index, one

census tract located in southwest Olympia is ranked as “very high” for social vulnerability and two are ranked as “relatively high”. All other census tracts are scored as relatively moderate.

Community resilience is the ability of a community to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions. The National Risk Index also includes a community resilience score and rating which represents the relative level of a community’s resilience compared to all other communities at the same level. A community’s community resilience score measures its national rank and is inversely proportional to a community’s risk. A higher community resilience score results in a lower risk index score. The City of Olympia’s community resilience score can be seen on the included “Community Resilience” map. According to the National Risk Index, all City of Olympia’s census tracts as “relatively high” related to community resilience.

A risk index score is the third component of information provided in the National Risk Index. Risk scores are calculated using an equation that combines scores for expected annual loss due to natural hazards (see the “Expected Annual Costs” map for the City of Olympia’s composite score), a community’s social vulnerability score, and a community’s community resilience score. The City of Olympia’s composite score for the 18 hazards included in the National Risk Index can be seen in the “Risk Index” map. According to the National Risk Index, two City of Olympia census tracts are ranked as “relatively high”: the downtown core and southeast Olympia. The National Risk Index also includes risk scores for individual hazards. Olympia’s risk scores by individual hazard are further explained in the following hazard risk assessment sections.


Social Vulnerability
National Risk Index | Risk Comparison Report
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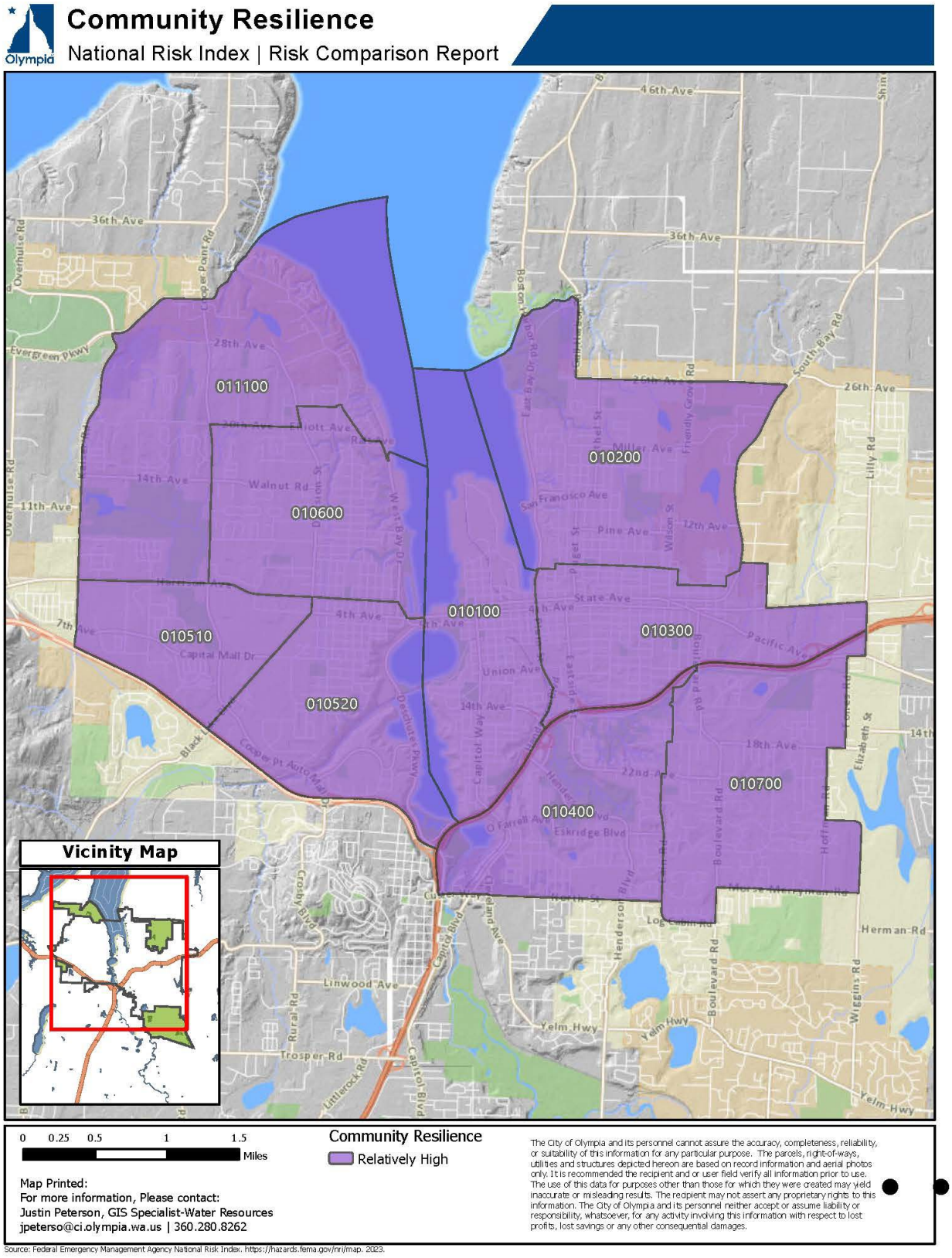
Vicinity Map
0 0.25 0.5 1 1.5
Miles
Map Printed:
For more information, Please contact:
Justin Peterson, GIS Specialist-Water Resources
jpeterso@ci.olympia.wa.us | 360.280.8262
Social Vulnerability
Very High
Relatively High
Relatively Moderate
Relatively Low
Very Low
The City of Olympia and its personnel cannot assure the accuracy, completeness, reliability, or suitability of this information for any particular purpose. The parcels, right-of-ways, utilities and structures depicted hereon are based on record information and aerial photos only. It is recommended the recipient and or user field verify all information prior to use. The use of this data for purposes other than those for which they were created may yield inaccurate or misleading results. The recipient may not assert any proprietary rights to this information. The City of Olympia and its personnel neither accept or assume liability or responsibility, whatsoever, for any activity involving this information with respect to lost profits, lost savings or any other consequential damages.
Source: Federal Emergency Management Agency National Risk Index. https://hazards.fema.gov/nri/map. 2023.


Community Resilience
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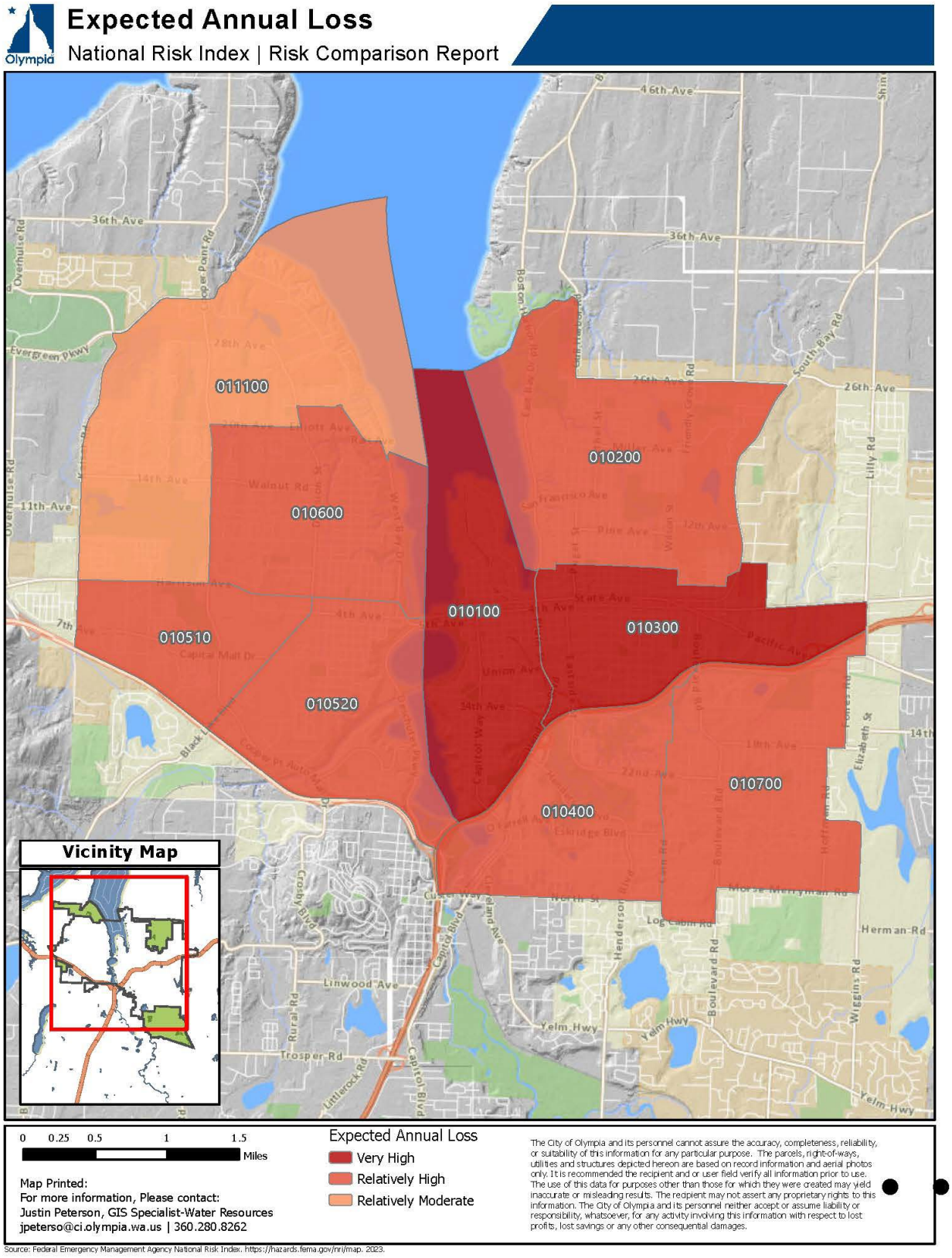
Source: Federal Emergency Management Agency National Risk Index. https://hazards.fema.gov/nri/map. 2023.


Expected Annual Loss
National Risk Index | Risk Comparison Report
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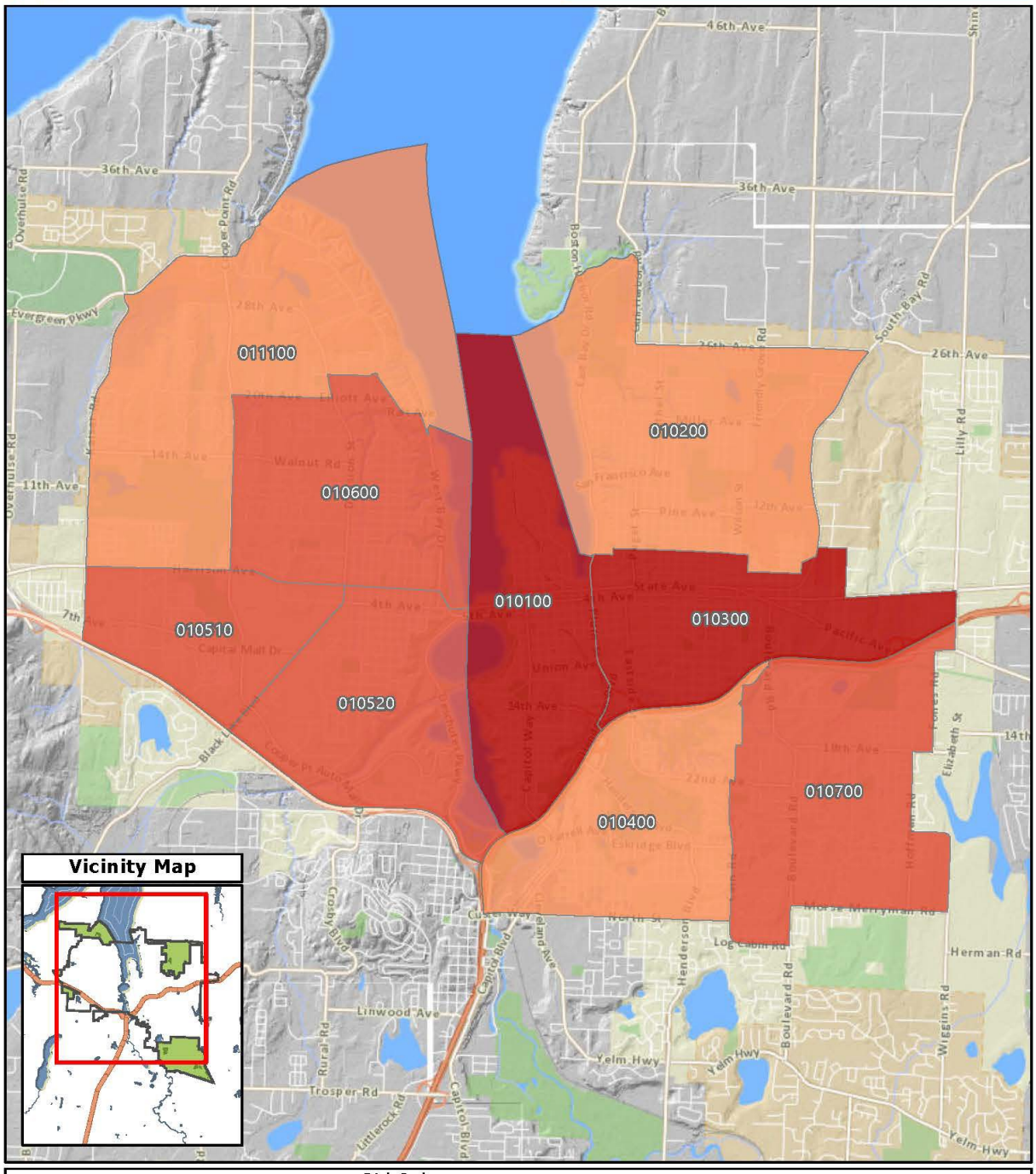
Source: Federal Emergency Management Agency National Risk Index. https://hazards.fema.gov/nri/map. 2023.

# Risk Index Map

National Risk Index | Risk Comparison Report




Source: Federal Emergency Management Agency National Risk Index. https://hazards.fema.gov/nri/map. 2023.

# Earthquake Hazards Risk Assessment

## Area of Impact

As described in the Regional Plan Chapter 4.2 the entire Pacific Northwest, including the City of Olympia, is seismically active and all communities are at risk for earthquake hazards. For the Regional Plan's analysis, three earthquake scenarios were modeled including a Cascadia Subduction Zone Magnitude 9.3, a Nisqually 7.2 deep intraplate, and a Seattle Fault 7.2 shallow or crustal faulting earthquake.

## Extent

While the City of Olympia will be affected similar to the rest of the county, there is one notable exception. The downtown core is composed of many older unreinforced masonry commercial buildings and the South Capitol neighborhood is composed of many brick residences or wood residences with brick chimneys. These buildings have historically suffered more damage than residential structures without brick chimneys and newer commercial construction. Additionally, as noted in the Regional Plan and as can be seen on the "City of Olympia Liquefaction Hazard Areas" map, the downtown core is rated high regarding liquefaction susceptibility.

## Previous Incidents

<u>February 28, 2001, Federal Disaster 1361: Nisqually Earthquake</u>

At 10:54 a.m. a magnitude 6.8 earthquake produced strong ground shaking across Washington State. The epicenter was located near Anderson Island, approximately 11 miles north of Olympia near the Nisqually River Delta. The focus was located nearly 33 miles underground. The depth of the earthquake minimized the intensity of the shaking and limited the impact on the built environment. A federal disaster declaration was issued only one day after the event. Building damage varied throughout the region. In particular, Downtown Olympia, including many historic structures, and Seattle's historic Pioneer Square area were hit hard. Unreinforced brick masonry buildings with un-braced parapets and without wall anchors were particularly vulnerable, resulting in several collapses. In many cases, fallen bricks resulted in damage to objects, such as cars and canopies, outside the building. This type of damage mirrored the damage of the 1949 Olympia earthquake.

Most buildings performed well from a life-safety standpoint, in that the limited structural damage that occurred caused no loss of life or collapse. However, the economic cost of nonstructural damage, i.e., damage to nonessential building elements, such as architectural features, ceiling failures, shifting of equipment, fallen furniture/shelving, desktop computer damage, fallen light fixtures, and losses due to lost productivity, was high. In general, new buildings and buildings that had recently been seismically upgraded typically displayed good structural performance, but many still sustained non-structural damage. In Olympia, 27 buildings were closed immediately following the earthquake. Several of the government buildings in Olympia, including the capitol, were significantly damaged. Other state agency buildings were closed for inspection and repair. The 74-year-old capitol dome sustained a deep crack in its exterior and damage to supporting columns. There were several other non-structural

damage areas throughout the Legislative Building. Previously scheduled renovation of the building was started early to accommodate $20 - $22 million in earthquake repairs and seismic upgrades.

Damage to residences came in a variety of forms, from severe landslide destruction of entire houses to breakage of replaceable personal property. The most common damage was to chimneys. FEMA records indicate that one-third of the 30,000 homes inspected by FEMA sustained chimney damage. In the City of Olympia, chimney damage in the South Capitol neighborhood was the most concentrated of anywhere in Puget Sound. The 40-80-foot depth of loosely consolidated soils and gravel found in the South Capitol neighborhood of Olympia serves as a conduit for earthquake energy that is particularly hard on single-family homes.

The 4th Avenue Bridge in Olympia was one of four bridges in the state to suffer substantial damage from the quake. Constructed in 1920 and retrofitted after the 1949 earthquake, the bridge had been scheduled for replacement even before the 2001 earthquake. The closure of the bridge severely restricted access to downtown Olympia and the City's west side. Replacing the bridge and connecting infrastructure cost $39 million; the largest public works endeavor in the city's history. According to the State, the Deschutes Parkway in Olympia suffered the most damage of any road in the state. Waterlogged soil under the road liquefied during the shaking. Huge voids were created beneath portions of the concrete road surface. Sections of road and sidewalk buckled from the force of the earthquake. This road, a vital link between downtown Olympia, the city's west side, and Tumwater, was closed to traffic for 20 months. Preliminary estimates to fix the road were put at $7 million.

Several landslides occurred. Most of these slides occurred in natural materials, including a 400-foot slide on the northeast side of Capitol Lake. Other slides occurred in engineered fills, particularly at locations where they spanned low-lying areas of natural soils. With the exception of transportation systems, lifeline systems generally performed well during the earthquake. Lifeline systems include water, wastewater, electrical power, communications, natural gas, liquid fuels, and transportation systems. The impact of lifeline damage was in most cases minimal. Puget Sound Energy reported 200,000 customer power outages and Seattle City Light reported 17,000 outages, but power was restored to most within a day. Landline and wireless communication systems were extremely overloaded immediately following the earthquake.

Only five of the state's 290 dams were found to have earthquake-related damage. One of these was the McAllister Springs Reservoir Dam, property of the City of Olympia, in Thurston County.

<u>April 29, 1965, Federal Disaster 196: Seattle Tacoma Earthquake</u>

A magnitude 6.5 earthquake struck the Puget Sound Region at 7:28 a.m. The epicenter was located about 12 miles north of Tacoma at a depth of about 40 miles. In Olympia, the Union Pacific Railroad reported a hillside fill slid away from beneath a 400-foot section of a branch line just outside Olympia. Damage to the legislative building forced the closure of the legislative session. Governor Dan Evans closed the Capitol Campus and state government operations came to a standstill except for retention of key personnel and critical services. In the Temple of Justice, cracks developed in the walls of the law library; a cabinet tipped over; books scattered around the floors; pictures fell from walls. In the Legislative Building, there was a crack about 3 feet long on the inside of the inner dome of the rotunda.

The 5-ton chandelier in the Capitol Building swung like a pendulum clock on its 110-foot chain in a 1-foot orbit for half an hour after the shock. The new post office was damaged considerably and ordered closed. A road around Capitol Lake, at the base of the Capitol complex, was damaged, allowing water to flow beneath the road. St. Peters Hospital reported four persons were treated for minor injuries. Damage to light fixtures and elevator shafts in the Capitol Building was about $200,000; damage to the road and railroad was estimated at the same amount. Chimney and interior plaster damage occurred throughout Olympia, but the greatest damage occurred in the area between 15th Avenue and 20th Avenue and between Capitol Way and Cherry Street.

April 13, 1949, Olympia Earthquake

A magnitude 7.1 earthquake rattled the region at 11:55 a.m. The epicenter was located about eight miles north-northeast of Olympia. Property damage for the Puget Sound Region likely exceeded $25 million (1949 dollars). Eight capitol buildings in Olympia were damaged with a loss of two million dollars. Two deaths occurred. Nearly all large buildings in Olympia were damaged through cracked or fallen walls and plaster. Two large smokestacks and many chimneys fell. Streets were damaged extensively. The water and gas mains were broken. A large portion of a sandy spit jutting into Puget Sound north of the city disappeared completely during the earthquake.

