

CHAPTER 7 - UTILITIES ELEMENT



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I. EXISTING CONDITIONS

Washington's Growth Management Act requires that County Comprehensive Plans contain a Utilities Element. The purpose of the Utilities Element is to ensure that utility services provided by both public and private suppliers are consistent with the County's Comprehensive Plan and can support the community's growth and development as anticipated over the 20 year planning period.

The Utilities Element must include an inventory of the general location of all existing and proposed utility facilities and a description of the current capacity and expected future capacity of each utility. This Plan identifies ways of improving the quality of these services and includes policies that ensure a provision of utilities is coordinated with land use. Mason County will implement these policies through its agreements with the utilities and through the land use permit process.

This Element of the Mason County Comprehensive Plan is based on the same assumptions and is consistent with the Land Use Element, which establishes the overall growth strategy for the County and its Urban Growth Areas. The system design and timing for extension of utility services supports the land use pattern and policies proposed throughout the Comprehensive Plan.

The level of service standards established for public utilities determines capital facilities costs and revenue analysis in the Capital Facilities Element and provides a foundation for analysis of the existing utility delivery system and proposed improvements which are necessary to meet the changing demands in six primary areas including:

- Electricity
- Natural Gas
- Solid Waste Management Systems
- Telecommunications
- Utility pipelines
- Water

Water, sewer, storm water and solid waste, which are also often considered as utilities, are also discussed in the Capital Facilities Chapter VI.

Appendix A includes a map showing the general location of existing or proposed utility districts, major electrical transmission lines, electrical distribution substations, natural gas pipelines and service areas, telecommunications service areas, cellular communication tower sites.

A. Connecting Land Use and Utilities

Gas, electricity, and telecommunications in Mason County are each tied into a regional system, where local capacity depends on regional capacity. The greatest growth in demand for services will be in the urban growth areas, which are near major transmission lines.

Many land use policies that address rural areas provide for clustering of development. Neighborhood distribution needs will have to be met, but this type of development allows for more efficient provision of utilities and services. By encouraging clustering of rural development at the scale of the rural activity centers and community centers, or at the scale of an individual clustered subdivision, local distribution costs should be reduced.

Growth is also focused in the designated Urban Growth Areas of Shelton, Allyn and Belfair and within fully contained communities in rural Mason County. It will be most cost effective to provide utility services to these urban development patterns and more cost effective for residents as well. For example, an analysis of electricity rates conducted by the Northwest Power and Conservation Council shows that the wholesale cost per megawatt-hour is not significantly different for customers in rural vs. urban areas. On the other hand, Retail electricity prices in rural communities tend to be somewhat lower than urban areas. This is primarily due to the fact that most rural areas of Washington State are served by not for profit electrical utilities, such as electric cooperatives or public utility districts.

The limited availability of natural gas heating in rural areas means many rural customers use electricity for heating which contributes to the difference in energy use.

Private utility providers in Mason County project and plan for growth. The Mason County Comprehensive Plan will be a resource for each of these providers that will assist in determining the longer-term need for service expansion and new facilities.

II. REGULATORY CONTEXT

Most development requires public and private utilities, whether it is residential, commercial, industrial, or agricultural. Public utilities in Mason County generally include: water, sanitary sewer systems, stormwater management systems, and solid waste management systems. Washington State Department of Health and local Health Departments define approved water systems serving more than one residence as "public" even though these systems may be owned and operated by a private person or company.

In Washington State, electricity is also often a publicly owned utility. This is true in Mason County where two public utility districts, PUD No. 1 and PUD No. 3, provide electricity services. In addition to electricity, PUD 1 manages a number of water systems in Mason County. In addition to electricity, PUD 3 operates a wholesale telecommunications network in Mason County. The public utility districts, authorized by RCW 54, are governed by elected boards of commissioners. All decisions regarding rates and policies are made at the local level.

Private utilities in Washington State including CenturyLink, iFiber One, Wave, and Cascade Natural Gas are regulated by the Washington State Utilities and Transportation Commission (WUTC). These public and private utilities and water and sewer systems are also discussed in the Capital Facilities Element of the Plan, Chapter VI.

A. State Regulations

Investor-owned utilities are regulated in Washington by the Washington Utilities and Transportation Commission (WUTC). WUTC is empowered by Title 80 of the Revised Code of Washington (RCW) to regulate electricity, gas, irrigation, telecommunications, and water providers. State law directs the commission to regulate the rates, charges, services, facilities, and practices of the utilities. Any change in customer charges or service provision requires commission approval.

The WUTC, under Title 81 RCW, also regulates the rates and safety practices of the transportation of solid waste (garbage), intrastate petroleum and gas products via pipeline, and scheduled auto transportation services.

B. Federal Regulations

The Federal Energy Regulatory Commission is an independent five-member commission working with the U.S. Department of Energy. The Commission regulates the interstate transmission of natural gas, oil, and electricity, as well as licensing natural gas and hydropower generation projects.

The Federal Communications Commission regulates interstate and international communications by television, wire, satellite, and cable. An independent U.S. government agency overseen by Congress, the five-member commission is the United States' primary authority for communications laws, regulation, and technological innovation.

