

## **Brier**

The City of Brier is a bedroom community located in the southwest corner of Snohomish County, just north of the Snohomish/King County border, and approximately 2 miles east of Interstate 5. The City has a population of 6,500 people located in 1,259 acres.<sup>1</sup>

Approximately 150 acres surrounding Brier are identified for inclusion in the City's MUGA under the Growth Management Act. This area includes Scriber Creek, half of a bridge that crosses Scriber Creek (the other half is owned by Bothell), and the area known as the Ridge.

Brier lies within three drainage basins or watersheds: Lyon Creek, Scriber Creek, and Swamp Creek. Creeks, wetlands, ponds, open meadows and forested areas all exist within and outside the City's boundaries.

The City operates with a minimal number of staff and contracts with surrounding jurisdictions and consultants for additional services as needed. A list of critical structures is provided in **Annex A**.

### **Hazard Identification**

Based on past experience, Brier rates its risk of natural hazards as follows:

<b>HAZARD</b>	<b>RATING</b> (out of 80 possible points)
Drought	24
Earthquake	52
Flood	
100-Year	--
Urban	33
Landslide	20
Tsunami & Seiche	05
Volcano	17
Wildland-Urban Interface Fire	07

### **Drought**

Rating: 24

Drought is not considered to be a high-risk hazard for Brier. The City's potable water is supplied by Alderwood Water District and is relatively stable for short-term (one season) droughts. Citizens may be asked to take conservation measures and limit lawn watering, but the City will still receive adequate potable water for its needs.

Brier rates its risk from drought as MODERATELY LOW.

## **Earthquake**

Rating: 52

The City of Brier is located in Seismic Zone 3, between several fault lines, and an earthquake is therefore considered to be a significant risk for the City.

As discussed in this document's HIVA, earthquakes occur in Washington State on an almost daily basis. While most quakes are minor, seismologists tell us that we can expect a 7.0 magnitude deep or intraplate earthquake about every 70 years and an 8.0 or greater subduction quake every 150 to 1,100 years.

Based on this information, there is significant risk of damage and/or destruction from a major earthquake with an associated level of injury or death. Earthquakes are considered to be a MODERATELY-HIGH risk.

*It should be noted that due to Brier's small size and its location, the City works in a cooperative manner with the surrounding communities (Lynnwood, Kenmore, and Mountlake Terrace) in implementing emergency response.*

## **Flood**

Brier does not have any major rivers flowing in or around its borders. It does, however, have creeks, wetlands, and several ponds. All of these items contribute to intermittent flooding in sections of the City.

The City complies with State requirements to preserve and protect streams and wetlands. It does not allow building within 50 feet of the wetlands or streams.

### **100-Year**

Brier is not located on a floodplain.

### **Urban**

Rating: 33

Brier does have localized, annual urban flooding. This occurs when the stormwater system, wetlands, and creeks are unable to absorb the volumes of water experienced during a heavy and prolonged rainstorm or – more rarely – snow melt. This natural hazard is usually of short duration and of limited scope. The City does not have any critical facilities located in flood-prone areas.

As mentioned at the beginning of Brier's section, the City's MUGA includes a portion of Scriber Creek, and this will increase Brier's level

of risk to a small degree. With these issues in mind, Brier rates its risk hazard at MODERATE.

### **Landslide and Soil Displacement**

Rating: 20

The City of Brier is in a region of gently rolling hills with some steeper slopes interspersed throughout the City. As was identified in the HIVA, in Section II, steep slopes may experience landslide, particularly in the event of saturating rains, snow thaw, or earthquake. These steeper slopes having building constraints placed upon them by Brier's Comprehensive Plan; and any new building in these areas requires special planning, design, or maintenance as mitigation for the project.

Brier may also experience soil displacement due to creek erosion or water activity from urban flooding. Creek erosion is of concern due to its impact on the environment and salmon habitat.

Erosion caused by urban flooding may result in sink holes and undermine streets or buildings, requiring significant reconstruction and repair.

In the future, Brier may experience some increased risk of landslide as the Ridge area in Brier's MUGA is developed. The Ridge includes several steep slopes and may require land use restrictions.

None of the City's Critical Facilities are located on or next to any landslide areas.

As a result of all these factors, Brier considers the risk from landslide to be MODERATELY-LOW.

### **Severe Storm**

Rating: 28

Brier is subjected to severe storms on a regular basis. Windstorms occur nearly every winter, and rainstorms are not unusual. While rarer, the City has also experienced heavy snows and freezing rains.

Winds and snow or ice regularly cause tree branches to break and/or trees to fall. This may cause power outages, damage buildings, and block roadways.

The Inaugural Day Storm in 1993 had winds of 66 mph. This storm interrupted power to the City for more than three days. Branches and trees were downed and laid across streets, roads, and yards. No damage occurred to City property, but many residents incurred damage. Roofs

were damaged from a combination of branches and the wind itself. (*Note: Brier does not have the figures for damage to private property.*)

Brier's risk from this natural hazard is MODERATE.

### **Tsunami & Seiche**

Rating: 5

Due to its location – its distance from Puget Sound and its elevation – the City of Brier has virtually no risk from tsunami or seiche. This hazard rating is EXTREMELY LOW.

### **Volcano**

Rating: 16

The City of Brier is unlikely to suffer direct damage from a volcano eruption. In the event of an eruption, Brier may experience ashfall, and this can interfere with the operation of motor vehicles, require expensive clean-up efforts by the City, and cause respiratory distress to the citizens. The City is highly unlikely to experience any lava flow, lahar activity, or any of the other risks associated with volcanoes.

A secondary effect of a volcano eruption is the influx of refugees into the area. This may be an issue to the City, and the region as a whole, as resources are overwhelmed by numbers of people that the infrastructure is not designed to handle. This includes everything from roads and highways, water and electric utilities, to the regional hospital.

