

# Northshore Utility District Plan Annex

## Introduction

Northshore Utility District is a special purpose water and sewer utility located at the northeast end of Lake Washington in King County. The District currently serves more than 74,000 people and encompasses more than 11,000 acres located within the cities of Kenmore, Lake Forest Park, Kirkland, Bothell and Woodinville. King County Water District Number 79 was formed in 1947. In 1979, Northeast Lake Washington Sewer District merged with the water district and the combined districts were known as Northeast Lake Washington Sewer and Water District which was subsequently renamed Northshore Utility District (NUD) in 1991. In October 1998, the District moved to its present location at 6830 NE 185th Street, in Kenmore, Washington.

The District gains governmental authority to operate from Title 57 of the Revised Codes of Washington. Northshore Utility District owns no water or wastewater treatment facilities. Currently, all drinking water is purchased from Seattle Public Utilities and sewage treatment is provided by King County Department of Natural Resources.

The District serves approximately 21,952 water customers and 21,608 sewer customers. We currently maintain 260 miles of sewer collection pipe with 11 lift stations and 282 miles of water main with three water pump stations. The District has eight water storage facilities with a combined capacity of 29 million gallons.

Northshore Utility District is governed by a five-member Board of Commissioners who are elected for staggered six-year terms by ratepayers. Daily operations of the District are the responsibilities of the General Manager and approximately fifty-three employees. There are four departments under the General Manager.

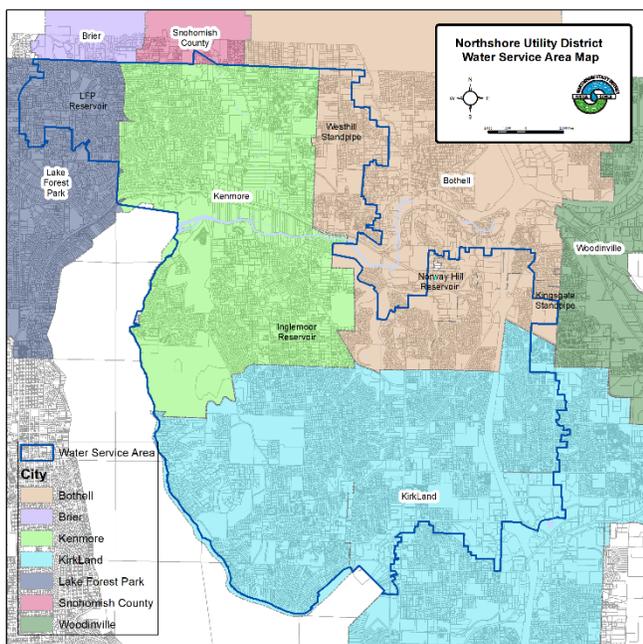
### Jurisdiction Profile

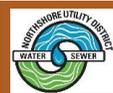
**Began in 1947**

**Current Total Population Served — 75,000**

**Governance** – A five-member Board of Commissioners elected to serve a six-year term.

The District's income is received primarily from customer user fees and developer connection charges. In general, user fees pay for operating expenses while connection fees pay for capital improvements. Northshore Utility District receives no money from taxes.





## Development Trends

Northshore Utility District has historically served a community predominately consisting of single-family homes with a moderate number of multifamily residences and a relatively small portion of commercial facilities. Service is also provided to a critical care hospital facility that supports a rapidly growing population in the region. In addition, the District's wastewater conveyance systems support environmental conditions that promotes the health of numerous sensitive urban wetland and waterways areas within the district.

The District growth over the past 10 years has been significant and it expects to see an additional 15,000 housing units over the next 15 years.

The current sustained development impacts significantly increase the hazards facing the District. Historically, the District has invested proactively in its infrastructure to mitigate hazards however with the impacts of today's development has created challenges to keep up and maintain the level of service required to continue to ensure safe, reliable and resilient service.