## Probability of Occurrence

There is a 40 to 80 percent chance of a large earthquake occurring in Washington State in the next 50 years. As such, the Regional Plan assigned all three earthquake scenarios a medium probability of occurrence – all are likely to occur within 100 years. The probability of an earthquake affecting the City of Olympia is identical to that of the rest of Thurston County but the concentration of buildings and population in the city may lead to increased impacts compared to the rest of the county.

## Changes in Development

The City of Olympia is expected to continue to grow, with higher densities and mixed-use developments occurring in the downtown core and along major transportation routes. Because building codes continue to evolve to address hazards such as earthquakes, increased development does not affect Olympia's overall vulnerability to impacts from earthquakes. As older buildings which are more susceptible to earthquake damages are eliminated or remodeled, Olympia's overall vulnerability to damage from earthquakes could improve.

## Effects of Climate Change

This hazard is not expected to be impacted by the effects of climate change.

## Vulnerabilities and Impacts

### General Impacts

Infrastructural failures can result in the loss of public and private sector services and businesses. Communities are likely to face communication, electricity, motor fuel, and natural gas disruptions.

Structural fires are a secondary hazard from earthquake destruction. Individuals and households may be displaced due to damaged homes. A subsequent economic downturn would likely result from major transportation disruptions and loss of revenue from suspended business and services.

In the Puget Sound Region, and Olympia specifically, older unreinforced masonry structures such as buildings, walls, chimneys, and facades are vulnerable to crumbling from ground shaking. Areas with soft soils, such as downtown Olympia and adjacent neighborhoods have experienced these types of destruction during the 1949, 1965, and 2001 earthquakes.

## Specific Impacts on the City of Olympia's People, Structures, and Systems

As detailed in Chapter 4.2 of the Regional Plan, the entire Thurston County population is at risk of earthquakes. The most severe earthquake modeled, a Cascadia Subduction Zone Earthquake, could result in 2,010 Olympia households displaced and 1,096 individuals requiring shelter. In addition to the impacts to structures and systems described above and in Chapter 4.2, several of the City of Olympia's unique infrastructure is susceptible to damage from an earthquake including, but not limited to, the 8-mile McAllister Wellfield Transmission main which delivers approximately 75 percent of Olympia's water to its residents and the Percival Utility Bridge which includes sewer and water utility lines.

The National Risk Index risk score for earthquakes by City of Olympia census tracts ranges from 99.74 (relatively high: census tract 010100) to 91.97 (relatively moderate: census tract 011100). As explained in the section "Social Vulnerability Rating and National Risk Index" this risk score takes into account a community's social vulnerability and resilience score.

# Severe Weather Hazards Risk Assessment

## Area of Impact

Severe weather includes hazardous temperatures, precipitation, and wind. As described in the Regional Plan Chapter 4.6 all Thurston County communities, including the City of Olympia, can be affected by extreme heat events, and severe rain and wind events.

## Extent

It has been noted in severe weather events such as the December storms of 2006 and 2007 that the west side of Olympia may receive greater impact from wind and rain events than other portions of the city.

## Previous Incidents

February 7, 2020, Federal Disaster 4539DR: Severe Winter Storm

Severe wind and heavy rain caused significant damage to 3 City parks trails and water/sewer infrastructure. Most notably, a large tree nearly broke in half the Percival Creek utility bridge which resulted in a release of raw sewage into the creek and connecting waterways. A water line supported by the bridge was also ruptured. The ensuing flow of water began to undermine the undamaged footings of the bridge. A federal disaster declaration was made, and the city reported approximately $900,000 in damages.

February 8-11, 2019 Severe Winter Storm

Approximately 20 inches of snow fell over a 4-day period. Staff were sent home early on Friday as the storm moved into the area and the city activated its EOC during days 3 and 4 of the event. Extensive power outages were reported across the region and a few auxiliary structures collapsed under the weight of the snow, including the City's salt and sand storage facility. On-duty Fire personnel were able to break up and remove the damaged structure so Public Works staff could continue to clear the City's lifeline transportation corridors.

December 12-27, 2008, Federal Disaster 1825: Severe Winter Storm

Near record snowfalls, freezing rain, and rain combined with sustained subfreezing temperatures froze the Thurston Region for a period of nearly two weeks making it one of the worst snow-laden winter storms in decades. Successive snowfall over the first week resulted in 18 to 20-inch depths in the Lacey, Olympia, and Tumwater areas. Depths of 36 inches were reported by some county residents at higher elevations outside of city limits. Governor Gregoire declared a state of emergency on December 24. On March 2, a Presidential Disaster Declaration was declared. 27 Area schools, closed three days before Christmas break. Thurston County closed its offices on December 18 and 22. Other local governments and colleges also closed their offices entirely or had delayed openings or early closures due to road conditions.

On December 25, a 2500 square foot section of Capital High School's roof, on Olympia's west side, collapsed from the strain of the snow load. Overhead fire sprinklers were activated and caused water damage to parts of the school's interior including the library. A natural gas pipe rupture contributed to a week's delay in the school's reopening after Christmas break. Overall repair costs were approximately $7 million.

December 1-7, 2007 Federal Disaster 1734: Severe Winter Storm, Landslides, and Flooding

Snow followed by heavy rain and winds caused record flooding on the Chehalis River. The Deschutes and Black rivers rose above their banks. Communities experienced stream and urban flooding and flash flood conditions in the Capital Hills and Capital Forest resulting in washouts, landslides, and urban flooding on major intersections in Olympia's west side. (See flood and landslide hazard profiles for more details on this event.)

October 18, 2007 Windstorm

The Olympian reported that wind gusts of 44 mph knocked down trees and power lines across Thurston County causing scattered power outages in mostly rural areas. The City of Olympia closed its parks as an emergency measure. A power line fell on an Olympia School District bus enroute to pick up students; the driver was not injured.

January 5, 2007 Windstorm

Sustained winds of 22 mph and a peak gust of 40 mph toppled trees and disrupted power for about 9,500 households in Thurston County.

December 14-15, 2006 "The Hanukkah Eve Storm" Federal Disaster 1682: Severe Winter Storm, Landslides, and Mudslides

The December 14th to 15th storm included snow, rain, and high winds. The windstorm may have produced the most damaging winds to hit the Pacific Northwest since the Columbus Day Storm of October 12, 1962. The Hanukkah Eve Storm achieved sustained winds of 36 mph and gusts of 53 mph as recorded at the Olympia Airport weather station before it lost power. KGY Radio, located on Budd Inlet, reported a wind gust of 78 mph at 12:30 a.m. on the 15th.

- In the City of Olympia, 13 residences were red-tagged and six were yellow-tagged.
- The power outage affected gasoline, water, sewage, and solid waste disposal facilities. City water and sewage pump stations had to be powered by generators and other means of backup power.

November 2-11, 2006 Federal Disaster 1671: Severe Winter Storm, Flooding, Landslides, and Mudslides

On November 6, 3.4 inches of rain fell; a 24-hour rainfall record. The Heavy rains caused flooding of urban roads and streets throughout the Thurston Region. Preliminary damage assessments for personal and business property damage exceeded $300,000.

January 6, 2004, Snow Storm

Six to nine inches of snow fell around Thurston County. Area schools and some businesses closed for up to three days.

December/January 1996/1997 Federal Disaster 1159, Ice, Wind, Snow, Landslides, and Flooding

Snow, ice, and freezing rain crippled Thurston County on December 26. This storm produced the worst freezing rain event to hit the south Puget Sound region in decades. 53,000 electric customers lost power due to snapped power lines and downed trees. Downed power lines ignited four tree fires in the Tumwater Hill neighborhood. Sub-freezing temperatures and power outages persisted for over a week into early January.

December 12, 1995 Windstorm

A windstorm caused widespread destruction from northern California to British Columbia. Wind gust of 57 mph rattled the Thurston Region causing widespread power outages to nearly 45,000 households and businesses. Road closures from fallen trees and limbs forced the closure of many local and state government offices and area businesses.

January 20, 1993 Inaugural Day Windstorm, Federal Disaster 981, Windstorm

The most powerful windstorm to hit western Washington since the 1962 Columbus Day Storm, caused nearly $130 million in damages statewide, resulted in five deaths, and destroyed 52 residential units statewide. Winds reached gusts of 55 mph at the Olympia Airport weather station. The power outage forced the LOTT Wastewater Treatment Plant in Olympia to discharge nearly 1.3 million gallons of barely treated wastewater into Budd Inlet. Customers flooded local area stores for provisions creating shortages in batteries, candles, and bottled water.

November 14-15, 1981 Windstorms

Two back-to-back windstorms brought winds with peak gusts of 64 mph to the region over a two-day period resulting in power outages for 60,000 households and businesses in the county. Nearly 150 boats broke loose from marinas in Budd Inlet. An estimated $3.4 million was reported in private property damages.

## Probability of Occurrence

As explained in Chapter 4.6 of the Regional Plan, there is a high likelihood that Thurston County, including the City of Olympia, will experience strong storm activity that will impact people, property, and the environment in the next 25 years.

## Changes in Development

The City of Olympia is expected to continue to grow, with higher densities and mixed-use developments occurring in the downtown core and along major transportation routes. Increased growth could mean more individuals are vulnerable to severe weather, especially related to increased temperatures in the event new housing stock is not equipped with air conditioning.

## Effects of Climate Change

The effects of climate change related to severe weather on the City of Olympia are consistent with the explanation in Chapter 4.6 of the Regional Plan.

## Vulnerabilities and Impacts

### General Impacts

The general impacts of storms will have a similar effect on the City of Olympia as detailed in Chapter 4.6 of the Regional Plan.

### Specific Impacts on the City of Olympia's People, Structures, and Systems

As detailed in Chapter 4.6 of the Regional Plan, severe weather including hazardous temperatures and storm activity has no geographic boundaries and there is no means to measure loss estimates for weather hazards in the absence of a defined hazard area and readily available modeling tools. Instead, Table 4.6.7 in the Regional Plan contains an overall subjective risk rating for the City of Olympia of "medium". However, the City of Olympia's Percival Utility Bridge remains susceptible to high wind and rain events given its location in the steep and heavily treed Percival ravine. Additionally, the City of Olympia Park facilities also remain susceptible to damage during high wind events. Finally, increased street flooding could occur with increased high rainfall events, including at the intersection of Black Lake Boulevard and Cooper Point Road and the other City of Olympia "hot spots".

The National Risk Index risk score for heat waves, ice storms, and winter weather for all City of Olympia census tracts is scored as "relatively low", while hail and strong winds are scored as "very low". As explained in the section "Social Vulnerability Rating and National Risk Index" this risk score takes into account a community's social vulnerability and resilience score.

# Flood Hazards Risk Assessment

## Area of Impact

Chapter 4.3 of the Regional Plan explains the various types of flood hazards facing the Thurston County region and the City of Olympia including riverine flooding, groundwater flooding, tidal flooding, and urban flooding. It is noted that urban flooding has historically impacted west Olympia and downtown Olympia more than other communities and that downtown Olympia faces the greatest impact from tidal flooding than other Thurston County communities.

The downtown is most susceptible to tidal flooding and riverine flooding from the Deschutes River. While the City of Olympia Storm and Surface Water Utility has made great progress in addressing urban flooding, the intersection of Black Lake Boulevard and Cooper Point remains vulnerable to major flooding and with increases in high rainfall events expected from climate change, other "hot spots" located throughout Olympia currently monitored by the Storm and Surface Water Utility could become more problematic. The "Flood Hazard Areas" map shows the extent of the 500 and 100-year floodplain in Olympia.

See "Sea Level Flood Hazard Rise" for additional information related to this flooding hazard.

## Extent

Many factors influence the severity of riverine flooding such as the pre-existing condition of the ground (saturated from previous rain, covered with snow, or frozen), the topography and size of the watershed, freezing level, and the influence of human activity on the landscape (development and logging practices). The City of Olympia experiences localized urban flooding in certain areas depending on rainfall conditions. These situations are typically noted on the west side of Olympia and are tied to Severe Weather. The City of Olympia also experiences downtown flooding at Capitol Lake associated with the Deschutes River.

The Deschutes River is a 53-mile-long lowland river that gives rise within Mt. Baker-Snoqualmie National Forest in north Lewis County. The river is located in the Deschutes Watershed (WRIA #13) and locally within the Budd/Deschutes Watershed. The Deschutes lies to the west of the Nisqually River and flows in a parallel pattern to the Nisqually River. The river mostly follows a natural course northwest through unincorporated Thurston County.

The Deschutes is the fastest rising and falling river in Thurston County. It responds quickly to local rainfall and runoff. The river is significant to the region as it is within the watershed which encompasses a great majority of the land area for the cities of Lacey, Olympia, and Tumwater.

The Deschutes River flows into Capitol Lake in Olympia before flowing into southern Puget Sound at Budd Inlet. Capitol Lake is an artificial lake formed by a small dam at the north end of the lake in downtown Olympia. The dam is regulated by the Washington State Department of Enterprise Services and exists to create a freshwater lake to complement the Capitol Campus parks and grounds. Percival Creek joins the Deschutes River in Capitol Lake's central basin, near Marathon Park, just north of Interstate 5. When the tides and lake water level conditions permit the opening of the dam's radial gate, the Deschutes River drains into Budd Inlet. Following years of study, the

Washington State Department of Enterprise Services is recommending the removal of the dam, which will allow Capitol Lake to revert back to an estuary.

Extremely high tides combined with low atmospheric pressure, excessive runoff, or strong northerly winds, can lead to either localized or general tidal flooding in coastal areas. Spring tides, the highest tides during any month, occur with each full and new moon. When these coincide with a northerly wind piling water in south Puget Sound, tidal flooding can occur.

Tidal flooding by itself does not produce major flooding in the region. However, tidal flooding will become more severe in the second half of the 21st Century if sea level rise projections, as forecasted by climate change models, occur.

High tides influence the timing of dam water release from Capitol Lake near 5th Avenue in downtown Olympia. A protective earthen berm was constructed around the north and eastern perimeter of Heritage Park to prevent major flood waters from flowing into downtown from Capitol Lake. However, when the Deschutes River experiences major flooding and a high tide prohibits discharge of lake water into Budd Inlet, it is plausible that floodwaters could crest the lake's bank at the southeast end of the north basin and flow into downtown Olympia along the utility road between the Capitol Campus Steam Plant and Water Street.

Various amounts of flooding are experienced in the downtown Olympia area when high flows on the Deschutes River coincides with high tides.

## Previous Incidents

A partial list of recent flooding events affecting the Thurston Region and the City of Olympia includes:

January 6-16, 2009, Federal Disaster 1817: Severe Winter Storms, Landslides, Mudslides, and Flooding
A "Pineapple Express" rainstorm raised temperatures and dropped heavy rains throughout Western Washington following one of the worst Pacific Northwest snowstorms in decades. Severe flooding occurred throughout Western Washington. The Chehalis, Skookumchuck, Deschutes, Nisqually, and Black Rivers all experienced major flooding on January 8, making it the second-worst flood level in the Rivers' recorded history. The heavy rains entering the sewer system in Olympia forced the LOTT Alliance to discharge 6.3 million gallons of partially treated wastewater from its Budd Inlet Sewer Treatment Plant via its emergency outfall at the Fiddlehead Marina.

December 1-7, 2007, Federal Disaster 1734: Severe Winter Storms, Flooding, Landslides, and Mudslides
Snow followed by a "Pineapple Express" on December 2nd and 3rd caused major flooding throughout southwest Washington. Heavy rainfall and melting snow resulted in record flooding. The Deschutes and Black Rivers also rose above their banks. The Deschutes River crested 2.75 feet above flood stage near Rainier.

Nearly ten inches of rain fell on the City of Olympia's west side resulting in the worst urban flooding ever experienced on the City's west side. On the morning of December 3, 2007, during the peak commute period, the west side of Olympia experienced major traffic backups for hours due to road closures. One of the highest traffic volume intersections in the region, Cooper Point Road and Black Lake Boulevard off of Highway 101, experienced major flooding resulting in permanent damage to the signal controller. Several motorists attempted to drive through the water only to become stranded and forced to abandon their vehicles. Some vehicles were eventually completely submerged. The Percival Creek Bridge on Cooper Point Road also experienced inundation forcing its closure. Several businesses on Olympia's west side were affected by floodwaters and power outages. Puget Sound Energy turned off power as a safety precaution requiring businesses to temporarily close their doors. The Woodshed, a furniture retailer, lost its entire inventory to three feet of water. Replacement cost was estimated at $250,000.

On December 3rd, the LOTT Alliance's Budd Inlet Sewer Treatment Plant was forced to discharge untreated wastewater into Budd Inlet due to the enormous volume of rainfall and runoff. At its peak, an estimated 1 million gallons per hour bypassed treatment processes and was sent through the emergency outfall near Fiddlehead Marina.

December 1996 (Federal Disaster 1159) to February 1997 Winter Storm and Flooding
1996 was the third wettest year of the 20th Century and December was especially wet, receiving over twice its normal monthly rainfall. The Deschutes River at Rainier crested at 17.01 feet, six feet over flood stage, setting the flood record. Major flooding also occurred on the Nisqually, Deschutes, Skookumchuck, and Chehalis rivers. Portions of downtown Olympia experienced urban flooding.

## Probability of Occurrence

The City of Olympia experiences nuisance tidal flooding one to two times a year. King tides combined with even moderate levels of sea level rise will increase the frequency of tidal floods. The probability of tidal flooding is high. See Chapter 4.3 for additional County-wide probability information that also applies to the City of Olympia for riverine, groundwater, and urban flooding.

## Changes in Development

The City of Olympia is expected to continue to grow, with higher densities and mixed-use developments occurring in the downtown core and along major transportation routes. The City of Olympia currently has a sea level rise flood damage reduction ordinance in place (OMC 16.80) which includes special provisions for building in downtown Olympia, including building to a higher elevation to protect new

development from the impacts of sea level rise. As building occurs at higher densities throughout the City of Olympia, managing stormwater will become more problematic. However, an increase in low-impact development could help address this issue.

## Effects of Climate Change

The effects of climate change related to flooding in the City of Olympia are consistent with the explanation in Chapter 4.3 of the Regional Plan. Addressing flooding within the City of Olympia is the responsibility of the Storm and Surface Water Utility. As such the utility has programs and procedures in place to monitor and react to the effects of climate change on flooding.

## Vulnerability and Impacts

### General Impacts

The general impacts from flooding will have a similar effect on the City of Olympia as detailed in Chapter 4.3 of the Regional Plan.

### Specific Impacts on the City of Olympia's People, Structures, and Systems

Flood damage in downtown Olympia renders businesses unsafe for occupancy and displaces normal traffic patterns and commerce around Capitol Lake. As these floods occur mostly during the winter months, the impact of these floods on the recreating public using Heritage Park along Capitol Lake is less impacting than if the flooding were to happen during other parts of the year. Typically, these events resolve as soon as the tides go down and/or the river flow returns to more normal levels. The damage done to businesses and the disruption to normal patterns of traffic and commerce can last significantly longer than the actual flooding event.

According to the analysis conducted for the Regional Plan, no City of Olympia residents will be displaced resulting from a 50-year flood, two individuals will be displaced resulting from a 100-year flood and 18 individuals will be displaced resulting from a 500-year flood. Additional Olympia-specific information can be found in Tables 4.3.6, 4.3.7, and 4.3.8 in Chapter 4.3 of the Regional Plan.

The National Risk Index risk score for coastal flooding includes four City of Olympia census tracts scored as "relatively moderate" (010100, 010600, 011100, 010200) and one as "relatively low" (010520). The remaining City of Olympia census tracts are outside the impact area for coastal flooding. As explained in the section "Social Vulnerability Rating and National Risk Index" this risk score takes into account a community's social vulnerability and resilience score.

Additional information related to the impacts of sea level rise in downtown Olympia can be found in the Sea Level Rise Hazard section.

# Landslide Hazard Risk Assessment

## Area of Impact

For the purposes of this hazard risk assessment, the landslide hazard area is defined as a combination of areas with slopes that are 40 percent or greater and areas mapped as historic landslide areas by the Washington State Department of Natural Resources. As can be seen in the Landslide Hazard Areas map, the entire marine shoreline and the shoreline around Capitol Lake are mapped as landslide areas. Several City of Olympia sewer lif, including Old Port I, are located within this area.

## Extent

There is no standard approach to measuring the severity of a landslide. Severity can be measured in the total cost of damages, impacts on transportation or utility systems, or in terms of injuries and fatalities. The severity of a landslide can also be measured in terms of its size and composition: from a thin mass of soil, a few yards wide to deep-seated bedrock slides miles across. The travel rate of a landslide can range from a few inches per month to many feet per second depending on the slope, type of material, and moisture content.