The rating for this hazard is LOW.

### **Wildland-Urban Interface Fire**

Rating: 7

Wildland-urban interface fire is a concern to Brier due to the unincorporated area around the City as well as the parks, wetlands, greenbelts, and undeveloped land parcels that are scattered throughout the City's boundaries. The threat is in reverse proportion to the amount of rainfall in the region. When rain is scarce, the fire threat increases.

During the summer of 2003, new records were set for number of days without rain. As a result, the north King and south Snohomish Counties region experienced several fires next to the freeway (I-5) that were caused by careless smokers or sparks from machinery being operated next to dry grass. These fires were quickly contained and extinguished, but the close proximity of houses to these wildland areas, and the relative density of the housing units, makes wildland-urban interface fires a slight risk during periods of drought or excessive dryness.

The risk from wildland-urban interface fire is EXTREMELY LOW.

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## Mitigation

### Existing and Ongoing Mitigation Activities

#### All Hazards

The City of Brier is a member of the Emergency Services Coordinating Agency (ESCA). As a Member City, Brier receives emergency management planning and response services.

In addition, ESCA provides education in the form of Community Emergency Response Team (CERT) training. This training is provided to the citizens of the member Cities and Towns free of charge. The goal is to prepare people to be self-sufficient for as much as three days after a major disaster until safety personnel can get to them.

#### **Codes**

**Table 1: Brier Codes and Plans**

Name of Document	Purpose	Review Schedule
Emergency Services – Disaster Coordination	Govern disaster preparedness and disaster response in the City.	Adopted 1984
Brier MC 18.04 State Environmental Policy Act – City Environmental Policy (SEPA)	Implement procedures and policies to improve and coordinate plans, functions, programs, and resources consistent with state and county policies for environmental protection.	Adopted 1984 Updated Dec. 1996
Chapter 16.16 BMC – Surface and Subsurface Drainage	Minimize adverse effects of alterations in groundwater quantities, locations, and flow patterns.	Adopted 1996 Updated 2006
Department of Ecology Stormwater Management Manual for Western Washington (Aug. 2005)	Provide guidance on the estimation and control of stormwater runoff quantity and quality.	Adopted 2006
Brier MC 18.12 -- Sensitive Areas Ordinance	Provides regulations to protect environmentally sensitive areas such as wetlands, fish and wildlife habitat conservation areas, frequently flooded areas, and geologically hazardous areas. Protect against adverse effects to the public health, the land and its vegetation and wildlife by managing shorelines.	Adopted Nov. 1992
International Building Code	Construct to the highest standards available.	Effective 2006

<b>Name of Document</b>	<b>Purpose</b>	<b>Review Schedule</b>
International Fire Code	Construct to the highest standards available.	Effective 2006
International Mechanical Code	Construct to the highest standards available.	Effective 2006
Uniform Plumbing Code	Construct to the highest standards available.	Effective 2008
National Electric Code	Construct to the highest standards available.	Effective 2008
Brier Comprehensive Plan	Contains community's vision of the City's future, provides a statement of long-range goals and policies.	Adopted 1994. Updated 2008.

**Drought**

- Encourage water conservation.
- Work with the Alderwood Water District to educate citizens about drought and conservation measures.
- The City of Brier coordinates with local water districts to restrict water usage during drought events.
- The City of Brier has minimized the amount of landscaping that requires irrigation and water use.
- Brier's Park Board is currently working with Seattle City Light at City Light Wood's Park to introduce native planting in the Seattle City Light Park area along with educational signage.
- The City of Brier included mostly drought-tolerant plantings in the landscape mix at City Hall.

**Earthquake**

- Brier currently uses the latest International Building Code to ensure construction standards. In July 2010, the code will be updated to comply with the State's adoption of the International Building Code.
- Brier City Hall was constructed in 2005 to meet current earthquake standards to improve earthquake readiness.

**Flood**

- Brier has adopted a Sensitive Areas Ordinance that regulates and protects wetlands. The Ordinance requires buffers to natural creeks, streams, and wetlands.
- In 2003, the City installed a regional detention pond at 228th and Old Poplar Way. This was a proactive step to address the needs of future development in that area.
- The City of Brier's Public Works Department recently completed several projects to address localized urban flooding:

- On 35<sup>th</sup> Avenue West, the City installed sidewalks between 228<sup>th</sup> Street and Alaska Way. They also installed a new storm drainage system with larger culverts and a bio-filtration system. This minimized recurrently flooding along 35<sup>th</sup> Avenue West and improved both pedestrian and driver safety.
- At the intersection of Oak Way and Vine Road, the City installed larger culverts to resolve chronic flooding issues.
- At Poplar Way and 212<sup>th</sup>, culverts were replaced to minimize silting which resulted in localized floods.
- Two culverts were replaced with larger culverts at the intersection of Elm Dr and Vine Rd

### **Landslide and Soil Displacement**

- Brier requires new buildings to be erected in accordance with current codes and has developed critical areas maps to regulate development on steep slopes. For safety and mitigation purposes, the City minimizes building on or near steep slopes.
- Brier's Public Works staff conducts a visual inspection of all roads in Brier on a weekly basis. This takes approximately half an hour, and allows staff to quickly identify developing trouble-spots and make road repairs in a timely manner. Regular road maintenance keeps water from seeping into and under the roadways and avoids the development of soil displacement and sinkholes.

### **Severe Storm**

- Work cooperatively with utilities to minimize damage to power and telephone lines from trees.
- As budget allows, the City of Brier removes trees located in the right-of-way that might pose a danger during a severe storm.
- The City has implemented a plan for de-icing roads and plowing to remove snow.

### **Tsunami and Seiche**

None at this time.

### **Volcano**

None at this time.

