Background and Analysis

The Growth Management Act (GMA) requires the utilities element of a comprehensive plan to consist of “the general location, proposed location and capacity of all existing and proposed utilities, including, but not limited to, electrical lines, telecommunication lines, and natural gas lines.” This element addresses these utilities, as well as solid waste disposal. Three services often thought of as utilities but not included in this element are potable water supply, sanitary sewers and stormwater management. The GMA requires that these three services be addressed in the capital facilities element of a comprehensive plan, and they are so located in this Imagine Bothell Plan.

In addition to meeting the GMA requirements with respect to utilities, this element also includes goals, policies and actions regarding conservation of resources utilized to provide these services. Please note that certain of these conservation goals, policies and actions deal with water usage, even though water supply, storage and distribution are addressed in the Capital Facilities Element.

Providers within the Bothell Planning Area of the utilities discussed in this element are as follows, as of 2004:

1. Electricity
   - Puget Sound Energy
   - Snohomish County PUD No. 1

2. Natural Gas
   - Puget Sound Energy

3. Liquid Petroleum Pipelines
   - Olympic Pipeline Company

4. Telecommunications
   - Telephone: Verizon
   - Personal Wireless Services: Various providers
   - Cable Television: Comcast
   - Fiber Optic Cable: Various providers

5. Solid Waste
   - Waste Management, Inc.
Electricity

Puget Sound Energy (PSE) and Snohomish County Public Utility District (PUD) supply electricity to Bothell residents. Electricity service areas are divided roughly along the county line with Puget Sound Energy serving Bothell Planning Area residents within King County and Snohomish County PUD serving Bothell Planning Area residents within Snohomish County. In addition, Seattle City Light, while not providing power to Bothell, maintains three sets of 230,000-volt transmission lines which pass through the east side of the North Creek Valley. Two of these proceed south along 124th Avenue NE; while the third turns southeast and follows the Sammamish Valley (see Figure UT-1).

Puget Sound Energy (PSE)

Puget Sound Energy provides electricity to the portion of the Bothell Planning Area within King County. Electricity is supplied to the area by 115,000-volt (115 kilovolt or 115 kV) transmission lines located as follows:

- Two sets of lines in the North Creek Valley, one running south from the County line to about NE 195th where it feeds a line running west (see below), the other running south to about NE 170th Street, then veering southeast down the Sammamish Valley (Beverly-Kenmore and Beverly-Cottage Brook);
- One set of lines extending west in approximate alignment with NE 195th (Beverly-Kenmore);
- One set of lines extending east in approximate alignment with NE 195th (Beverly-Cottage Brook);
- One set of lines extending southeast along the Tolt Pipeline right of way (Cottage Brook-Wayne);

The above-described transmission lines serve a system of distribution substations which reduce the current to 12,000 volts (12kV). From these substations extend 12 kV distribution lines which run along local streets. Transformers then further reduce the voltage to 240 for distribution to residences or to 480 or 720 for commercial or industrial users.

Each substation has a rated "nameplate" capacity of 25 megawatts of electricity, with the exception of Vitulli, which has a rated nameplate capacity of 50 megawatts and is planned to be expanded to supply an additional 50. In addition, the Wayne substation may be expanded in the future to supply an additional 25 megawatts.

PSE officials provided figures for average load demands per square mile for the following different general categories of uses:

<table>
<thead>
<tr>
<th>Category</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single family housing</td>
<td>8 megawatts/sq. mi.</td>
</tr>
<tr>
<td>Multi-family housing</td>
<td>19 megawatts/sq. mi.</td>
</tr>
<tr>
<td>Commercial development</td>
<td>29 megawatts/sq. mi.</td>
</tr>
<tr>
<td>Industrial development</td>
<td>Varies</td>
</tr>
</tbody>
</table>

As an example of heavy industrial development demand, PSE officials pointed to the Seattle Times production facility, which demands as much as 12-15 megawatts, amounting to one-third of the
current total for the City of Bothell. PSE officials stated that optimally, substations should be no more than two miles apart to serve an area at full buildout.

In addition to substations, an area may require one or more switching stations. Switching stations contain circuit breakers to improve reliability, but do not necessarily lower voltage.

PSE is planning projects to improve reliability of service to the Bothell area. These include adding additional transformers at existing substations and expanding interconnections with Snohomish County PUD No. 1. PSE hopes to meet 20 percent of projected future demand with conservation and 80 percent with new facilities.

