CHAPTER 1 – UTILITIES ELEMENT

INTRODUCTION

This Utilities Element presents basic information about the utility systems in the city of Carnation, including solid waste, water, wastewater, stormwater, natural gas, electricity, and telecommunications. The City of Carnation manages its own water system and sewage collection system, but all other utilities are owned and managed by others. Utility services and the provider of these services are shown in Table U–1.

Table U-1: Utility Service Providers

PROVIDER	UTILITY SERVICE
Recology Cleanscapes	Solid waste collection
City of Carnation	Water service, sewage collection, stormwater
Puget Sound Energy	Natural gas distribution and electrical power
Comcast	Telecommunications
CenturyLink	Telecommunications

INVENTORY AND ANALYSIS

This is an **inventory and analysis** of the following utilities: solid waste, water, wastewater, storm water, natural gas, electricity, and telecommunications.

SOLID WASTE

The King County Solid Waste Management Plan was first adopted in 1975 and has been updated a number of times. Carnation has adopted and is party to the King County plan. The Plan guides solid waste disposal and future needs in King County.

The City's Solid Infrastructure consists of recycling collection, solid waste collection, landfill closure maintenance and administrative services to support these cost centers.

Landfill. Until the late 1970s the City of Carnation operated its own municipal Landfill to serve city residents. The landfill is located approximately one mile south of the city. Beginning in 1992, the City undertook a project to officially close the landfill. This was financed through a surcharge on solid waste utility bills and a grant from the Washington Department of Ecology. The landfill site entered into a 20-year post-closure period in 1995. Landfill post-closure utility charges continue to be levied on property owners within the city limits to provide financial assurance for ongoing water quality monitoring and maintenance of the site. Monitoring of the closed landfill site will be an ongoing financial responsibility of the City until the end of the post closure period. In 2024 the City was

approved for annual monitoring as opposed to quarterly monitoring. Issues that arise, such as ponding, from the monitoring will need to be addressed utilizing the fees collected from utility billing.

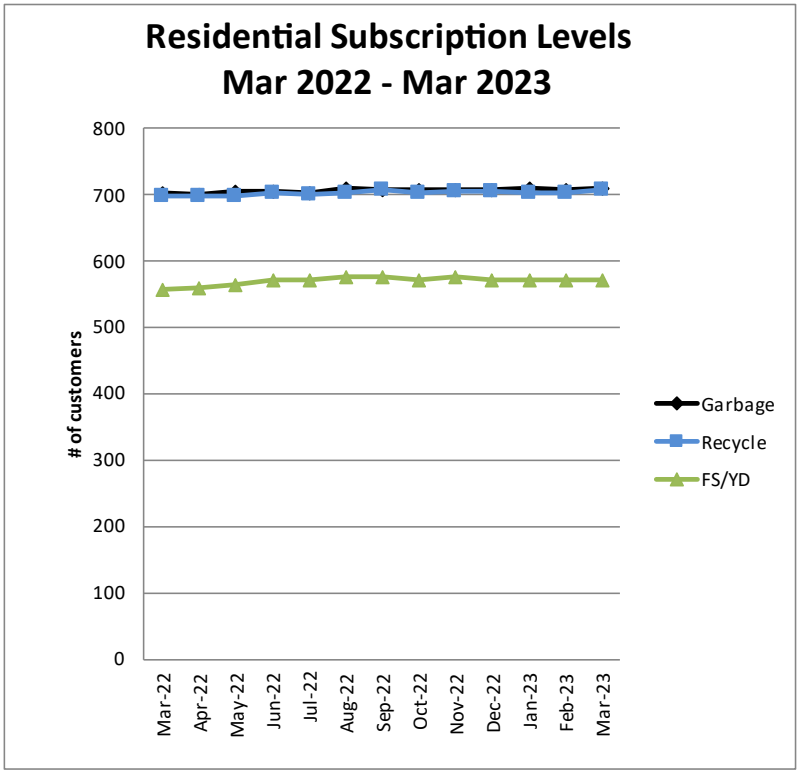
The City has a Solid Waste Interlocal Agreement (ILA) with King County which provides for cooperative management of solid waste and allows the City's waste collector to utilize the Cedar Hills Regional Landfill. The ILA expires in 2028.