III. PUBLIC AND PRIVATE UTILITIES

A. Electricity

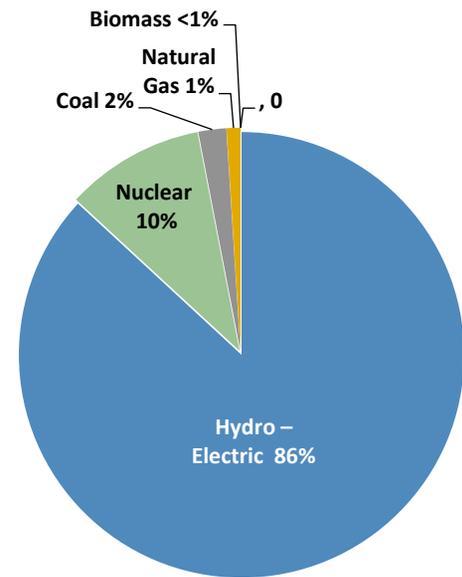
Public Utilities District No. 1 and Public Utilities District No. 3 provide electrical power to residents of Mason County. Both districts purchase power marketed by the Bonneville Power Administration and distribute it to their customers. Neither public utility district has large-scale power production facilities. The Bonneville Power Administration and the City of Tacoma have transmission facilities in Mason County.

The City of Tacoma also has an electrical generation facility near Hoodspport, which uses water drawn from Lake Cushman. It does not provide local service in Mason County.

The electrical power for Mason County is supplied through a regional transmission grid (which is the interconnected network of transmission lines and other supporting equipment) at 500,000 volt and 230,000 volts from 31 federally managed dams in the Columbia River Basin, and a nuclear power plant in Kennewick, Washington. Transmission to Mason County is through the Olympia Transmission Substation through 115,000 and 230,000 volt power lines which go to the BPA Shelton Transmission Substation, where service is split to serve East and West of the Hood Canal. The Mason County Urban Growth Areas are served by 115,000 volt power lines. The network connects to the PUDs through switching stations and then to distribution substations. The electrical power carried by the high voltage lines is transformed to lower voltages for distribution to

PUD's neighborhood distribution substations and on to the user. Both PUDs provide annual capital improvement programs either directly from user revenues, or from the sale of bonds which are redeemed by user revenues.

Figure 1. Current Fuel Mix for Electricity in Mason County



Public Utility District No. 1



Mason County PUD No. 1 became the first operating Public Utility District in the State of Washington when voters approved a proposition on November 6, 1934. Mason County PUD No. 1 is publicly owned and serves approximately 4,770 electric customers.

The electric service area for Mason County Public Utility District 1 (PUD No. 1) begins approximately one mile west of Twanoh State Park, on the south side of Hood Canal, and extends approximately 50 miles along the Canal to the Mason/Jefferson County line.

PUD No. 1 also serves into south Jefferson County up to Walker Mountain. The district encompasses several river valleys including the Skokomish, Lilliwaup, Hamma Hamma, Duckabush and Dosewallips. PUD No. 1 serves power to the

communities of Lilliwaup, Hoodsport, Potlatch, Union, and the Skokomish Indian Reservation. PUD No. 1 provides water services throughout all of Mason County. Both PUD 1 and PUD 3 have a memorandum of understanding that allows PUD No. 1 to provide water/wastewater services in PUD 3's service territory and PUD No. 3 may provide telecom services in PUD 1's service territory.

In 1993, PUD No. 1 supplied a total of 58.7 million kilowatt hours to customers within the service area and in 2016, PUD No. 1 sold 73.1 million kilowatt hours, an increase of 25 percent.

The district purchases power from the Lilliwaup Falls and Rocky Brook Hydro Facilities, with the remainder of their energy provided by Bonneville Power Administration. PUD No. 1 has substations located at Potlatch (T3ba'das), Duckabush, Hoodsport, and Union.

Public Utility District No. 3



Mason County PUD No. 3 provides electrical power to all areas of Mason County except those serviced by PUD No. 1. In 1993, PUD No.3 provided electrical power to approximately 24,400 customers. That service population has risen to nearly 33,000 in 2016. Similarly, in 1993, PUD No. 3 supplied a total of 493 million kilowatt hours and in 2016, over 610 million kilowatt hours are being supplied.

Mason County PUD No. 3 is a full-requirements customer of the Bonneville Power Administration (BPA), meaning that BPA provides all of the District's power requirements at cost-based rates. PUD No. 3 takes delivery of BPA power at eleven substations, ten of which are owned by the utility. It has 1,777 miles of primary lines and owns and operates 29.80 miles of 115 kV transmission lines.

PUD 3 also receives small amounts of electricity from the Nine Canyon and White Creek wind farms, and Packwood Lake Hydroelectric Project. The PUD owns a 5.4 megawatt natural gas-fired generator (Olympic View Generating Station) located on Highway 102 near Shelton. The station is powered by reciprocating natural gas engines. The generator was used during the 2001 energy crisis to reduce energy demands. It is kept on standby for potential demand reduction, backup, reduction of Bonneville Power Administration transmission congestion on the Olympic Peninsula, or load shedding during times of high power demands in the region.

The PUD is subject to the Washington State Energy Independence Act (Chapter 19.285 RCW), which establishes a renewable portfolio standard with renewable energy targets as a percentage of customer load. The targets have increased over time, from 3 percent in 2012, to 9 percent in 2016, to 15 percent in 2020. Eligible resources include water, wind, solar energy, geothermal energy, landfill gas, wave, ocean or tidal power, gas for sewage treatment plants and biodiesel fuel and biomass energy. Electricity generated at existing hydropower facilities do not count towards I-937 renewable portfolio compliance.