## Previous Incidents

Small slides were reported after the 2001, Nisqually Earthquake. One slide was near the west end of the 4th Avenue Bridge and the second was above Capitol Lake adjacent to Capitol Way overlooking the upper end of the upper basin. In 2014, the steep ravine under which the City of Olympia's Old Port I sewer lift station is located and through which an existing force main runs, experienced a partial slide. This partial slide exposed the lift station's electrical conduit.

## Probability of Occurrence

According to Chapter 4.4 of the Regional Plan, a high probability of occurrence of landslides exists for all the planning partners.

## Changes in Development

Due to the City of Olympia's critical area regulations, changes in development are not expected to increase Olympia's overall vulnerability to this hazard.

## Effects of Climate Change

The effects of climate change related to landslides in the City of Olympia are consistent with the explanation in Chapter 4.4 of the Regional Plan.

# Vulnerabilities and Impacts

## General Impacts

The general impacts from landslides will have a similar effect on the City of Olympia as detailed in Chapter 4.4 of the Regional Plan.

## Specific Impacts on the City of Olympia's People, Structures, and Systems

According to the analysis prepared for the Regional Plan, 702 residential structures, 166 commercial structures, and 3 government structures are located within the City of Olympia's landslide hazard area. Additionally, the City of Olympia's Old Port I and East Bay Drive sewer lift stations are located within Olympia's landslide hazard area. As noted above, Old Port I Sewer Lift Station's electrical conduit was damaged in a 2014 landslide. See Chapter 4.4 of the Regional Plan for additional Olympia-specific information.

The National Risk Index risk score for landslides includes one City of Olympia census tract scored as "relatively high" (010520), six scored as "relatively moderate" (010300, 010100, 010510, 010400, 011100, 010200), and two as "relatively low" (010600 and 010700). The remaining City of Olympia census tracts are outside the impact area for coastal flooding. As explained in the section "Social Vulnerability Rating and National Risk Index" this risk score takes into account a community's social vulnerability and resilience score.

# Wildland Fire Risk Assessment

## Area of Impact

For the purpose of this hazard risk assessment, the wildland hazard area is defined as the Washington State Department of Natural Resources Wildland Urban Interface and Intermix mapped areas. Areas mapped as Wildland Urban Interface are on the periphery of urbanized areas where homes, businesses, and other structures meet wildlands such as West Olympia. Areas mapped as Intermix are where homes and structures intermingle with wildlands and include areas along Percival Creek, Capitol Lake, Ken Lake, Louise Lake, and the City of Olympia's Squaxin and Watershed parks. See the Wildland Urban Interface map for additional information.

As a component of a recently completed "Risk and Resiliency Assessment" conducted by the City of Olympia Drinking Water Utility as required by the Environmental Protection Agency, the Drinking Water Utility identified several of its water sources as susceptible to potential wildland fires, including the McAllister Wellfield (located outside City limits) and its Shana Park and Allison Springs sources.

## Extent

Human behavior, weather, fuel, terrain, and road access influence wildland fire behavior and suppression response activity. Details on each of these factors applicable to the City of Olympia can be found in Chapter 4.9 of the Regional Plan.

## Previous Incidents

There are no known incidents of impactful wildland fire having occurred in the City of Olympia in recorded history.

## Probability of Occurrence

According to Chapter 4.9 of the Regional Plan, the City of Olympia has a low probability of a destructive 10-acre wildland fire occurring in the next 100 years.

## Changes in Development

The City of Olympia is expected to continue to grow, with higher densities and mixed-use developments occurring in the downtown core and along major transportation routes. By encouraging higher densities and growth in already developed areas, the City of Olympia's overall vulnerability to wildfire hazards may be reduced despite an increase in growth.

## Effects of Climate Change

The effects of climate change related to wildland fires in the City of Olympia are consistent with the explanation in Chapter 4.9 of the Regional Plan.

## Vulnerabilities and Impacts

### General Impacts

The general impacts from wildland fires will have a similar effect on the City of Olympia as detailed in Chapter 4.9 of the Regional Plan.

### Specific Impacts on the City of Olympia's People, Structures, and Systems

According to the analysis done for the Regional Plan, 18 percent of the City of Olympia's population resides within the Wildland-Urban Interface and 8.4 percent of the City of Olympia's population resides within the Wildland-Urban Intermix Area. See Chapter 4.9 of the Regional Plan for additional Olympia-specific information.

The National Risk Index risk score for wildfire includes four City of Olympia census tracts scored as "relatively low" (011100, 010700, 010600, 010520) and five scored as "very low" (010300, 010100, 010510, 010400, 010200). As explained in the section "Social Vulnerability Rating and National Risk Index" this risk score considers a community's social vulnerability and resilience score.

# Volcanic Hazards Risk Assessment

## Area of Impact

For the purposes of this hazard risk assessment, while there are numerous volcanic hazards including volcanic landslides, lava flows, pyroclastic flows, volcanic ash, and lahar, only volcanic ash and lahar pose a direct threat to areas within Thurston County.

Mount Rainier is only 22 miles from the border of southeast Thurston County. With the right winds, the entire County could conceivably be blanketed with ash. The severity of the hazard would depend on the thickness of the ash deposition. The 1980 eruption of Mount St. Helens blew an ash column 15 miles into the atmosphere above the crater. Over the course of the day of the eruption, nearly 540 million tons of ash was blown by winds to the east. Fallout from the ash created complete darkness in Spokane, nearly 250 miles away; dropping one-half inch of ash only a few hours after the start of the eruption. Light accumulations of ash were noted in Olympia.

Lahar flows are not anticipated to pose a direct risk within the City of Olympia as the river systems that might be affected by, and/or channel the Lahar do not enter or border the city. However, the City of Olympia's largest water source, the McAllister Wellfield, is located within the Nisqually River Valley: An area the Regional Plan notes as the most susceptible to lazar hazards.

## Extent

The severity of the hazard depends on the depth and geographic extent of ash deposition. For example, an ash fall of a quarter inch or more will reduce motorists' visibility and disrupt nearly every mode of transportation. Wet ash could create hazardous driving conditions and result in traffic injuries or fatalities. Inhalation of ash particles could cause respiratory irritation and pose more serious problems for people with asthma or other respiratory diseases, but this could be mitigated by avoiding exposure. Ash falls of just a few inches in depth could exceed the load capacity of some building rooftops and lead to structural failure. Failure could occur with lower depths if ash absorbs subsequent precipitation. Wet ash has been known to cause power lines to short out. Cleanup and recovery would likely be the greatest cost to both the public and private sectors. As noted above, lahar flows are not anticipated to pose a direct threat within the City of Olympia.

## Previous Incidents

There are no known significant impacts from volcanic hazards having occurred in the City of Olympia in recorded history.

## Probability of Occurrence

The United States Geological Survey reports that Mount Rainier has only produced moderate quantities of ash in past eruptions. The eruption of Mount St. Helens in 1980 did deposit a scant layer of ash in Thurston County, but the fallout did not pose a significant hazard to the region. Thurston County winds prevail from the south and west, therefore ash is more likely to fall on the east side of the Cascades than the west side. If Mount Rainier or Mount St. Helens were to erupt, a resultant ash plume would require an easterly wind to deposit ash in Thurston County. The USGS calculated that

the annual probability for a significant ash deposit of one centimeter or greater in Olympia is 0.01 percent. This hazard has a low probability of occurrence.

## Changes in Development

Because this hazard has a low probability of occurrence, changes in development within the City of Olympia are not expected to increase or decrease the vulnerability of Olympia residents to this hazard.

## Effects of Climate Change

Climate change is not expected to influence this hazard.

## Vulnerabilities and Impacts

### General Impacts

The general impacts from volcanic hazards will have a similar effect on the City of Olympia as detailed in Chapter 4.8 of the Regional Plan.

### Specific Impacts on the City of Olympia's People, Structures, and Systems

According to the analysis done for the Regional Plan located in Chapter 4.8, no structures within Olympia City limits, including community lifelines, are located within the potential lahar hazard areas. However, the City of Olympia's largest water source, the McAllister Wellfield, is located within the Nisqually River Valley: An area the Regional Plan notes as the most susceptible to lazar hazards. As a component of its long-range planning, the City of Olympia Drinking Water Utility's level of service for system reliability is to maintain the capacity to meet winter demands (inside water use only) with the loss of the largest water source, with the largest water source defined as the McAllister Wellfield. This reliability level of service standard ensures that the Drinking Water Utility plans the development of its sources in a way that mitigates for the possible loss of the McAllister Wellfield for any reason, including as the result of a lahar event. Current analysis conducted for the 2021-2026 Water System Plan shows that the Water Utility can meet winter demands through 2040, but short of 2070, with the entire McAllister Wellfield unavailable.

The National Risk Index risk score for volcanic activity includes six City of Olympia census tracts scored as "relatively high" (010300, 010100, 010510, 010520, 010600, 010700) and three scored as "relatively moderate" (011100, 010200, 010400). As explained in the section "Social Vulnerability Rating and National Risk Index" this risk score takes into account a community's social vulnerability and resilience score.

# Tsunami Hazard Risk Assessment

## Area of Impact

As included in Chapter 4.7 of the Regional Plan, the tsunami hazard area for Thurston County is defined by the modeled tsunami inundation zone from a Cascade subduction zone magnitude 9 earthquake scenario produced by the Washington State Department of Natural Resources. This modeled tsunami inundation zone includes areas along West Bay, the west side of the Port of Olympia, and areas along Percival Landing.

## Extent

Chapter 4.7 of the Regional Plan describes that waves from a Cascade subduction zone earthquake generated a tsunami that would impact communities from Blaine at the US/Canadian border down to Olympia. After the onset of the earthquake, the tsunami wave would reach Blaine in approximately two hours and Olympia in approximately four hours. Inundation levels for the Port of Olympia are estimated at 0.5 feet.

## Previous Incidents

No known tsunami events are having occurred in the City of Olympia in recorded history.

## Probability of Occurrence

The likelihood of a large tsunami striking Thurston County, including the City of Olympia, is tied to the probability of a large Cascadia Subduction Zone earthquake. The Regional Plan assigned a medium probability of a major earthquake occurring within 100 years; therefore the City of Olympia has a medium probability of a tsunami event occurring.

## Changes in Development

A change in development within the tsunami inundation zone is not expected.

## Effects of Climate Change

In general, climate change is not expected to influence this hazard. However, sea level rise, depending on the tide during a tsunami event would influence the depth and extent of tsunami inundation areas. See the Sea Level Rise Hazard Risk Assessment for additional information.

## Vulnerabilities and Impacts

### General Impacts

The general impacts from a tsunami event will have a similar effect on the City of Olympia as detailed in Chapter 4.7 of the Regional Plan.

## Specific Impacts on the City of Olympia's People, Structures, and Systems

According to the analysis done for the Regional Plan located in Chapter 4.7, there are 54 residential, 28 commercial, and 2 industrial buildings located within the City of Olympia mapped tsunami inundation zone and are at risk for tsunami hazards.

The National Risk Index does not contain a risk score for tsunami hazards for the City of Olympia census tracts.

# Sea Level Rise Flood Hazard Risk Assessment

## Area of Impact

Downtown Olympia all along Budd Inlet including the Port of Olympia Peninsula, Percival Landing, portions of historic downtown, and areas around Capitol Lake will be the most affected by sea level rise. The recognition that 450 acres of downtown are vulnerable to flooding from sea level rise brought the City of Olympia, the Port of Olympia, and the LOTT Clean Water Alliance together in 2017 to collectively work on a sea level rise response plan. The resulting Olympia Sea Level Rise Response Plan was approved in March 2019. Maps prepared for the Olympia Sea Level Rise Response Plan have been included here.

## Extent

For the Regional Plan's Sea Level Flood Hazard Assessment (Chapter 4.5), a six-inch sea level rise scenario was used to estimate vulnerabilities and potential losses. This six-inch sea level rise scenario is consistent with what the Olympia Sea Level Rise Response Plan describes as its "near-term" planning projections. However, the Olympia Sea Level Rise Response Plan was prepared with a 100-year time horizon. The sea level rise scenarios included in the Olympia Sea Level Rise Response Plan are as follows:

- 6 inches sea level rise: most likely projection at 2030
- 12 inches sea level rise: most likely projection at in 2050; high-range projection at in 2030
- 18 inches sea level rise: most likely projection at 2060; high-range projection at 2040
- 24 inches sea level rise: most likely projection at 2080; high-range projection at 2050

Inundation maps contained in the Olympia Sea Level Rise Response Plan have been included in this Olympia Annex for additional reference.

## Previous Incidents

December 27, 2022, High Tide and Coastal Flooding

On December 27, 2022, the high tide in Budd Inlet came in at 9:25 a.m. at 18.40, or 1.77 feet over the predicted tide of 16.33 feet. The barometric pressure during the morning bottomed out at approximately 28.6 includes but rose at the time of the flooding. This was the worst flooding event on record for Olympia. The previous worst was 17.99 in 1987. During the January 7, 2022 capital lake flooding event, the tide came in at approximately 17.9 feet.

Because the December 27, 2022 flood event was primarily a marine tidal flooding event, it was of short duration. As usual, flooding first occurred at Sylvester Street where it was controlled by sandbags. Marine water overtopped the shoreline in several additional locations, including along 4$^{th}$ Avenue, generally between Thurston Avenue and A Avenue and between B Avenue and Corky Avenue. Structural flooding was observed at Budd Bay Café, Capitol City Yacht Sales, Olympia Autohaus, and the Row Restaurant. The storm drainage system associated with the Fiddlehead outfall was overwhelmed.

Several streets were closed – 4th Avenue between Sylvester and Water Streets, Water Street between 4th Avenue and State Avenue, and State Avenue between Water Street and Columbia Street.

## Probability of Occurrence

As noted in the Regional Plan Chapter 4.5 sea level rise is occurring and the probability for sea level rise impacts for areas such as downtown Olympia is high. In recognition of this high probability, the City of Olympia, the Port of Olympia, and the LOTT Clean Water Alliance worked with the community to develop the Olympia Sea Level Rise Response Plan. The projections of sea level rise and the probable timeframe in which impacts are expected as contained in the Olympia Sea Level Rise Response Plan, March 2019, are included above and in Table 4.5.3 of the Regional Plan.

## Changes in Development

The City of Olympia is expected to continue to grow, with higher densities and mixed-use developments occurring in the downtown core and along major transportation routes. The City of Olympia currently has a sea level rise flood damage reduction ordinance in place (OMC 16.80) which includes special provisions for building in downtown Olympia, including building to a higher elevation in order to protect new development from the impacts of sea level rise. Additionally, the Olympia Sea Level Rise Response Plan contains strategies to protect downtown and the Port Peninsula from the impacts of sea level rise. Implementation of the Olympia Sea Level Rise Response Plan is occurring through the Olympia Sea Level Rise Collaborative.

## Effects of Climate Change

The actual rate at which rising global temperatures occur will have a direct impact on the rate at which sea level rise occurs and impacts downtown Olympia and the Port Peninsula. The science associated with sea level rise is regularly updated, revised, and strengthened and includes research being done by the University of Washington Climate Impacts Group. The City of Olympia and its partners will continue to monitor this science and make decisions based on this review. The strategies contained in the Olympia Sea Level Rise Response Plan were developed to be phased over time as conditions change.

## Vulnerabilities and Impacts

### General Impacts

The general impacts from sea level rise will have a similar effect on the City of Olympia as detailed in Chapter 4.5 of the Regional Plan.

## Specific Impacts on the City of Olympia's People, Structures, and Systems

As a component of the Olympia Sea Level Rise Response Plan, a vulnerability and risk assessment was conducted to evaluate flooding and sea level rise impacts to key assets, services, and operations within downtown Olympia. As a result of the vulnerability and risk assessment, specific impacts to

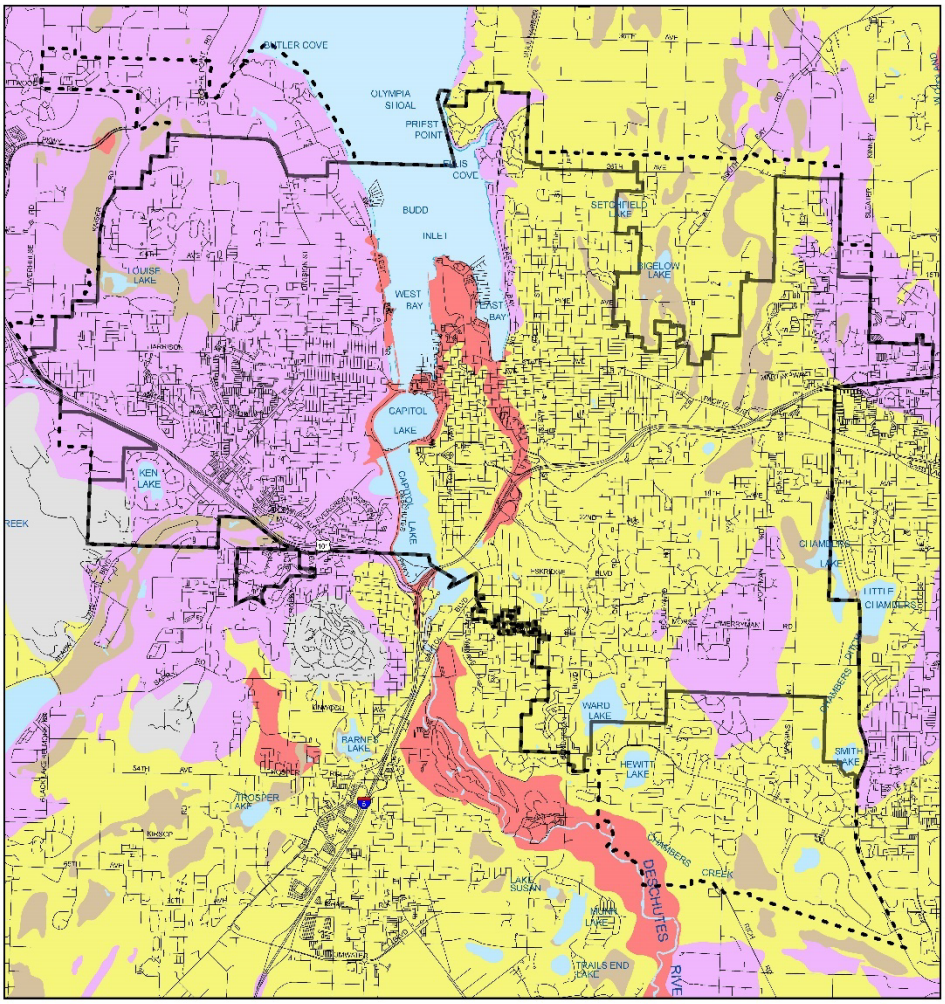
downtown Olympia, the Port of Olympia, and the LOTT Budd Inlet Treatment Plant that are expected to result from up to 24-inches of sea level rise – the most-likely projection at year 2080 and the high-range project for year 2050 – were identified.

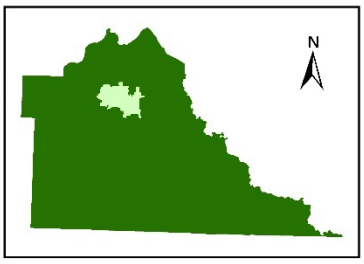
The summary of sea level rise impacts to land, employment, residents, buildings, and roads is provided in the below table for sea level rise of up to four feet above the current 100-year flood level in Budd Inlet. As sea levels rise, high water events in Budd Inlet will inundate more area, impact people's homes and places of work, and disrupt travel on Olympia's streets. The City of Olympia, the Port of Olympia and the LOTT Clean Water Alliance will continue to use the Olympia Sea Level Rise Response Plan and any updates in information resulting from the work of the Sea Level Rise Collaborative as its source of information for expected risks resulting from sea level rise in downtown Olympia.

| Sea Level Rise (ft) | Land Inundated (acres) | Employment (number of people) | Residential Population (number of people) | Buildings Impacted (number and value) | Roads Impacted (miles) |
|---|---|---|---|---|---|
| 0 | 55 | 800 | 1484 | 18 ($15.0M) | 1.7 |
| 0.5 | 108 | 1300 | 1694 | 140 ($91.4M) | 5.7 |
| 1 | 163 | 2200 | 1780 | 175 ($172.4M) | 11.5 |
| 2 | 252 | 2900 | 1860 | 197 ($237.6M) | 20.3 |
| 3 | 322 | 3600 | 1932 | 321 ($341.0M) | 30.4 |
| 4 | 368 | 7000 | 1988 | 337 ($370.3M) | 41.8 |

Table Source: Olympia Sea Level Rise Response Plan Table 4: Olympia Exposure to Sea Level Rise

The National Risk Index does not contain a risk score for sea level rise for the City of Olympia census tracts. However, the Olympia Sea Level Rise Response Plan and the work being done by the Olympia Sea Level Rise Collaborative recognizes the potential impacts of sea level rise and flooding on vulnerable populations.




