

Chapter 4

PUBLIC UTILITIES ELEMENT

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4.04

BACKGROUND AND ANALYSIS

PURPOSE AND RELATIONSHIP TO GMA

The Growth Management Act requires the utility 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.” (RCW 36.70A.070(4)). Utilities, however, are privately owned, subject to regulation by the Washington Utilities & Transportation Commission (WUTC) and are not “public facilities,” subject to concurrency. Levels of service for such utilities cannot be determined locally; rather such matters fall within the exclusive jurisdiction of the WUTC. Levels of services described in the following narratives are the estimates of the separate utilities. In accordance with the directions from the GMA, the following utilities which provide service to the Sedro-Woolley planning area will be addressed in this element of the comprehensive plan:

1. Electricity
Puget Sound Energy
2. Natural Gas
Cascade Natural Gas
3. Water
Skagit County PUD No.1
4. Telecommunications
Multiple carriers
5. Cable
Comcast

ELECTRICITY

Existing Facilities

Electrical service to the Sedro-Woolley Urban Growth Area is provided by Puget Sound Energy (formed by a merger of Puget Power and Washington Natural Gas), an investor-owned public utility. Puget Sound Energy builds, operates, and maintains an extensive electrical system consisting of generating plants, transmission lines, substations, and distribution systems.

Transmission System Overview

Puget Sound Energy (PSE) is the largest energy utility in the State of Washington, serving more than 1 million electric customers and 750 thousand natural gas customers. PSE does not serve any natural gas customers in Skagit County but it does serve all of the electric customers in Skagit County. The PSE electric transmission facilities in Skagit County are important components of the electric energy delivery grid serving the Puget Sound region. The Skagit County facilities integrate over 670 MW's of generation at six different generating plants, three of them not owned by PSE, and transport power to large industrial customers such as the Shell and Tesoro oil refineries near Anacortes.

In addition to integrating power from generating plants, PSE's transmission system provides important energy links between a number of counties. Two PSE 115 kV transmission lines connect Skagit County (at Sedro-Woolley Substation) to Whatcom County (at Bellingham Substation). A PSE 230 kV line connects Skagit County (at Sedro Woolley Substation) to Snohomish County (at Horseranch Substation and at Seattle City Light's Bothell Substation). PSE's Sedro Woolley Substation terminates two Bonneville Power Administration (BPA) 230 kV lines, the BPA Bellingham-Sedro line and the Sedro North Tap of the BPA Custer-

Murray line. The transmission system in Skagit County also feeds Whidbey Island and transports power for the Bonneville Power Administration along its lines to BPA's Fidalgo Substation located southwest of Anacortes which feeds Orcas Power and Light Cooperative, a BPA power customer.

Electric distribution services (designated by lines less than 115 kV) in Skagit County are also provided to customers by PSE.

PSE has identified a number of projects that will be needed over the next 5-20 year time-frame. The projects are grouped into three categories depending on their function within the overall grid and are not prioritized in any way. The timing for several of the projects mentioned below may change depending on area load growth or new generating resources.

I. PSE Transmission Grid Reinforcement Projects

Projects in this category are primarily intended to reinforce the PSE's transmission delivery system.

1. SEDRO-WOOLLEY – HORSERANCH 230 kV TRANSMISSION LINE- new line

A new 230 kV transmission line from Sedro-Woolley Substation in Skagit County to the Horseranch Substation in Snohomish County will be constructed in 2010 and 2011. The new 230 kV line will consist of 5.5 miles of new transmission facilities (poles, insulators and aerial conductors) on an existing transmission line corridor between PSE's Sedro Woolley Substation and Beaver Lake. The remaining part of the line (nearly all of it is located in Snohomish County) will rebuild 30-miles of the former Beaver Lake-Beverly Park 115 kV line to 230 kV between the former Beaver Lake Substation to north of Washington State Highway 2 in Snohomish County. The new line will add needed capacity across the critical Skagit/Snohomish county line "cutplane" and eliminate electric transmission constraints under many

operating conditions. This project would also remove the current need for PSE and BC Hydro to trip generation due to loss of the single Sedro-Woolley-Horseranch-Bothell line.