There are 11 substations that serve PUD 3 customers. They are Collins Lake, Union River, Belfair, Benson (Mason-Benson Rd.), Pioneer (Highway 3, near Pickering Rd.) Mason (Downtown Shelton), Dayton, Skookum (near the Hwy 108

and Hwy 101 intersection), Mountain View, and Potlatch (near Lake Cushman, owned by BPA). To increase system reliability, there is another substation planned for construction near Taylor Towne.

Substations and distribution networks are constructed or improved to meet electrical demand and ensure reliable and safe operation of the PUD 3 power grid. The utility is demand driven - that is, it expands its level of service to meet demand as needed or projected. Customers needing to be connected to the service generally cover the costs of the connection. This may include infrastructure expansion and improvements, which vary by site and service requirements. Once service is connected, customers in the same class of service (for instance, residential) pay a rate based on the cost to serve their type of energy demand and consumption.

The PUD has not identified any lands needed for future expansions of facilities as capital or maintenance projects. However, when land developers submit an application for connection, the utility plans and coordinates construction of the required electrical facilities to serve the load of the completed planned development. The developer bears the cost of required infrastructure improvements.

Existing transmission lines are generally located in road rights-of-way. The PUD does not normally purchase or condemn rights-of-ways for their utility lines, and plans to continue to use public rights-of-way for their utility lines in the future. The

location of electrical lines on property being developed is determined by the property owner, although the county subdivision regulations provide for utility easements. These usually include the roadways and along lot lines.

The PUD recommends installation of distribution facilities below ground and in conduit. Although this method of installation is more expensive, the benefits include greater reliability, lower maintenance costs, and improved aesthetics.

B. Natural Gas

Cascade Natural Gas

Cascade Natural Gas Corporation provides natural gas throughout Mason County. It has offices in Aberdeen and Bremerton. The Aberdeen office serves the Shelton, Oak Park and Lake Limerick areas. The Bremerton office serves the Belfair area.

In 1993, Cascade Natural Gas served 1,450 commercial and residential customers. Today they serve 2,300 customers throughout Mason County, a nearly 60 percent increase, providing 30 million cubic feet of natural gas monthly. The company does not plan for individual connections, but responds to requests for service which might be for new development or for conversion from other energy sources. System expansions generally use existing rights-of-way or public road rights-of-way. Transmission capacity can be

expanded through existing lines or by adding or enlarging lines. Cascade Natural Gas serves 16 counties in Washington State.

Cascade Natural Gas provides gas service to Mason County from a tap off of Williams Northwest Pipeline in Shelton. A major supply line for the company runs through Mason County by the Shelton Urban Growth Area and the Belfair Urban Growth Area. The company continually expands its natural gas system in response to demand. The method used to determine the economic viability of natural gas system expansion is regulated by the Washington Utilities and Transportation Commission. Routes for expansion of services depends on the demand, available rights-of-way, environmental permitting issues, and opportunities created by new development, or the work in rights-of-way by other utilities or the county or state.

Table 1. Natural Gas Pipelines in Mason County

Northwest Pipeline LLC	10 Miles
Cascade Natural Gas Corp	23 Miles

Natural Gas Regulation

The activities of Puget Sound Energy are regulated by both federal and state legislation. This legislation is primarily concerned with promoting competition among gas suppliers and controlling the cost of natural gas to the consumer. Cascade Natural Gas is subject to the general regulations and oversight by the energy agencies, such as the Washington Utilities and Transportation Commission (WUTC) and the Federal Energy Regulatory Commission. WUTC regulations prohibit extending gas facilities to areas that are not expected to pay for themselves from the outset. While this keeps the existing ratepayers from financing improvements to other areas, it does limit service delivery of natural gas to marginally profitable areas.

Other pieces of legislation that have specific implications for the natural gas industry are described below:

Natural Gas Policy Act 1978

The National Gas Policy Act encouraged competition among fuels and suppliers across the United States. As a result, natural gas has essentially been de-controlled. The Act also contained incentives for developing new natural gas resources and a tiered pricing structure aimed at encouraging the development of national transmission pipelines.

The Clean Air Act Amendment of 1990

The passage of the Clean Air Act amendments in 1990 has shown a federal intent to promote the diversification of fuel sources for motor vehicles. This is in response to the need to both reduce carbon dioxide atmospheric emissions and to reduce the nation's reliance on gasoline for strategic reasons.

The Olympic Region Clean Air Agency serves Clallam, Grays Harbor, Jefferson, Mason, Pacific, and Thurston counties and it is one of seven such regional air pollution control agencies in the state of Washington. Olympic Region Clean Air Agency works cooperatively with the State Department of Ecology and the regional United States Environmental Protection Agency to measure criteria ambient air pollutants, meteorological parameters, and other air-related data. It currently operates and maintains air monitoring equipment for measurement of three of the six criteria pollutants: particulate matter (PM2.5), ozone (O3), and carbon monoxide (CO).

C. Telecommunications

Telephone Services

Several companies provide local telephone service in Mason County. They include Hood Canal Telephone Company, Inland Telephone Company, and Century Link. Century Link serves over 90 percent of Mason County Residents. Existing transmission lines are generally located in road right-of-ways. The location of telephone lines on property being developed is determined by the property owner, although the county subdivision regulations provide for utility easements. These usually include the roadways and along lot lines.