### **Wildland-Urban Interface Fire**

- Maintain right-of-way to minimize dry grasses and undergrowth as budget allows.
- Restrict fireworks to 4th of July.
- Implemented BMC 8.04 to ban outdoor burning without a permit.
- The City of Brier currently contracts fire services with Fire District 1.

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## **Mitigation Action Items**

The Mitigation Plan identifies short- and long-term action items developed through data collection, research, and the public participation process. Mitigation Plan activities may be considered for funding through federal and state grant programs and when other funds are made available through the school budgeting process or the passage of bonds.

Action items address multi-hazard (MH) or hazard-specific issues. Upon implementation, the coordinating organizations may look to partner organizations for resources and technical assistance.

To help ensure activity implementation, each action item includes several pieces of information in the description. These include:

- *Coordinating Organization*  
The coordinating organization is that which is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring and evaluation. The coordinating organizations may be local or regional agencies. Organizations written in *italics* are not participating in this Plan but have an established relationship with this jurisdiction.
- *Timeline*  
Action items include both long- and short-term activities. Each action item includes an estimate of the timeline for implementation. *Short-term* action items (ST) are activities that organizations may implement with existing resources and authorities within one to two years. *Long-term* action items (LT) may require new or additional resources or authorities, and may take between two and five years to implement.
- *Ideas for Implementation*  
Each action item includes ideas for implementation. This may be individual steps for one project, or it may be several related projects that address the natural hazard.
- *Plan Goals Addressed*  
The plan goals are identified to monitor and evaluate how well the Mitigation Plan is achieving its goals once implementation begins.
- *Benefit-to-Cost Review*  
Due to limitations in staff time, and because project priorities may shift based on changes in funding options and local events, a generalized benefit-to-cost review is used. The steps associated with prioritizing the mitigation projects are as follows:

1. The jurisdiction rates the project cost as “high,” “medium,” or “low” in relation to budget and previous projects, and each rating is assigned a numerical value.
2. The project outcome is then rated as “low,” “medium,” or “high,” and each of these ratings is assigned a numerical value.
3. The two values are added together, and the total provides the cost-benefit and the priority.

Example:

If a project has a *medium approximate cost*, and is considered to be *highly effective*, the boxes would be marked as shown below.

<u>Approx Cost</u> +	<u>Effectiveness</u>	=	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input checked="" type="checkbox"/> 2 – Medium	<input type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input type="checkbox"/> 3 – Low	<input checked="" type="checkbox"/> 3 – High		<input type="checkbox"/> 4
			<input checked="" type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

The priority ratings with the highest numbers are considered to be the highest priorities. As always, however, these are subject to financial realities and may not be carried out in the exact order indicated.

**BR-01-MH-LT: Implement GIS and develop mapping data for the City of Brier. Improve technical analysis of natural hazards including earthquake, flood, and landslide.**

**Ideas for implementation:**

- Install GIS and develop system data.
- Install HAZUS software and conduct risk analysis for natural hazards, including earthquake and flood.

**Coordinating Organization:** Brier Community Development  
**Estimated Price:** To be determined (medium cost)  
**Funding Source:** To be determined  
**Timeline:** 5 years  
**Plan Goals Addressed:** Protect Life & Property; Provide for Emergency or Critical Services; Facilitate Continuity & Recovery  
**Benefit-to Cost Review:** 5

<u>Approx Cost</u>	+	<u>Effectiveness</u>	=	<u>Priority</u>
<input type="checkbox"/> 1 – High		<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input type="checkbox"/> 3 – Low		<input checked="" type="checkbox"/> 3 – High		<input type="checkbox"/> 4
				<input checked="" type="checkbox"/> 5
				<input type="checkbox"/> 6 – Highest

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**DROUGHT MITIGATION ACTION ITEMS (D)**

**BR-02-D-ST: Work with Alderwood Water District’s to educate consumers about drought impacts and ways to minimize water waste.**

**Ideas for implementation:**

- Offer informational booklets with watering guidelines and methods to conserve water in homes and businesses such as: flow restriction devices, low volume toilets, and drought tolerant landscaping.
- Work with schools to educate young people on the importance of water conservation and the impact of drought on watersheds.
- Revise City plantings to include drought tolerant, xeriscape and native planting techniques to reduce water consumption.
- Work cooperatively with local water districts to advise residents of watering schedules as recommended by local water districts.

**Coordinating Organization:** Brier Public Works; Brier Community Development; Brier Administration; *Alderwood Water District*

**Estimated Price:** \$5,000

**Funding Source:** General funds and grants as available

**Timeline:** Ongoing

**Plan Goals Addressed:** Increase Public Awareness; Encourage Partnerships

**Benefit-to Cost Review:** 4

<u>Approx Cost</u> +	<u>Effectiveness</u>	=	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input checked="" type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input type="checkbox"/> 2 – Medium	<input type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input checked="" type="checkbox"/> 3 – Low	<input type="checkbox"/> 3 – High		<input checked="" type="checkbox"/> 4
			<input type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

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## EARTHQUAKE MITIGATION ACTION ITEMS (E)

### **BR-03-E-ST: Conduct non-structural retrofit activities.**

#### **Ideas for implementation:**

- Strap down and secure computers and other office equipment and machinery.
- Secure shelves, lockers, and furniture to walls.
- Conduct walk-through to ensure that heavy items are not stored overhead. Secure heavy items in place or move to safer locations.
- Mount computer servers on seismic isolation platforms, or use other appropriate technology to secure servers.
- Ensure facility water heaters are strapped securely to wall studs in accordance with current requirements.
- Secure ceiling tiles and light fixtures with wires.
- Secure back-up generator and HVAC equipment.
- Secure ducts and piping.
- Install plastic sleeves on fluorescent lighting tubes.
- Replace untempered glass with tempered glass, or install polyester shatter-resistant film over existing glass.
- Install child-proof latches on drawers and cabinets in appropriate locations.
- Prepare three-day emergency kits with water, food, etc. for City of Brier staff.