Estimated In-Service Date: 2010-2011

Transmission Line Length: 6 miles within Skagit County

2. Sedro-Bellingham #3 115 kV transmission line – Existing line Upgrade

Replace the existing Sedro-Bellingham #3 line with a new 115 kV line including new poles, insulators and higher capacity conductors.

The low capacity rating of the existing line (4/0 Copper conductor with a summer rating of 107 MVA)) constrains the transmission system between Whatcom and Skagit Counties, particularly under N-1 conditions. Loss of BPA's double-circuit 230 kV line between Custer and Sedro-Woolley substations can cause this line to exceed its allowable limits by more than 140%. The short-term solution has been the use of a control scheme that trips open the line if it overloads. This line-overload problem will be compounded in future years by the potential withdrawal of the British Petroleum refinery from PSE's 115 kV system in Ferndale. Loss of this load in Whatcom County will increase the power flows on the Sedro-Bellingham #3 and #4 lines.

The Sedro-Bellingham #3 line averaged more than 3 outages a year between 1996 and 2008, causing sustained service interruptions for the customers served by the two distribution substations Alger and Norlum. Most of the poles along the 23-mile Sedro-Bellingham #3 line are in poor condition. In addition, the low capacity rated 4/0 Copper (Cu) conductors require a special overcurrent control scheme that automatically opens at Sedro Woolley Substation to prevent the line from exceeding its allowable capacity limits. The high resistance of the 4/0 Cu conductor also causes substantial energy losses during high power flows on the line.

Estimated In-Service Date: 2009

Transmission Line Length: 24 miles total (7-8 miles of the line are in Whatcom County)

3. Sedro-Bellingham #4 115 kV transmission line – existing line Upgrade

The same project write-up for the Sedro-Bellingham #3 line above can be said for this line. The two lines are electrically in parallel and consist of the same sub-grade poles and other equipment.

Estimated In-Service Date: 2011-15

Transmission Line Length: 24 miles total (7-8 miles of the line are in Whatcom County)

4. SEDRO-WOOLLEY- FREDONIA 115 KV LINE UPRATE – existing line Upgrade

The capacity ratings of 11 miles of existing 1272 kcmil all-aluminum conductor (AAC) 115 kV line between the Sedro Woolley Substation and the Fredonia Substation will be increased. Most of the line parallels Washington State Highway 20. The line's capacity rating will be increased by changing its existing 55°C conductor temperature rating to a higher conductor temperature (100°C) rating. The higher capacity rating will be accomplished by changing out the existing poles to taller poles. The higher line capacity ratings are needed to remove transmission constraints on this line that can occur after forced outages on other parts of the transmission system and to meet the growing electric loads in central and western Skagit County.

Estimated In-Service Date: **Estimated** 2011-2012

Transmission Line Length: 11 miles (existing line) in Skagit County

5. Baker River Switch-Sedro Woolley 115 kV #1 Line rebuild and reconductor – existing line Upgrade

When PSE's Upper and Lower Baker River hydro generating plants (170 MW combined generation) and the privately owned Komo Khulshan (16 MW) hydro plant are operating and there is a forced or planned outage on

one of the two parallel, 23-mile Baker River – Sedro-Woolley 115 kV lines, the other line can exceed its allowable capacity limits. Even when both lines are in service, the potential exists for both lines to exceed their allowable capacity limits on very hot days. A Remedial Action Scheme (RAS) is used to reduce and/or trip Baker River Hydro generation to prevent the transmission lines from overloading. However, these actions have undesirable consequences as they can trigger more expensive generation to run as replacement generation or cause PSE to not meet its operating reserve obligations (per WECC and NERC reliability standards). The lines have experienced numerous outages caused by trees contacting and/or damaging the lines during wind storms. A couple of times during the 2006/2007 winter storms, high winds knocked trees into both lines and caused both lines to be out of service at the same time. Installing higher capacity conductors will reduce line losses and this will save energy.