**Snohomish County PUD No. 1**

Snohomish County supplies electricity to the portion of the Planning Area within Snohomish County. The general arrangement of transmission lines, substations, distribution lines, transformers and service lines to individual homes and businesses is as described above, except that each Snohomish County PUD substation has a 28 megawatt capacity, as compared to the 25 megawatt capacity to which PSE substations are constructed.

In addition, this portion of the Planning Area contains a major Bonneville Power Administration substation. The Sno-King substation, located south of Maltby Road at 35th Avenue SE, has a 1,650 megawatt capacity, and distributes power to several 115,000 volt PUD transmission lines serving south Snohomish County.

Within the Planning Area, these transmission lines are located as follows (see Figure UT-1):

- Extending west from BPA's Sno-King substation, roughly parallel to but south of Maltby and Filbert Roads;
- Extending south along 9th Avenue SE, then west along 228th Street SE;
- Extending east from the Sno-King substation along Maltby Road, then south parallel to and west of 45th Avenue SE, then east along 228th;
- Extending south parallel to and east of 45th Avenue SE.

The Snohomish County portion of the Planning Area contains four substations as well. The PUD designs most of its substations to accommodate a future second bank of transformers for additional capacity. Snohomish County PUD reports that developments in the computing industry have led to commercial facilities that consume substantially more power than traditional facilities of similar size. These facilities are composed of extremely dense “computer server” load and associated cooling systems. Facilities of this type locating within Bothell or its Planning Area may require the construction of additional transmission, substation and/or distribution facilities to serve the electric demand in the future.
Natural Gas

Puget Sound Energy

Puget Sound Energy (PSE) is certified by the Washington Utilities and Transportation Commission to provide the Bothell Planning Area with natural gas.

PSE’s source of natural gas is the Northwest Pipeline, which originates in Canada and consists of two pipes, one 26 inches in diameter and designed to carry natural gas at a pressure of 600 pounds per square inch, the other 30 inches in diameter and designed for 1,000 pounds of pressure. The main Pipeline route is east of Woodinville and Redmond, but also includes lateral lines to facilitate service to areas. Two of these lateral lines branch off from the main pipeline in south Snohomish County, north of the Bothell Planning Area boundary, and extend in parallel west to Lynnwood. The Planning Area is served primarily from three PSE lines which branch off the Northwest Pipeline lateral, one at 31st Avenue SE and about 184th Street SE, the other two at a location in Mountlake Terrace.

Distribution lines branching off from the main PSE supply lines may be four, six or eight inches in diameter. Lines serving individual homes are typically five-eighths inch in diameter, and those serving commercial uses have a diameter of one and one-quarter inch.

PSE has established as its optimum service standard a pressure of 45 pounds per square inch, and as the minimum service threshold a pressure of 15 pounds per square inch. According to PSE officials, during cold weather, the pressure in Bothell decreases to as low as 25 pounds per square inch. Approaches utilized by PSE to improve service to an area demonstrating decreases in pressure include the following:

- Looping systems to provide alternate directions of supply;
- Adding parallel lines to supplement supply;
- Replacing existing lines to increase volume.

Within the Bothell Planning Area, PSE is planning several construction projects to improve future service delivery (see Figure UT-1).

PSE officials estimate that the natural gas supply system will be able to meet the demand for natural gas supply within the Planning Area over the next 20 years. PSE does not anticipate the need for additional pipeline corridors within the Planning Area unless growth accelerates, at which time additional studies will be necessary to analyze system needs.

Liquid Petroleum Pipelines

Olympic Pipeline Company

The Olympic Pipeline Company operates a 400-mile long refined petroleum pipeline system from refineries in extreme northwestern Washington to Portland, Oregon. These pipelines carry refined petroleum products consisting of diesel, jet fuel and gasoline. Two parallel transmission lines pass through the eastern portion of the City (See Figure UT-1).

The Federal Office of Pipeline Safety (OPS) regulates interstate liquid pipelines and their associated facilities.
Telecommunications

Telephone

Verizon provides telephone and related services throughout the Bothell Planning Area. Telephone system facilities within the Planning Area include switching stations, trunk lines, and distribution lines running along streets and to individual homes and businesses. Switching stations, housed in typically small, windowless structures, are located within the Planning Area as follows (see Figure UT-1):

- On 228th Street SW, west of Fitzgerald Road;
- On Main Street at 103rd Avenue NE, in downtown Bothell; and
- On NE 160th Street east of Brickyard Road.