**Coordinating Organization:** Brier Administrative Department; Brier Public Works; Brier Maintenance

**Estimated Price:** \$500

**Funding Source:** General funds

**Timeline:** 3 years, ongoing

**Plan Goals Addressed:** Protect Life & Property; Provide for Emergency or Critical Services; Facilitate Continuity & Recovery

**Benefit-to Cost Review:** 5

Approx Cost +	Effectiveness	=	Priority
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input type="checkbox"/> 2 – Medium	<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input checked="" type="checkbox"/> 3 – Low	<input type="checkbox"/> 3 – High		<input type="checkbox"/> 4
			<input checked="" type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

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**BR-04-E-ST: Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices.**

**Ideas for implementation:**

- Provide information to, and cooperate with, all City and Government departments, Edmonds School District, including its school facility managers and teachers, on securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits.
- Encourage facility managers, business owners, and teachers to refer to FEMA’s practical guidebook: *Reducing the Risks of Nonstructural Earthquake Damage*.
- Encourage homeowners and renters to use *Is Your Home Protected from Earthquake Disaster? A Homeowners Guide to Earthquake Retrofit (IBHS)* for economic and efficient mitigation techniques.
- Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals, and contractors.

**Coordinating Organization:** Edmonds School District; Brier Community Development

**Estimated Price:** To be determined (low cost)

**Funding Source:** To be determined

**Timeline:** Ongoing

**Plan Goals Addressed:** Protect Life & Property; Increase Public Awareness; Encourage Partnerships

**Benefit-to Cost Review:** 5

Approx Cost	+	Effectiveness	=	Priority
<input type="checkbox"/> 1 – High		<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input type="checkbox"/> 2 – Medium		<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input checked="" type="checkbox"/> 3 – Low		<input type="checkbox"/> 3 – High		<input type="checkbox"/> 4
				<input checked="" type="checkbox"/> 5
				<input type="checkbox"/> 6 – Highest

**BR-05-E-ST: Identify public buildings and infrastructure that require structural retrofitting.**

**Ideas for implementation:**

- Conduct a seismic survey of all public buildings and infrastructure.
- Coordinate with State to identify transportation infrastructure in Brier that requires seismic retrofits.
- Work cooperatively with the Cities of Mountlake Terrace, Lynnwood, and Kenmore to coordinate emergency plans, refugee management, communication systems, and *infrastructure stabilization* to prepare for disaster management.

**Coordinating Organization:** Brier Public Works; Brier Building Inspectors; Brier Administration; Brier Administrative Department

**Estimated Price:** \$200,000

**Funding Source:** General funds; grants

**Timeline:** 2 years & ongoing

**Plan Goals Addressed:** Protect Life and Property; Provide for Emergency or Critical Services; Facilitate Continuity & Recovery

**Benefit-to Cost Review:** 4

<u>Approx Cost +</u>	<u>Effectiveness</u>	=	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input checked="" type="checkbox"/> 2 – Medium	<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input type="checkbox"/> 3 – Low	<input type="checkbox"/> 3 – High		<input checked="" type="checkbox"/> 4
			<input type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

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## FLOOD MITIGATION ACTION ITEMS (F)

### **BR-06-F-LT: Construct and enhance stormwater drainage systems and minimize urban flooding.**

#### **Ideas for implementation:**

- 37th Place West and 233rd Place SW: Construct curb, gutter, sidewalk and drainage on west and north side of the street.
- Elm Drive / 214th Place SW: Construct curb, gutter, and sidewalk replacement of failed infrastructure from Elm Drive to Oak Way.
- Crestview Hills: Install curb, gutter and sidewalk replacement of failed infrastructure.

**Coordinating Organization:** Brier Public Works

**Estimated Price:** \$212,000

**Funding Source:** Construction funds; state funds

**Timeline:** Ongoing over the next 6 years

**Plan Goals Addressed:** Protect Life & Property; Facilitate Continuity & Recovery; Protect Natural Systems

**Benefit-to Cost Review:** 4

<u>Approx Cost</u> +	<u>Effectiveness</u>	=	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input checked="" type="checkbox"/> 2 – Medium	<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input type="checkbox"/> 3 – Low	<input type="checkbox"/> 3 – High		<input checked="" type="checkbox"/> 4
			<input type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

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**BR-07-F-LT: Identify surface water drainage obstructions within the City of Brier.**

**Ideas for implementation:**

- Map culverts and include in GIS data.
- Prepare an inventory of culverts that historically create flooding problems and target them for retrofitting.
- Prepare an inventory of major urban drainage problems. Continue to identify causes and potential mitigation actions for urban drainage problem areas.
- Identify drainage and possible solutions to the Abby View Cemetery, Lyons Creek, and Old Poplar Way residential areas.
- Create a maintenance program of stormwater systems, creeks and streams to ensure that system remains functional.
- Regrade and restore streams and creeks that indicate lessened function due to runoff and construction.