Estimated In-Service Date: **Estimated** 2011-2012

Transmission Line Length: 11 miles (existing line) in Skagit County

6. Baker River Switch-Sedro Woolley 115 kV #2 Line rebuild and reconductor – existing line Upgrade

The same project write-up for the Baker River Switch-Sedro Woolley #1 line above can be applied to this line. The two lines are electrically in parallel and consist of the same 636 kcmil ACSR conductors. In addition, most of the wood poles and cross arms on this are degrading and need to be replaced.

Estimated In-Service Date: **Estimated** 2011-2012

Transmission Line Length: 11 miles (existing line) in Skagit County

7. March point-burrow’s bay #1 115 KV LINE reconductor – existing line Upgrade

The capacity ratings of the 8-mile long 397.5 kcmil ACSR 115 kV line between the March Point Substation and the Burrow’s Bay Substation (northwest of Anacortes) will be increased by installing a higher capacity conductor. The proposed work is necessary to increase the line’s capacity rating to prevent the line from exceeding its allowable capacity limits when the March Point-Burrow’s Bay #2 line is out of service. The line was uprated in 2008 to a higher conductor temperature rating and as part of this work the new poles that were installed can support the proposed heavier, higher capacity, conductors. The higher line capacity ratings are needed to meet area load growth including the growing loads of the San Juan Islands.

Estimated In-Service Date: **Estimated** 2018-2022 Estimate

Transmission Line Length: 8 miles in Skagit County

8. March point-burrow’s bay #2 115 KV LINE reconductor – existing line Upgrade

The same project write-up for the March Point-Burrow’s Bay #1 line above can be applied to this line. The two lines are electrically in parallel and consist of the same 397.5 kcmil ACSR conductors.

Estimated In-Service Date: **Estimate** 2018-2022 Estimate

Transmission Line Length: 8 miles in Skagit County

9. Blackburn Substation – new transmission substation – south Skagit County

A new transmission substation will be required in the next 8-15 years to terminate existing and proposed 115 kV transmission lines. PSE will rebuild one of its former Sedro-Mt. Vernon 55 kV lines to 115 kV to prevent Sedro Woolley Substation lines from exceeding their allowable capacity limits under certain outage contingencies (see Item #10 below). In the summer of 2008, with no

Skagit County thermal generation running, loss of the Sedro-March Point 230 kV line will cause the Sedro-March Point #2 115 kV line to reach 87% of its emergency rating and the Sedro-Fredonia line to reach 83% of its emergency rating. Normal load growth will cause these lines to reach their emergency ratings within 7 years. Higher growth coming from oil refinery expansion could cause overloads sooner. PSE expects the Sedro-March Point #3 line to overload within the next 10 years under certain outage contingencies.

The Sedro-March Point #3 line will soon be feeding 5 distribution substations after the proposed Eaglemont Substation is constructed in 2010. These 5 distribution substations serve 20,000 customers in the Mt Vernon and south Skagit County area. Loss of this line can result in thousands of customer service interruptions. PSE plans to loop the Sedro-March Point #3 line through the Blackburn Substation. In addition, area load growth will require additional distribution substations that will need new 115 kV transmission lines which will come out of the Blackburn Substation.

Estimated In-Service Date: **Estimated** 2018-2022 Estimate

Transmission Line Length: 8 miles in Skagit County

10. Sedro-Blackburn 115 kV LINE rebuild and reconductor – existing (de-energized) 55 kv line

Another 115 kV line from Sedro Woolley Substation to the proposed Blackburn Substation (mentioned above) will be required when the existing Sedro-March Point 115 kV line loadings exceed their allowable limits for certain outage contingencies. This new 115 kV line will effectively parallel and thus share the power flows on the existing Sedro-March Point 115 kV lines. The proposed new 115 kV line will connect Sedro Woolley Substation to the proposed Blackburn Substation through the cities of Sedro Woolley, Burlington and Mt.

Vernon utilizing as much of the former (de-energized) Sedro-Mt. Vernon 55 kV line as possible. The proposed new line will feed the existing Rita and Gages Substations. The Gages Substation is currently fed from a 1.5-mile 115 kV radial transmission line. When this new line is constructed it will loop the Gages Substation by constructing a second 115 kV line providing an alternate feed.