# City of Olympia Liquefaction Hazard Areas

Road
City
Urban Growth Area

Liquefaction Susceptibility
- High
- Moderate to High
- Low to Moderate
- Low
- Very Low to Low
- Very Low
- N/A (Bedrock)
- N/A (Peat)
- N/A (Water)

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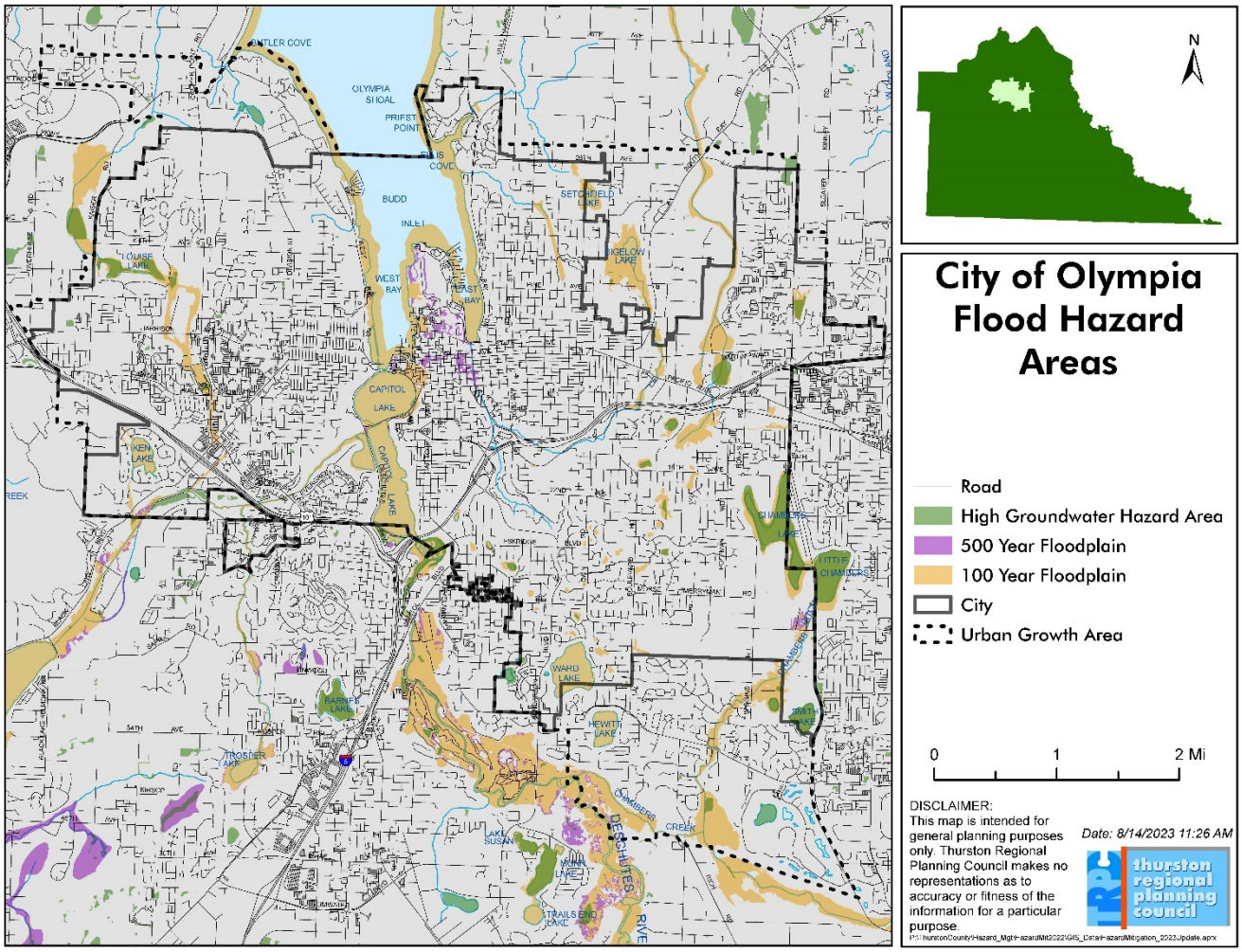
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Flood Hazard
Areas
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500 Year Floodplain
100 Year Floodplain
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OLYMPIA SHOAL
PRIEST POINT
BUDD
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EAST BAY
CAPITOL LAKE
KEN LAKE
LOUISE LAKE
BIGELOW LAKE
SETCHFIELD LAKE
CHAMBERS LAKE
LITTLE CHAMBERS
WARD LAKE
HEWITT LAKE
BARNES LAKE
TROSPER LAKE
LAKE SUSAN
MUD LAKE
TRAILS END LAKE
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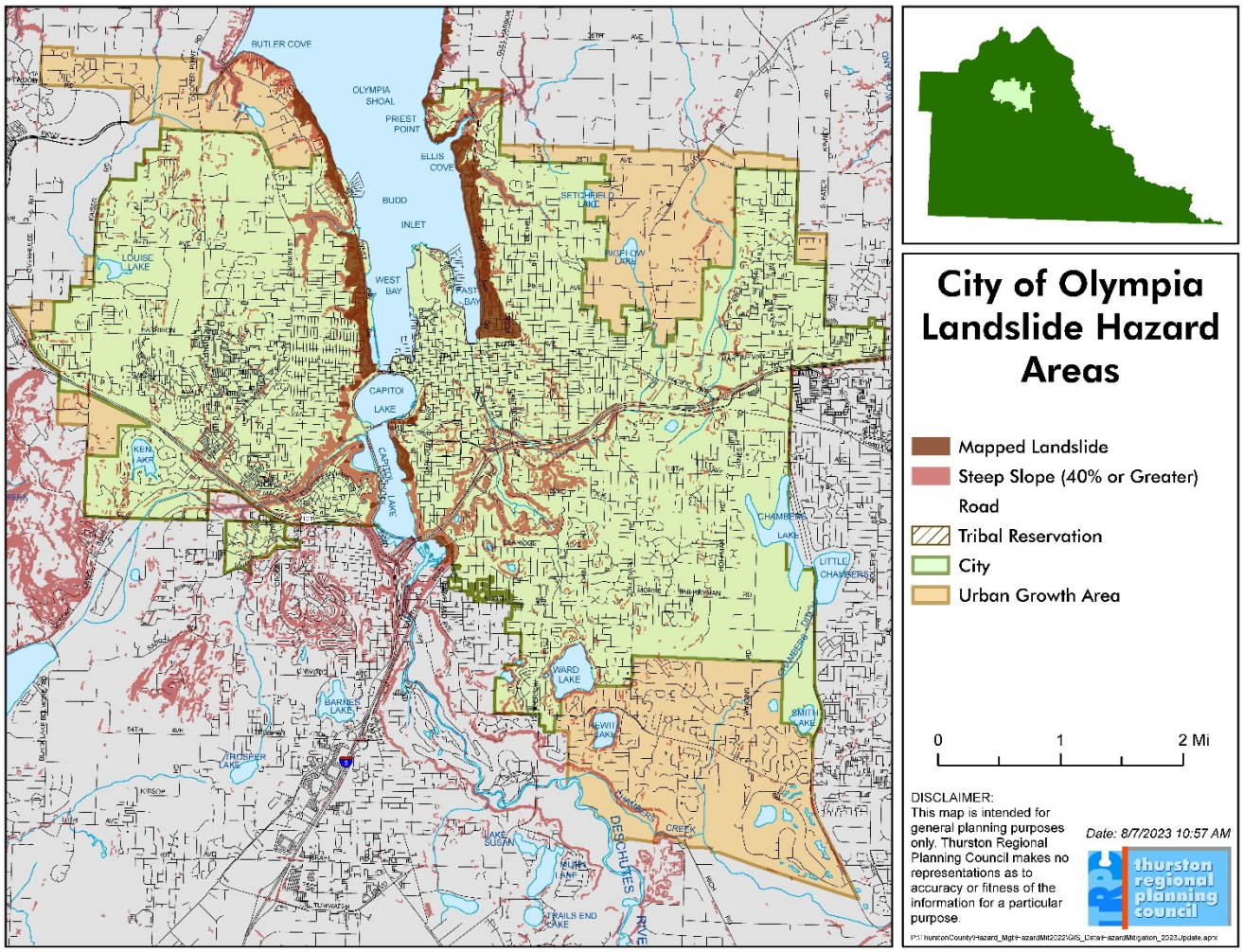
DESCHUTES RIVER
CHAMBERS CREEK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CAPITOL LAKE
KEN LAKE
CHAMBERS LAKE
LITTLE CHAMBERS
WARD LAKE
BARNES LAKE
NEWII LAKE
SMITH LAKE
TROSPER LAKE
LAKE SUSAN
MILLER LAKE
TRAILS END LAKE
DESCHUTES RIVER
CHAMBERS CREEK
City of Olympia Landslide Hazard Areas
Mapped Landslide
Steep Slope (40% or Greater)
Road
Tribal Reservation
City
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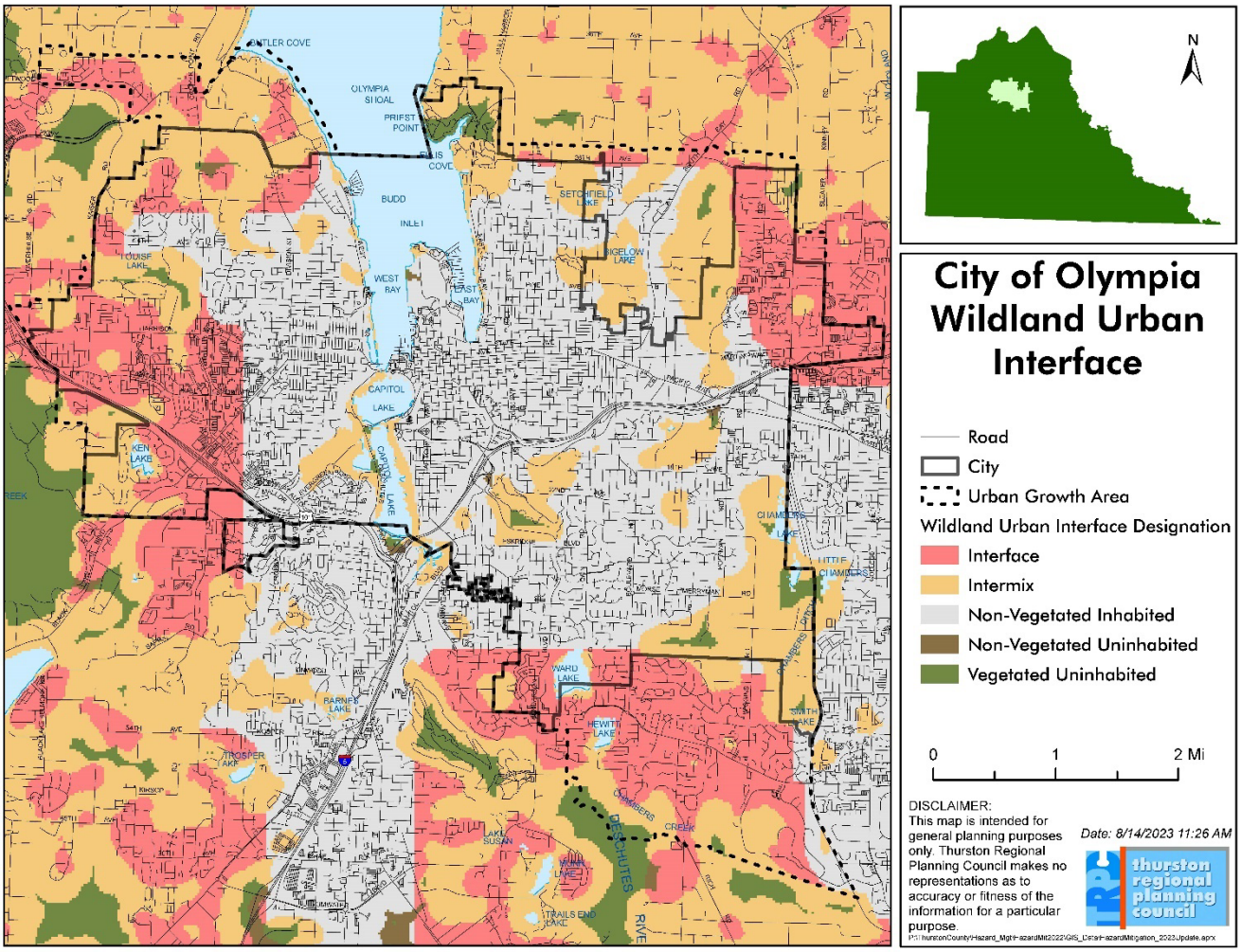
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City of Olympia
Wildland Urban
Interface
Road
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OLYMPIA SHOAL
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CAPITOL LAKE
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SETCHFIELD LAKE
BIGELOW LAKE
CHAMBERS LAKE
LITTLE CHAMBERS
WARD LAKE
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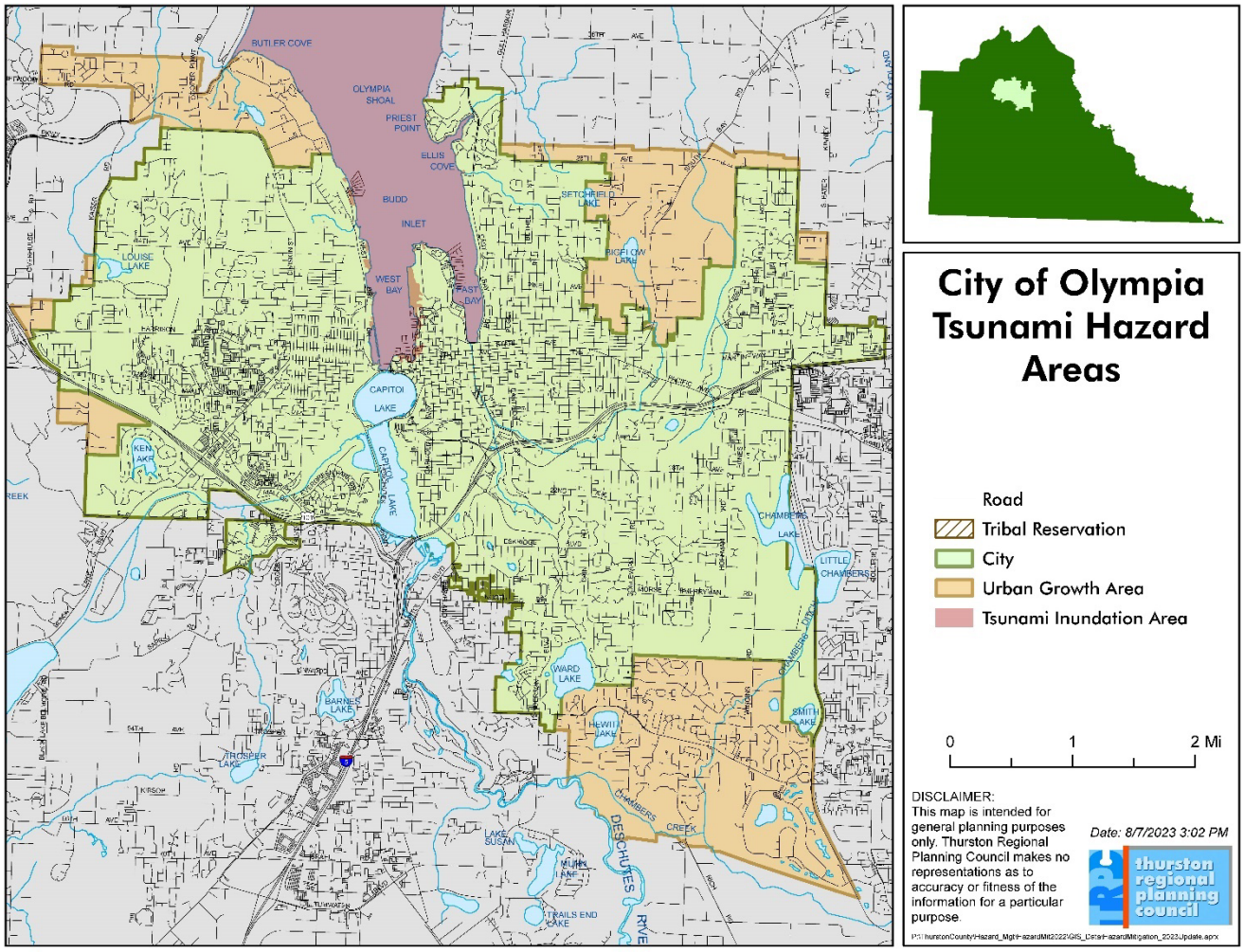
TROSPER LAKE
SMITH LAKE
LAKE SUSAN
TRAILS END LAKE
DESCHUTES RIVER
CHAMBERS CREEK


City of Olympia
Tsunami Hazard
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DISCLAIMER:
This map is intended for general planning purposes only. Thurston Regional Planning Council makes no representations as to accuracy or fitness of the information for a particular purpose.
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thurston regional planning council
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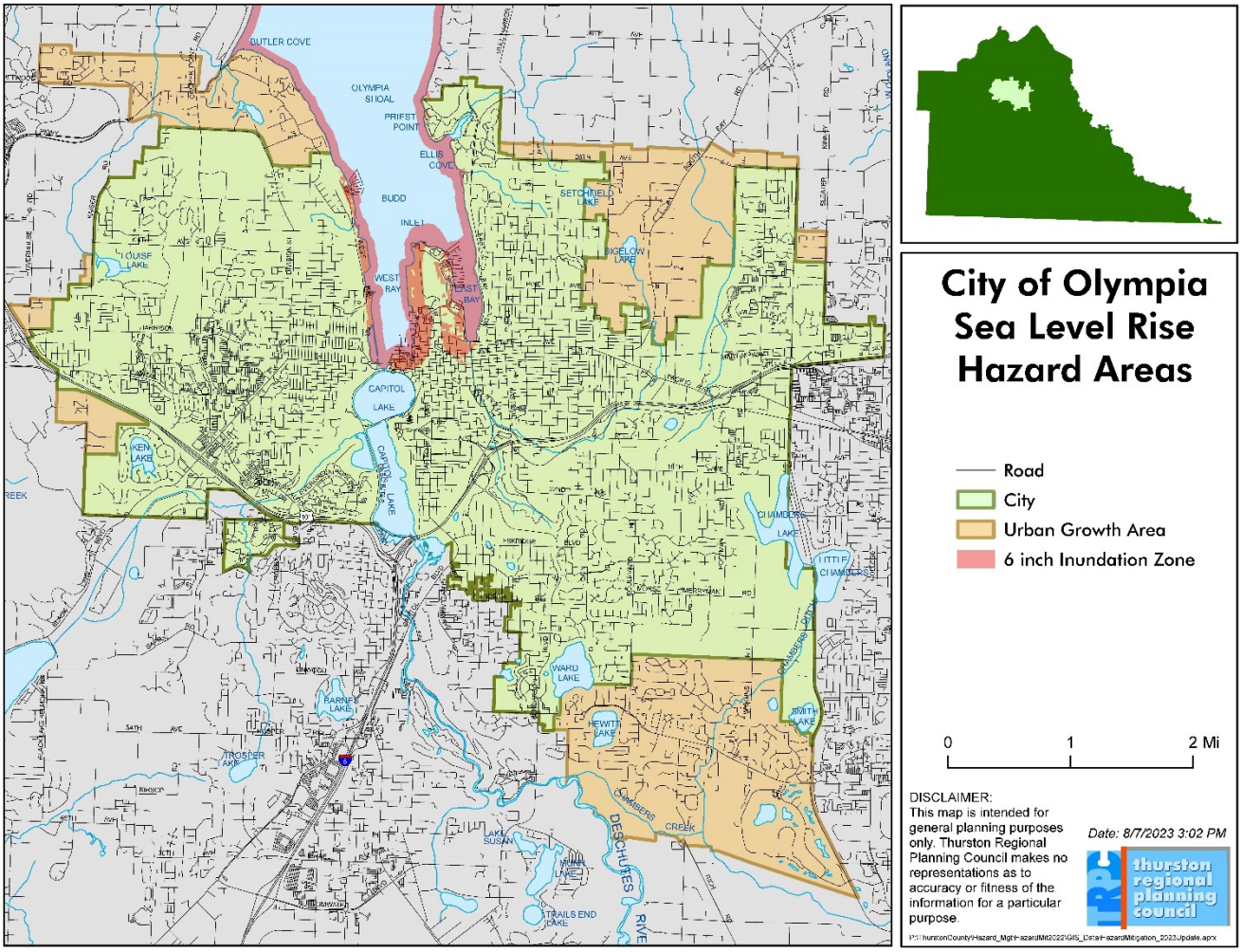
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City of Olympia
Sea Level Rise
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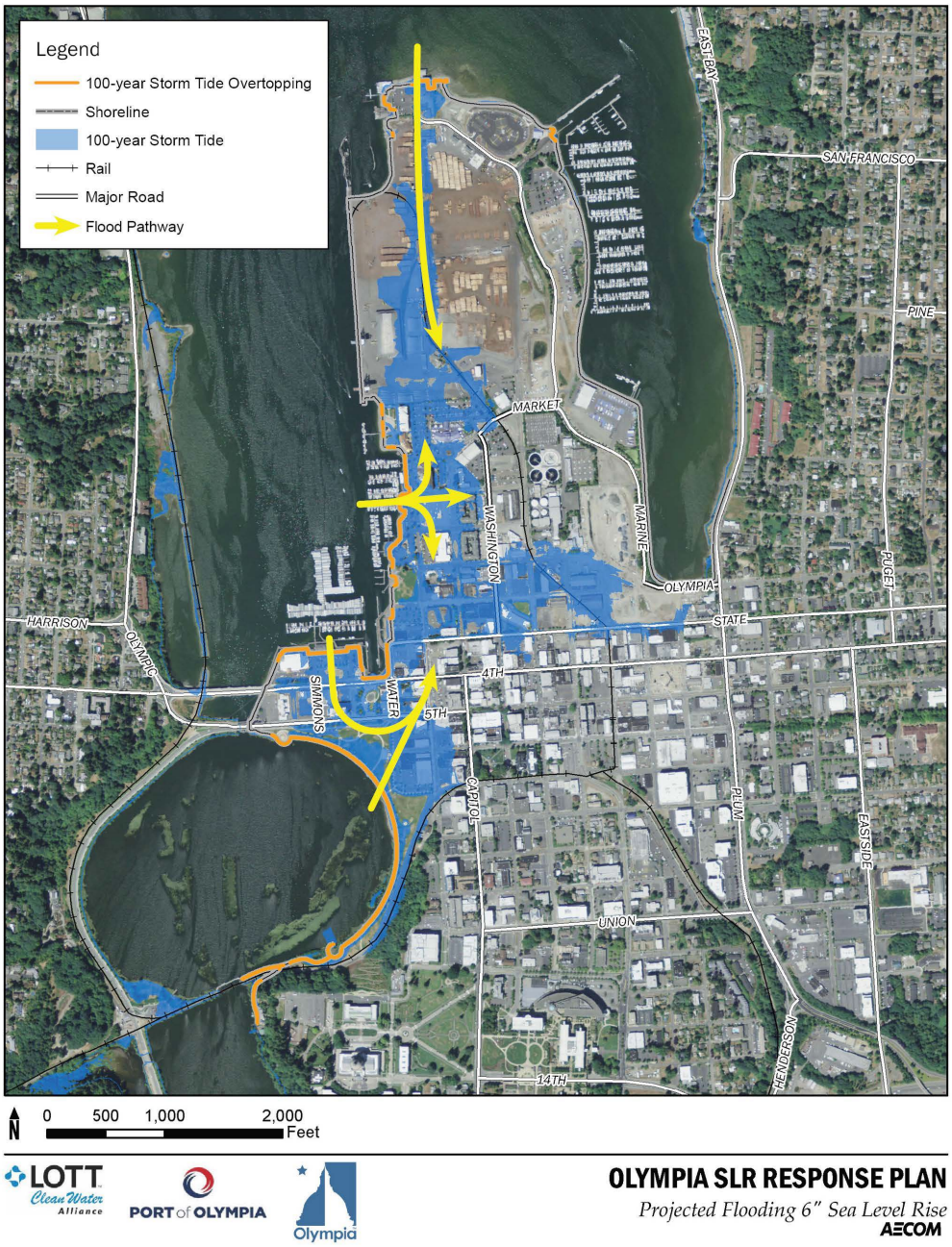