No additional switching stations or other major construction projects are anticipated for the Planning Area over the next 20 years.

Personal Wireless Services

The Federal Communications Commission (FCC) has granted licenses to several personal wireless service providers to serve the portion of Western Washington containing the Bothell Planning Area. Within the Planning Area there are numerous cell sites which relay signals to and from PWS users. While these sites originally consisted of lattice or monopole towers on or near the tops of hills, the growth in cell phone usage and number of providers has necessitated additional sites, and relay facilities are now found on telephone poles, light poles, water tanks, churches and commercial buildings as well.

Cable

Comcast Cable Communications offers cable TV service within Bothell in accordance with a contract with the City. Under the terms of the contract, Comcast provides a channel (Channel 21) for use by the City. As of 2004 the City utilizes the channel to broadcast City Council and Planning Commission meetings, public service announcements and previews and replays of City events such as the annual Fourth of July celebration.

Capital facilities owned and operated by Comcast include underground and aerial trunk and distribution lines, signal amplifiers approximately every 2,000 to 2,200 feet, and junction boxes at each individual property receiving service. Until 2003 Comcast maintained a microwave relay facility mounted on a tower on City property at the top of Norway Hill: improvements in ground transmission facilities made the microwave relay unnecessary, and it has been removed.

Comcast rents pole space or shares trenches with Puget Sound Energy, Snohomish County PUD, or Verizon to carry overhead or underground cables which supply service to homes and businesses within the Planning Area. Comcast is upgrading its cable system to a hybrid fiber coaxial system that will serve the entire Puget Sound region. Once the upgrade is complete, the system will provide enhanced services such as high-speed Internet.
Fiber Optic Cable

Various private operators have installed underground fiber optic cable in the Planning Area. Fiber optic cable allows high-speed data communications and transport across the United States.

Solid Waste

Waste Management, Inc.

Solid waste, recycling and yard waste collection services within the City of Bothell are primarily provided through contracted services with Waste Management, Inc. Most households within the City receive solid waste recycling and yard waste collection services. Most businesses within the City receive solid waste collection service with recycling and yard waste collection available as optional services.

In 2003, the total single family, multi-family and commercial waste stream amounted to approximately 24,235 tons. Of this total, single family homes accounted for about 62 percent, multi-family about 11 percent, and commercial about 27 percent. The total tonnage was divided among solid waste, recycling and yard waste as follows: solid waste, 14,219 tons; recycling, 4,512 tons; and yard waste, 5,504 tons.

Solid waste collected within the City of Bothell is delivered to a transfer station and then hauled to a regional landfill. The recyclables and yard waste are collected and transported to a facility where the material is sorted and sold on the commodities market or, in the case of yard waste, turned into compost and sold.

The City of Bothell participates in ongoing programs with Waste Management, Inc. and King County to organize and promote special collection events and opportunities for bulky and extra waste items that aren't collectable at the curb and for collection of hazardous waste materials.

Siting of Essential Public Facilities

The Growth Management Act requires local governments to develop a process for identifying and siting essential public facilities and to incorporate that process into local comprehensive plans. Essential public facilities can be difficult to site, and their location in a community may be locally unpopular. The Act charges state and local governments with the task of ensuring that such facilities as needed to support orderly growth and the delivery of public services are sited in a timely and efficient manner.

Several types of utility facilities may be considered difficult to site, including but not limited to high voltage transmission lines, electrical substations, cellular transmission towers, and large transmission pipelines.

The Land Use element discusses the siting of essential public facilities in detail, and provides for a regionally coordinated siting process. This element incorporates a policy (UC-P13) referencing the discussion and policy in the Land Use element.
Utilities and Conservation Goals, Policies and Actions

Goals

UC-G1 To ensure that utilities are available or can be provided to serve the projected population within the Planning Area in a manner which is fiscally and environmentally responsible, aesthetically acceptable to the community, and safe for residents.

UC-G2 To reduce the rate of consumption of natural resources in order to improve air and water quality and slow solid waste accumulation. Reduction of natural resource consumption will diminish the need to identify and develop costly new resource supplies.

Policies

UC-P1 Utility providers have indicated that they do not anticipate the need for major new transmission or distribution facilities within the Planning Area during the time horizon of the Plan. If any providers identify a need for such major facilities, the City shall coordinate with the provider(s) to include consideration of alternative locations for the new facilities, at the earliest possible stage in planning.

UC-P2 Regulate construction of utilities within and near critical areas in accordance with applicable federal, state and city regulations. Particular attention should be paid to minimizing the impacts of utilities construction in areas which contribute to the health of habitat for those species protected under the Endangered Species Act.