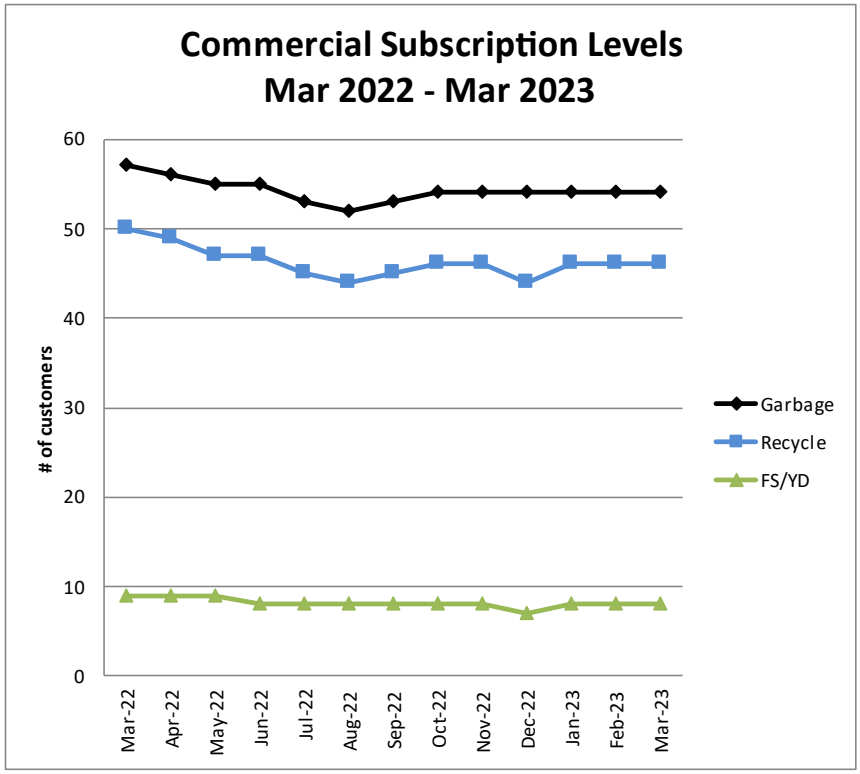
The primary planning tool for the King County solid waste system is the 20-year Comprehensive Solid Waste Management Plan. The long-range goal of the King County Solid Waste Management Plan is to coordinate regional energy and resource recovery in King County. The current adopted plan was published in November 2019.

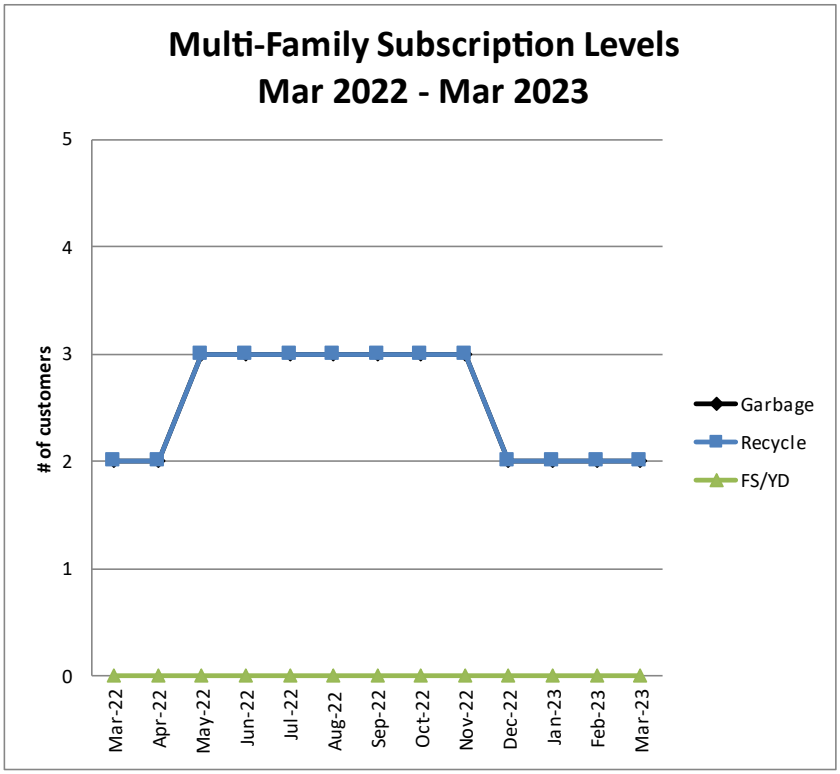
Solid Waste Collection. The City's service provider for solid waste collection is responsible for the collection and disposal of Carnation's solid waste, and all customer support. The City's only involvement with solid waste collection is to monitor the contract. The City contracts with Recology Cleanscapes for solid waste collection and recycling services. The City's current franchise agreement expires in December 2024. A new agreement is currently in negotiation. Residential service occurs weekly on Tuesdays and commercial service on Fridays.