Figure 9. Inundated Assets at 6 Inches of Sea Level Rise

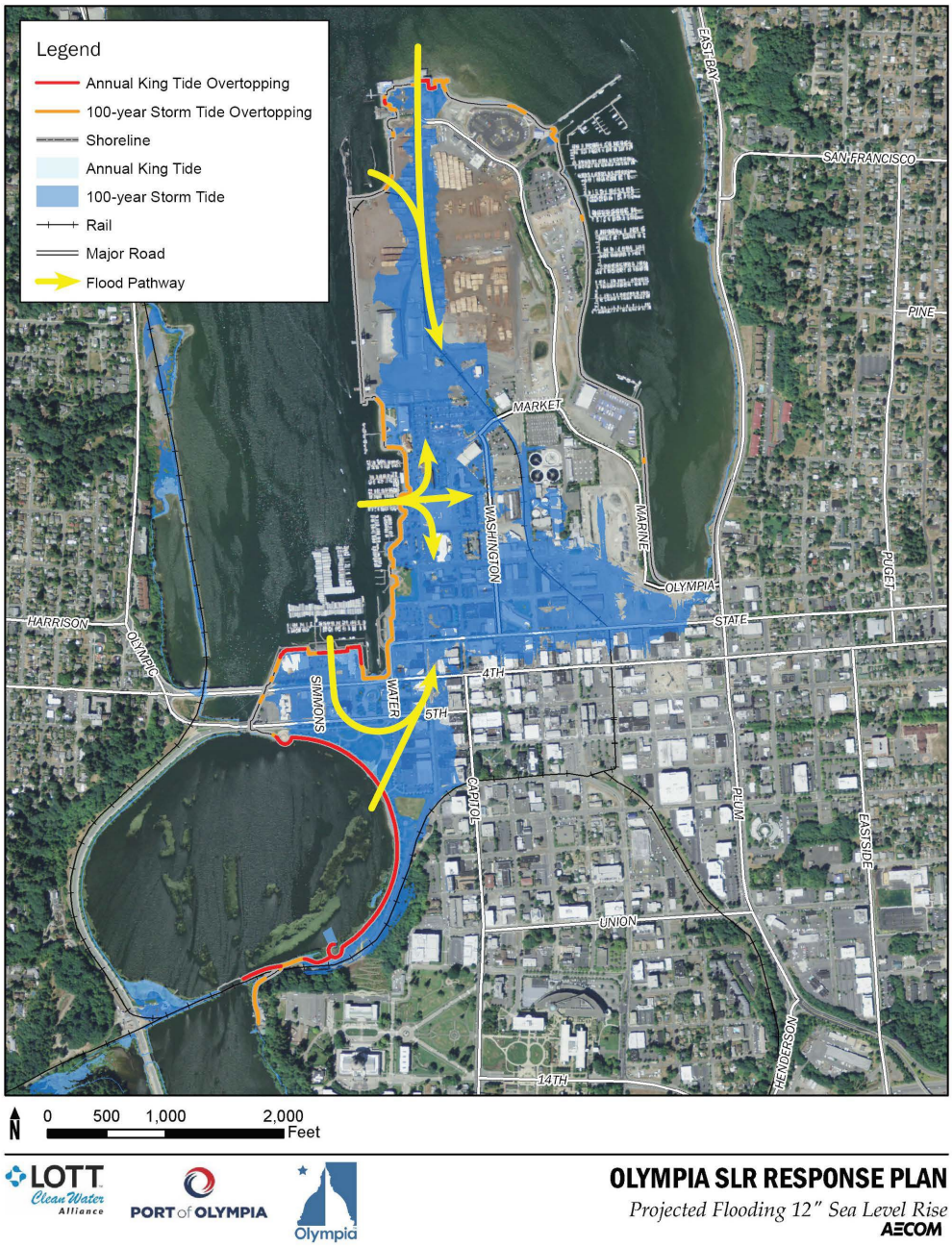



Figure 10. Inundated Assets at 12 Inches of Sea Level Rise

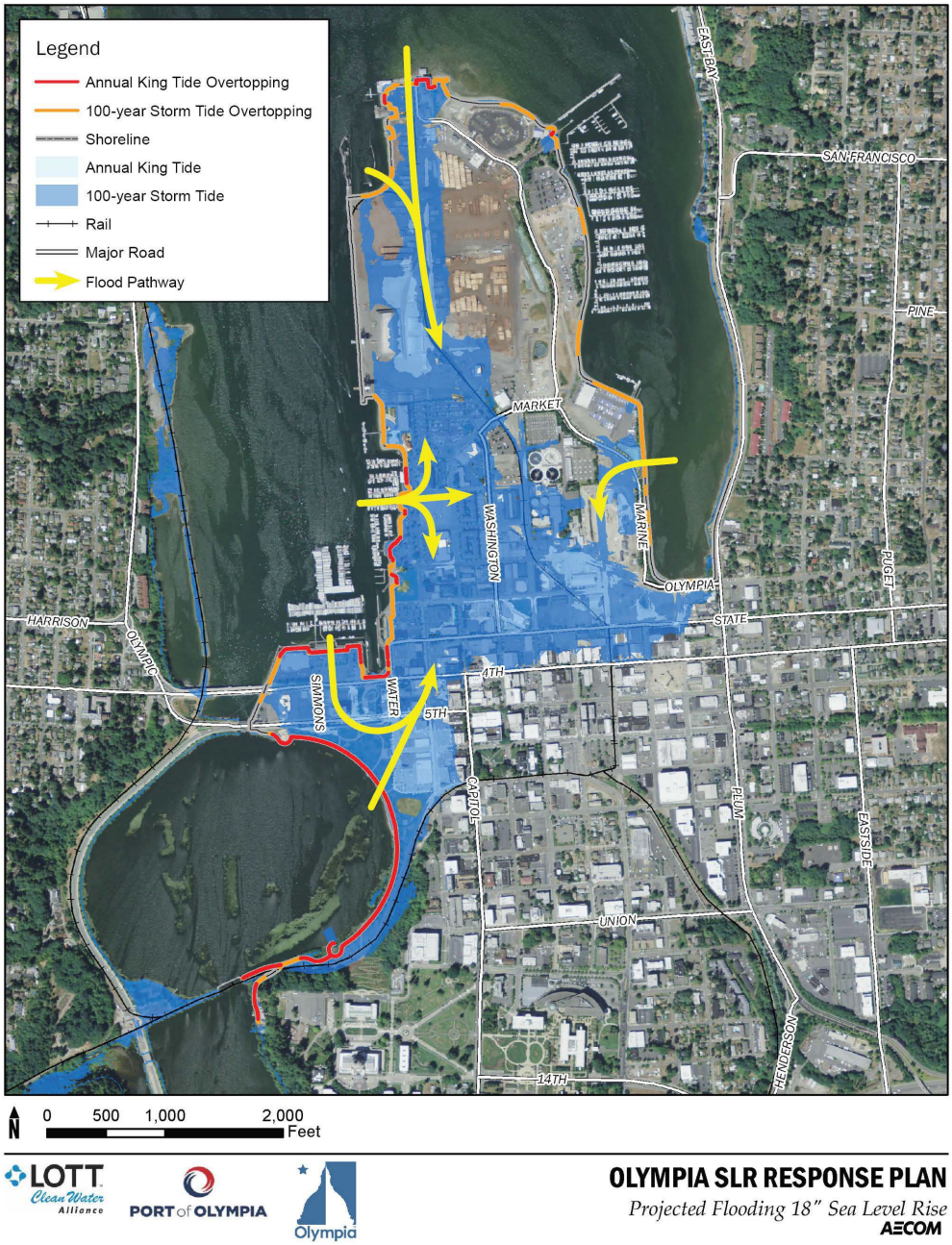



Figure 11. Inundated Assets at 18 Inches of Sea Level Rise

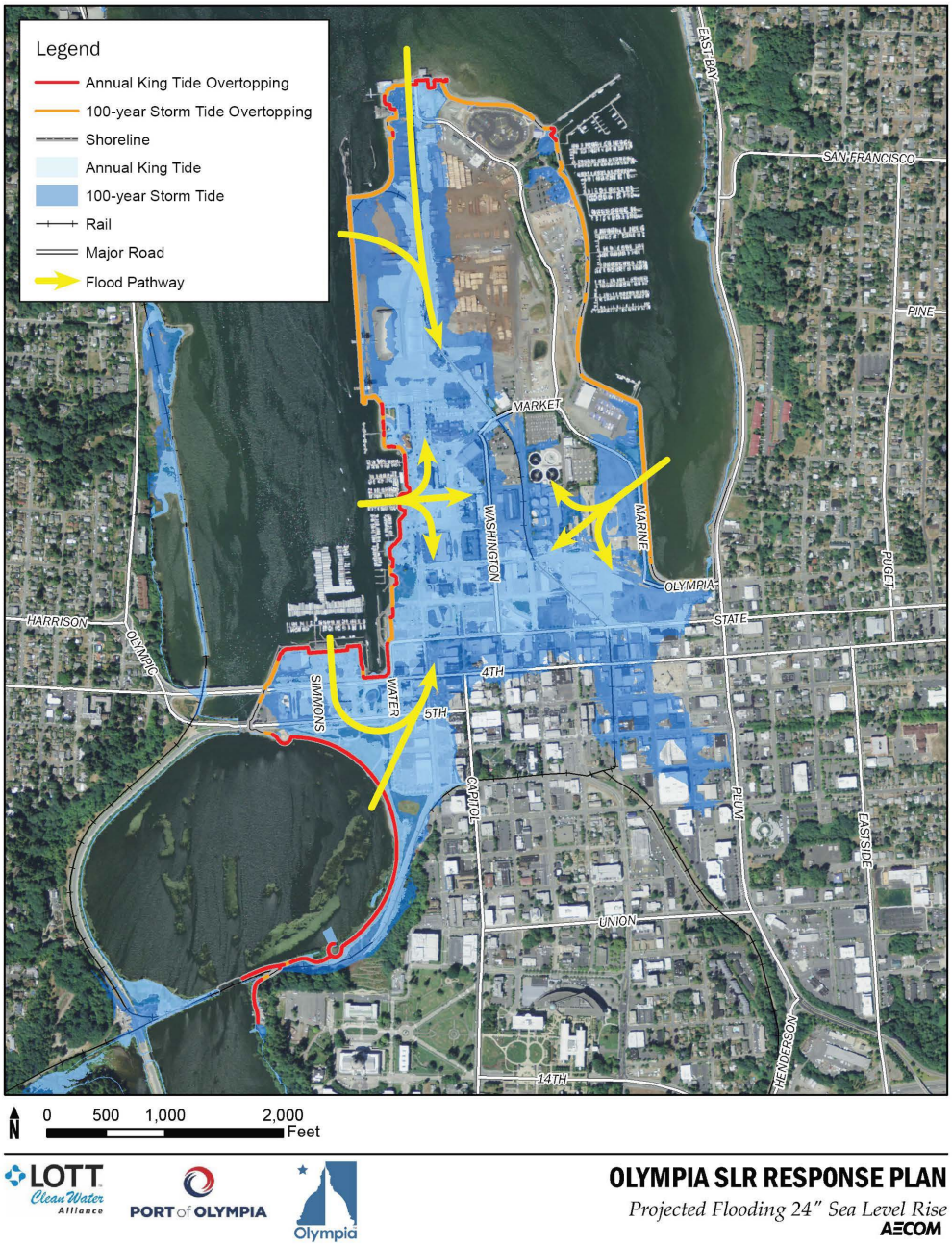



Figure 12. Inundated Assets at 24 Inches of Sea Level Rise

# City of Olympia Mitigation Initiatives

## Current Adopted Mitigation Initiatives

The current Olympia-specific Mitigation Initiatives are actions that have not yet begun or require additional work. They consist of new initiatives identified during the mitigation plan update process and existing initiatives carried over from previous editions of the Hazard Mitigation Plan. Existing initiatives may be modified with each update to reflect changes in priorities, needs, technology, etc. Finally, the Mitigation Initiatives were scored by a subcommittee of the Hazard Mitigation Plan Update Team using the scoring criteria developed for the regional planning process. (See section "Mitigation Initiative Priority Process" for additional information). In several instances, scores were identical, leading to a tie in priority rank.

Taken together with the Regional Mitigation Initiatives contained in the Regional Plan, the Olympia-specific and Regional Mitigation Initiatives form Olympia's comprehensive mitigation strategy. This is because, when taken together, the Regional and Olympia-specific Mitigation Initiatives address all natural hazards potentially impacting Olympia residents including earthquake, flooding, landslides, sea level rise, severe weather, tsunami, volcanic lahar and wildfire in some way. Further, the Regional Initiatives, if implemented, will benefit multiple jurisdictions and improve interagency hazard mitigation planning capabilities. The Regional Initiatives will be overseen by the Emergency Management Council, the Hazard Mitigation Planning Workgroup and leads. Finally, Olympia will participate in regional mitigation planning activities and is responsible for implementing the Olympia-specific Mitigation Initiatives.

| Priority | I.D. Number | Category | Action | Status |
|---|---|---|---|---|
| **1** | Oly-MH 10 | Plan Coordination and Implementation | Develop and adopt a Climate Resilience Plan. | New |
| **2** | OLY-FH 1 | Hazard Damage Reduction | Continue to plan, identify, and implement strategies to mitigate the adverse effects from sea level rise. | Modified |
| **2** | OLY-FH 5 | Hazard Damage Reduction | Protect Heritage Park and the downtown corridor from seasonal flooding. | Existing |
| **3** | OLY-MH 11 | Hazard Preparedness | Develop a Resilience Hub Strategy | New |
| **4** | OLY-EH 1 | Critical Facilities Replacement/retrofit | Conduct seismic assessment and complete retrofit of critical facilities and infrastructure. | Existing |
| **5** | OLY-MH 3 | Critical Facilities Replacement/retrofit | Add backup generators and/or solar and battery energy storage to critical facilities. | Modified |
| **5** | OLY-MH-1 | Hazard Preparedness | Add infrastructure to facilitate multiple radio channels for the Public Works Department. | Modified |
| **6** | OLY-MH 7 | Critical Facilities Replacement/Retrofit | Designate McAllister Wellfield as a sole source aquifer. | Existing |
| **7** | OLY-MH 8 | Critical Facilities Replacement/Retrofit | Assess and install seismic valves on the McAllister Wellfield Transmission Main. | Existing |
| **8** | OLY-MH 9 | Critical Facilities Replacement/Retrofit | Replacement of the sewer and water mains located on the Percival Creek Utility Bridge. | Modified |
| **8** | OLY-EH 2 | Critical Facilities Replacement/Retrofit | Construct a new Maintenance Center. | Existing |

| | | | | |
|---|---|---|---|---|
| **9** | OLY-SH 1 | Critical Facilities Replacement/Retrofit | Replace the existing overhead utility lines throughout the City of Olympia. | Existing |
| **10** | OLY-FH 4 | Hazard Damage Reduction | Design and construct stormwater conveyance systems. | Existing |

Hazard Category Codes are as follows: EH=Earthquake Hazard; FH=Flood Hazard; LH=Landslide Hazard; MH=Multi Hazard; SH=Storm Hazard; WH=Wildland Fire Hazard; and VH=Volcanic Hazard.

## Completed or Removed Mitigation Initiatives

Completed Initiatives, when relevant, are included in this plan to provide evidence of progress made. Initiatives removed from the last Hazard Mitigation Plan (and 2019 update) are either no longer relevant, obsolete, or outside the City's purview.

| I.D. Number | Category | Action | Status |
|---|---|---|---|
| **OLY-MH 1** | Hazard Preparedness | Upgrade the Olympia segment of the county-wide VHF radio system | Removed |
| **OLY-MH 5** | Critical Facilities Replacement/Retrofit | Build an alternative data center to protect and preserve vital records, data and information technology systems | Removed |

Hazard Category Codes are as follows: EH=Earthquake Hazard; FH=Flood Hazard; LH=Landslide Hazard; MH=Multi Hazard; SH=Storm Hazard; WH=Wildland Fire Hazard; and VH=Volcanic Hazard.

## Priority: 1 of 13 Status: New

**OLY-MH 10:** Develop and Adopt a Climate Resilience Plan.

**Hazard Addressed:** Multi Hazard

**Category:** Plan Coordination and Implementaion

**Background and Need:** Thurston County and the City of Olympia is already experiencing the effects of climate change, and these impacts are expected to intensify in the future, including more frequent and severe extreme heat events, increased wildfire risk and smoke exposure, more frequent severe storms and extreme precipitation events, more frequent and severe flooding, and many more. Developing and implementing a Climate Resilience Plan will help Olympia prepare for and adapt to the impacts of climate change that cannot be avoided. This initiative will leverage ongoing work to develop a Climate a Risk and Vulnerability Assessment (CRVA) for the City of Olympia. This initiative may include further analysis of climate hazards identified through the CRVA; identification of new policies, programs, and strategies to adapt and prepare for climate impacts in Olympia; a review and analysis of existing programs and policies that may support climate resilience; and the development of a final Climate Resilience Plan with recommended resilience actions and cost estimates for implementation.