Estimated In-Service Date: **Estimated** 2018-2022

Transmission Line Length: 8 miles in Skagit County

II. PSE Transmission Reliability Projects

Projects in this category are intended to improve the reliability of service to PSE customers.

1. Install a 230-115 kV, 325 MVA transformer in Sedro-Woolley Substation

Loss of either the March Point Substation or Sedro Woolley Substation 230-115 kV, 325 MVA transformers will exceed the allowable rating of the other transformer during periods of high loads and low Skagit County generation. Loss of the March Point Substation transformer would cause the Sedro Woolley transformer to load 112% above its emergency rating with no Skagit County generation running. Loss of the March Point Substation 230-115 kV transformer with a PSE winter peak load of 5617 MW's and 72 MW's of (Lower) Baker hydro running and all other Skagit County generation off line could load the Sedro Woolley 230-115 kV transformer to 101% of its emergency rating. This is equivalent to a heavy winter base case in the year 2018/2019. Installing a second 230-115 kV transformer in Sedro Woolley Substation will increase the number of PSE Skagit County ties with BPA's main grid from four to five and thus provide greater stability to the Skagit County transmission system.

Estimated In-Service Date: **Estimated** 2013-2014

Transmission Line Length: None

2. CONSTRUCT NEW 115 KV LINES AS NECESSARY TO FEED FUTURE DISTRIBUTION SUBSTATIONS and/or meet customer demands for higher system reliability

As Skagit County continues to grow, PSE's electric system must expand to meet this continuing demand for electricity. This system expansion will include new 115 kV lines that will provide the power to the new local area distribution substations. In addition, there may be requests (projects paid for by the individual customers) to increase the system reliability above that which PSE would normally provide that will require changes to the existing transmission system including the construction of new transmission lines and substations.

Estimated In-Service Date: **Varies**

Transmission Line Length: Unknown

III. Integrating Generation Resources and Projects of Regional Significance

Projects in this category are intended to integrate known or potential electric generation resources or identify projects that might influence the power flow within the Puget Sound region.

PSE and other companies may want to install new and/or additional generating resources in Skagit County. These projects may require reinforcements to the transmission system in Skagit County.

Estimated In-Service Date: **Varies**

Transmission Line Length: Unknown

4.12

NATURAL GAS

Existing Facilities

Natural gas service to the Sedro-Woolley urban growth area is provided by Cascade Natural Gas Corporation (CNG) which builds, operates and maintains the natural gas facilities. Immediately to the east of the city lies the Northwest Pipeline Corporation's Transmission Line, which owns and operates the regional pipeline that supplies natural gas to the states of Washington, Oregon and Idaho. Natural gas is then transmitted via Cascade Natural Gas Laterals to and through Sedro-Woolley to the cities of Burlington, Mount Vernon, LaConner, Anacortes and to other areas within Skagit County. Within the city limits of Sedro-Woolley, CNG's natural gas system currently meets demand with residences being served through a number of various sized transmission lines. Service is also available to some of the unincorporated areas within the urban growth area.

Projected Need

As the population and the number of residences in the Sedro-Woolley urban growth area increases, CNG will be required to increase the facilities serving the community, including the construction and location of gate stations, high pressure lines and pressure reduction stations. An additional factor involved in the provision of increased supplies of natural gas may be electrical demands through cogeneration (with gas used as a fuel source) and hydro-firming with gas-fired turbines being used as backup to hydro generated turbines.

The maximum capacity of the existing distribution system can be increased as required by one or more of the following methods: a) Increasing distribution and supply pressures in existing lines; b) Adding new distribution and supply mains for reinforcement; c) Increasing existing distribution system capacity by replacement

with larger sized mains; and d) Adding district regulators from supply mains to provide additional intermediate pressure gas sources to meet the needs of new development. CNG does not maintain a comprehensive expansion plan; rather, system upgrades are implemented on a developer driven need.