Recycling. The City's service provider also provides curbside recycling and yard/food waste collection services to the City. The City has a goal to achieve a 75% residential waste reduction and recycling rate. Residential service occurs every other week on Tuesdays and commercial service on Fridays. Recycling services are free for residents.

Please see the tables below for residential, commercial and multi-family customers.




Commercial Subscription Levels
Mar 2022 - Mar 2023
# of customers
60
50
40
30
20
10
0
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
Garbage
Recycle
FS/YD


Multi-Family Subscription Levels
Mar 2022 - Mar 2023
# of customers
5
4
3
2
1
0
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23
Feb-23
Mar-23
Garbage
Recycle
FS/YD

Introduction. The City of Carnation owns and operates a municipal "Group A" water system with 1,121 service connections within the Water Service Area, which includes all of the corporate limits of the City plus portions of King County. The water system includes:

1) Three storage reservoirs
2) A spring source
3) A well source and a distribution network
4) A booster pump station

The water system is managed by the City of Carnation which is responsible for daily operations and for the implementation of the Comprehensive Water System Plan. The City's Comprehensive Water System Plan (Water System Plan) was developed in 2015 and 2016, and submitted to the Department of Health and King County for agency review in 2017. It was approved in July 2018. The next update of the Comprehensive Water System Plan will be due in July 2028. Detailed information about the water system and its operating and capital plans can be found in the Comprehensive Water System Plan located on the City of Carnation's website.

WASTEWATER

The City of Carnation sewer system became operational in 2008. Prior to that time, Carnation was one of the few cities that relied on private septic systems for wastewater treatment. Inadequate septic systems prevented economic development and an inability to accommodate residential growth at urban densities in accordance with the Growth Management Act.

In 2002, the City entered into an Inter-local Agreement with King County whereby the County's Wastewater Treatment Division designed, constructed and operates a wastewater treatment plant using membrane bio-reactor (MBR) technology. The City designed, constructed and operates the collection and conveyance system. The City studied options for the collection and conveyance system, and, due to the flat topography combined with a high water table, a recommendation was made to construct a vacuum system.

The Wastewater Treatment Plant operated by King County uses an advanced treatment technology called a membrane bioreactor or MBR. The plant produces reclaimed water that can be used safely as a drought-proof water source for wetland enhancement and other beneficial uses. Reclaimed water from the Carnation Treatment Plant is discharged to a wetland in King County's Chinook Bend Natural Area, next to the plant's river outfall site at the Carnation Farm Road Bridge.

The Collection System is operated by the City of Carnation Public Works Department. The collection system consists of eleven miles of sewer collection pipe that are collected into five main trunk lines that transport effluent under vacuum pressure to the vacuum station located at 4301 Larson Avenue. Trunk Lines A through D each serve one of the

four quadrants of the City that are divided by the Snoqualmie Trail along the north-south axis and Entwistle Street along the east-west axis. Trunk Lines A through D begin as 4" diameter at the furthest upstream ends and increase in size to 6, 8 and 10 inch diameter as required by the amount of flow that is introduced into the system. A fifth Trunk Line, E, is routed northward from the vacuum station and terminates at the north end of the city limits at Stewart Avenue. Trunk Line E is intended to be extended to provide service to the annexation area north of the City for future development. In the meantime, it provides sewer service for existing customers located on Stewart Avenue.