Hood Canal Telephone Company

Hood Canal Telephone Co. Inc, dba as Hood Canal Communications is the Local Exchange Carrier (ILEC) in Union. They are a Competitive Local Exchange Carrier (CLEC) providing the same services into CenturyLink's serving territory using fiber and coaxial cables. The CLEC serves the communities of Skokomish Reservation, Potlatch, Hoodport, Lilliwaup, Hamma Hamma, Lake Cushman, Skokomish Valley, Shelton, Squaxin Tribe, Kamaliche, Timberlakes, Shorecrest, and Spencer Lake. They have interconnection agreements with CenturyLink for telephone service and utilize multiple providers for middle mile fiber connections. They provide telecommunication services to approximately 5,000 business and residential customers. This is a significant growth in services from 930 customers in 1993.

Inland Telephone Company

The Inland Telephone Company provides local telephone service in the Dewatto area. Its service area includes the east shore of Hood Canal from the Mason/Kitsap County Line south to Red Bluff. Inland Telephone provides single party service to business and residential customers.

CenturyLink

CenturyLink is the largest provider of local exchange service in Mason County, with a service area that includes all areas of the county not served by the Hood Canal and Inland Telephone Companies. The company provides telephone service to the urban growth areas in the county. Century Link generally provides a full range of telecommunication services, however services available in specific areas depend on customer demand and the capabilities of the local central offices.

Cellular Communications

Cellular communications differs from other types of telecommunications in that cellular communications systems use phones and other communication devices that transmit and receive radio signals on bands reserved solely for such activity. Signals are transmitted and received by low power antennae. The area one antenna can transmit and receive to the individual phones is called a cell. The coverage of the cells overlaps so that, ideally, the user can be transferred from one cell to another without interruption of service.

Fiber Optics

PUD No. 3 provides wholesale fiber optic services to five service providers, who in turn provide retail services to approximately 1,000 devices over 467 miles of fiber optic lines within Mason County. PUD No. 3 is also a major hub for high capacity data lines throughout western Washington. Its strategic location provides redundant service capabilities through two major internet routes.

The demand for service and new facilities for telecommunications is difficult to assess because of the changing technologies and the consumer demand for new services. Known service providers with facilities located or currently applied for in Mason County include United States Cellular, CenturyLink, Air Touch Cellular, and NEXTEL, Sprint, AT&T, T-Mobile.

Table 2. Inventory of Telecommunications Infrastructure

Infrastructure	Number
Cell Phone Towers	64
Antenna Towers	10
Maritime Coast & Aviation Ground Towers	3
Amateur Radio Licenses	122

Telecommunication Regulation

The cellular industry is regulated by the Federal Communications Commission (FCC). Local government authority to regulate telecommunication services are also limited and defined by Federal law. In 1998, Mason County adopted an ordinance to regulate telecommunication facilities. This was a response to the Federal Telecommunications Act of 1996, which established the ground rules for increased competition in the telecommunications industry. The Act removed previous limits on the entry of new providers into an area.

D. Sewer and On-Site Sewage Systems

Mason County Utilities and Waste Management is a Division of the Mason County Public Works Department. It is responsible for managing water, waste water and solid waste facilities in the unincorporated areas of Mason County. This includes operations of the Rustlewood and Beards Cove water systems and the Rustlewood, North Bay/Case Inlet, and Belfair water reclamation/sewer collection and treatment facilities.

In 2013, Mason County Board of County Commissioners established the Belfair Sewer Advisory Committee through Resolution No. 14- 13 in order to gather community input and provide recommendations to the Mason County Board of County Commissioners regarding the development and funding of the existing and subsequent phases of the Belfair Sewer System.

Mason County also manages the On-Site Sewage System Program with the goal of protecting public health and the environment by minimizing the threat of surface and ground water contamination from failing or improperly designed, installed or maintained onsite sewage systems. There are currently about 25,000 on-site sewage systems across Mason County. These sewage systems play an important role of groundwater recharge often overlooked in water and stormwater management discussions. Activities of the On-Site Sewage Program include:

- Soil evaluation to determine site suitability for an on-site sewage system
- Review and inspect on-site system designs and installations.
- Provide homeowner education about on-site sewage system maintenance and operation
- Review building permits
- License onsite sewage system Installers, operation & maintenance service providers and pumpers

E. Solid Waste Management Systems

Mason County Solid Waste Facilities

The Mason County Landfill is located near Shelton in Mason County, Washington (Section 4, Township 20 North, Range 4 West). The site address is 501 West Eells Hill Road, Shelton, Washington.

The facility is located in a sparsely populated area used primarily for tree farming. Two private properties, the Culver (formerly Ruggle) residence and the Shelton Auto Yard, are located within 1 mile of the facility. The 8-acre landfill is situated within a 77-acre property and was the primary municipal solid waste disposal facility for Mason County from the early 1970s until the summer of 1993, when closure construction began. Closure activities were completed in 1993 and consisted of capping, implementing surface water controls, and constructing a gas extraction system.

A solid waste transfer station is currently operating at the facility. Solid waste from a majority of Mason County is transported to this transfer station. Then it is trucked to Chehalis and placed on a train to the Roosevelt landfill in Goldendale, WA. Solid waste from Belfair and Tahuya is transported to Olympic View Transfer Station in Port Orchard. Waste Management then transports it by train to their landfill in Arlington, WA.