**Coordinating Organization:** Brier Public Works; Brier Engineering; Brier Community Development

**Estimated Price:** To be determined (medium costs)

**Funding Source:** General funds; Stormwater funds

**Timeline:** 5-10 years

**Plan Goals Addressed:** Protect Life & Property; Provide Emergency & Critical Services; Facilitate Continuity & Recovery; Protect Natural Systems

**Benefit-to Cost Review:** 4

Approx Cost +	Effectiveness	=	Priority
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input checked="" type="checkbox"/> 2 – Medium	<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input type="checkbox"/> 3 – Low	<input type="checkbox"/> 3 – High		<input checked="" type="checkbox"/> 4
			<input type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

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**BR-08-F-LT: Analyze each repetitive flood property within the City of Brier, and the current MUGA as it is incorporated, and identify feasible mitigation options.**

**Ideas for implementation:**

- Identify appropriate and feasible mitigation activities for identified repetitive flood properties. Funding may be available through FEMA’s Hazard Mitigation Grant and Flood Mitigation Assistance Programs and the Pre-Disaster Mitigation (PDM) Program.
- Contact repetitive loss property owners to discuss mitigation opportunities and determine interest should future project opportunities arise.
- Explore options for incentives to encourage property owners to engage in mitigation.

**Coordinating Organization:** Brier Community Development; Brier Planning Commission

**Estimated Price:** To be determined (medium costs)

**Funding Source:** To be determined

**Timeline:** 5 years

**Plan Goals Addressed:** Protect Life & Property; Increase Public Awareness; Facilitate Continuity & Recovery

**Benefit-to Cost Review:** 4

<u>Approx Cost</u> +	<u>Effectiveness</u>	=	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input checked="" type="checkbox"/> 2 – Medium	<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input type="checkbox"/> 3 – Low	<input type="checkbox"/> 3 – High		<input checked="" type="checkbox"/> 4
			<input type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

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**BR-09-F-LT: Develop acquisition and management strategies to preserve opens space for flood mitigation, fish habitat, and water quality in the floodplain.**

**Ideas for implementation:**

- Explore funding for property acquisition from federal (e.g., FEMA’s Hazard Mitigation Grant Program), state, regional, and county governments, as well as private and non-profit organizations, trails programs, fish programs, as well as options for special appropriations.
- Develop a regional partnership between flood mitigation, fish habitat, and water quality enhancement organizations and programs to improve educational programs.
- Identify sites where environmental restoration work can benefit flood mitigation, fish habitat, and water quality.
- Work with landowners to develop flood management practices that provide healthy fish habitat.
- Identify existing watershed education programs and determine which programs would support a flood education component.

**Coordinating Organization:** Brier Public Works; Brier Community Development; Brier Administrative Department; *Adopt-A-Stream Foundation*

**Estimated Price:** To be determined

**Funding Source:** To be determined

**Timeline:** 5 years (as funding allows)

**Plan Goals Addressed:** Protect Life & Property; Increase Public Awareness; Encourage Partnerships; Protect Natural Systems

**Benefit-to Cost Review:** 4

<u>Approx Cost</u>	<u>+</u>	<u>Effectiveness</u>	<u>=</u>	<u>Priority</u>
<input type="checkbox"/> 1 – High		<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input checked="" type="checkbox"/> 2 – Medium		<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input type="checkbox"/> 3 – Low		<input type="checkbox"/> 3 – High		<input checked="" type="checkbox"/> 4
				<input type="checkbox"/> 5
				<input type="checkbox"/> 6 – Highest

**LANDSLIDE MITIGATION ACTION ITEMS (L)**

**BR-10-L-ST: Limit activities in identified potential and historical landslide areas through regulation and public outreach.**

**Ideas for implementation:**

- Analyze existing regulations regarding development in landslide prone areas.
- Identify existing mechanisms for public outreach (e.g., watershed councils, etc.).

**Coordinating Organization:** Brier Community Development; Brier Administrative Department

**Estimated Price:** To be determined

**Funding Source:** To be determined

**Timeline:** 2 years

**Plan Goals Addressed:** Protect Life & Property; Increase Public Awareness; Provide for Emergency & Critical Services; Facilitate Continuity & Recovery

**Benefit-to Cost Review:** 6

<u>Approx Cost</u> +	<u>Effectiveness</u>	=	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input type="checkbox"/> 2 – Medium	<input type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input checked="" type="checkbox"/> 3 – Low	<input checked="" type="checkbox"/> 3 – High		<input type="checkbox"/> 4
			<input type="checkbox"/> 5
			<input checked="" type="checkbox"/> 6 – Highest

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**BR-11-L-ST: Perform asphalt overlay to provide maximum protection for roadways and minimize long-term damage from soil erosion and displacement caused by gatoring and other structural damage.**

**Ideas for implementation:**

- Perform weekly visual inspection of roads and assess for condition.
- Evaluate weekly assessments and incorporate into street repair plan.
- Complete repairs on an ongoing basis in order to minimize soil erosion and structural damages.

**Coordinating Organization:** Brier Public Works  
**Estimated Price:** \$662,000  
**Funding Source:** Construction funds  
**Timeline:** Ongoing since 1998  
**Plan Goals Addressed:** Protect Life & Property; Provide for Emergency & Critical Services; Facilitate Continuity & Recovery  
**Benefit-to Cost Review:** 5

Approx Cost +	Effectiveness	=	Priority
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input checked="" type="checkbox"/> 2 – Medium	<input type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input type="checkbox"/> 3 – Low	<input checked="" type="checkbox"/> 3 – High		<input type="checkbox"/> 4
			<input checked="" type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

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**BR-12-L-LT: Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to live and property in hazard-prone areas.**

**Ideas for implementation:**

- Incorporate landslide information into GIS mapping, and planning and the City of Brier Comprehensive Plan.
- Develop public information to emphasize economic risk when building on potential or historical landslide areas.
- Develop public information brochures to educate the community on how to maintain and enhance slope stability.