Projected Demand

Although the existing Sedro-Woolley City limits are presently being served, as growth occurs in the unincorporated UGA, service expansion will be required as the population and number of residences increases. The primary service expansion in the UGA will be required to the north in the vicinity of Cully Road and Bassett Road, north in the vicinity of Highway 9 and Fruitdale Road, and east in the vicinity of Highway 20. The location, capacity and timing of these improvements depend on opportunities for expansion and on how quickly the city grows. There are usually several different routes to connect different parts of the system. The final routes depend on right-of-way permitting, environmental impact, and opportunities to install gas mains with new development, highway improvements and other utilities. Whenever possible, CNG will: attempt to co-locate new public and private utility distribution facilities in shared trenches and coordination of construction timing to minimize construction-related disruptions; ensure that land will be made available for the location of utility lines, including location within transportation corridors; and where natural gas franchises exist, promote the extension of distribution lines to and within the urban growth area. Land use and facility planning will be coordinated to allow eventual siting and construction of distribution lines within rights-of-way which are being dedicated or within roads which are being constructed or reconstructed.

A listing of the existing and projected generation and transmission projects, and

locations is available for review at the planning department office or at the Cascade Natural Gas Company office. The latter may be contacted with regards to information regarding main extensions.

4.16

WATER

Existing Facilities

Water service to the Sedro-Woolley is provided by Public Utility District #1 of Skagit County (hereafter, PUD), which is authorized to acquire, construct and operate water systems within the county boundaries and to furnish water service to the inhabitants of the District and other persons. PUD presently serves all of the population of the Sedro-Woolley UGA. The Sedro-Woolley UGA is served from the Judy Reservoir (supplemented by the city of Anacortes intertie) which is located approximately three miles southeast of the city, south of the Skagit River. Judy Reservoir (surface rights of 7,475.2 MG/yr), encompassing the Cultus Mountain Watershed (Gilligan, Salmon, Turner and Mundt Creeks) serves as the primary source of water to most of the PUD customers in Skagit County. PUD also has water rights to augment these surface supplies with groundwater from a well in Sedro-Woolley and a well in Mount Vernon (groundwater rights of 2,576.9 MG/yr). Due to water quality, the groundwater sources are used for emergency/summer supply. The Judy Reservoir water is pumped to an adjacent Water Treatment Plant with a peak day capacity of thirty (30) mgd. Water is distributed north across the Skagit River to a pressure reducing station in Sedro-Woolley, serving the UGA and also branching west to Burlington and other areas of the county. Another line runs south from the Reservoir to Mount Vernon allowing PUD to maintain a looped system, ensuring continuity of service. Transmission lines range in size from four inches to thirty (30) inches in diameter within the service grids. Storage reservoirs are located on Dukes Hill and at Hoogdal.

Projected Need

Service demands for Skagit County are currently one hundred seventy-eight (178) gallons per service per day (gpsd) average

daily demand, three hundred three (303) gpsd peak day demand, three hundred fifty-six (356) gpsd peak hour demand, one hundred ninety-two (192) million gallon peak month demand and three thousand sixty (3,060) million gallons annual demand in the Judy Reservoir system. Non-revenue water (i.e. unaccounted for, fire flow) has been under eight (8) percent which the District plans to reduce by one percent by 2016. Operating revenues are obtained from water rates. PUD has adopted separate meter and consumption charges and a flatter rate along with system development fees (expenditures must be beneficial district-wide). In addition, occasional grants are received. The district does not appear to have sufficient revenues from its current rates to fully support its projected expenses through 2014, so the adoption of alternatives for rate adjustment will be necessary. Annual rate increases are mitigated by increased revenues due to projected growth.

The population presently served in the Sedro-Woolley UGA is ten thousand sixty (10,060). PUD utilized population data based on incremental annexations into the new UGAs presented by the County's Final EIS on its Land Use Element (1994). Sedro-Woolley's population is projected to increase to fifteen thousand (15,000) by 2025. The district's forecasts assume the following: that by the year 2014, one hundred (100) percent of the Sedro-Woolley UGA will be served, that service connections for wholesale customers will increase based on zoning potential (with service connections for residential, commercial, farms and municipal services increasing proportionate to the population increase in the UGA while industrial projections will add an addition mgd demand per day by the year 2014) and water demand projections will be reduced by 1.6% by 2016 due to conservation. Although the present sources of supply for the district are sufficient to satisfy current demands, they will not be able to meet the needs of the area without proper management. PUD's Water