# Northshore Utility District Risk Summary

## Hazard Risk and Vulnerability Summary

HAZARD	RISK SUMMARY	VULNERABILITY SUMMARY	IMPACT SUMMARY
<b>Avalanche</b>	There is no risk of avalanche for Northshore Utility District (NUD)	N/A	N/A
<b>Earthquake</b>	Earthquakes pose the largest, most destructive hazard for the District.	Liquefaction zones along Lake Washington and the Sammamish River contain critical piping. Unpredictable ground movement during an earthquake put all district piping at risk as well as tanks, control valves, and pumping facilities.	The most recent earthquake that affected the District was the Nisqually Quake of 2001. NUD experienced some localized damage and indications that a quake located closer to the District would have resulted in more significant damage. The District implemented an early earthquake warning system (2019-20) in an attempt to mitigate some potential impacts in the future.
<b>Flood</b>	The District does have some piping facilities located in flood zones.	NUD facilities have limited exposure to damage or loss from flooding.	Storm related flooding is likely in some areas but flooding in 1997 and 2007 did not result in District loss.
<b>Landslide</b>	A significant portion of the District has potential for landslides.	The topography of the District includes many steep slopes and ravines that have the potential for landslides. District piping in these areas can be broken, pulled apart or crushed by landslides.	In the early 1990's a District sewer collection pipe in ULID 66 was damaged due to land movement requiring an emergency repair.
<b>Severe Weather</b>	The District is at risk for heavy rain, high winds as well as snow & ice weather events.	Heavy rain can result in localized flooding and increased sewer intrusion. Erosion can occur which may expose piping or damage both water and sewer systems. Heavy wind can result in a loss of	Severe weather events routinely alter District operation and will continue to impact the District.



		power, damage to District buildings or the uprooting of trees damaging underground piping. Snow and ice have the potential to make it dangerous and difficult to travel by vehicle and extended cold can damage unprotected water meters or cause customer plumbing to freeze resulting in increased customer service calls.	
<b>Tsunami</b>	The District is not at risk for a tsunami but could experience a “seiche”—a wave off of Lake Washington. Studies have not been done to show the potential inundation area of the District.	The District’s sewer lift station 4 is located in the suspected impact area along Lake Washington.	Flooding of lift station 4 could occur resulting in a loss of that facility.
<b>Volcano</b>	The District could be affected by ashfall from nearby volcanoes (Mt. Rainier or Glacier Peak for example).	Ash fall models are not available to assess vulnerability.	Ashfall could impact the District by clog machinery, air intakes and restricting employee movement.
<b>Wildfire/Fire</b>	The District has only a small amount of open natural space that has the potential for wildfire, but	Swamp Creek, Saint Edward State Park, and Big Finn Hill Park are large natural areas bordered by residential homes and Bastyr University. Limited access and	In the past 5 years, 12 small fires (less than 100’ x 100’) have been reported and extinguished.  Structure fires pose a limited impact for the District as a whole but can have devastating isolated impact.

	<p>a seasonal risk impacted by climate change does exist.</p> <p>The majority of structure fires in the city are residential homes averaging about 3 per year requiring additional outside resources.</p>	<p>difficult terrain pose challenges for firefighting.</p> <p>Existing mutual aid agreements have been enough to provide additional resources for fighting structure fires and building codes requiring fire sprinklers in single family residential homes should offset the increase in number of homes in the city.</p>	
<b>Civil Disturbance</b>	<p>It is unlikely but possible for a civil disturbance to occur in Northshore Utility District.</p>	<p>District residents are generally active participants in local government and have a good relationship with political leaders. The District relies on local area police force which is trained to deal with civil disturbances and mutual aid agreements are in place.</p>	<p>There has been some localized Black Lives Matter (BLM) protest in 2020 located near District facilities however they did not pose a threat to District Operations.</p>
<b>Cyber Incident</b>	<p>Increasingly, cyberattacks are plaguing local governments. Valuable information may be held hostage or important systems corrupted.</p>	<p>The District is vulnerable to these attacks although IT staff continuously train staff, keep software and machines updated or avoid and deter this type of attack.</p>	<p>The District was a victim of cyber-attack in 2020. The incident was promptly addressed and mitigated. Systems were hardened, policies and past practice were improved and increased emphasis on training was implemented.</p>
<b>Hazardous Materials Incident</b>	<p>With limited commercial facilities in the District and none of them storing large supplies</p>	<p>The transportation of hazardous materials on State Route 522 is the primary source and location of hazardous chemicals in the District.</p>	<p>Hazardous material incidents have been limited in size, less than 50 gallons, of flammable liquids in the past 5 years, but much larger quantities are transported through the District daily.</p>