The County's four solid waste facilities include:

- Shelton transfer station and recycling facilities, 501 W Eells Hill Road
- Belfair drop box station, 1611 NE Sand Hill Road
- Union drop box station, 1391 E McReavy Road
- Hoodspoint drop box station, 260 N Foothills Park Road

Shelton-Matlock Landfill

This landfill is located in the unincorporated Matlock area. It operated for an unknown period of time prior to its closure in 2001. While the landfill was open, it was receiving wood waste from nearby forest product operations. The landfill has a groundwater monitoring system in place and has been monitored since 1997. It is currently in post-closure stage and has continued to have groundwater monitoring as part of the post-closure agreement. As of early 2017, there is discussion on the potential for this landfill to end its post-closure care due to evidence that suggests the landfill has reached stability.

Simpson Dayton Landfill

This landfill is located in the unincorporated Dayton area. This landfill was also operated for an unknown period of time prior to its discontinued use in 2006. The material that was accepted at this site was mostly wood waste and an unlimited amount of wood ash. A groundwater monitoring system has been in place and monitored since 1997. In 2016, the closure process was completed and the application for a post-closure permit was submitted and officially accepted in early 2017. The landfill is now moving into post-closure status with limited monitoring.

City of Shelton – C Street Landfill

The C Street landfill is located on a 16.7 acre parcel located southwest of the intersection of West C Street and US Highway 101. The property was acquired by the City in 1928 for use as a municipal landfill. Landfilling operations occurred at the site between 1928 and 1974. After that time, municipal solid waste was sent to the Eells Hill facility to the northwest of Shelton. The City of Shelton has entered into an Agreement with the Washington State Department of Ecology and is working with the agency to conduct a Remedial Investigation and Cleanup Action Plan as well as to finalize closure of the facility.

Total solid waste tonnage generated in Mason County is reported in Table 3.

Regulating Solid Waste

The Federal Resource Conservation and Recovery Act is our nation’s primary law governing the disposal of solid and hazardous waste. Congress passed this Act on October 21, 1976, to address the increasing problems the nation faced from our growing volume of municipal and industrial waste. The Resource Conservation and Recovery Act, which amended the Solid Waste Disposal Act of 1965, set national goals for:

- Protecting human health and the environment from the potential hazards of waste disposal
- Conserving energy and natural resources
- Reducing the amount of waste generated
- Ensuring that wastes are managed in an environmentally-sound manner.

Table 3. Solid Waste Tonnage Produced by Mason County Residents 2010-2016

Total Tonnage	2010	2011	2012	2013	2014	2015	2016
Exported for land disposal	33,474	31,484	31,447	32,340	33,558	33,779	33,880
Collected through recycling	1,302	1,229	1,318	1,313	1,375	1,464	1,590
Total Tons generated	34,776	32,713	32,766	33,653	34,933	35,243	35,345
Per Capita Annual Tonnage	2010	2011	2012	2013	2014	2015	2016
OFM Population for Mason County	60,699	61,100	61,450	61,800	62,000	62,200	62,320
Exported for land disposal	0.551	0.515	0.512	0.523	0.541	0.543	0.544
Collected through recycling	0.05	0.049	0.051	0.05	0.053	0.054	0.026
Total tons generated per capita	0.601	0.564	0.563	0.573	0.595	0.597	0.567

Source: Mason County Public Works Division

Washington State Regulations

Similar to federal regulations, laws for waste disposal are established in the Revised Code of Washington (RCW) and implemented through the Washington Administrative Code (WAC). The laws related to solid waste are found in several sections which include:

- Title 36 Counties - establishes all County authorities and responsibilities
- Title 70 Public Health and Safety – establishes programs and responsibilities for public health and safety
- Title 80 Public Utilities – establishes the Public Utilities and Transportation Commission with its authorities and responsibilities
- Title 81 Transportation – establishes laws relative transportation activities such as motor transport, ferries, pipelines, railroads and air transport.

State law, RCW 70.95, is of particular importance to Mason County's Comprehensive Plan. It requires that county and city governments assume the primary responsibility for solid waste management and implement effective waste reduction and recycling strategies. In addition, RCW 70.95 requires that local solid waste management plans demonstrate how the following goals will be met:

- Washington State's goal is to achieve a statewide recycling and composting rate of 50 percent.
- There is a statewide goal to eliminate yard debris from landfills by 2012 in those areas where alternatives exist.
- Source separation of waste (at a minimum, separation into recyclable and non-recyclable fractions) must be a fundamental strategy of solid waste management.
- Steps should be taken to make recycling at least as affordable and convenient to the ratepayer as mixed waste disposal.

Also, under Washington State Growth Management Act 36.70A, all Counties and Cities are required to establish a process for siting essential public facilities, including those facilities typically difficult to site like solid waste handling facilities and other regional utility facilities, as well as facilities like regional transportation facilities, state education or correctional facilities, substance abuse and mental health facilities, and secure community transition facilities.

F. Water and Stormwater

PUD No. 1

PUD No. 1 owns and manages 40 water systems throughout Mason County serving approximately 1,860 connections and providing 93 million gallons of water annually to customers across the service area (about 50,000 average annual gallons per connection).

Washington State Department of Health – Public Water Systems

In Mason County, there are 300 Group A wells including those managed by PUD 1, 230 are active with over 24,000 connections providing water to over 44,000 people. These wells provide an estimated 2.1 billion gallons of water annually across the County.

Of the 750 existing Group B wells in Mason County (including those managed by PUD 1), 520 are active and provide water to over 6,000 people through 3,000 connections. These wells provide an estimated 935 million gallons of water annually.