System Plan (September, 2008) addresses a twenty (20) year period. As of 2008, there were four thousand four hundred and forty (4,440) district water services in the Sedro-Woolley UGA (three thousand eight hundred twenty-eight (3,828) residential, one hundred eighty-two (182) multi-family, two hundred fifty-five (255) commercial/industrial, and one hundred seventy-five (175) other). These services represented a thirty-three and a half (33.5%) percent increase in services from 1993 with the increases occurring primarily in residential demand, however, residential and municipal consumption has actually decreased with consumption increases occurring in farm and irrigation. Also, overall consumption increases projected to grow to meet additional industrial demands. Within the district overall water consumption was one hundred seventy-eight (178) mgd and is projected to be one hundred seventy-five (175) mgd by 2016 based on improved water use efficiencies gained through conservation (Due to conservation and in-house leak detection water production has decreased while the number of additional customers has increased). Based on peak flow diversion and assuming average rainfalls of 46.44 inches per year and maximum authorized diversions, the district's rights to Cultus Mountain streams (20.48 mgd) are adequate to supply existing average annual demands thru 2014. The district must also plan for having water resources available to accommodate demands and infrastructure to meet those demands.

Projected Demand

Possible additional water supply options must be explored which the city will work with PUD to achieve. These options include: conservation, purchasing of additional water from Anacortes, additional supply from existing stream diversions, new supplies from different sources (watersheds), diversion of Skagit River water (the diversion area which is located southeast of Sedro-Woolley by the river crossing which has the ability to provide 36 mgd, a project of the 1996 MOA), development of

groundwater/artificial recharge resources (east of Sedro-Woolley are areas of high production potential), dredging, the dam at Judy Reservoir was raised to increase its capacity from 1.01 billion to 1.45 billion gallons. The transmission lines have adequate capacity for the current demands of the system but are projected to reach their capacity and the end of their useful life around 2030 for the WTP/Sedro-Woolley line. Projected demands indicate pressures will drop below PRY settings by these dates and higher capacity lines will be needed. Proposed PUD projects within the Sedro-Woolley UGA will include a number of twelve (12) inch pipelines. Potential distribution projects include a thirty (30) inch pipeline between Judy Reservoir to north of the Skagit River and a parallel twenty-four (24) inch line north of the Skagit River to Burlington along Highway 20. Other projects include a new emergency booster at the Dukes Hill Reservoir and additional storage in the Sedro-Woolley area. A number of smaller projects are scheduled in the Sedro-Woolley UGA as set forth in the district's plan and are incorporated into this utilities plan by reference.

A listing of the existing and projected generation and transmission projects, and locations is available for review at the PUD office. The PUD may be contacted with regards to information regarding line extensions. The city of Sedro-Woolley has its own detailed maps which reference local landmarks, communities, roads, sloughs and basic legal descriptions. Fire protection by fire hydrants (including spacing) and/or other means shall be required as determined by the Sedro-Woolley fire marshal (chief). The district may be contacted with regards to information regarding main extensions.

TELECOMMUNICATIONS

Existing Facilities

Telephone, cable and internet service to the Sedro-Woolley urban growth area is provided by many private companies. The telephonic and cable transmission system presently has the capacity to serve all of the population within the city's urban growth area with future facility improvements centered on providing better and more varied service capabilities.

Among the currently existing facilities, the Sedro-Woolley Central office was installed in 1990 and is equipped with seven thousand forty (7,040) lines and has an emergency stand alone capability feature. Within the Sedro-Woolley exchange are the following ESA remotes: Garden of Eden (equipped with four hundred twenty (420) lines), Northern State (six hundred forty (640) lines) and United General (six hundred forty (640) lines). Sedro-Woolley also serves as a conduit on the fiber optic routes with branches running east along Highway 20, south to Burlington and Mount Vernon, and north to Deming and other communities.