	of hazardous materials, the primary risk is limited to those materials being transported through District.	SR522's proximity to Lake Washington, its tributaries and the District offices do leave the District with some exposure to a hazardous material incident.	
<b>Health Incident</b>	Like most primarily-residential areas the risk of a public health emergency is limited by the lack of large public gathering spaces (stadiums, etc.)	The District vulnerability is primarily with the loss or limitation of staff from an epidemic. The District's water system is protected by a robust water quality program to prevent health incidents caused by drinking water.	The District maintained services throughout the 2020 COVID-19 Pandemic. It was able to implement remote work options, infrastructure and policies that provided minimal interruption of services to the community.
<b>Terrorism</b>	Like all public water systems, the District has some risk of terrorist attack.	NUD has increased the use of deterrents and surveillance at its storage and pumping facilities as well as integrated automatic controls to both reduce the frequency and impact of a terrorist attack.	There is no history of direct terrorism in the District.
<b>Dam Failure</b>	The failure of the Seattle Public Utility's Tolt dam would limit or eliminate the supply of source water to the District.	The Tolt River Dam is the source of supply for the entire NUD service area. Loss of the dam would result in the loss of supply.	A loss of water supply would limit the District's ability to provide drinking water to our customers.

## Hazard and Asset Overview Map(s)

Figure 1: NUD Water System Service Area Map

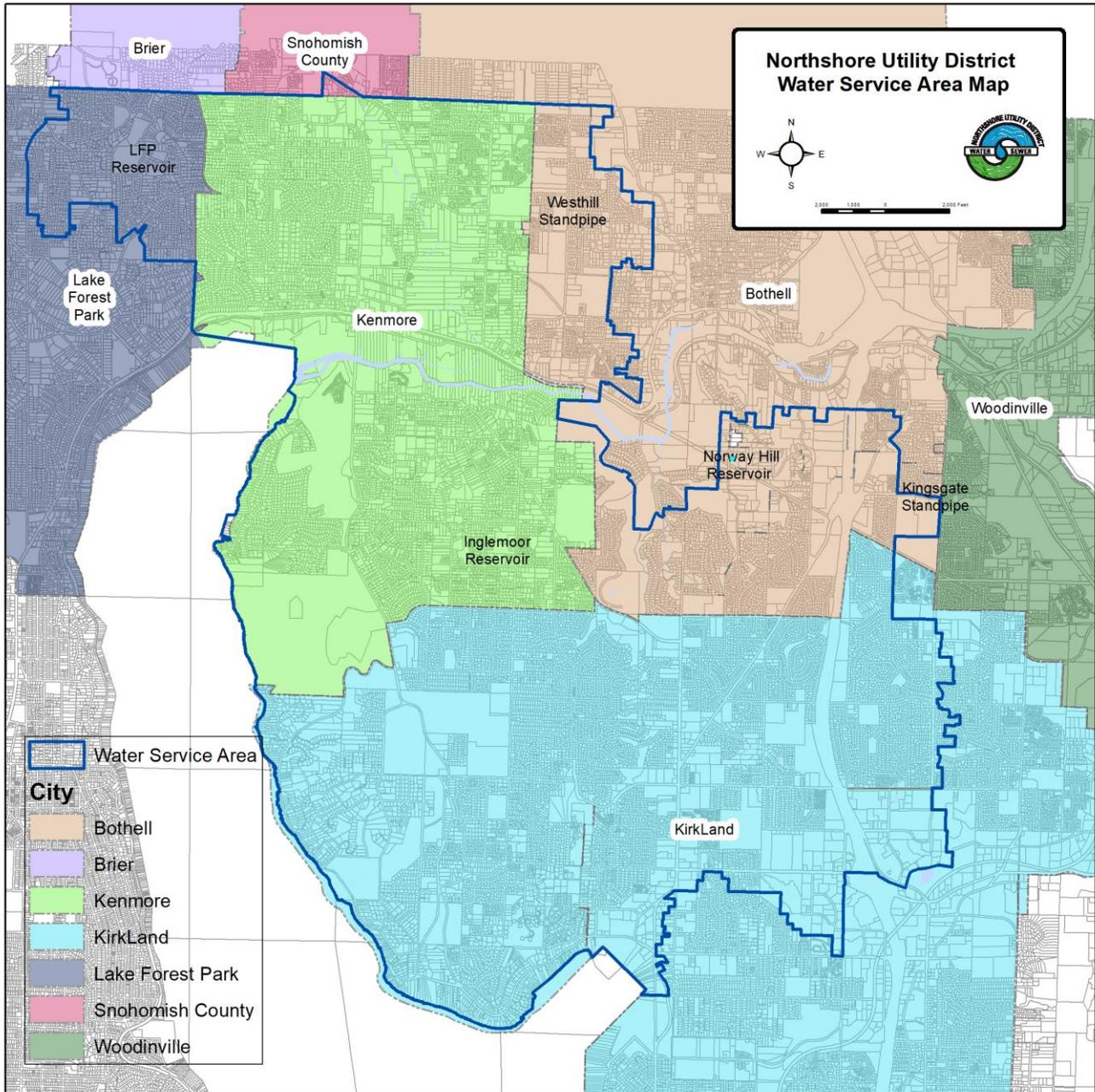
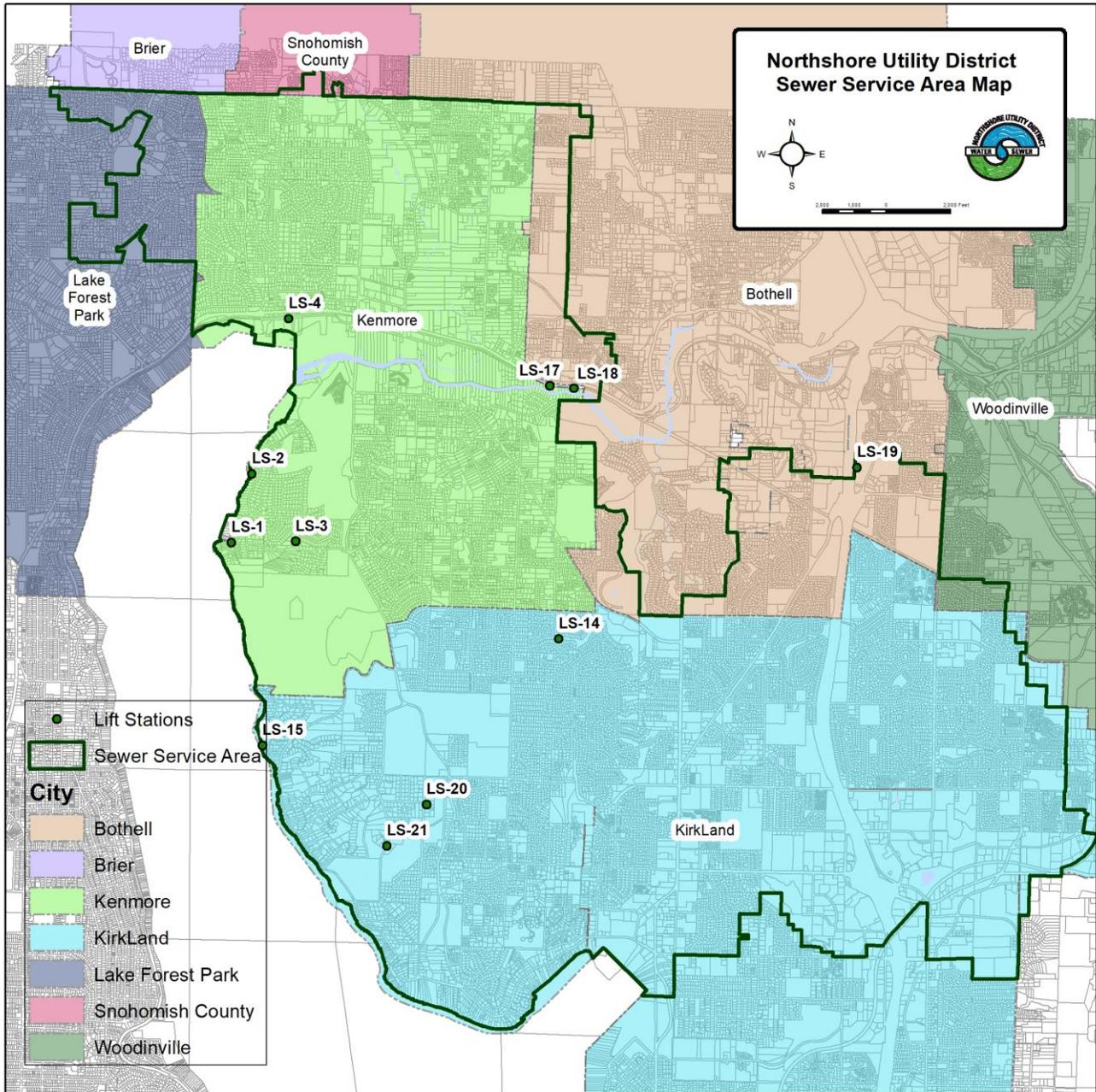