**Coordinating Organization:** Brier Community Development

**Estimated Price:** To be determined (low cost)

**Funding Source:** To be determined

**Timeline:** 5 years

**Plan Goals Addressed:** Protect Life & Property; Increase Public Awareness

**Benefit-to Cost Review:** 5

<u>Approx Cost</u> +	<u>Effectiveness</u>	=	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input type="checkbox"/> 2 – Medium	<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input checked="" type="checkbox"/> 3 – Low	<input type="checkbox"/> 3 – High		<input type="checkbox"/> 4
			<input checked="" type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

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**BR-13-L-LT: Encourage construction and subdivision design that can be applied to steep slopes to reduce the potential adverse impacts from development.**

**Ideas for implementation:**

- Continue to implement the City’s Comprehensive Plan and Municipal Code that encourages the retention of natural features of the land and minimizes impacts to steep slopes.
- Work with the City of Brier Planning Commission and City Council to develop guidelines to mitigate and prevent landslides.

**Coordinating Organization:** Brier Administrative Department; Brier Community Development

**Estimated Price:** To be determined (low cost)

**Funding Source:** To be determined

**Timeline:** 5 year

**Plan Goals Addressed:** Protect Life & Property; Increase Public Awareness; Encourage Partnerships; Provide for Emergency & Critical Services

**Benefit-to Cost Review:** 5

<u>Approx Cost</u> +	<u>Effectiveness</u>	=	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input type="checkbox"/> 2 – Medium	<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input checked="" type="checkbox"/> 3 – Low	<input type="checkbox"/> 3 – High		<input type="checkbox"/> 4
			<input checked="" type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

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## SEVERE STORM MITIGATION ACTION ITEMS (S)

**BR-14-S-ST: Enhance strategies for public safety during and after severe storm events.**

### Ideas for implementation:

- Develop coordinated management strategies for clearing roads of fallen trees, and clearing debris from public and private property.

**Coordinating Organization:** Brier Public Works

**Estimated Price:** \$3,000

**Funding Source:** Public Works budget

**Timeline:** 2 years

**Plan Goals Addressed:** Protect Life & Property; Provide for Emergency or Critical Services; Facilitate Continuity & Recovery

**Benefit-to Cost Review:** 6

<u>Approx Cost +</u>	<u>Effectiveness</u>	<u>=</u>	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input type="checkbox"/> 2 – Medium	<input type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input checked="" type="checkbox"/> 3 – Low	<input checked="" type="checkbox"/> 3 – High		<input type="checkbox"/> 4
			<input type="checkbox"/> 5
			<input checked="" type="checkbox"/> 6 – Highest

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**BR-15-S-ST: Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe storms.**

**Ideas for implementation:**

- Partner with responsible agencies and organizations to design and implement programs that reduce risk to life, property, and utility systems.
- Develop partnerships between utility providers and City public works agencies to document known hazard areas.

**Coordinating Organization:** Brier Administrative Department; Brier Public Works; *Alderwood Water District; Snohomish County PUD; Puget Sound Energy*

**Estimated Price:** To be determined (low to medium costs)

**Funding Source:** General fund

**Timeline:** 2 years

**Plan Goals Addressed:** Protect Life & Property; Encourage Partnerships; Provide for Emergency or Critical Services; Facilitate Continuity & Recovery

**Benefit-to Cost Review:** 5

<u>Approx Cost +</u>	<u>Effectiveness</u>	<u>=</u>	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input checked="" type="checkbox"/> 2 – Medium	<input type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input type="checkbox"/> 3 – Low	<input checked="" type="checkbox"/> 3 – High		<input type="checkbox"/> 4
			<input checked="" type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

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**BR-16-S-ST: Increase public awareness of severe storm mitigation activities.**

**Ideas for implementation:**

- Collect information on public education materials for protecting life, property, and the environment from severe storm events.
- Distribute educational materials to residents and public and private sector organizations regarding evacuation routes during road closures.
- Target the vulnerable or at-risk populace for disseminating preparedness information (i.e., seniors, medically fragile individuals, etc.)

**Coordinating Organization:** Brier Administration; Brier Administrative Department; Edmonds School District; *Snohomish County PUD; Puget Sound Energy*

**Estimated Price:** To be determined (low cost)

**Funding Source:** General funds; grants

**Timeline:** 2 years

**Plan Goals Addressed:** Protect Life & Property; Increase Public Awareness; Encourage Partnerships

**Benefit-to Cost Review:** 5

<u>Approx Cost</u> +	<u>Effectiveness</u>	=	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input type="checkbox"/> 2 – Medium	<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input checked="" type="checkbox"/> 3 – Low	<input type="checkbox"/> 3 – High		<input type="checkbox"/> 4
			<input checked="" type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

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**BR-17-S-ST: Encourage development and enforcement of wind-resistant building siting and construction codes.**

**Ideas for implementation:**

- Continue to evaluate current building codes for proficiency in protecting structures from severe storms, including windstorms.

**Coordinating Organization:** Brier Community Development  
**Estimated Price:** To be determined  
**Funding Source:** To be determined  
**Timeline:** Ongoing  
**Plan Goals Addressed:** Protect Life & Property; Increase Public Awareness; Provide for Emergency & Critical Services; Facilitate Continuity & Recovery  
**Benefit-to Cost Review:** 6

<u>Approx Cost +</u>	<u>Effectiveness</u>	<u>=</u>	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input type="checkbox"/> 2 – Medium	<input type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input checked="" type="checkbox"/> 3 – Low	<input checked="" type="checkbox"/> 3 – High		<input type="checkbox"/> 4
			<input type="checkbox"/> 5
			<input checked="" type="checkbox"/> 6 – Highest

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**BR-18-S-ST: Develop and implement programs to keep trees from threatening lives, property, and public infrastructure during severe storm events.**

**Ideas for implementation:**

- Partner with responsible agencies and organizations to design and disseminate education information to property owners to reduce risk from tree failure to life, property, and utility systems.
- Develop partnerships between utility providers and local public works agencies to document known hazard areas.
- Continue to identify potentially hazardous trees in urban areas.
- Monitor the protection of trees and root systems during construction projects.
- Develop stormwater systems to control waterways and reduce destabilization of root systems.
- Provide information to residents with tree recommendations for urban landscapes.
- Provide information and/or clinics on proper pruning of trees to promote maximum health.