The Vacuum pump station collects the city's sewage flow and subsequently transports it to the King County Wastewater Treatment Plant that abuts it to the north. The pump station is designed for a peak flow of 975 gallons per minute (gpm). Current usage is 57.8 gpm.

Wastewater Contributors and Characteristics. There are 1,014 sewer connections served by the City of Carnation sewer system: 903 single family customers, 26 multi-family meters and 85 non-residential customers. The wastewater characteristics are typical of a residential community comprised largely of residences, schools, businesses and commercial establishments.

Table U-2: Sewer Service Connections by Account Type

Single-Family Residential Connections	**912**	**89%**
Multi Family Residential Connections	28	3%
Non-residential Connections	85	8%
Total Connections	1,025	100%

Source: City of Carnation Utility Billing System, September 2024

System Capacity. Both the wastewater treatment plant and the collection and conveyance systems were designed to serve the City of Carnation's forecasted growth within the Urban Growth Area. Both the treatment plant and the collection/conveyance systems are designed to accommodate increases in capacity.

STORMWATER

The City of Carnation formally created a stormwater utility in 2022. Stormwater from impervious surfaces must be infiltrated on-site, which can sometimes be difficult to achieve given localized areas of poorly drained soils and/or seasonal high water tables. Local drainage facilities that collect and convey surface water runoff consist of open channels and roadside ditches, bioswales, wetlands, infiltration systems and detention ponds. The Snoqualmie and Tolt rivers ultimately serve as receiving waters, but there are no direct outfalls to the rivers.

NATURAL GAS

Puget Sound Energy (PSE) supplies natural gas to six Western Washington counties: Snohomish, King, Kittitas, Pierce, Thurston, and Lewis. Puget Sound Energy provides natural gas service to over 900,000 customers.

Natural gas is not an essential service, and, therefore, the service is not mandated. The extension of service is primarily based on requests from customers.

According to the PSE rate department, the average house (using natural gas for both heat and hot water) consumes about 850 therms per year. This translates into an average annual cost of $966.00 per household plus basic fees.

PSE forecasts customer additions using an analysis calculation based on PSE's revenue report which is generated by town tax codes established in our Exception Billings Dept.

It is estimated that PSE currently serves approximately 457 individual customers in the Carnation area.

Existing Distribution System. The Pacific Northwest (Washington, Oregon, and Idaho) receives its natural gas from a wide range of sources in North America. Sixty percent (60%) of the region's natural gas supply comes from British Columbia and Alberta in the north; 40% comes from domestic sources including the San Juan Basin in New Mexico/Texas in the south. The Pacific Northwest consumes 380 billion cubic feet of natural gas per year.

Natural gas is supplied to the City of Carnation from Redmond City Gate Station. The back-bone feed is a 6" main coming from the Ames Lake area along NE Tolt Hill RD, located at southwest corner of the City. In 2009, PSE installed about 1.5 miles of 8" IP main (Notification 109027910) along Redmond- Fall City RD (from 292 AV SE northerly to SE 8 ST) to reinforcement this general area.

High pressure (HP) supply lines (measuring 16", 12", 8", 6", and 4" in diameter) transport gas from gate stations to district regulators. The pipe material is typically steel wrap (STW). No high pressure gas lines are located within the city limits of Carnation.

District regulators (DR) reduce high pressure to typical distribution operating pressures of 60 to 25 psi. Distribution pressures are typically called intermediate pressures (IP). There are no district regulators within the Carnation city limits.

Distribution mains are fed from the district regulators. These typically are 8", 6", 4", 2", and 1-1/4" diameter lines. The pipe material typically is polyethylene (PE) or steel wrapped (STW). Puget Sound Energy has approximately 6.5 miles of main serving the

City of Carnation.