Figure 2: NUD Sewer System Service Area Map





### Assets at Risk

ASSET	VALUE (\$)	RISK SUMMARY	VULNERABILITY SUMMARY	IMPACT SUMMARY
<b>Equipment/Vehicles</b>	956,098	The District's vehicles and equipment are primarily stored at District headquarters and are at risk due to earthquake damage.	The District headquarters facility is a tilt up building built on piling due to poor soils. The facility is at risk of failure in a large earthquake.	Without vehicles or equipment repairs and maintenance on the water and sewer, systems would not be possible.
<b>Water System Components</b>	63,934,247	Many of the District's Water System Components are located in areas of poor soils impacted by land movement and earthquakes	Water System Components often are located on steep hillsides or in areas of know landslides, liquefaction, or are otherwise subject to failure during earthquakes.	Loss of water supply directly impacts fire suppression capabilities, public health, and potentially leaves Evergreen Hospital with limited water supply.
<b>Sewer System</b>	71,058,790	Many of the District's Sewer System Components are located in areas of poor soils impacted by land movement and earthquakes	Sewer System Components often are located on steep hillsides or in areas of know landslides, liquefaction, or are otherwise subject to failure during earthquakes.	Loss of wastewater system components would leave areas without sewer service and cause public health emergencies.



## Plan Update Process

Northshore Utility District has participated in the multi-jurisdictional planning process led by King County and locally supported by NEMCo. The District completed a hazard and vulnerability assessment in 2002 and has used that process as the foundation of hazard mitigation from that point until this planning process began.

The District team worked individually and collectively to discuss hazards impacting the District and sought input from customers during outreach efforts led by NEMCo partners; the city of Kenmore and the city of Lake Forest Park.

Additional meetings were held to discuss specific hazard mitigation efforts with the City of Kirkland, Evergreen Hospital, and the Engineering firm Gray & Osborne, Inc.

### *Northshore Utility District Planning Team*

NAME	TITLE	ORGANIZATION	CONTRIBUTION
Al Nelson	General Manager	Northshore Utility District	Contributor
Carl Lunak	Emergency Operations Manager	NEMCO	Composer
Stephen Dennehy	Engineering Director	Northshore Utility District	Contributor
Ethan Maiefski	Maintenance & Operations Director	Northshore Utility District	Contributor
Eric Delfel	Project Manager	Gray & Osborne Inc.	Contributor

### *Plan Update Timeline*

PLANNING ACTIVITY	DATE	SUMMARY	ATTENDEES
King County HMP introduction meeting	12/13/2018	Reviewed plan expectations with interjurisdictional planning group.	Carl Lunak
Initial meeting with Derrick Hiebert	2/27/2019	Reviewed planning expectations and HMP template	Carl Lunak, NUD Planning Team
Mitigation project meeting	6/18/2109	Review and discuss Evergreen Hospital water supply project and mitigation strategies.	NUD Planning Team, Evergreen Hospital, City of Kirkland
Mitigation strategy development	9/6/2019	Mitigation strategy discussion and development	NUD Planning Team
Hazard Mitigation integration with American Water Infrastructure Act	9/17/2019	Determine if compliance with AWIA will accomplish regional hazard mitigation participation	Carl Lunak, Al Nelson
Mitigation project meeting	9/30/2019	Plan development	Carl Lunak, Al Nelson