**Relates to Plan Goal(s) and Objectives:** 2B, 2A, 2B, 2C, 2D, 3B, 3C, 4A, 4B, 4C, 5A, 5B, 7D, 7E, 8A, 8B, 9A

**Lead:** Climate Program

**Estimated Cost:** $100,000-$500,000

**Time Period:** 2024-2028

**Funding Source:** To be determined.

**Source and Date:** 2024 Hazard Mitigation Plan Update

**Initiative and Implementation Status:** This initiative was identifying during the 2024 Hazard Mitigation Plan update process. Progress on this initiative will be reported during the next plan update.

## Priority: 2 of 13 (Tied) Status: Modified

**OLY-FH 1:** Continue to plan, identify, and implement strategies to mitigate the adverse effects of sea level rise.

**Hazard Addressed:** Multi Hazard (formerly flooding only)

**Category:** Hazard Damage Reduction

**Background and Need:** Downtown Olympia is vulnerable to flood hazards from sea level rise as well as high flow events in the Deschutes River watershed. With only a 12-inch increase in sea level rise, a 100-year flood event could occur every other year. The recognition of this increased flood risk created a need for the City of Olympia, the Port of Olympia and the LOTT Clean Water Alliance to form a collaborative partnership and produce the 2019 Olympia Sea Level Rise Response Plan. The resulting Sea Level Rise Response Plan (2019) identified four primary Focus Areas for Vulnerability, one of which incorporates the entire boundary of Percival Landing. The City is currently developing a Percival Landing Master Plan that will incorporate the findings of the 2019 Sea Level Rise Response Plan.

This initiative would address the physical, operational, governance and information strategies outlined in the Olympia Sea Level Rise Response Plan. Examples of capital projects, operational, governance and informational strategies include, but are not limited to:

- Construct a berm at Heritage Park
- Install raised planters along Columbia Street and 4th Avenue
- Raise vulnerable Budd Inlet Treatment Plant components
- Raise Billy Frank Jr. Trail
- Consolidate stormwater outfalls and construct a stormwater discharge pump station
- Protect Percival Drinking Water Pump station
- Conduct emergency response activities during flood events
- Develop and implement a sea level rise community and stakeholder strategy

Additional strategies may result from the Percival Landing Master Plan process currently underway.

**Relates to Plan Goal(s) and Objectives:** 1B, 2A, 2B, 2D, 3C, 4A, 4B, 4C, 5B, 5C, 7A, 8B, 8C,5A, 6A

**Lead:** Public Works, Parks, Arts and Recreation, and Community Planning and Development

**Estimated Cost:** Full implementation of the Olympia Sea Level Rise Plan before any refinement to Percival Landing strategies resulting from the Percival Landing Master Plan process is estimated at $190M to $350M (2018 planning estimate)

**Time Period:** 2023-2100

**Funding Source:** To be determined but expected to include, but not be limited to, general funds and grant programs for specific projects.

**Source and Date:** 2009 Natural Hazards Mitigation Plan for the Thurston Region, 2019 Sea Level Rise Response Plan, March 2019

**Initiative and Implementation Status:** To implement the Olympia Sea Level Rise Response Plan and inform its evolution, the Olympia Sea Level Rise Response Collaborative was formed through an Interlocal Agreement. The Collaborative has adopted an annual budget and work plan and its short-term focus is on conducting a groundwater study, and land subsidence survey and investigating funding mechanisms. The City is also developing a Percival Landing Master Plan that will incorporate the findings of the 2019 Sea Level Rise Response Plan.

## Priority: 2 of 13 (Tied) Status: Existing

**OLY-FH 5:** Protect Heritage Park and the downtown corridor from seasonal flooding.

**Hazard Addressed:** Flooding

**Category:** Hazard Damage Reduction

**Background and Need:** Shoreline elevations along Capitol Lake are at elevations of approximately 13 to 14 feet NAVD88, compared to a 100-year flood level of approximately 15 feet. Under existing conditions, flood waters in Capitol Lake can overtop the Heritage Park shoreline and travel eastward and northward to inundate the low-lying business district between 4th and 7th Avenues and Columbia and Simmons Streets. The project would either re-landscape Heritage Park to create a raised berm; or rebuild and raise the current floodwall and walkway; and install a flood gate across the railroad at Powerhouse Road.

This initiative is related to, and consistent with, initiative OLY-FH 1 Continue to plan, identify and implement strategies to mitigate the adverse effects of sea level rise.

**Relates to Plan Goal(s) and Objectives: 2A,** 2B, 2D, 3C, 4A, 4B, 8C

**Lead:** Department of Enterprise Services, Public Works, and Parks, Arts and Recreation

**Estimated Cost:** $4,000,000 to $6,000,000.

**Time Period:** 2025-2050

**Funding Source:** To be determined.

**Source and Date:** 2019 Initiative Update. Olympia Sea Level Rise Response Plan, 2019

**Initiative and Implementation Status:** To implement the Olympia Sea Level Rise Response Plan and inform its evolution, the Olympia Sea Level Rise Response Collaborative was formed through an Interlocal Agreement. The Collaborative has adopted an annual budget and work plan and its short-term focus is on conducting a groundwater study, and land subsidence survey and investigating funding mechanisms.

## Priority: 3 of 13 Status: New

**OLY-MH 11:** Develop a Resilience Hub Strategy.
**Hazard Addressed:** Multi Hazard

**Category:** Hazard Preparedness

**Background and Need:** As climate change increases the frequency and severity of extreme weather and other hazards (such as heat waves, flooding, and severe storms), there is a growing need to conduct pre-disaster outreach and education; and provide a safe space for communities to shelter, receive information, and access resources during and after hazard events. Community Resilience Hubs can complement existing emergency response services by serving as a physical location to support community members before, during, and after an emergency or major disaster (i.e., hazard preparedness, response, and recovery). Resilience Hubs are often developed by augmenting existing community-serving facilities such as schools, libraries, community centers, and other community gathering spaces. This initiative would address scoping, planning, and siting for community resilience hubs in Olympia. This may include: 1) identifying community centers and service providers that are most suitable to serve as resilience hubs; 2) scoping and designing mitigation measures (i.e., capital enhancements and upgrades) necessary for identified hubs to serve the community during and after a hazard event; and 3) identifying administrative and staffing needs for continued operation of identified hubs. Although the impetus for this new Olympia-specific Mitigation Strategy may be tied to concerns associated with increasing impacts from climate change, the pre-disaster outreach and education, shelter and information sharing components of this Mitigation Strategy will also assist with natural hazards not expected to be impacted by climate change in terms of increased probability and intensity such as earthquakes, volcanic lahars and tsunamis.

**Relates to Plan Goal(s) and Objectives:** 1B, 2C, 2B, 7E, 9A

**Lead:** Climate Program, in coordination with Public Works, Parks, Arts, and Recreation, and Fire Department

**Estimated Cost:** $100,000-$500,000

**Time Period:** 2024-2028

**Funding Source:** To be determined.

**Source and Date:** 2024 Hazard Mitigation Plan Update

**Initiative and Implementation Status:** This initiative was identified during the 2024 Hazard Mitigation Plan update process. Progress on this initiative will be reported during the next plan update.

## Priority: 4 of 13 Status: Existing

**OLY-EH 1:** Conduct seismic assessments and complete retrofit of critical facilities and infrastructure.

**Hazard Addressed:** Earthquake

**Category:** Critical Facilities Replacement/ Retrofit

**Rationale:** The City depends on City Hall, the Justice Center, pump stations, sewer lift stations, piping networks, the Maintenance Center, Washington Center, the Olympia Center, the 5th Avenue Bridge and Dam, etc. to maintain government, public health, the local economy, traffic flow, drinking water, etc.

**Relates to Plan Goal(s) and Objectives:** 2A, 2B, 2C, 3B

**Lead:** Public Works

**Estimated Cost:** To be determined.

**Time Period:** 2024-2030

**Funding Source:** To be determined.

**Source and Date:** 2009 Natural Hazards Mitigation Plan for the Thurston Region. 2021-2026 Water System Plan.

**Initiative and Implementation Status:** Olympia has built a New City Hall but other buildings critical to operations of the City need to be replaced or retrofitted. Several City of Olympia water storage tanks (e.g. Elliott, Fir and currently Boulevard) have been retrofitted to meet current seismic standards in recently years using low interest Drinking Water State Revolving Fund loans.

## Priority: 5 of 13 (Tied) Status: Modified

**OLY-MH 3:** Add backup generators and/or solar and battery energy storage to critical facilities.

**Hazard Addressed:** Multi Hazard

**Category:** Critical Facilities Replacement/ Retrofit

**Background and Need:** Electrical power at critical facilities provides immediate support to responders and the public during a disaster. It also expedites the recovery process.

The Olympia Center hosts senior citizens each weekday including a meals program on site, a meals-on-wheels program, and other social services. Loss of power forces these seniors out into a disaster environment that can quickly make them part of the problem further taxing resources. The center is also available as an emergency shelter for City employees and has been used as a warming center for the public.

Emergency backup power for wastewater lift station reduces the risk of a sewage release in the event of power outages. The following lift stations do not have backup power generation: Colonial Estates, East Bay Dr., Springer, Woodcrest, Wood field, Sleater Kinney. Specific projects will upgrade existing emergency backup power:, Miller and Ann, Old Port 1&2, , Roosevelt and Yew, and Jasper Avenue Lift Stations.

The Squaxin Park maintenance facilities are essential for supporting crews through the debris management process after storms and earthquakes.

The Drinking Water Utility has two critical water infrastructure sites currently without on-site backup power: the Westbay Booster Pump Station and the Shana Park well.

**Relates to Plan Goal(s) and Objectives:** 1B, 2B, 3C

**Lead:** Public Works and Parks, Arts, and Recreation

**Estimated Cost:** $40,000 to $1,500,000.

**Time Period:** 2024-2030

**Funding Source:** To be determined.

**Source and Date:** 2009 Natural Hazards Mitigation Plan for the Thurston Region

**Initiative and Implementation Status:** As funds are allocated generators are purchased. The Wastewater Utility has added emergency backup generators at the following lift stations since this initiative was first developed: Water Street, Miller and Central.

## Priority: 5 of 13 (Tied) Status: Modified

**OLY-MH 1:** Add infrastructure to facilitate multiple radio channels for the Public Works department.

**Hazard Addressed:** Multi Hazard

**Category:** Hazard Preparedness

**Background and Need:** The Public Works department currently operates with one channel for radio communication. During an emergency or disaster this channel will quickly become overwhelmed with radio traffic. Additional channels would support operations and command. This upgrade will also improve overall City communications and will foster preparedness from potential impacts from natural hazards including earthquakes, flooding, landslides, severe weather, tsunamis, volcanic lahars and wildfires.

Thurston 9-1-1 Communications (TCOMM), Thurston County's enhanced 911 emergency dispatch center, recently completed a project to establish a digital trunk 700 MHz system. Discussions with TCOMM to determine if this new system provides opportunities for additional radio channels for use by the Public Works department could result in a solution for this ongoing need.

**Relates to Plan Goal(s) and Objectives:** 1A, 1B

**Lead:** Public Works

**Estimated Cost:** $500,000

**Time Period:** 2024-2030

**Funding Source:** To be determined.

**Source and Date:** 3rd Edition Hazards Mitigation Plan for the Thurston Region

**Initiative and Implementation Status:** Planning and research is ongoing. TCOMM completed the construction of a 700 MHz system.

## Priority: 6 of 13 Status: Existing

**OLY-MH 7:** Designate McAllister Wellfield as a sole source aquifer.

**Hazard Addressed:** Multi Hazard

**Category:** Critical Facilities Replacement/Retrofit

**Background and Need:** The wellfield supplies approximately 80 percent of the drinking water consumed by the City of Olympia. The sole source aquifer designation will help protect the aquifer from contamination and may prioritize the wellfield for financial assistance in the event of a major disaster.

**Relates to Plan Goal(s) and Objectives:** 2B, 2D, 3C, 3C, 3D, 5E

**Lead:** Public Works

**Estimated Cost:** $50,000 to $150,000

**Time Period:** 2024-2030

**Funding Source:** Drinking Water Utility Capital Fund.

**Source and Date:** 2019 Initiative Update. 2021-2026 Water System Plan.

**Initiative and Implementation Status:** This initiative has been included in the Drinking Water Utility 6-Year Capital Facility Plan for possible implementation in 2024.

**Priority: 7 of 13** **Status: Existing**

**OLY-MH 8:** Assess and install seismic valves on the McAllister Wellfield Transmission Main

**Hazard Addressed:** Multi Hazard

**Category:** Critical Facilities Replacement/Retrofit

**Background and Need:** The 8-mile long, 36-inch diameter water transmission main is used to supply 80 percent of the drinking water consumed by the City of Olympia and is vulnerable to earthquakes. If damaged by an earthquake, severe localized flooding is possible. Installing seismic valves will reduce water loss and flooding damage.

**Relates to Plan Goal(s) and Objectives:** 1B**,** 2B, 2D, 5E, 8C

**Lead:** Public Works

**Estimated Cost:** $1,500,000

**Time Period:** 2024-2030

**Funding Source:** The Drinking Water Utility was informed that it had received Hazard Mitigation Assistance grant funding for this project, contingent on approval of the Thurston Regional Hazard Mitigation Plan and Olympia Annex.

**Source and Date:** 2019 Initiative Update. 2021-2026 Water System Plan.

**Initiative and Implementation Status:** The Drinking Water Utility applied for a Hazard Mitigation Assistance grant for this project in 2021. Receipt of the grant award was delayed until approval of the Thurston Regional Hazard Mitigation Plan and Olympia Annex occurs.

## Priority: 8 of 13 (Tied) Status: Modified

**OLY-MH 9:** Replacement of the sewer and water mains located on the Percival Creek Utility Bridge.

**Hazard Addressed:** Multi Hazard

**Category:** Critical Facilities Replacement/Retrofit

**Background and Need:** The Percival Creek Utility Bridge supports a 10-inch diameter sewer and 10-inch diameter water main. During a wind event in February 2020, one span of the utility bridge was completely severed by a felled tree breaking both the sewer and water mains. The water main break resulted in severe erosion of the bridge abutment. The sewer main break discharged approximately 30,000 gallons of sewage to Percival Creek which flows to Capitol Lake and Budd Inlet. The sewer main serves approximately 765 residential units and 42 commercial accounts including the Thurston County Courthouse. The water main provides drinking and fire protection to a pressure zone serving approximately 2,100 residential units and 64 commercial accounts. Additionally, the area served by this sewer and water line is identified as relatively moderate in terms of its National Risk Index.

The location of the utility bridge makes it susceptible to a repeat wind event and the utility bridge is not built to current seismic standards. Because the utility bridge is structurally unreliable, addressing the water main along the bridge was included in the 2015-2020 Water System Plan and 2021-2026 Water System Plan.

Following the 2020 wind event, the City obtained FEMA PA funding to repair the storm damage. The City also obtained a Washington State Department of Commerce emergency loan which, in addition to assisting with covering costs to bring the Utility Bridge back to its pre-disaster function, also includes an analysis of the possibility of boring a sewer siphon under Percival Creek and rerouting water as an alternative to full restoration of the utility bridge.

Wind-storm related repairs to the utility bridge were completed in July 2020 and it has been returned to its pre-disaster function. (Repairs did not include seismic upgrades to the utility bridge.)

The Percival Creek Sewer HDD Crossing Alternative Analysis and Feasibility Study was completed in 2021. This analysis concluded that replacing the existing sewer line with a new gravity sewer inverted siphon pipeline under Percival Creek using HDD construction is feasible and appears to be the best options to mitigation the vulnerabilities associated with the existing sewer line attached to the Percival Utility Bridge. An analysis of water main rerouting alternatives is pending.

**Relates to Plan Goal(s) and Objectives:** 1B, 2A**,** 2B, 2D, 4A, 6D, 8C

**Lead:** Public Works

**Estimated Cost:** $5,000,000

**Time Period:** 2024-2030

**Funding Source:** To be determined.

**Source and Date:** 2019 Initiative Update. 2015 – 2020 Water System Plan. 2021-2026 Water System Plan.

**Initiative and Implementation Status:** In 2021, the City completed the Percival Creek Sewer HDD Crossing Alternative Analysis and Feasibility Study and started the effort to apply for Building Resilient Infrastructure and Communities (BRIC) grant funding.

## Priority: 8 of 13 (Tied) Status: Existing

**OLY-EH 2:** Construct a new Maintenance Center.

**Hazard Addressed:** Earthquake

**Category:** Critical Facilities Replacement/Retrofit

**Background and Need:** The Maintenance Center is a series of buildings that are critical to response and recovery efforts during emergencies and disasters. It serves as a call center, dispatch hub, and command center. Equipment is stored, prepared, restocked, and fueled out of this facility. Additionally, employees report to, deploy from, and rest and recover at the Maintenance Center during emergencies.

The Maintenance Center is located on highly liquefiable soils, the Swan Town slough and fill dirt. It is at high risk for significant damage during a major seismic event. The buildings, including the fueling island, were not constructed to withstand a seismic event. It would debilitate response and recovery efforts if this facility was lost or compromised during a seismic event.

**Relates to Plan Goal(s) and Objectives**: 1B, 2A, 2B**,** 2C, 2D

**Lead:** Public Works

**Estimated Cost:** $20,000,000 to 30,000,000

**Time Period:** 2024-2030

**Funding Source:** To be determined.

**Source and Date:** 3rd Edition Hazards Mitigation Plan for the Thurston Region

**Initiative and Implementation Status:** A 2016 feasibility study included a facility needs assessment, site analysis, cost estimate, and a recommendation to rebuild on the existing site.

**Priority: 9 of 13** **Status: Existing**

**OLY-SH 1:** Replace the existing overhead utility lines throughout the City of Olympia.

**Hazard Addressed:** Storm

**Category:** Critical Facilities Replacement/Retrofit

**Background and Need:** Loss of services to the citizens, specifically power, phones and cable has a damaging effect on the wellbeing of our citizens following a disaster. Loss of power can affect heating and cooling at critical times of the year and some of our residents require power to operate medical equipment in their homes. Telephone lines are crucial in the community's ability to request assistance after a disaster. Cable, while often considered a comfort item can also be utilized as an effective tool to provide citizens with critical survival information following a disaster. This project would be completed in two phases, phase one to include the downtown core, phase two would be the remainder of the city. Additionally, existing overhead utility lines which provide service to critical facilities and services could be considered for prioritization.

**Relates to Plan Goal(s) and Objectives:** 2B

**Lead:** Puget Sound Energy, Public Works, and Community Planning and Development

**Estimated Cost:** To be determined.

**Time Period:** 2025-2075

**Funding Source:** Development infrastructure upgrade funds and other to be determined sources.

**Source and Date:** 2009 Natural Hazards Mitigation Plan for the Thurston Region.

**Initiative and Implementation Status:** Partial replacements in the downtown core.

## Priority: 10 of 13 Status: Existing

**OLY-FH 4:** Design and construct stormwater conveyance systems.

**Hazard Addressed:** Flooding

**Category:** Hazard Damage Reduction

**Background and Need:** Each of the identified projects will reduce historical overland flooding which obstructs lifeline transportation routes and disrupts the local economy.

Ken Lake Flood Stormwater Conveyance:

- Design and construct a stormwater conveyance system to reduce historical overland flooding associated with the Gruen Swale and Stonewall Swale tributary to Ken Lake in West Olympia.

Cooper Point and Black Lake Stormwater Conveyance:

- Design and construct improvements to the stormwater conveyance system between Yauger Park and U.S. Route 101 in West Olympia. This is the City's busiest intersection and provides primary access to the Westside Medical Center.

**Relates to Plan Goal(s) and Objectives:** 2A, 2B

**Lead:** Public Works

**Estimated Cost:** $750,000 to $4,850,000

**Time Period:** 2025-2050

**Funding Source:** To be determined.

**Source and Date:** 2019 Initiative Update. Storm and Surface Water Plan, 2018.

**Initiative and Implementation Status:** City staff, along with engineering consultants, have investigated alternatives for addressing flooding at Cooper Point and Black Lake in preparation for the submittal of a Building Resilient Infrastructure and Communities (BRIC) grant funding.

# City of Olympia Implementation of the National Flood Insurance Program

## Introduction

All Local Mitigation Plans approved by FEMA after October 1, 2008, must describe each jurisdiction's participation in the NFIP and must identify, analyze, and prioritize actions related to continued compliance with the NFIP. Basic compliance NFIP actions could include, but are not limited to:

- Adoption and enforcement of floodplain management requirements, including regulating all and substantially improving construction in Special Flood Hazard Areas (SFHAs);
- Floodplain identification and mapping, including any local requests for map updates, if needed; or
- Description of community assistance and monitoring activities.

| | |
|---|---|
| Requirement 201.6(c)(3)(ii): | [The Mitigation Strategy] must also address the jurisdiction's participation in the NFIP, and continued compliance with NFIP requirements, as appropriate. |

## NFIP Participation

The City of Olympia has actively participated in the National Flood Insurance Program (NFIP) since 1981. The City of Olympia continues to participate in the NFIP because it is integral to current and future flood mitigation efforts and completed its latest Community Assistance Visit in Spring 2023. In addition, the hazard mitigation strategy is based upon continued participation and compliance with the NFIP. See Appendix A "NFIP Capability" for additional information, including the current number of NFIP policies and total coverage as well as information about repetitive loss and severe repetitive loss properties located within the City of Olympia zip codes.