Individual residential service lines are fed by distribution mains and are typically 5/8" in diameter. Individual commercial and industrial service lines are typically 1-1/4" or 2" in diameter.

ELECTRICITY

Puget Sound Energy supplies electrical service to 1.2 million electric customers across eight counties. Carnation is currently supplied with enough electricity to satisfy the demand for electrical power. The transmission and distribution of electricity to Carnation and other rural communities in the Snoqualmie Valley is delivered by Puget Sound Energy (PSE) and regulated by the Washington Utilities and Transportation Commission. Currently, the substation has the capability to provide 20 MVA (units of electrical demand), and can be upgraded to 25 MVA. The current load on the substation from Carnation and the surrounding area is approximately 10 MVA. According to PSE, 1 MVA can typically provide enough electrical power for approximately 230 households, based on normal usage. Carnation anticipates less than 2 MVA of additional electrical demand upon the Tolt substation over the next 20 years. However, the Tolt Substation's service area includes residents and businesses halfway between Carnation and substations located in Duvall and Fall City, as well as those in Carnation. Additional growth in the County along with Carnation's growth may eventually necessitate construction of a new facility.
In the Fall of 2023 PSE launched a pilot program to move more customers from natural gas to electric heat. The program offers incentives for switching to electric heat.

Existing Transmission and Distribution System. Transmission of electrical power is supplied to the City of Carnation and the surrounding area from the Snoqualmie – Stillwater 115 kV transmission line. The 115 kV transmission line voltage is stepped down to 12.5 kV at the Tolt Substation where it is distributed to the City of Carnation and the surrounding area. The Tolt substation is located on Entwistle St in Carnation. The 12.5 kV distribution system consists of 3 circuits out of the Tolt substation. There are currently three different circuits coming out of Tolt substation. Two of them are running at about 75% their peak capacity and the third circuit is about 30% its capacity. There is room for growth on all of them.

TELECOMMUNICATIONS

Carnation is served by a variety of telecommunication companies. CenturyLink provides local calling services and internet service, and is able to extend lines on demand. Cable television and broadband internet service is offered in Carnation through Comcast and dish. Astound also offers broadband in the Carnation area. Wireless telecommunications are supplied to Carnation residents by a variety of wireless services, including Sprint, AT&T, Xfinity and Verizon.

FUTURE NEEDS AND ALTERNATIVES

This is an inventory and analysis of the future capital needs for the following utilities: solid waste, water, wastewater, storm water, natural gas, electricity, and telecommunications.

SOLID WASTE

The solid waste collection and disposal system is adequate to meet Carnation's needs. The City will continue to monitor and contract with service providers throughout the planning period. As discussed previously, the City currently contracts with Recology Cleanscapes.

WATER

The source, storage, treatment and distribution system must demonstrate the capacity to serve future populations within the water service area. New improvements will be required to address any existing or projected deficiencies; these are listed in the Water Capital Improvements Plan as adopted in the Water System Comprehensive Plan. Work on updating the Water System Comprehensive Plan will begin in 2026 and be completed in 2028. The Water System Comprehensive Plan can be found on the City of Carnation's website.

WASTEWATER

The wastewater treatment plant owned and operated by King County and the collection and conveyance system owned and operated by the City of Carnation have both been sized to accommodate future build-out of the Carnation Urban Growth Area and according to the Wastewater Treatment Division, have adequate capacity to serve increased population that could result from future growth. The technologies utilized can be expanded beyond that capacity if needed. It should be noted that unlike water service that can be provided outside of the City's jurisdiction, sewer service is restricted to urban areas. There are a few exceptions to that rule. For example, sewer service can be expanded outside the urban growth area to a public school system, or to a tribal reservation.

STORMWATER

The City of Carnation formally created a stormwater utility in 2022. Stormwater from impervious surfaces must be infiltrated on-site, which can sometimes be difficult to achieve given localized areas of poorly drained soils and/or seasonal high water tables. Local drainage facilities that collect and convey surface water runoff consist of open channels and roadside ditches, bioswales, wetlands, infiltration systems and detention ponds. The Snoqualmie and Tolt rivers ultimately serve as receiving waters, but there are no direct outfalls to the rivers. The stormwater system is adequate to meet community needs.