**Coordinating Organization:** Brier Community Development; Brier Planning Commission; *Snohomish County PUD; (Master Gardener Program)*

**Estimated Price:** To be determined (low costs)

**Funding Source:** To be determined

**Timeline:** Ongoing

**Plan Goals Addressed:** Protect Life & Property; Increase Public Awareness; Encourage Partnerships; Provide for Critical or Emergency Services; Facilitate Continuity & Recovery; Protect Natural Systems

**Benefit-to Cost Review:** 5

<u>Approx Cost</u> +	<u>Effectiveness</u>	=	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input type="checkbox"/> 2 – Medium	<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input checked="" type="checkbox"/> 3 – Low	<input type="checkbox"/> 3 – High		<input type="checkbox"/> 4
			<input checked="" type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

**BR-19-S-LT: Require electrical utilities to use underground construction methods where possible to reduce power outages from severe storms.**

**Ideas for implementation:**

- Continue to require the use of underground utilities where possible to be consistent with the City of Brier Municipal Code.

**Coordinating Organization:** Brier Community Development; *Snohomish County PUD*

**Estimated Price:** \$2,000

**Funding Source:** General Fund

**Timeline:** Ongoing

**Plan Goals Addressed:** Protect Life & Property; Encourage Partnerships; Provide for Emergency & Critical Services; Facilitate Continuity & Recovery

**Benefit-to Cost Review:** 6

<u>Approx Cost</u>	+	<u>Effectiveness</u>	=	<u>Priority</u>
<input type="checkbox"/> 1 – High		<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input type="checkbox"/> 2 – Medium		<input type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input checked="" type="checkbox"/> 3 – Low		<input checked="" type="checkbox"/> 3 – High		<input type="checkbox"/> 4
				<input type="checkbox"/> 5
				<input checked="" type="checkbox"/> 6 – Highest

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**VOLCANO MITIGATION ACTION ITEMS (V)**

**BR-20-V-ST: Collaborate to develop ash fall models that are specific to the north King and south Snohomish Counties area.**

**Ideas for implementation:**

- Determine critical activities that must be implemented for varying degrees of ash fall.

**Coordinating Organization:** Brier Community Development; *Washington State Department of Natural Resources*

**Estimated Price:** To be determined (medium costs)

**Funding Source:** Grants or general funds

**Timeline:** 2 years

**Plan Goals Addressed:** Protect Life & Property; Increase Public Awareness; Encourage Partnerships

**Benefit-to Cost Review:** 4

<u>Approx Cost +</u>	<u>Effectiveness</u>	<u>=</u>	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input checked="" type="checkbox"/> 2 – Medium	<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input type="checkbox"/> 3 – Low	<input type="checkbox"/> 3 – High		<input checked="" type="checkbox"/> 4
			<input type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

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**BR-21-V-LT: Develop and implement policy for maintaining stock of filters for key vehicles and pieces of equipment.**

Ideas for implementation:

- Identify key vehicles and equipment such as: back-up generators, fire and police vehicles, other large or unusual equipment requiring filters.
- Establish policy and budget to maintain spare filters.

**Coordinating Organization:** Brier Administrative Department; Brier Public Works; Brier Police Department;

**Estimated Price:** To be determined (low costs)

**Funding Source:** General fund

**Timeline:** Ongoing

**Plan Goals Addressed:** Protect Life & Property; Provide for Emergency Services; Facilitate Continuity and Recovery

**Benefit-to Cost Review:** 5

<u>Approx Cost</u>	<u>+</u>	<u>Effectiveness</u>	<u>=</u>	<u>Priority</u>
<input type="checkbox"/> 1 – High		<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input type="checkbox"/> 2 – Medium		<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input checked="" type="checkbox"/> 3 – Low		<input type="checkbox"/> 3 – High		<input type="checkbox"/> 4
				<input checked="" type="checkbox"/> 5
				<input type="checkbox"/> 6 – Highest

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**WILDLAND-URBAN INTERFACE FIRE MITIGATION ACTION ITEMS  
(W)**

**BR-22-W-LT: Enhance outreach and education programs aimed at mitigating wildland-urban interface fire hazards and reducing or preventing the exposure of citizens, public agencies, private property owners, and businesses to natural causes.**

**Ideas for implementation:**

- Visit neighborhoods and conduct education and outreach activities.
- Conduct specific community-based demonstration projects of fire prevention and mitigation in the urban interface.
- Perform public outreach and information outreach by holding open houses at fire stations. Allow the public to visit, see the equipment, and discuss wildland-urban interface fire mitigation with the crews.

**Coordinating Organization:** Brier Administrative Department; *Fire District No. 1*  
**Estimated Price:** To be determined (medium costs)  
**Funding Source:** Grants  
**Timeline:** 3 years  
**Plan Goals Addressed:** Protect Life & Property; Increase Public Awareness; Encourage Partnerships; Provide for Emergency & Critical Services; Protect Natural Systems  
**Benefit-to Cost Review:** 4

<u>Approx Cost +</u>	<u>Effectiveness</u>	=	<u>Priority</u>
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input checked="" type="checkbox"/> 2 – Medium	<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input type="checkbox"/> 3 – Low	<input type="checkbox"/> 3 – High		<input checked="" type="checkbox"/> 4
			<input type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

**BR-23-W-LT: Increase communication, coordination, and collaboration between wildland-urban interface property owners, city planners, fire prevention crews, and city officials to address risks, existing mitigation measures, and federal assistance programs.**

**Ideas for implementation:**

- Encourage all residents to practice fire plans and evacuation routes.
- Require fire department notification of new business applications to ensure that appropriate fire plans have been developed.
- Have the City Planners and Planning Commission work closely with landowners and/or developers who choose to build in the wildland-urban interface area to identify and mitigate conditions that aggravate fire hazards, including:
  - Limited access for emergency equipment due to width and grade of roadways.
  - Poor turn-around for emergency equipment.
  - Inadequate water supplies.
  - Spacing, consistency, and species of vegetation around structures.
  - Inadequate fuel breaks, or lack of defensible space.
  - Highly flammable construction materials.
  - Building lots and subdivisions that are not in compliance with state and local land use and fire protection regulations.
  - Inadequate entry/escape routes.
- Encourage all new homes and major remodels involving roofs or additions that are located in the wildland-urban interface area to have fire-resistant roofs and residential sprinkler systems.