Exempt Wells

Currently, there are an estimated 1,490 exempt wells serving 11,000 connections in Mason County, based on data collected by the County from 1992 to the present. These wells provide an estimated 790 million gallons of water annually.

Regulating Water

There are three types of public water systems: Group A, Group B and Two-Party. A Group A system is the largest type of system. Any system with more than 14 connections or that serves 25 or more individuals for 60 or more days per year is considered a Group A public water system. All Group A systems are regulated by the State Department of Health Office of Drinking Water.

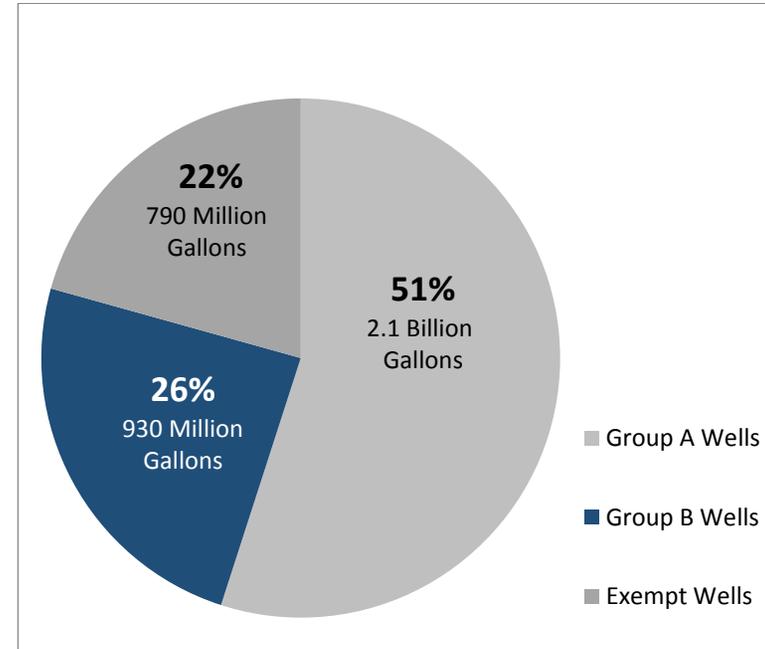


Figure 2. 2016 Mason County Water Consumption by Well Type

Mason County Public Health regulates all Group B Water Systems in Mason County. A Group B water system serves from 1 to 14 connections and less than 25 individuals per day. The regulations governing public water systems are Washington Administrative Code (WAC) 246-290 for Group A systems and WAC 246-291 for Group B systems.

Managing Stormwater

Mason County is in compliance with state and federal requirements and continues to develop and improve its Stormwater Management Program. The County is also working to raise awareness of the importance of stormwater management among development partners and others.

In 2008, Mason County adopted a Countywide Stormwater Management Plan to both protect and enhance water quality. Of special concern are the impacts of continued and increased stormwater discharges to the local water quality of Hood Canal, Oakland and Annas Bays, and the rich shellfish habitat in nearby natural and commercial rearing areas. Pollution from pathogens in sewage and animal wastes are a chronic problem in many areas of Puget Sound and is closely associated with rainfall events and stormwater runoff as well as being influenced by population densities and development levels. Because of fecal contamination, shellfish beds in both Oakland and Annas Bays have been downgraded and shellfish protection districts have been created to improve water quality and preserve natural resources.

As part of the Stormwater Management Plan development process, Mason County Board of County Commissioners created a Stormwater Task Force of eight community members to assist in review and development of the Plan. The composition of the Task Force reflected major stakeholder groups such as business owners, the timber and shellfish industries, the Tribes, environmental groups, the Washington Association of Sewer and Water Districts, the City of Shelton and the general public. Over the course of a series of meetings and briefings, the Task Force facilitated public input and provided feedback that helped to ensure the public's interests were represented and that contributed to shaping the final plan.

The Allyn, Belfair and Hoodport Stormwater Management Plans complement and support the development of the Comprehensive Countywide Stormwater Management Plan and are incorporated as part of the Comprehensive Plan by reference.

Mason County's 2008 Stormwater Management Ordinance was codified in Mason County Code Chapter 14.46. The adoption and application of this Ordinance based on the 2005 Ecology Manual will further reduce erosion and sedimentation provided effective enforcement authority is established and exercised.

Mason County's Stormwater Management Plan takes a decentralized approach that is based on low impact development (LID) techniques, innovative stormwater management designs with the basic principle that they are modeled after nature. The goal of the Plan is to minimize the impacts of future land use changes, as well as promote the design and construction of onsite LID systems.

Significant steps have been taken in implementation of the County Stormwater Management Plan, including:

- Establishing a Countywide Stormwater Utility.
- Implementing a facility retrofit program to detain and treat the runoff from existing development using LID techniques.
- Treating county road runoff by retrofitting existing facilities, as well as by adding water quality treatment to all new County road designs.
- Pursuing further expansion of these programs, particularly maintenance.

Regulating Stormwater

Under the Federal Clean Water Act regulations, local governments in Washington subject to the federal National Pollutant Discharge Elimination System (NPDES) Storm Water Program, including Mason County, are required to have stormwater management programs.

The U.S. Environmental Protection Agency controls water pollution by regulating point sources that discharge pollutants into waters of the United States. The Washington State Department of Ecology (DOE) administers the federal NPDES program in the state.

Also, the listing of salmon under the Endangered Species Act (ESA) requires that streams and wetlands be protected. All local governments with salmon habitats are encouraged to develop storm water management plans.