NATURAL GAS

Puget Sound Energy (PSE) maintains a minimum pressure delivery through intermediate pressure mains from a design standard of approximately 15 psi. If the pressure drops below 15 psi, there are several methods of increasing the pressure in the line, including:

a. Looping the distribution and/or supply lines to provide an alternative route for the gas to travel to an area needing additional supply. This method often involves construction of high pressure lines, district regulators, and intermediate pressure lines.

b. Installing lines parallel to existing lines to supplement supply of natural gas to a particular service area.

c. Replacing existing pipelines to increase volume. (This includes efforts to replace low pressure cast iron systems with intermediate pressure plastic systems.)

There are three types of construction for maintenance or installation of new facilities:

a. New or replacement of existing facilities due to increase capacity requirements due to new building construction and conversion from alternate fuel.

b. Main replacement to facilitate improved maintenance of facility.

c. Replacement or relocation of facilities due to municipal and state projects.

d. Puget Sound Energy makes an effort to coordinate construction work with municipal projects in order to minimize cost and impacts to surrounding community. Due to franchise agreements, PSE is required to relocate existing facilities which is costly and usually unplanned. Improved coordination decreases this occurrence.

The average gas customer growth rate has been around 1.5% in the last five years. PSE anticipates the growth rate in this area to be the same (1.5%) in the next five years. Based on the 1.5% growth rate, there is no expectation to perform system capacity improvements in the area in the next five years. The natural gas system improvements serving the Carnation area should operate without capacity issues for the next five years. There are no major natural gas projects currently anticipated to serve customers in the City of Carnation.

Puget Sound Energy will continue to review projects proposed by the City of Carnation and may choose to take advantage of an opportunity when projects are scheduled.

ELECTRICAL POWER

The existing Snoqualmie – Stillwater 115 kV transmission line consists of small copper wire, with many of the poles nearing the end of their useful life. The future plans include replacing the older poles and the small copper wire with larger aluminum wire. This will increase both the capacity and reliability of the line. Future plans include rerouting the Snoqualmie – Stillwater 115 kV transmission line into Puget Sound Energy's planned Novelty substation. The reroute of this line would take place approximately half way between Carnation and Duvall along the existing BPA right-of-way. The line would be renamed "Snoqualmie – Novelty 115 kV" line at that time. Future plans also include an expansion of the Tolt Substation when the demand on the Tolt substation reaches approximately 16 or 17 MVA. Puget Sound Energy will increase capacity by adding a second transformer at this location.

Additional property will be required to accommodate this expansion. It is currently envisioned that the existing 115 kV transmission line would not be upgraded to 230 kV.

The 12.5 kV distribution system is expanded as additional customers are added, i.e. single family residences, platted developments, commercial businesses, etc.

At the winter peak load period the Tolt substation is currently running at about half its rated capacity so there's plenty of room for growth in the area.

There are no plans at this time to expand capacity in the Carnation area. PSE is confident it has enough capacity to handle future growth rates.

PSE continually monitor outages in the area and will generate projects to improve reliability should problems arise. Currently there are no reliability issues.

TELECOMMUNICATIONS

There are no shortages in the existing or future capacity of the telecommunication services for Carnation at this time. The existing network of telecommunication lines, including telephone, cable television, and broadband internet access has sufficient capacity to accommodate increases in development or subscription. Some wireless telecommunications providers have sought to improve service within the Carnation area by constructing new wireless facilities.

UNDER GROUNDING UTILITY WIRES

Development Regulations currently require new utilities to be placed underground with some exceptions as specified in the Municipal Code. The under grounding of existing above ground utilities is difficult and costly. The cost will vary greatly depending on site specific factors. The burden of the cost falls on the utility company and on the individual property owner or developer. The utility's cost would involve burying the utility, while the property owner would be responsible for preparing the utility system within the building for conversion, as well as bearing a portion of the cost of extending the service utility from the primary distribution line to the property. New development projects are required to underground their utilities, as feasible.