## Public Outreach

### *Public Outreach Events*

EVENT	DATE	SUMMARY	ATTENDEES
Kenmore Movie Night	8/21/19	Information provided and survey taken on mitigation priorities. A raffle was held for participants to win emergency supplies.	Derrick Hiebert, Bryan Hampson, Carl Lunak, interacted with a dozen or more citizens of Kenmore.
Northshore Safety and Emergency Preparedness Fair	9/21/19	Information provided on the mitigation plan and planning process.	Carl Lunak and volunteers Dawn Teel-Friedman, Asa Louis, Robin McKenzie, Gail Siani, John Cornaby and Jiles Baggett. Over 500 residents of LFP and Kenmore visited the event and 12 citizens left comments about the hazards in the community



## Northshore Utility District Hazard Mitigation Program

Hazard mitigation strategies were developed through a two-step process. The internal planning team met to identify a comprehensive range of mitigation strategies. These strategies were then prioritized using a process established at the county level and documented in the base plan. Input from a community survey was used to help with prioritization.

Hazard mitigation strategies in Northshore Utility District are managed through a collaborative process involving multiple departments, the cities of Kenmore, Lake Forest Park, Kirkland, Bothell and NEMCo. The District also identifies and mitigates hazards to comply with the Bioterrorism Act, the American Water Infrastructure Act and other regulatory requirements.

### Plan Monitoring, Implementation, and Future Updates

King County leads the overall mitigation plan monitoring and update process and schedules the annual plan check-ins and bi-annual mitigation strategy updates. Updates on mitigation projects are solicited by the county for inclusion in the countywide annual report. As part of participating in the 2020 update to the Regional Hazard Mitigation Plan, Northshore Utility District agrees to convene its internal planning team at least annually to review their progress on hazard mitigation strategies and to update the plan based on new data or recent disasters.

As part of leading a countywide planning effort, King County Emergency Management will send to planning partner any federal notices of funding opportunity for the Hazard Mitigation Assistance Grant Program. Proposals from partners will be assessed according the prioritization process identified in this plan and the county will, where possible, support those partners submitting grant proposals. This will be a key strategy to implement the plan.

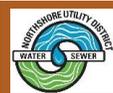
The next plan update is expected to be due in April 2025. All jurisdictions will submit letters of intent by 2023, at least two years prior to plan expiration. The county will lead the next regional planning effort, beginning at least 18 months before the expiration of the 2020 plan.

### Continued Public Participation

King County along with Northshore Utility District and its other partners maintain substantial public outreach capabilities, focusing on personal preparedness and education. Information on ongoing progress in implementing the hazard mitigation plan will be integrated into public outreach efforts. This will provide King County residents, already engaged in personal preparedness efforts, with context and the opportunity to provide feedback on the county's progress and priorities in large-scale mitigation. In the vertical integration of risk-reduction activities from personal to local to state and federal, it is important that the public understand how its activities support, and are supported by, larger-scale efforts.

### King County Plan Goals

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



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

### Mitigation Plan Integration

Northshore Utility District will use this plan to guide the development of additional programs and District policies including but not limited to the Comprehensive Emergency Management Plan and Water System Plan. To continue that ongoing integration the District’s Hazard Mitigation Plan has been identified as a reference document in other planning documents and members of the Hazard Mitigation Planning Team are included in the development of additional programs and policy updates.