IV. MEETING FUTURE UTILITIES DEMANDS

A projected inflow of 19,400 new residents are expected between 2016 and 2036 in Mason County and services areas of PUD 1 and PUD 3. This will increase the electric service territory population to almost 82,000 by 2036. The growth in housing as shown in Table 4 is similar to trends in population growth, with a projected 7,500 housing units being added in Mason County by 2036 with 3,900 of these new housing units in the Urban Growth Areas.

There were 13,800 jobs in Mason County in 2016. Additionally, employment is expected to grow at an average annual rate of 0.7 percent between 2016 and 2035, manufacturing employment is expected to decline annually by 0.4 percent on average between 2016 and 2035, and local employers are expected to create about 2,100 jobs between 2016 and 2035. The gain in employment is primarily in the areas of government, professional services, and retail.

The biggest changes in employment occur in information, construction, and utilities.

These projections form the basis of the utility forecast for Mason County helping ensure adequate services are in place and identify potential changes or adjustments needed.

Table 4. Projected Housing Needs 2016-2036

	2016 Housing Units	2036 Housing Units	Number of New Housing Units	% Increase 2016-2036
Urban Growth Areas	3,000	4,500	1,500	50%
Rural County	26,500	34,500	8,000	30%
Shelton	3,900	5,000	1,150	30%
Mason County Total	33,400	44,000	10,650	32%

Source: US Census Housing Survey and Office of Financial Management

A. Projecting Energy Demand

One simple measure of the energy intensity is the gross measure of total energy consumed divided by the population. This per capita indicator is a good measure of energy consumption because decisions by individual consumers have an important effect on overall energy consumption. Combined with energy efficiency projections outlined in this document, this measure provides a straight-line projection that provides a picture of anticipated demand based on historic trends. This projection does not take into account innovation and efficiencies expected from the building industry or other innovations that could be as high as 20 percent over the 20 year planning horizon based on Washington State Department of Energy studies.

System-level Impacts of Energy Efficiency

The Energy Independence Act requires electric utilities with 25,000 or more retail customers in Washington to use renewable resources and conservation to help meet their customers’ energy needs. The utilities report annually to the State Department of Commerce on their compliance.

Utilities in Washington State use wind power to meet about 80 percent of their mandated renewable requirements. Energy efficiency improvements, solar, and other various qualified sources account for about 15 percent. In 2016, the renewable energy target increased from 3-9 percent of customers’ electricity load, and in 2020, the target will increase to 15 percent.

Table 5. Mason County Residential, Commercial, Industrial Electricity Demand 2016-2036

	1993	2016	2036 Projection
Mason County Population	38,350	62,320	83,850
PUD 3 Electricity (kWh)	493,000,000	610,000,000	770,000,000
PUD 1 Electricity (kWh)	58,700,000	73,100,000	91,000,000
Per Capita kWh	14,390	10,960	10,000

Source: U.S. Energy Information Administration (EIA) State Energy Data System, PUD No. 1, PUD No.3, and the 2010 Census

Average household size was estimated to be 2.57, US Census Bureau, American Community Survey

In 2005, in response to Washington Administrative Code 458-20-273, PUD No. 3 serving Mason County participated in the Washington State renewable energy production incentive payment program. Under this program, the PUD facilitates payments from the state program to interconnected electric customers who own and operate eligible renewable energy systems. The renewable sources may include solar PV, wind, anaerobic digesters, or microhydro.

Average annual credits range from \$0.12 to \$1.08 per kWh of energy produced by their system. The PUD receives a state tax credit equal to the payments made to customers.

In 2016, PUD No. 3 was meeting its renewable energy target at 9 percent of customers’ electric load and exceeding its energy conservation target. Washington State Department of Energy anticipates that electric demand side efficiency efforts have the potential to continue to reduce statewide consumption by an estimated 20 percent by 2035.

B. Projecting Water Demand

Table 6. shows an estimate of current and water consumption. Estimating demand for water is more complex than other utilities as we know much less about the amount of water in ground water stores and have a limited ability to estimate potential impacts of water conservation, recycling, reuse and recharge. A collaborative study is necessary to help the County and partner agencies learn more about future supply and demand.

Table 6. Mason County Water Demand 2016

Source	2016	
	2016 Gallons per Year (millions)	2016 Connections
Group A Systems	2100	24,000
Group B Systems	930	3,000
Exempt Wells	790	11,000
TOTALS	3,820	38,000

Source: PUD No.1, Washington State Department of Health, and Mason County

System-level Impacts of Recharge

Water conservation, wastewater recycling, and reuse is becoming more important due to increases in:

- Demand on potable water resources,
- The cost of treating wastewater,
- Regulations requiring greater flows for streams and rivers, which reduces irrigation sources, and
- The demand for sustainable building options.

By design, on-site sewage systems, also known as septic systems, naturally recycle wastewater by recharging ground water. To ensure on-site sewage systems are treating waste effectively and not polluting the ground water, there must be a strong commitment to regular and ongoing monitoring to ensure these systems are working properly.

Under existing Washington State Law, several types of water conservation, recycling and reuse are currently permitted and regulated as shown in Table 7. However, additional State policy innovation and flexibility for Washington Counties promoting water conservation, recycling and reuse will be critical over the 20 year planning horizon in order to support projected growth and development in the way Mason County envisions, a way that maintains rural character, quality of life, and unique natural environment.