Under grounding power lines along SR203 (Tolt Avenue) in the downtown was included in the Tolt Corridor Plan and was undertaken as part of the SR 203 Tolt Avenue CBD Improvement Project. This project was completed in 2022.

GOALS AND POLICIES

GOAL U1

To ensure that the energy, communication, and solid waste disposal facilities and services needed to support current and future development are available when they are needed.

Policy U1.1 The City does not provide energy, communication or landfill disposal services. These facilities and services are currently provided by private companies and King County. To facilitate the coordination of these services, the City should discuss and exchange population forecasts, development plans and technical data with the agencies identified in this plan.

Policy U1.2 Carnation adopts the following Level of Service Standards for utility services:

A. Collection service for garbage, recyclable materials, and yard waste should be available to all properties within the City. Level of service provisions should be included in franchise/license agreements with solid waste haulers. Cooperatively work with King County and related agencies for an adequate system of collection and disposal of hazardous wastes, and public education regarding hazardous wastes.

B. For electrical service, coordinate land use and facility planning with Puget Sound Energy to allow for siting and construction of distribution facilities that provide sufficient amounts of electrical power with minimal periods of service interruption.

C. Coordinate land use and facility planning to allow for eventual siting and construction of natural gas distribution conduits along roadways which are undergoing construction.

D. For telecommunications, including telephone, cellular telephone, cable television, and Internet services, advocate the development or maintenance of facilities necessary to provide services as needed to accommodate population growth and advancements in technology. Include level of service provisions in franchise/license agreements with providers of cable television services.

Policy U1.3 New development would be allowed only when and where all public utilities are adequate, and only when and where such development can be adequately served by essential public utilities without reducing level of service elsewhere.

Policy U1.4 Coordinate Carnation's Land Use Element with the facility/utility planning activities of the service providers, including Puget Sound Energy, CenturyLink, Comcast, solid waste collection provider, the King County Solid Waste Division and city operated utilities, by ensuring that these providers of public services and private utilities use the Land Use Element of this Plan in planning future facilities. Adopt procedures for the City's review of and comment on proposed actions and policies by these public and private providers of public services.

GOAL U2

To provide an adequate and effective recycling program to serve the needs of Carnation residents, which maintains public health, environmental and land use quality.

Policy U2.1 The City shall strive to educate public and private sector developments about on-site recycling options, and shall encourage the use of recycled products, and support ongoing special event recycling.

Policy U2.2 The City shall strive to decrease the amount of solid waste entering land fill sites, extend the useful life of regional landfills and transfer stations, and minimize natural resource depletion by continuing solid waste recycling programs and participating in the procurement of recycled products.

GOAL U3

To minimize impacts associated with the siting, development, and operation of utility services and facilities on adjacent properties and the natural environment.

Policy U3.1 Utility service providers should design utility infrastructure and facilities in a way that does not damage or destroy the functions or features of the impacted properties, by, for example, providing buffers between public and private uses.

Policy U3.2 Electric power substations and other essential public facilities should be sited, designed, and buffered (through screening and/or landscaping) to fit in harmoniously with their surroundings. The vegetation should be managed to maintain system reliability. When sited within or adjacent to residential areas, special attention should be given to minimizing noise, light and glare impacts. Visual and land use impacts resulting from electrical, communication and other above ground essential public facility system upgrades should also be mitigated.

Policy U3.3 The City shall encourage or require implementation of resource conservation practices and best management practices during the construction, operation, and maintenance of utility structures and improvements.

Policy U3.4 Adopt regulations that establish a process for identifying and siting essential public facilities, such as solid waste or recycling handling facilities, waste water treatment plants and power substations. This process may include the assessment of future climate related hazards. Cooperatively work with surrounding municipalities and King County during the siting and development of facilities of regional significance.

Policy U3.5 The impacts from utility lines on the visual and physical environment should be mitigated by requiring the under grounding of utility lines to minimize clutter and the obstruction of views in new developments.