**Coordinating Organization:** Brier Community Development; Brier Planning Commission; *Fire District No. 1; ESCA*

**Estimated Price:** To be determined (medium costs)

**Funding Source:** Grants

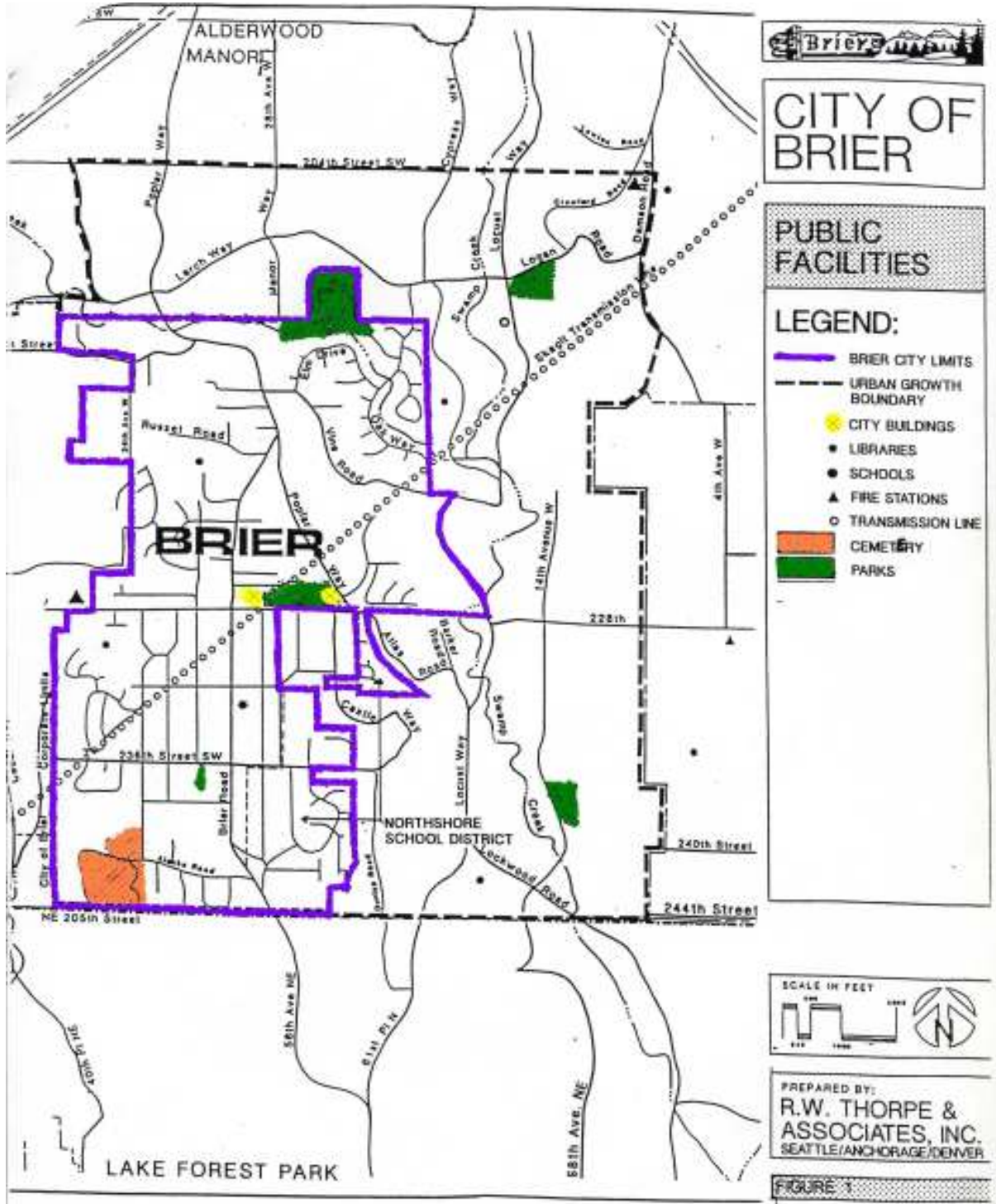
**Timeline:** 3 years

**Plan Goals Addressed:** Protect Life & Property; Increase Public Awareness; Encourage Partnerships; Provide for Emergency & Critical Services

**Benefit-to Cost Review:** 4

Approx Cost +	Effectiveness	=	Priority
<input type="checkbox"/> 1 – High	<input type="checkbox"/> 1 – Low		<input type="checkbox"/> 2 – Lowest
<input checked="" type="checkbox"/> 2 – Medium	<input checked="" type="checkbox"/> 2 – Medium		<input type="checkbox"/> 3
<input type="checkbox"/> 3 – Low	<input type="checkbox"/> 3 – High		<input checked="" type="checkbox"/> 4
			<input type="checkbox"/> 5
			<input type="checkbox"/> 6 – Highest

Figure 1: Brier Public Facilities Map



<sup>1</sup> Hammond Collier Wade Livingston. City of Brier Comprehensive Plan (December 2000).