## Flood Plans, Ordinances, and Regulations

Portions of the City of Olympia are located within the 100-year floodplain, a designated floodway, and/or a coastal high-hazard V zone.

The City of Olympia has a strong framework of policies and laws that help reduce property damage due to floods as well as protect the natural functions of floodplains. Beginning with the Olympia Comprehensive Plan contains the following Goals, Objectives, and Policies that pertain to floodplains:

> ENV 5.1 Direct development to those areas best suited for it. Limit development in areas with geological instability, frequent flooding, high habitat values, or steep slopes.
>
> ENV 5.2* Enforce regulations that minimize damage due to landslides, seismic hazards, erosion, or flooding.

ENV 5.3 Enforce regulations that protect the general public against avoidable losses from flooding. Developments proposed within flood hazard areas must meet the requirements of the City of Olympia Floodplain Management Ordinance.

The City of Olympia Codes as they pertain to restrictions to building in the floodplain include Olympia Municipal Chapter 16.70 Development in Flood Hazard Areas (last updated and approved in 2021). OMC 16.70 includes the following intent and purpose:

## A. Authorization.

1. The Legislature of the State of Washington has delegated the responsibility to local governmental units to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry. Therefore, the City Of Olympia does ordain as follows:

## B. Findings of Fact.

1. The flood hazard areas of the City of Olympia are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.
2. These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated, or otherwise protected from flood damage also contribute to the flood loss.

## C. Statement of Purpose.

1. It is the purpose of this ordinance to promote the public health, safety, and general welfare; reduce the annual cost of flood insurance; and minimize public and private losses due to flood conditions in specific areas by provisions designed:
   a) To protect human life and health;
   b) To minimize expenditure of public money and costly flood control projects;
   c) To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
   d) To minimize prolonged business interruptions;
   e) To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard;
   f) To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard to minimize future flood blight areas;
   g) To ensure that potential buyers are notified that the property is in an area of special flood hazard;
   h) To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

## D. Methods of Reducing Flood Losses.

1. To accomplish its purposes, this ordinance includes methods and provisions for:

a) Restricting or prohibiting uses that are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
b) Requiring that uses vulnerable to floods, including facilities that serve such uses, be protected against flood damage at the time of initial construction;
c) Controlling the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;
d) Controlling filling, grading, dredging, and other development which may increase flood damage; and
e) Preventing or regulating the construction of flood barriers that unnaturally divert floodwaters or may increase flood hazards in other areas.

(Ord. 7031 §1, 2016; Ord. 6816 §1, 2012; Ord. 6523 §15, 2008).

## City of Olympia Floor Mitigation Activities

The following activities are carried out as part of our participation in the NFIP to further reduce the effects of flooding.

1. Elevation Certificates: City of Olympia maintains elevation certificates for new and substantially improved buildings. Copies of elevation certificates are made available upon request.
2. Map Information: City of Olympia furnishes flood zone information from the community's latest Flood Insurance Rate Map (F.I.R.M.), annually publicizes the service, and maintains records.
3. Hazard Disclosure: City of Olympia recognizes the disclosure requirements of the State of Washington disclosure law.
4. Flood Protection Information: Documents relating to floodplain management and locally pertinent flood issues are available throughout the Timberline Regional Library system.
5. Flood Protection Assistance: City of Olympia provides technical advice and assistance to interested property owners and annually publicizes the service.
6. Additional Flood Data: City of Olympia maintains a high-level restrictive floodway and floodplain standard and uses the flood of record elevations when applying its regulations.
7. Higher Regulatory Standards: City of Olympia enforces regulations that require freeboard for new construction and substantial improvement, protection of critical facilities, natural and beneficial functions, other higher regulatory standards, land development criteria, and state-mandated regulatory standards.
8. Flood Data Maintenance: City of Olympia has established and maintains a system of elevation reference marks and maintains copies of all previous F.I.R.M. maps and Flood Insurance Study Reports.
9. Stormwater Management: The State of Washington has instituted a Clean Water Program and the County has adopted the Department of Ecology's Stormwater Manual for Puget Sound. The County enforces regulations for stormwater management, freeboard in non-special flood hazard area zones, soil and erosion control, and water quality.

10. Flood Warning Program: City of Olympia provides a program for the timely identification of impending flood threats, disseminating warnings to appropriate floodplain residents, and coordinating flood response activities.

# Public Comment Summary

COMMENT FORM: HAZARDS MITIGATION PLAN FOR THE THURSTON REGION

## #1

COMPLETE

| | |
|---|---|
| **Collector:** | Web Link 1 (Web Link) |
| **Started:** | Monday, November 13, 2023 7:04:47 PM |
| **Last Modified:** | Monday, November 13, 2023 7:13:56 PM |
| **Time Spent:** | 00:09:08 |
| **IP Address:** | 73.181.184.225 |

Page 1

**Q1**

What is your name?

Karen Messmer

**Q2**

What community do you live in?

**Olympia**

**Q3**

What is your zip code?

98501

**Q4**

Which community's plan are you submitting comments on?

**City of Olympia**

**Q5**

Comment #1. What Section of the plan does your comment address?

**Mitigation Strategy,**
Insert your feedback:
The downtown flooding (sea level rise) plans need to include the potential for some retreat from part of downtown. The costs for saving all of the downtown area are so high that it likely won't happen in time. Meanwhile the annual flooding will get worse and more costly. Making plans and forming a committee to investigate funding will not save downtown from the floods that are already happening. Also the building standards for flood avoidance should be reassessed.

COMMENT FORM: HAZARDS MITIGATION PLAN FOR THE THURSTON REGION

| | |
|---|---|
| **Q6**<br>Comment #2. What Section of the plan does your comment address? | **Mitigation Strategy,**<br>Insert your feedback:<br>Large areas of town are subject to electric power disruption because they have overhead power lines. The franchise to allow PSE to operate in the city should include requirements for undergrounds some of the system each year. Yes, new construction has underground lines, but retrofitting existing areas needs to be done. |
| **Q7**<br>Comment #3. What Section of the plan does your comment address? | **Mitigation Strategy,**<br>Insert your feedback:<br>There should be a wider discussion to re-visit the shorelines and assess how we will address sea level rise and restoration of the estuary. The cost of simply putting up berms around everything is so huge that we need to look at the big picture of what we can realistically save along with the restoration. |
| **Q8**<br>What is your gender? | **Female** |
| **Q9**<br>What is your age range? | **55-69** |
| **Q10**<br>What is your race/ethnicity? Check as many as apply. | **White** |
| **Q11**<br>What is your household's annual income (before taxes)? Choose one | **$50,000-$74,999** |

# Appendix A: Part 1
# Community Capability Assessment

## Introduction

Each jurisdiction is required to evaluate and document their unique set of capabilities and tools that can be leveraged to support hazard mitigation and increase community resilience. A capability assessment can aid a plan participant to perform this task. Below are the specific FEMA requirements related to the capability assessment and documentation – its listed in Element C: Mitigation Strategy.

> *C1. Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement 44 CFR § 201.6(c)(3))*
>
> *C1-a. Does the plan describe how the existing capabilities of each participant are available to support the mitigation strategy? Does this include a discussion of the existing building codes and land use and development ordinances or regulations?*
>
> *C1-b. Does the plan describe each participant's ability to expand and improve the identified capabilities to achieve mitigation?*

*A more detailed description of the Community Capability Assessment can be found in the Updated FEMA Local Mitigation Planning Handbook in Task 5, starting on page 79 (pdf page 87).*

Your annex must describe which authorities, policies, programs, funding, and resources your jurisdiction has to accomplish hazard mitigation. The description should include a discussion on:

- Capital facilities plans
- Comprehensive and/or strategic plans
- Building codes
- Land use and development codes
- Ordinances and regulations key to reducing risk

Your annex must also describe ways your jurisdiction can expand on and improve your capabilities to help you understand your hazards and reduce your risks.

- Do your capabilities actively support mitigation?
- How can you specifically address gaps, challenges, and opportunities?

## Capability Assessment Worksheets - Instructions

Begin by using the Capability Assessment Worksheets to document the various resources available to your jurisdiction. The worksheet will point your agency to the range of plans, regulations, resources, and practices that you should consider. Consider which department staff who can assist your planning team with the relevant sections of the Capability Assessment Worksheet. Completing the worksheet will help your planning team identify your strengths and weaknesses to satisfy the FEMA planning requirements.

You can reference the Core Plan's Capability Assessment to consider state and regional resources that you may be unfamiliar with. You can also the responses to the SWOO Assessment performed in March 2023 by the plan participants.

You must document the evaluation of your capability Assessment. Each worksheet is followed by an "Observation and Discussion" sheet to report your key findings. Your completed worksheet and evaluation can help you select mitigation actions that are matched to your capabilities. The evaluation may also help you identify new mitigation actions to increase your capacity such as data collection, staff training, and amending existing plans, codes, and policies. FEMA will not penalize jurisdictions for not having the ability to improve a capability, however gaps must be described. Gaps are opportunities for new capacity building mitigation actions.

# Capability Assessment Worksheets

## Types of Capabilities

There are four mitigation worksheets. Use the worksheets to take notes about relevant capabilities within your jurisdiction. Each type of capability may include laws, regulations, policies, programs, staff, or funding. They may go beyond traditional mitigation, too. Your planning team may find other capabilities that help make your jurisdiction more resilient.

1. Planning and regulatory
2. Administrative and technical
3. Financial
4. Education and outreach

## Observations and Discussion Form

Each worksheet includes an 'Observations and Discussion' form. It includes a series of questions to help you document which authorities, policies, programs, funding, and resources your jurisdiction has to accomplish hazard mitigation. The discussion must account for building codes, land use and development codes, ordinances and regulations that are key to reducing risk. It must also describe ways your jurisdiction and expand on and improve your capabilities.

## Evaluating Equity in the Capability Assessment

Consider low-income, communities of color, people with disabilities, people who lack English proficiency, people with insecure housing, and others who may be disenfranchised from economic, social, and civic life. Are there barriers to accessing resources in your community? By reducing barriers to socially vulnerable and underserved populations, your jurisdiction can support a whole-community approach to hazard mitigation. Use the following questions to bring equity into your capability assessment.

- Which communities and populations lack resources to improve their resilience?
- What gaps might exist that decrease an underserved community's ability to access resources and plan for risk reduction?
- Do any capabilities disproportionately benefit wealthy areas or neighborhoods?
- Do any capabilities actively increase the vulnerability of underserved and socially vulnerable populations and communities?
- How can you think differently about leveraging non-monetary and non-traditional resources and partners to support underserved communities?

## Notes for Special Purpose Districts

FEMA requires that the non-city/non-county planning participants address how your special purpose district adheres to the permitting process, building codes, development regulations, etc. of the jurisdiction that has land use authority over your building and land use activity. There should be a general discussion on how your jurisdiction complies with the plans, policies, and programs that you follow for development of your jurisdiction's facilities (fire stations, transit stops and stations, school buildings and campuses, pump houses, administrative offices, etc.)

## 1. Planning and Regulatory

*Evaluation for Planning and Regulatory Capabilities*

- What is the legal framework for land use planning in your jurisdiction? (Special Purpose Districts are required to report how they coordinate with the county or cities to adhere to their plans, development codes, and regulatory land use requirements).
- What kinds of plans does your jurisdiction have? Which are used most often?
- Are there any specific laws or ordinances that mitigate hazards?
- How do you regulate growth and development?
- How does your jurisdiction protect community lifelines such as well heads, wastewater treatment facilities, and other critical facilities, including dams and levees?

| Plans | In Place? Y or N | **Notes - Does the plan address hazards? Can the plan be used to implement mitigation actions? When was it last updated?** *Cite specific sections or language that supports hazard mitigation. Note if there are gaps.* |
|---|---|---|
| **Comprehensive / Master Plan** | Yes | Yes, the Comp Plan addresses hazards and can be used to implement mitigation actions. A minor update occurred in 2021, and a major update in 2014. The City is currently undertaking a GMA required update cycle, due June 2025. We have a new requirement to address natural hazards during this update cycle. A thorough review will occur at that time. |
| **Capital Facilities / Improvement Plans** | Yes | Yes the CFP addresses hazards and can be used to implement mitigation actions. The CFP is updated annually, with the last update approved in December 2022 for the time period 2023-2028. The City's Storm and Surface Water Utility's CFP includes projects that address localized flooding, purchasing property for habitat and flooding reasons as well as projects to address sea level rise. The City's Drinking Water Utility's CFP includes projects that address potential wildfire at 2 drinking water well sites and well as protecting infrastructure against earthquakes. The City's Wastewater Utility's CFP includes projects that address sea level rise impacts to infrastructure and purchasing generators for key infrastructure. |
| **Climate Adaptation Plan** | No | A Climate Adaptation Plan prepared for the Thurston County region was not officially adopted by the City of Olympia. The City is currently developing phase I of a climate risk and vulnerability assessment which is expected to lead to a Climate Adaptation Plan. |
| **Community Wildfire Protection Plan** | No | |

| | | |
|---|---|---|
| **Comprehensive Emergency Management Plans** | Yes | The City adopted an updated Comprehensive Emergency Management Plan in early 2023. The City of Olympia's Comprehensive Emergency Management Plan specifies the purpose, organization, responsibilities and role of the City in the prevention of, mitigation of, preparation for, response to and recovery from emergencies and disasters. As such, mitigation is spread throughout the document. |
| **Comprehensive Flood Management Plan** | Yes | The City maintains FEMA flood plain maps and has a designated flood plan manager – the city's building official. The City's critical area ordinance places restrictions on building in flood plains. |
| **Continuity of Operations Plan** | Maybe | The public works department maintains COO Plans for its operations. It is currently unclear if the City has a city wide COO. |
| **Economic Development / Resiliency Plan** | Yes | The Thurston County region has an economic development/resiliency plan – Thurston Strong. The City is working on a new "Olympia Strong" economic development/resiliency plan. The City's ability to rebound after a disaster could be considered via the Comprehensive Plan Update project. |
| **Habitat Conservation Plan** | Yes | The Storm and Surface Water Utility developed its Habitat and Stewardship Strategy in 2013. The Utility's habitat strategy includes land acquisition, riparian and wetland vegetation maintenance and enhancement and projects to improve aquatic habitats. As such, this strategy supports mitigation planning. |
| **Stormwater Management Plan** | Yes | Yes, the Stormwater Management Plan addresses flooding hazards. It was last updated in 2016. The Stormwater Management Plan provides the background needed for flooding projects that are incorporated into the annually adopted CFP. |
| **Transportation Plan** | Yes | The City's Transportation Master Plan was approved in February 2021. The plan includes projects to improve Olympia's street system for walking, biking, driving and riding the bus. By stressing multimodal projects, the Plan helps prepare the community for natural disasters by making movement by bike and walking a priority in roadway system design. |
| **Other (describe and append rows as needed)** | | |
| **Land Use Planning and Ordinances** | **Y or N** | **Notes - Is the ordinance an effective measure for reducing hazard impacts? Is it adequately administered and enforced?** *Cite specific language or sections of ordinances or codes that support hazard mitigation, if applicable. Note if there are gaps.* |

| | | |
|---|---|---|
| **Acquisition of land for open space, public recreation, or conservation** | Yes | The Storm and Surface Water Utility purchases property for habitat protection and to address flooding. |
| **Building codes** | Yes | The City's building codes were revised to address flooding from sea level rise in our downtown core. The Olympia Sea Level Rise Plan contains a strategy recommending revision of the current building code to ensure new downtown construction continues to be protected from sea level rise. A potential gap in our building code related to "right to cool" laws exists. |
| **Flood Insurance Rate Maps** | Yes | |
| **Floodplain ordinance** | Yes | A potential gap exists in that areas outside the 100-year floodplain are currently vulnerable to flooding, and may experience increased flooding due to climate change in the future. |
| **Natural hazard specific or Critical Areas Ordinance** | Yes | The City has a Critical Areas Ordinance (CAO) that addresses frequently flooded areas and geologically hazardous areas, as well as wetlands, critical aquifer recharge areas, important habitat and species, and streams and priority riparian areas. OMC 18.32. |
| **Subdivision ordinance** | Yes | The City has a subdivision ordinance (OMC Title 17). The ordinance requires compliance with applicable development standards, including the CAO, prior to the subdivision of land. OMC 17.16.090 requires review of, "…the public health, safety and general welfare, for open spaces, drainageways, streets, alleys, other public ways, water supplies, sanitary wastes, parks playgrounds, sites for schools and school grounds, fire protection and other public facilities, and shall consider all other relevant facts, including the physical characteristics of the site and determine whether the public interest will be served by the subdivision and dedication…" and makes specific provisions for flood hazard areas. |
| **Zoning ordinance** | Yes | The Unified Development Code is OMC Title 18. It contains the CAO, which protects frequently flooded areas and geologically hazardous areas. |
| **Other (describe and append rows as needed)** | Yes | The City has a residential fire sprinkler ordinance which protects the community against fire hazards. |
| | | |

## 1. Plans and Regulations Capabilities Observations and Discussion

*1.1 What specific sections of your plans, land use regulations, building codes, and ordinances support your jurisdiction's ability to reduce risks and implement your mitigation actions?*

Response: See chart for specific information.

*1.2 Are there any gaps in your plans, regulations, or ordinances that may prevent your jurisdiction from supporting your jurisdiction's mitigation actions?*

Response: No known gaps exist.

*1.3 How can your plans and regulations be expanded or modified to improve your understanding of hazards and vulnerabilities? How can they be improved to reduce risks?*

Response: The City is currently updating its Comprehensive Plan which must include a natural hazard element. As the Comprehensive Plan update occurs, the City will address this item.

*1.4 What type of development regulation mitigation initiatives, if any, could support the integration of hazard mitigation planning policies and programs?*

Response: As the City updates its Comprehensive Plan per above comment, the City will further its work in this area. In the event our work on the Comprehensive Plan results in policy recommendations that could take the form of a development regulation mitigation initiative, such an initiative will be considered for incorporation into Olympia's Annex as soon as possible.

## 2. Administrative and Technical

*Evaluation for Administrative and Technical*

- Who will be responsible for implementing mitigation actions?
- Have available staff been trained to support mitigation?
- Are outside technical expertise or resources needed?
- Do government agencies and departments regularly coordinate and problem-solve?
- Are agreements in place between participants or between participants and other organizations that provide regular administrative or technical assistance?
- Do you work with nongovernmental organizations who also work in mitigation?
- Which staff and abilities are available to help carry out your mitigation plan?
- If you do not have staff in your jurisdiction, consider how county, regional, and state partners can assist your jurisdiction.

| Administrative | In Place Y or N | Notes - Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective? |
|---|---|---|
| **Chief Building Official** | Y | The City of Olympia has a City-wide Emergency Management Committee. The Chief Building Official or designee participates in the EMC, through which training and coordination occurs. |
| **Civil Engineer** | Y | The City of Olympia has engineers in place at various levels throughout the organization – primarily in the Public Works Department. In some cases, engineering staff participate in the City-wide Emergency Management Committee. In other cases, engineering staff participate on the Public Works specific emergency response team. Through both avenues training and coordination occurs. Additionally, such engineering staff assist with designing and constructing city capital projects which may include projects that address mitigating for natural hazards. |
| **Community Planner/Development Director** | Y | The City of Olympia has several planners on staff responsible for subjects generally related to planning for and mitigating hazards (i.e. our shoreline master program). The City of Olympia has a City-wide Emergency Management Committee. Representatives from CP&D participate in the EMC, through which training and coordination occurs. |
| **Emergency Manager** | Y | The City of Olympia has a City-wide Emergency Management Committee. The interim emergency manager oversees the EMC. |

| | | |
|---|---|---|
| **Floodplain Administrator** | Y | The City of Olympia has a City-wide Emergency Management Committee. The Floodplain Manger or designee participates in the EMC, through which training and coordination occurs. |
| **GIS Coordinator/Manager** | Y | The City of Olympia has a City-wide Emergency Management Committee. GIS staff participate in the EMC, through which training and coordination occurs. |
| **Planning Commission** | Y | While the City of Olympia does have a Planning Commission in place, the role of the Planning Commission is not thought to include responsibilities for hazard mitigation planning. |
| **Other (describe and append rows as needed)** | | |
| **Technical** | **In Place Y or N** | **Notes - Has capability been used to assess/mitigate risk in the past? Will you use it to implement your current action plan?** |
| **Grant Writing** | Y | City of Olympia staff have submitted requests for emergency hazard/FEMA funding in the past, including BRIC funding. Yes, we will continue to seek FEMA funding for our mitigation initiatives. |
| **Hazard data and information** | Y | As a component of the Thurston Regional Hazard Mitigation Plan, the Thurston Regional Planning Council is updating hazard data and information. The City of Olympia will use this information in its hazard mitigation planning. Gather new information related to sea level rise and its impact on downtown Olympia is occurring through the work of the Olympia Sea Level Rise Collaborative. |
| **GIS Analysis** | Y | As a component of the Thurston Regional Hazard Mitigation Plan, the Thurston Regional Planning Council is updating hazard data and information. The City of Olympia will use this information in its hazard mitigation planning. The City of Olympia has done significant GIS analysis associated with sea level rise. |
| **Mutual Aid Agreements** | Y | The City of Olympia Comprehensive Emergency Management Plan contains a listing of mutual aid agreements available to Olympia, including those with WAMAS, EMAC and PNEMA. Although not listed in the plan, the City of Olympia has other mutual aid agreements associated with fire/EMS and police services, water interties, emergency management (Thurston County Emergency Management Committee regularly works on planning efforts that support mitigation). The Homeland Security Region 3 Omnibus agreement covers emergency management planning, mitigation and response for Thurston, Mason, Lewis, Pacific and Grays Harbor counties. |
| **Other (describe and append rows as needed)** | | |

## 2. Administrative and Technical Capabilities Observations and Discussion

### *2.1 What specific administrative and technical strengths does your jurisdiction have to support hazard mitigation?*

The City of Olympia has the following strengths:

- A City-wide Emergency Management Committee
- A Climate Program
- A sea level rise implementation partnership with the Port of Olympia and LOTT
- An annual capital facilities program
- Master planning conducted by its 3-water related utilities (storm and surface water, drinking water and wastewater)
- A regional wastewater treatment partnership – LOTT – which is taking active measures to respond to sea level rise
- A storm and surface water utility which actively addresses flooding during storm events
- A Risk and Resiliency Assessment completed by the Drinking Water Utility

### *2.2 Are there any gaps in administrative or technical capabilities to support your jurisdictions understanding of hazards and vulnerabilities?*

A vacant full-time emergency manager. Hazard mitigation planning could be more fully integrated into the work of the City-wide Emergency Management Committee, or another similar team.