## Hazard Mitigation Authorities, Responsibilities, and Capabilities

### Plans

PLAN TITLE	RESPONSIBLE AGENCY	POINT OF CONTACT	RELATIONSHIP TO HAZARD MITIGATION PLAN
<b>Water System Plan</b>	Northshore Utility District	Stephen Dennehy	Identifies projects and system improvements.
<b>Cross Connection Control Plan</b>	Northshore Utility District	Brian Gumke	Cross connection mitigates water contamination risk
<b>Northshore Utility District (NUD) Comprehensive Emergency Management Plan, 2019</b>	Northshore Utility District	Ethan Maiefski	NUD’s Hazard Mitigation Plan is also an annex to the King County Plan. NUD is an active participant in NEMCO.



### Programs, Policies, and Processes

PROGRAM/POLICY	RESPONSIBLE AGENCY	POINT OF CONTACT	RELATIONSHIP TO HAZARD MITIGATION PLAN
<b>Vulnerability Assessment</b>	Northshore Utility District	Stephen Dennehy	Identified hazards.
<b>Northshore Utility District Standard Specifications</b>	Northshore Utility District	Stephen Dennehy	Ensures new construction is designed and built to consistent standards.
<b>Building Codes</b>	Cities of Bothell, Kenmore, Kirkland, Lake Forest Park	Building Officials	District facilities are built to current standards.
<b>Fire Flow Requirements</b>	Northshore Fire District, Bothell Fire, Kirkland Fire	Fire Chiefs & Fire Marshalls	Ensure new facilities and improvements are designed to meet fire flow standards

### Entities Responsible for Hazard Mitigation

AGENCY/ORGANIZATION	POINT OF CONTACT	RESPONSIBILITY(S)
<b>Northshore Utility District</b>	Al Nelson	Responsible for the operation of the District’s water system and all improvements identified in the Hazard Mitigation Plan.
<b>NEMCO (Northshore Emergency Management Coalition)</b>	Carl Lunak	Coalition of the cities of Kenmore and Lake Forest Park and the Northshore Fire Department and Northshore Utility District to address emergency preparedness and provide public education

### National Flood Insurance Program

Northshore Utility District does not participate in NFIP.

### Hazard Mitigation Strategies

#### 2015 Hazard Mitigation Strategies

Northshore Utility District did not develop a Hazard Mitigation Plan for 2015.

#### 2020 Hazard Mitigation Strategies

STRATEGY	LEAD AGENCY/POC	TIMELINE	PRIORITY
<b>Inglemoor Water Transmission Main</b>	NUD/Stephen Dennehy	2020	High
<b>Evergreen Hospital Water Supply Reservoir</b>	NUD/Stephen Dennehy	2021	High
<b>Totem Lake Wastewater Conveyance</b>	NUD/Stephen Dennehy	2020	Medium
<b>Earthquake Early Warning System</b>	NUD/Ethan Maiefski	2019-20	High



<b>Reinforcement and Hardening of District Business and Operation's Office (Security and Seismic)</b>	NUD/Stephen Dennehy	2021-22	High
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## Hazard Mitigation Strategy

<b>Lead Points of Contact</b> Stephen Dennehy	<b>Partner Points of Contact</b> <i>Eric Delfel</i>	<b>Hazards Mitigated / Goals Addressed</b> Earthquake and Landslide / 2,6,8,12	<b>Funding Sources and Estimated Costs</b> District Funds, Grants/\$600,000
<b>Strategy Vision/Objective</b>  Retrofit the existing 24-inch water transmission main to increase the pipeline’s ability to withstand an earthquake.			
<b>Mitigation Strategy</b>  Restrain joints on both North and South ends of the 24-inch reinforced concrete water transmission mains crossing of the Sammamish River. Restraint and the joints on either end of the main will also include the installation of isolation valves to manually shut off the section located in liquefaction area.			
<b>2-Year Objectives</b> Completed retrofit project	<b>5-Year Objectives</b>	<b>Long-Term Objectives</b>	
<b>Implementation Plan/Actions</b>  Complete engineering design, request bids, select contractor, and complete construction.			
<b>Performance Measures</b> A functional 24-inch transmission main connecting the District’s North and South halves.			