Policy U3.6 Through the Land Use Code, the City will ensure environmentally sensitive, safe, and reliable utility service that is aesthetically compatible with the surrounding land uses and results in reasonable economic costs.

Policy U3.7 The City will recognize the difference between utility lines serving individual customers, distribution lines carrying power from a substation to the customer service line, and transmission lines carrying power from generating source to a substation. In recognition of these differences, the City may exempt the under grounding of utility lines over a certain voltage from any under grounding ordinance.

GOAL U4

To provide and maintain safe, reliable and cost-effective water and wastewater systems to serve the needs of Carnation residents.

Policy U4.1 The City will continue to upgrade its water system to ensure efficient water use and good management of the water system, in accordance with federal and state regulations.

Policy U4.2 The City will continue to manage and maintain its wastewater collection and conveyance system in accordance with Department of Ecology standards and regulations. Special consideration shall be given to conservation measures and salmon recovery.

Policy U4.3 The City will continue to work cooperatively with King County as they maintain and operate the Carnation wastewater treatment plant.

Policy U4.4 In the event the City wishes to sell surplus water to adjacent water utilities, the City shall negotiate an inter-local service agreement setting forth the terms and limitations of the sale of the surplus water.

GOAL U5

Promote and achieve reasonable levels of energy conservation and conversion throughout the Carnation community.

Policy U5.1 Encourage planning and location of future facilities to accommodate future growth and to minimize incompatibility with surrounding land uses; joint use agreements among public and private utility providers for coordinated facility planning are also encouraged.

Policy U5.2 Conserve land, energy and natural resources by minimizing sprawl and encourage the replacement of energy and water saving appliances.

Policy U5.3 Streets, water, and sewer extensions should be designed to provide service to the maximum area possible with the least length of extension.

Policy U5.4 Partner with PSE to promote local investments and customer enrollments in clean energy projects and programs including solar, green power, carbon balance and others.

Policy U5.5 Partner with PSE to promote energy efficiency programs and initiatives.

GOAL U6

To process permits and approvals for utility facilities in a consistent, fair and timely manner and in accordance with Development Regulations and other pertinent standards and guidelines.

Policy U6.1 The City shall promote, where feasible, the co-location of new public and private utility distribution facilities in shared trenches, and coordinate construction timing to minimize disruptions and cost.

Policy U6.2 The City will provide timely effective notice to utilities to encourage coordination of public and private utility trenching activities for new construction and maintenance and repair of existing roads.

Policy U6.3 The City will encourage provision of an efficient, cost effective and reliable utility service by ensuring land will be made available for the location of utility lines, including location within transportation corridors.

Policy U6.4 The City will promote the extension of distribution lines to and within the Potential Annexation Area, and coordinate land use and facility planning to allow siting and construction of natural gas distribution lines within rights-of-way which are being dedicated or within roads which are being constructed or reconstructed.

Policy U6.5 The City will ensure that all maintenance, repair, installation, and replacement activities by utilities are consistent with the city's critical areas ordinances.

Policy U6.6 The City will encourage communication among the Washington Utilities and Transportation Commission (WUTC) and utilities regulated by the WUTC regarding the requirements of the Growth Management Act, especially the requirement that service be provided concurrently with or in advance of demand.

Policy U6.7 The City shall encourage system design practices intended to minimize the number and duration of interruptions to customer service.

GOAL U7

Surface water management activities should address quantity and quality of water entering the natural environment.

Policy U7.1 The City should minimize water quality degradation through education programs and implementation of Best Management Practices to reduce pollution entering surface waters.

Policy U7.2 Stormwater facilities required of new development should be designed and built in accordance with the City's adopted stormwater manual. Design should be conservative to allow for effective for low-cost, long term performance and maintenance. Low impact stormwater facilities should be

encouraged where feasible and cost-effective. Where feasible the approach should emphasize conservation, use of on-site natural features, site planning and stormwater management practices in the project design.

Policy U7.3 Educate homeowners and developers on appropriate plantings for bioswales.