The telephone service industry has changed drastically since 2000 and consumers have a much greater choice of telephonic service providers. With the expansion of cable and wireless technology and restructuring of regional service provider licenses and contracts, a consumer is no longer restricted to one provider for "land-line" telephone service. Verizon is the primary land-line telephone provider for home and businesses in the Sedro-Woolley UGA. Comcast cable provides digital phone service and internet service as well as television cable service. Clear (formerly Clearwire) provides internet service and some phone service using cellular tower connections instead of relying on telephonic transmission lines or coaxial cable lines.

Several smaller companies provide internet service within the Sedro-Woolley UGA.

Projected Need and Demand

The Telecommunications provider plans are developed in five year increments so long-term 20 year plans are unavailable. Increased facilities are dependent on population and service demands. Within the next five years, the Sedro-Woolley exchange will be adequately served by line adds to existing remotes, TCDPG for analog carrier replacement, and equipment required for special service. A project was recently completed to provide feeder pairs to cross connect serving approximately five hundred (500) new housing units in the area defined by Highway 9 and Highway 20, Sapp Road and the railroad right-of-way. In addition, at the present time, ninety-two working channels of analog carrier exist in the Sedro-Woolley exchange. Finally, upgrades on the remote switch and direct interface pair gain devices identified in the five year plan will affect future base unit sizing. These requirements will be reflected in the Central Office Exchange (COE) Equipment Plan program as forecast and capital budget information is finalized. The COE plan will be updated annually to reflect longer range changes or as required for critical changes.

In general, the existing backbone network of cable and switches will not change. AT &T does have fiber following Highway 20 through the town.

A listing of the existing and projected generation and transmission projects, and locations is available for review at the planning department office

Cellular

A cellular telephone system is a series of transmission facilities or (cell sites), which use FM radio signals to transmit conversations and data to mobile/portable phone users. Cell sites consist of transmitting and receiving equipment and microwave

relays, usually mounted on monopole or lattice tower, and ground mounted switching equipment. Cells cover roughly hexagonal-shaped areas, so as to maximize coverage while minimizing signal overlap, and thus interfering with other cells.

The effect of this limitation on the number of channels per cell is that as the number of mobile phone users in an area grows, each cell must be subdivided into smaller cells to accommodate the increased demand. Consequently, an increased number of transmission facilities is required. However, since the height of the transmission facility determines the area it covers as cells are subdivided into smaller cells, the height of transmission facilities must be reduced to minimize signal overlap.

There are two licensed cellular towers in the Sedro-Woolley limits. The first is located near the center of town at the south end of the Sea-Land Industrial Park. The second tower is located on the south facing side of Dukes Hill, just east of the end of Marie Place, north of McGarigle Road. Cellular service is available in Sedro-Woolley from all the major cellular phone carriers.

4.24

CABLE TELEVISION

Comcast Cable Services provides cable television service throughout most of the Sedro-Woolley planning area. Service is provided on overhead lines throughout most of the city. However, new plats require underground utilities. Wave Broadband provides service to areas not served by Comcast. The cable companies observe a service area agreement that prevents overlapping of service. Dish and satellite television is available in all areas of the UGA, but no regional infrastructure is necessary for these services.

GOALS AND POLICIES

Goal U1: To develop all city utilities at levels of service appropriate to planned orderly growth.

Policy U1.1: Manage city-owned utility systems effectively to provide quality service.

Policy U1.2: Provide utility permits in a fair, timely and predictable manner.

Policy U.1.3: Expand existing utility system according to the city's land use plan.

Policy U1.4: Require services as a condition for annexation, consistent with proposed land use and utility comprehensive plans.

Policy U1.5 Work in coordination with the respective utility providers to establish levels of service.

Policy U1.6 Work in coordination with P.U.D. to explore additional supply options, including but not limited to conservation, purchasing of additional water, diversion of Skagit River water, development of groundwater/artificial recharge resources, dredging, raising the dam at Judy reservoir, and the construction of an additional impoundment reservoir.

Goal U2: To ensure that utility service promotes public safety and convenience.

Policy U2.1: Cooperate with other utility agencies to control hazardous wastes.

Policy U2.2: Educate the public in proper handling of hazardous waste. Encourage the use of alternative products and practices that reduce use of hazardous materials.

Policy U2.3: Provide disposal locations for household, commercial and industrial hazardous wastes.