Table 7. Existing Options for Water Conservation, Recycling or Reuse in Washington State

State Law	Methods	Description	Benefits
WAC 246-272A	On Site Septic - Using Subsurface (Underground) Drip Irrigation	Treats residential wastewater for subsurface irrigation of plants.	All wastewater from building can be used and irrigation can be controlled precisely for maximum benefit
WAC 246-272A	Greywater On Site Septic	On-site sewage system used in a building equipped with waterless toilets	Reduction in total volume of water used and wastewater irrigates vegetation
WAC 246-272A	Greywater for Subsurface Irrigation	Treats residential wastewater for subsurface irrigation of plants.	Reduction in total volume of water used and wastewater irrigates vegetation
WAC 51-56-1600	Greywater and Rainwater Recycling	Recycling of any water, including greywater, inside of a building and using it for flushing toilets and other non-potable water uses	Reduces water use by recycling greywater or rainwater for surface irrigation, industrial processes, toilet flushing, and other non-potable water needs.
WAC 246-272B	Large On-site Sewage Systems	Provides subsurface soil treatment and disposal of sewage for a design flow of 3,500 to 100,000 gallons per day for 10-350 homes.	Can accommodate developments, schools, churches, campgrounds, business parks, parks, resorts, etc.
RCW 90.46	Reclaimed Water	Wastewater (sewage) that is treated to remove solids and impurities and recycled	Reduces water use by recycling wastewater for surface irrigation, industrial processes, toilet flushing, and other non-potable water needs.

*Greywater - Flows from bathtubs, showers, bathroom sinks, washing machines, dishwashers, and kitchen or utility sinks.

The amount of runoff entering streams and the amount of precipitation entering groundwater systems in Mason County can and has been estimated by Washington State Department of Ecology using annual rainfall of 65 inches, based on Western Regional Climate Center data. Assuming one-third of the 65 inches of rainfall infiltrates to groundwater, that is 22 inches or 1.8 feet of water into each acre of land per year.

C. Projecting Solid Waste Needs

Table 8. provides an estimate of future total solid waste tonnage using the OFM Growth Management projections assuming Mason County continues to generate 0.6 tons of solid waste per person. In terms of population and waste stream tonnage, Mason County has been following the mid-range growth rate. Solid Waste projections for the 20 year planning horizon show that the County’s waste stream will exceed 50,000 tons of solid waste per year by 2036.

Table 8. Low, Intermediate, and High Projections for Total Waste Stream, 2020 through 2040

Year	2020	2025	2030	2035	2040
High Range Population	76,240	82,620	89,090	95,470	101,580
High-Range Tonnage	45,740	49,570	53,460	57,280	60,950
Mid-Range Population	67,550	71,930	76,400	80,780	84,920
Mid-Range Tonnage	40,530	43,160	45,840	48,470	50,950
Low Range Population	58,740	61,080	63,490	65,820	67,930
Low Range Tonnage	35,250	36,650	38,090	39,490	40,760

Source: Mason County Public Works Division

D. Moving Toward Zero Waste

Despite new technologies and processes that have improved the ability of residents, businesses and municipalities to handle, sort, and recycle materials, recycling volumes, including yard and food waste, only remove approximately one percent of the waste stream.

As more landfills in the region close and the County seeks innovative solutions to the problem of higher waste disposal costs, state government has fewer resources to help. Solid waste continues to be a contributor to greenhouse gas (GHG) emissions, which Washington is bound by law to reduce 25 percent by 2020 below 1990 levels and 80 percent by 2050.

Waste reduction is the highest priority for solid waste management and is preferred over recycling and composting because the social, environmental and economic costs are typically lower for waste reduction. All three methods avoid the cost of disposing the diverted materials as garbage, but

recycling and composting frequently require significant additional expenses for collecting and processing the materials.

Consistent with Mason County's Comprehensive Solid Waste Management Plan and through a blend of innovative policies, ranging from technical assistance to legislation and initiatives prioritizing waste reduction, Mason County is addressing these challenges and placing the County on the pathway to higher reuse and recycling volumes that will help make zero waste a reality.

V. POTENTIAL IMPACTS OF CLIMATE CHANGE

There are at least two ways in which climate change can affect energy demand and availability. First, long-term changes in temperature will alter electricity demand and change precipitation patterns, river flows and hydroelectric generation. Second, policies enacted to reduce greenhouse gases will affect future resource choices.

Northwest Power and Conservation Council (NPCC) analysis and planning shows that climate induced changes to loads and river flows will not affect resource choices during the period 2016 through 2021. However, beyond 2026, resource decisions may be impacted.

NPCC predicts the Pacific Northwest will have less snow and more rain during winter months, resulting in a smaller spring snowpack and lower summer flows. Winter electricity demands would decrease with warmer temperatures, easing generating requirements. In the summer, demands driven by air conditioning and irrigation loads would rise.

Power supplies projected through 2026 are anticipated to meet demand, even under a climate change scenario. After considering the climate induced shift in river flows and load to the assumptions in NPCC's modeling scenarios, the likelihood of a shortfall in 2035 grows to 15 percent.

Other potential climate change impacts include increased flooding concerns in fall and winter, reduced salmon migration survival due to lower summer river flows and higher water temperatures, and increased summer electricity prices.

Increased diversion of water from electricity generation to salmon migration and survival may mean foregone power supplies and rate revenues.

Washington utility agencies recommend that research continue in this area and suggest that while no immediate actions regarding reservoir operations are indicated, the region should consider alternative reservoir operations that could potentially mitigate for future climate change impacts.