UC-P3 Require utility providers to implement best management practices (BMP’s) for any development activities.

UC-P4 Require the undergrounding of new utility distribution lines with the exception of high voltage electrical transmission lines. High voltage lines are exempted due to the high cost and potential adverse environmental impacts of undergrounding such lines.

UC-P5 Consistent with rules and tariffs of the Washington Utilities and Transportation Commission, require the undergrounding of existing utility distribution lines where physically feasible as streets are widened and/or areas are redeveloped. Assign a high priority to undergrounding of lines within view corridors.

UC-P6 Promote co-location of major utility transmission facilities such as high-voltage electrical transmission lines and water and natural gas trunk pipelines within shared utility corridors, to minimize the amount of land allocated for this purpose and the tendency of such corridors to divide neighborhoods.
UC-P7 Promote co-location of utility distribution facilities in shared trenches and coordination of construction timing to minimize construction-related disruptions to the public and to reduce the cost of utility delivery to the public.

UC-P8 Promote conservation measures to reduce the need for additional utility distribution facilities in the future.

UC-P9 Promote recreational use of utility corridors, for example, for trails, sports courts and similar facilities where found to be safe and compatible with the primary use.

UC-P10 Ensure that utility purveyors limit disturbance to vegetation within major utility transmission corridors to that necessary for safety and maintenance of transmission facilities.

UC-P11 Encourage utility providers to exercise restraint and sensitivity to neighborhood character in the practice of trimming tree limbs around aerial utility lines.

UC-P12 Ensure utility facilities are designed in such a manner as to minimize adverse aesthetic impacts on surrounding land uses.

UC-P13 Provide for a common regional site review process for consideration of proposed utility facilities which constitute essential public facilities of a countywide or statewide nature, as defined in the Land Use element. Such utility facilities are necessary components of a system or network which provides a public service or good, serve a population base extending beyond the limits of the host community, and may be difficult to site due to perceived environmental impacts on their immediate surroundings. See Land Use Policy LU-P14.

UC-P14 Support improvements to the telecommunications system which facilitate business, educational, and recreational activities and ensure that Bothell maintains a competitive advantage in attracting and retaining businesses.

UC-P15 Pursue development of regulations encouraging water conservation.

UC-P16 Provide water conservation assistance to customers.

UC-P17 Promote public education, awareness and involvement in water conservation programs.

UC-P18 Practice efficient water use in municipal buildings, parks, City maintained planting areas and the Bothell Cemetery.

UC-P19 Adopt and implement energy efficient practices in all municipal buildings.

UC-P20 Continue to promote the City recycling program in single family and multi-family residential areas and extend the program to all businesses.

UC-P21 Continue to promote recycling within all municipal facilities.
Actions

UC-A1  Maintain detailed maps and plans depicting the location of existing and proposed utility facilities and their capacities.

UC-A2  Meet periodically with representatives of utility purveyors to ensure coordination of plans and construction projects.

UC-A3  Pursue alternative water sources.

UC-A4  Work with utility purveyors to identify opportunities for recreational facilities within utility corridors, where found to be safe, and to develop a program which addresses funding, construction of facilities, and long-term maintenance.

UC-A5  Prepare a list of view corridors adversely impacted by aerial utility distribution lines, to identify high-priority corridors for undergrounding of existing lines upon street widening or redevelopment.

UC-A6  Continue to participate in and develop information programs for homeowners, apartment dwellers and business that provide advice on how to reduce water consumption. This information may be disseminated through the City newsletter, with monthly utility bills, or by other means that should be readily accessible to the public.

UC-A7  In the review of proposed developments, encourage the use of low water demand landscaping (also referred to as xeriscaping) and water-efficient irrigation systems, temporary irrigation systems or no irrigation system if the landscaping can establish and is sustainable without an irrigation system.

UC-A8  Continue to actively identify, evaluate and repair leaks in City water mains and meters.

UC-A9  Develop and implement new and innovative programs to support water conservation.

UC-A10  Explore and when feasible, include water consumption history in customer water bills.

UC-A11  Provide to building permit applicants information on energy-efficient appliances and building materials and techniques.

UC-A12  Give priority in City procurement procedures to recycled materials, if equal in cost or less expensive than other materials.

UC-A13  Investigate the feasibility of using Brightwater reclaimed water for irrigation and other purposes and pursue if found to be cost-effective.