<b>Lead Points of Contact</b> Stephen Dennehy	<b>Partner Points of Contact</b> <i>Eric Delfel</i>	<b>Hazards Mitigated / Goals Addressed</b> Earthquakes / 2,6,8,12	<b>Funding Sources and Estimated Costs</b> District funds, grants / \$7,000,000
<b>Strategy Vision/Objective</b>  Secure a reserve supply of emergency water for Evergreen Hospital and meet the future needs of fire flow for future development.			
<b>Mitigation Strategy</b>  Design and build a water storage facility near Evergreen Hospital to meet the growing fire flow demands that could also be used as an emergency supply of water to the regional hospital and surrounding medical clinics.			
<b>2-Year Objectives</b> Completed environmental study and initial design approval.	<b>5-Year Objectives</b> Project completion.	<b>Long-Term Objectives</b> Meet the needs of the rapidly growing Totem Lake areas demand for water and have a functional emergency supply of water for Evergreen Hospital	
<b>Implementation Plan/Actions</b>  Evaluate design options, select most appropriate option, environmental impact study, request bids, begin construction, complete tank construction.			
<b>Performance Measures</b> A completed water storage facility serving the Totem Lake area and Evergreen Hospital.			



<b>Lead Points of Contact</b> Stephen Dennehy	<b>Partner Points of Contact</b> <i>Eric Delfel</i>	<b>Hazards Mitigated / Goals Addressed</b> Earthquake / 2,6,8,12,14	<b>Funding Sources and Estimated Costs</b> District funds, grants / \$1,000,000
<b>Strategy Vision/Objective</b>  Build a secondary connection from the East side of Interstate 405 to move sewage to the West.			
<b>Mitigation Strategy</b>  Design and construct a wastewater component to effectively connect the area East of Interstate 405 to the sewage drainage basin on the West side of Interstate 405.			
<b>2-Year Objectives</b> Completed design options and environmental study.	<b>5-Year Objectives</b> Project complete.	<b>Long-Term Objectives</b> A functional connection across Interstate 405	
<b>Implementation Plan/Actions</b>  Propose option, evaluate design options, select most appropriate option, environmental impact study, request bids, begin construction, complete construction.			
<b>Performance Measures</b> A functional second crossing of interstate 405 for wastewater.			



<b>Lead Points of Contact</b> Stephen Dennehy	<b>Partner Points of Contact</b> <i>Eric Delfel</i>	<b>Hazards Mitigated / Goals Addressed</b> Earthquake / 2,6,8,12,14	<b>Funding Sources and Estimated Costs</b> District funds, grants / \$100,000
<b>Strategy Vision/Objective</b>  Install and integrate an early warning system for earthquakes.			
<b>Mitigation Strategy</b>  Installation and integrations of the Shake Alert early warning earthquake system into District automated control system to reduce water loss and damage from earthquakes.			
<b>2-Year Objectives</b> Complete the integration of Shake Alert into District control systems.	<b>5-Year Objectives</b> Project complete.	<b>Long-Term Objectives</b> A functional early warning system reducing potential water loss and damage.	
<b>Implementation Plan/Actions</b>  Complete the purchase and integration of the Shake Alert system.			
<b>Performance Measures</b> A successful test of the early warning system isolating water storage facility controls and pumping stations by the end of 2021.			



<b>Lead Points of Contact</b> Stephen Dennehy	<b>Partner Points of Contact</b> <i>Eric Delfel</i> <i>Michael Silva</i>	<b>Hazards Mitigated / Goals Addressed</b> Civil Unrest/Earthquake / 2,6,8,12,14	<b>Funding Sources and Estimated Costs</b> District funds, grants / \$,000
<b>Strategy Vision/Objective</b>  Address life safety issues of district personnel through implementation.			
<b>Mitigation Strategy</b>  The District commissioned a study (Silva Report) to address work and life safety issues within its business operation center. The study further prompted an architectural/engineering design (G&O Inc.) which identified several seismic vulnerable concerns that identified the need to reinforcement walls and equipment.			
<b>2-Year Objectives</b> Complete remodel/engineering design and construction.	<b>5-Year Objectives</b> Project complete.	<b>Long-Term Objectives</b> A functional safe work environment that provides protection life.	
<b>Implementation Plan/Actions</b>  Implement design plan and construct to ensure safe work environment.			
<b>Performance Measures</b> Test additional implemented security measures.			