### *2.3 How can your jurisdiction expanded or improve its administrative and technical capabilities to reduce risks or your mitigation actions?*

Fill the gaps listed above. Complete a Climate Adaptation Plan.

### *2.4 What type of plan coordination and implementation mitigation initiatives, if any, could enhance your technical and administrative capabilities?*

As the City of Olympia completes its Comprehensive Plan update and/or Climate Adaptation Plan, such mitigation initiatives may be determined beyond those already included in the Regional Hazard Mitigation Plan and Olympia's Annex.

### 3. Financial

*Evaluation for Financial*

- What financial resources can your jurisdiction program for mitigation activities?
- What resources have you used in the past?
- What grant programs can your jurisdiction pursue to fund your mitigation actions?
- Can your jurisdiction cover the 25 percent match for a federally grant funded mitigation project?
- How do your mitigation projects get programmed into your capital facilities/improvement plan?
- Are there any financial policies to direct available funds to mitigation projects?

| Funding Resources | In Place Y or N | Notes - Has the funding resource been used in past and for what type of activities? Could it be used to fund future mitigation actions? |
|---|---|---|
| **Capital Improvements Project Funding** | Y | The City of Olympia has capital funding which has funded projects such as seismic upgrades on water tanks, property acquisition to address flooding and habitat, the relocation of Waste Resources to another less vulnerable location, raising Percival Landing to address sea level rise, addition of tide gates to address sea level rise, adding backup generators to critical utility infrastructure etc. |
| **Community Development Block Grant** | | Unknown related to this topic. |
| **Non-FEMA Federal Funding Programs** | Y | The Drinking Water Utility has received money to make seismic upgrades of water tanks. |
| **Impact Fees** | Y | The City of Olympia has impact fees for both Parks and Transportation which fund projects related to growth. |
| **State Funding Programs** | Y | The Drinking Water Utility has received money to make seismic upgrades of water tanks. The Wastewater Utility has received money to repair a sewer line damaged by a windstorm and money to reconstruct a lift station vulnerable to landslides. CP&D received funding to update the City's Shoreline Master Program. |
| **Utility Fees** | Y | Utility fees pay for both the operations/maintenance work conducted by our utilities as well as for the capital program. See above for some examples of what has been funded. |
| **Other (describe and append rows as needed)** | | |

## 3. Financial Capabilities Observations and Discussion

### *3.1 What specific financial strengths does your jurisdiction have to support hazard mitigation?*

We have staff available to apply for grants and low interest loans.

### *3.2 Are there any gaps in financial capabilities to support your jurisdictions understanding of hazards and vulnerabilities?*

Other than general financial limitations all local government face/share, the City of Olympia does not have any specific gaps.

### *3.3 How can your jurisdiction expanded or improve its financial capabilities to implement your mitigation actions?*

Unknown.

### *3.4 What type of actions can your jurisdiction take, if any, to secure funding to make your community more resilient?*

Apply for more opportunities. Form partnerships with others. Have relationships with consultants knowledgeable about FEMA funding, in particular as related to preparing required BCE using FEMA's requirements.

## 5. Education and Outreach

*Evaluation for Education and Outreach*

- What outreach programs does your jurisdiction use to share important information?
- What venues do you use for outreach activities? Could they be used to promote risk reduction?
- What new or additional outreach efforts could get the most public participation and support for risk reduction?

| Programs or Activities | In Place Y or N | Notes – How widespread and effective are these programs in your community? |
|---|---|---|
| **Hazard awareness campaigns such as Firewise, Storm Ready, Flood Awareness Month, School Programs, or Public Events** | Y | Much of this work occurs at the regional level through dedicated staff at Thurston County. The City's storm and surface water staff do general outreach to the community and schools about flooding and through the City's sea level rise work impacts from sea level rise has been communicated. |
| **Local News Media** | Y | The jurisdictions in Thurston County, including Olympia, are skilled in using local news media. |
| **Organizations that represent or advocate for socially vulnerable and underserved populations** | Y | The City of Olympia is currently building its knowledge of how to effectively communicate with underserved populations and has recently dedicated staff to doing so. |
| **Social Media** | Y | We have systems in place to use social media including next door, facebook and Instagram. |
| **Other (describe and append rows as needed)** | | |

## 4. Public Outreach and Education Capabilities Observations and Discussion

*a. What specific public outreach and education capabilities/strengths does your jurisdiction have to support hazard mitigation?*

The City of Olympia currently has a communications department available to assist with general community messaging. The City of Olympia's fire department hosts hazard preparation events. The storm and surface water utility conducts public outreach and maintains information about sea level rise in the downtown area.

*b. Are there any gaps in your capabilities to engage the public about natural hazards and your jurisdiction's vulnerabilities?*

The unfilled emergency manager position is a gap. The storm and surface water utility is interested in increasing communications about downtown flooding to downtown residents both before, during and after events.

*c. How can your jurisdiction expanded or improve its public education and outreach activities?*

The City of Olympia could 1) develop general communication plan(s) around hazards including staffing required, 2) identify vulnerable population and develop targeted outreach.

*d. What type of mitigation actions can your jurisdiction take, if any, to engage your constituents and stakeholders about the natural hazard risks or mitigation actions?*

The City of Olympia could have a mitigation action around identifying vulnerable populations.

# Appendix A: Part 2
# National Flood Insurance Program Assessment

## 1. National Flood Insurance Program (NFIP) assessment worksheet

*Evaluation for National Flood Insurance Program (NFIP) participation*

- Who is the floodplain manager? Is this their primary or a secondary role? Does this person have adequate training and capacity for their role?
- Is the FIRM and FIS report in an accessible location? Does the community (or state) promote public access to floodplain information?
- How does the community support map change requests? These could be requests during the Risk MAP process or through Letters of Map Amendment or Revision.
- Does the community collect updated floodplain data or modeling? Is this shared with partners and with FEMA?
- How does the community issue development permits in the special flood hazard area? Who is responsible for permitting?
- How are floodplains regulated in new subdivisions?
- Does the community maintain elevation records? Does it track the number of buildings in the special flood hazard area?
- How does the community enforce its floodplain rules? Does enforcement include monitoring compliance and acting to correct violations?
- How does the community educate the public on floodplain management and the availability of flood insurance, in and out of the floodplain?

| NFIP Topic | Response | Source of Information | **Notes -** *If you were unsure or answered "no" to any of these questions, consider short- and long-term action items to address them.* |
|---|---|---|---|
| **Staff Resources** | | | |
| Who is responsible for floodplain management in your community? Do they serve any roles other than Community Floodplain Administrator (FPA)? | The City of Olympia's Building Official also serves in the role of the City's floodplain administrator/manager. | City of Olympia's job duties – Olympia's FPA | |

| NFIP Topic | Response | Source of Information | **Notes -** *If you were unsure or answered "no" to any of these questions, consider short- and long-term action items to address them.* |
|---|---|---|---|
| Is the Community FPA or NFIP Coordinator a Certified Floodplain Manager? | Yes – Erik Jensen | Olympia's FPA | |
| Is floodplain management an auxiliary function? | Yes | Olympia's FPA | |
| Explain NFIP administration services (e.g., permit review, GIS, inspections, engineering capability). | Permit review, GIS will automatically address any development application in a SFHA, Inspectors verify elevations documentation | Olympia's FPA | |
| Insurance Summary | | | |
| How many NFIP policies are in the community? What is the total premium and coverage? | 54 policies are in place with a total coverage of $19,257,000 and $39,058 in total written premium + FPF | State Mitigation Strategist via Paul Brewster/TRPC | |
| How many claims have been paid out in the community? What is the total amount of paid claims? How many of the claims were for substantial damage? | Unknown | | State Mitigation Strategist was unable to provide this information |
| How many structures (residential and non-residential) are exposed to flood risk within the community? | Within the 50-year flood area – 0.<br>Within the 100-year flood area – 77 total (34 residential/41 commercial).<br>Within the 500-year flood area – 125 | Draft Thurston Regional Mitigation Plan | Olympia has the GIS tools in place to do a deeper dive into this information as may be needed for Olympia's future use. |

| NFIP Topic | Response | Source of Information | **Notes -** *If you were unsure or answered "no" to any of these questions, consider short- and long-term action items to address them.* |
|---|---|---|---|
| | total (37 residential/86 commercial/2 industrial). | | |
| Are there any repetitive or severe repetitive loss structures in the community? | A total of 11 single-family structures are located within the Olympia zip codes of 98512, 98513 and 98502. Exact location unknown. RL = 10 and SRL = 1. | State Mitigation Strategist via Paul Brewster/TRPC | Information as of 9/17/2022 |
| Describe any areas of flood risk with limited NFIP policy coverage. | Sea Level Rise areas that are not in SFHA are Olympia's flood risk with limited NFIP policy coverage | Olympia's FPA | We treat new and substantial development in Sea Level Rise area to follow NFIP guidelines |
| How does the community teach property owners or other stakeholders about the importance flood insurance? | We just mailed all property owners with SFHA on their property information about Thurston Lakes Map updates | | |
| What digital sources (like the FEMA Map Service Center, National Flood Hazard Layer) or non-regulatory tools does the community use? | We have incorporated the current Flood Panels into our internal mapping which allows any inquiry to be addressed immediately | | We are looking into adding links to this mapping on the Olympia website. |
| Compliance History | | | |
| Is the community currently suspended from the NFIP? | No | Olympia's FPA | |
| Are there any outstanding compliance issues? (i.e., current violations)? | No. | Olympia's FPA | |

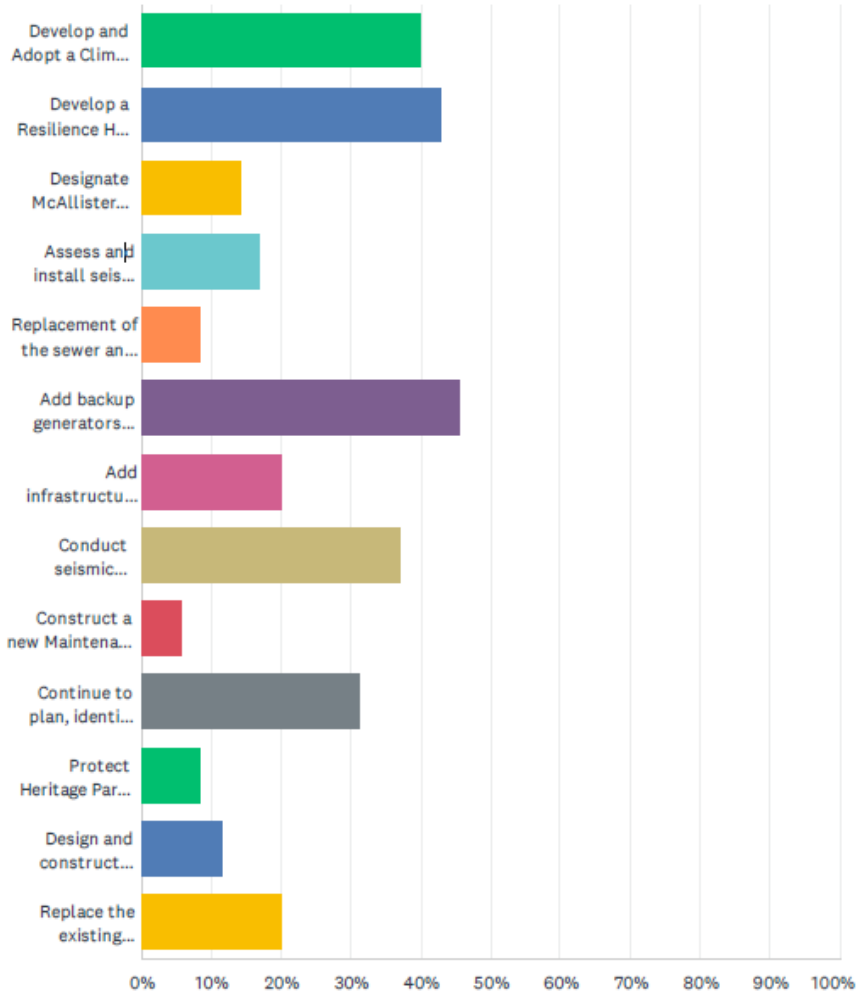
| NFIP Topic | Response | Source of Information | **Notes -** *If you were unsure or answered "no" to any of these questions, consider short- and long-term action items to address them.* |
|---|---|---|---|
| How does the community identify substantially damaged/improved structures? What is the process to make sure these structures are brought into compliance? | At the time of a Development Permit Application submittal, we are notified that this property is in a SFHA via our GIS System. During plan review is the time for determination of mitigating flood damage | Olympia's FPA | |
| When was the most recent Community Assistance Visit (CAV or Community Assistance Contact (CAC)? | We successfully completed our CAV in the spring of 2023 | Olympia's FPA | |
| Is a CAV or CAC scheduled or needed? | Not at this time | Olympia's FPA | |
| Regulation | | | |
| When did the community enter the NFIP? | 1981 | Community Status Book | |
| Are the FIRMs digital or paper? | Digital | Olympia's FPA | |
| How does the community enforce local floodplain regulations and monitor compliance? | Any development permit, code enforcement action or parcel search will notify the Olympia employee that a Special Flood Hazard Area is on this property. Appropriate action will take place by notifying the Flood Plain Manager. | Olympia's FPA | |

# HAZARD MITIGATION PLAN – DRAFT MITIGATION ACTIONS SURVEY RESULTS

## CITY OF OLYMPIA – AUGUST 2023

### Q1 Based on your understanding of hazards and how they might impact you or your community, select the three actions that you would like to see prioritized highest.

Answered: 35 Skipped: 1



**Based on your understanding of hazards and how they might impact you or your community, what other actions do you suggest should be taken to minimize hazard impacts? Share as much detail as you can.**

unincorporated part of rural Thurston County are generally prepared for short-term emergencies (weather-related power interruptions and so forth), it will take neighbor-to-neighbor planning to prepare for the kinds of disasters that might isolate our community from fuel, food, and medical assistance for 2 or more weeks.

Most of the weather we're having now could have been avoided had there been better plans in place to combat climate change. We need to move closer to being green, faster to combat even worse weather. That is our single-most important task. Retrofitting old infrastructure comes next.

I have read the federal reports predicting the damage that will be caused by a subduction zone earthquake. This includes extended periods -- years -- without basic services like water, sewer, and electricity. Parts of Olympia are not near water bodies and will therefore not be able to get water to stay alive. I'm thinking of the dense housing area north of the mall, as an example. We need to provide at least a couple of weeks of water in these areas or people will die from lack of it. Unlike food, water is too heavy and bulky to be air-dropped. Streets and bridges will be broken up, preventing water trucks to access these areas. This is a very serious shortcoming in our planning for the Big One. Please address it.

I think identifying reinforced roadways/bridges would be helpful for people to plan potentials safe options to return home from their typical locations, such as work. Having a list of potential shelters throughout the area along with a ready checklist of what they allow (pets (not service animals), children, people with medical needs, etc.) and what they will provide, if anything (meals, shower facilities, toiletries, etc.). Having a ready checklist will make is easy for the shelters to be able to identify what they will allow and provide to easily and quickly get that information out to the public.

I would recommend re-invigorating the program called "Map Your Neighborhood" which allowed for small groups of residences to be included in an inventory of residents, needs, and communications methods to be used in disaster recovery. A personalized approach to identifying needs and solutions, and one which can built neighborhood cohesion.

Unfortunately it seems all of these are very important

Plans for a Resilience Hub should incorporate procedures for involving county representatives and community partners in preparation and response plans. Our emergency shelter capacity and identified distribution locations are already defined by gaps in access, and city representatives/committees in direct contact with currently unhoused, displaced, or economically disadvantaged community members are uniquely qualified to assist with these issues in real time.

I was told the emergency generator at the Olympia Armory is out of service. The Armory could serve as an excellent emergency shelter IF this generator is put back in service.

Assist neighborhoods to inventory resources, develop response plans and run scenario practices.

Hubs should serve as information centers, cooling centers, and respite from smoke annually to passively teach the community where to go when a disaster finally occurs. Hubs should also have water filtration devices and info on nearest water source, instead of relying on water storage only. How will information be shared with the public if power/wifi/cell is disabled? Is there a way for the most vulnerable to self-report their location so we can help elderly, blind, mobility-device-dependent folks? Can the shared-use trails be used by emergency officials as an alternative route if roads are closed/congested? Do we have vehicles that are more nimble during major earthquake devastation (dirt bikes, e-cargo bikes, ATVs)?

Identify a smaller area of downtown to protect from sea level rise. 'Saving it all' will take huge resources from other important community needs. We cannot rely on federal or state funding since so many other areas will also be experiencing sea level rise.

The biggest challenge is funding.  All of the above subjects have merit.

Please learn from the lessons of the pandemic. This community is not resilient economically or medically, particularly in the mental health arena. Education efforts (and you have done many) don't seem to work -- most people I know do NO disaster planning. I don't know what will cure this, except a full-scale disaster. Please keep trying.

Use amateur radio operators as a data gathering tool and as a communications backup.

With the exception of protecting heritage Park from flooding, all of these listed actions are required to avoid exacerbated impacts further injury and death, as well as economic loss & loss of local businesses. Happy to fill out a survey on how I prefer to fund all the actions.

Improve communications infrastructure through the use of amateur radio volunteers such as Thurston County Amateur Radio Emergency Service, TCARES. This improvement will assist first responders in prioritizing responses to disasters as it could provide real-time data to emergency management on damage, injuries and casualties.

I'm concerned about the impacts of changes in weather due to climate change and the impact to all of us in Oly… heat spikes, wildfire smoke, and fires due to drought conditions all over. (We are not used to the severe weather here, and not everyone has the ability to buy heat bumps, air conditioners, or other such equipment) to stay safe. Heat stroke and other heat-related illnesses concern me for all of us here. Although earthquakes are concerning in ways, as is rising sea levels, I'm thinking mostly of the serious situations right now. Planning, though, for all of this is key, too. Thanks for asking us!

I think our biggest hazards are earthquakes and seasonal flooding, particularly when it is paired with king tides (I live near downtown Olympia). I think our community preparedness should be enhanced on a personal level, making sure folks are prepared to shelter in place for 3-7 days, with water. I think conveying that message, maybe with bulk purchasing assistance to make emergency kits for community members (5 gallon jugs, first aid kits, MRE/equivalents, etc). To a certain extent folks need to be able to take care of themselves. I feel like neighborhood associations/cities could encourage education on this front. Also large apartment complexes, do they plan for emergencies by stockpiling water , supplies for their tenants? Thank you for taking public comment. This is a huge endeavor!!

Prepare City of Olympia to move critical infrastructure to higher ground.