Policy U2.4: Engage a public review process for the siting of any waste disposal facility.

Policy U2.5: Site utilities in such a manner to protect citizens from short- and long-term adverse health impacts.

Policy U2.6: Provide public education programs on topics such as pollution control and water quality.

Policy U2. 7: The city supports efforts to establish an open, competitive marketplace for telecommunication services in order to provide the latest and best technology available and keep service prices affordable for all city residents and businesses.

Policy U2.8: Encourage economic development while preserving aesthetic and other community values and preventing proliferation of above ground facilities.

Policy U2.9: Encourage the provision of advanced and competitive telecommunications on the widest possible basis to the businesses, institutions and residents of the city.

Policy U2.10: Require all new development to provide either telecommunications or conduit to encourage the extension of telecommunications within the public right-of-way.

Policy U2.11: Site plans for proposed developments shall show the location of all pipeline easements.

Policy U2.12: Sedro-Woolley recognizes the potential hazards associated with developments located near or adjacent to pipeline corridors.

Policy U2.13: Developments located near or adjacent to pipeline corridors should incorporate design elements and safety features to minimize the level of risk of injury to property and persons and loss of life which may result from pipeline accidents, both during construction and during occupancy following construction.

Policy U2.14: Sedro-Woolley should seek the pipeline operator's participation in determining appropriate safety measures for specific locations, and to educate the public about safety risks associated with pipelines.

Policy U2.15: Sedro-Woolley shall seek monitoring by the pipeline operator of permitted development that involves land disturbance or other significant work within the pipeline corridor, including potential soil erosion problems over pipelines associated with storm water discharge.

Goal U3: To benefit community aesthetics and protect the environment.

Policy U3.1: Maintain infrastructure design and construction standards which are environmentally sensitive, cost-effective and safe. Facilities should be designed to be compatible with surrounding neighborhoods.

Policy U3.2: Promote conservation of water and electricity within the urban growth area. Work with utilities, service agencies and other jurisdictions to promote conservation products and programs.

Policy U3.3: In accordance with state rules, regulation, and tariffs, require undergrounding of all new electrical distribution or communication lines, and encourage undergrounding of existing electrical distribution or communication lines in residential areas.

Policy U3.4: Require city notification prior to removal of vegetation within a city right-of-

way or sensitive area by private service providers.

Policy U3.5: Require reasonably appropriate screening and compatible integration of all new above-ground utility facilities.

Policy U3.6: Encourage professional and sensitive vegetation management within utility right-of-ways, recognizing utilities' needs for clearance between trees and lines.

Policy U3.7: Combine utility and communication facilities such as antennas and easements wherever possible. Encourage joint use of utility corridors as recreational trails where appropriate and reasonably achievable.

Policy U3.8: Encourage conversion to environmentally-sensitive alternative energy sources.

Policy U3.9: Encourage local businesses to contribute to improving community infrastructure through local improvement districts (LID's).

Policy U3.10: Require new development to connect to Skagit PUD water system and not allow new well connections.

Policy U3.11: Work with Skagit PUD to identify existing wells. Encourage new main extensions be made available in areas where PUD water is not available. Encourage well-users to connect to PUD water when water main is available.

Goal U4: To ensure non-city utilities are consistent with city plans and community values.

Policy U4.1: Coordinate with other jurisdictions and government agencies to plan and implement regional or multi-jurisdictional utility improvements.

Policy U4.2: Coordinate with Skagit County and the State of Washington to ensure that new utility facilities constructed in potential annexation areas conform to city of Sedro-Woolley standards.

Policy U4.3: Ensure that local policies do not conflict with public service obligations of utility service providers.

Policy U4.4: Negotiate a strategy with service providers in the county for transfer of services to the city of Sedro-Woolley upon annexation. Such a strategy should include relevant environmental, financial and engineering studies.

Policy U4.5: Recognize Puget Sound Energy's Skagit County GMA Electrical Facilities Plan as the electrical facilities plan of the city of Sedro-Woolley and its urban growth area (UGA).

Policy U4.6: As to great an extent as possible, require placement of utilities in transportation right-of-ways and utility corridors.

(Ord.1663-10)