

F. ~~Non-City-Managed Utilities~~ Energy

Relation to sustainability principles

A variety of energy sources are used in Redmond, each playing a vital role in the City's infrastructure. Energy directly contributes to Redmond's economy and community character, residents' quality of life and the experience for Redmond visitors. Energy also has an environmental dimension; how the City, residents and businesses consume energy IN BUILDINGS, PROCESSES AND VEHICLES can influence the environmental impacts associated with energy production. Efficiencies in energy distribution such as smart grid technology, and energy consumption such as low-voltage LED lighting, make it possible to reduce energy demand without compromising benefits.

Moreover, clean energy such as wind and solar, and alternative approaches such as electric vehicle charging, can potentially increase Redmond's energy supply in an environmentally sustainable manner. Pursuing these options can enhance our economic security and prosperity while minimizing environmental risks associated with traditional energy sources.

Because energy is so intimately tied to Redmond's economy and quality of life, and because environmental impacts of energy consumption have local, regional and global implications, SOUND energy PRACTICES ARE PRIME CONTRIBUTORS IN FURTHERING is uniquely positioned to further Redmond's sustainability principles.

Service overview

Availability of energy INFRASTRUCTURE and communications can influence decisions of developers to locate particular land uses. Conversely, DEMANDS RESULTING FROM land use decisions may influence the need for energy ~~or communications~~ utilities to support the land use. It is important to link the provision of energy utilities with the Land Use Plan.

The City can take steps to promote efficient use of energy resources. Examples of such steps include locating land uses PLANNING THAT CAN ~~to~~ reduce car trips or encourage transit, using building codes to promote efficient heating/cooling, encouraging common wall construction, adding street trees which cool asphalt or maintaining height codes which protect solar gain. Less conversion of fossil fuels to energy or use of cleaner, more-efficient fuels can also lead to cleaner air and reduced cost to individuals and society. It is also prudent to encourage conservation and efficient land uses to reduce the need for additional facilities which can result in higher utility costs.

Electrical energy and natural gas is provided to the City of Redmond and surrounding communities by Puget Sound Energy (PSE), ~~a private company. Telecommunications are provided by numerous different companies.~~

Work with energy providers to Ensure ~~non-City-owned utilities~~ energy
UT-587 facility plans reflect and support Redmond's Land Use Plan and ~~work with those utilities to ensure~~ that energy ~~and telecommunications~~ resources

are available to support the proposed Land Use Plan.

~~UT-58 Reduce energy consumption and encourage conservation of energy resources through measures such as:~~

~~(MOVED TO ENERGY EFFICIENCY SECTION BELOW)~~

- ~~◆ Supporting trip-reducing or transit-oriented land use.~~
- ~~◆ Using alternative fuel City vehicles.~~
- ~~◆ Requiring installation of street trees and parking landscape.~~
- ~~◆ Allowing clustering with common wall construction.~~
- ~~◆ Enforcing the energy code.~~
- ~~◆ Encouraging the use of “Green” roofs.~~
- ~~◆ Encouraging building design with natural solar gain for heating.~~

New 12 Promote an affordable and secure energy supply that increases the development and use of renewable and less carbon-intensive sources and that minimizes demand and consumption.

UT-59 Coordinate and seek to cooperate with other jurisdictions when energy transmission facility additions or improvements cross jurisdictional boundaries. Include efforts to achieve consistency between jurisdictions in permit timing.

~~UT-60 Negotiate aggressively franchise contract conditions that support the delivery of cost effective services desired by Redmond residents and businesses.~~

~~(MOVED TO TELECOMMUNICATIONS SECTION)~~

G. Electricity Electrical energy and facilities

Inventory of Conditions and Future Needs

Redmond is served by PSE Puget Sound Energy (PSE), a private electrical utility whose operation and rates are governed by the Washington Utilities and Transportation Commission. PSE is part of a western regional system, which means electricity is produced elsewhere and transported to Redmond through high-voltage transmission lines. As electricity nears its point of destination, the voltage is reduced and redistributed through the use of transmission substations, distribution substations and transformers. Redmond has several high-voltage transmission lines running east-west

and north-south. At present, it has one transmission substation and a number of smaller distribution substations.

Map UT-1 shows the locations of major existing electrical facilities.

Map UT-2 shows proposed major electrical facilities.

Planning for electrical production and distribution is done on a regional basis. Currently the majority of electricity in the region is from hydroelectric, natural gas, and ~~or~~ coal-fired plants, and increasingly wind generation. Future possibilities of demand reduction are also factored into the planning process through probable conservation factors. ~~PSE is exploring the use of wind generated technology to meet future demand and expects additional conservation efforts to occur in the future. There is a possibility of biomass production (the burning of methane or organic products to produce energy) in the long-term future; however, PSE's current energy planning does not account for using this source.~~

Electrical Facilities

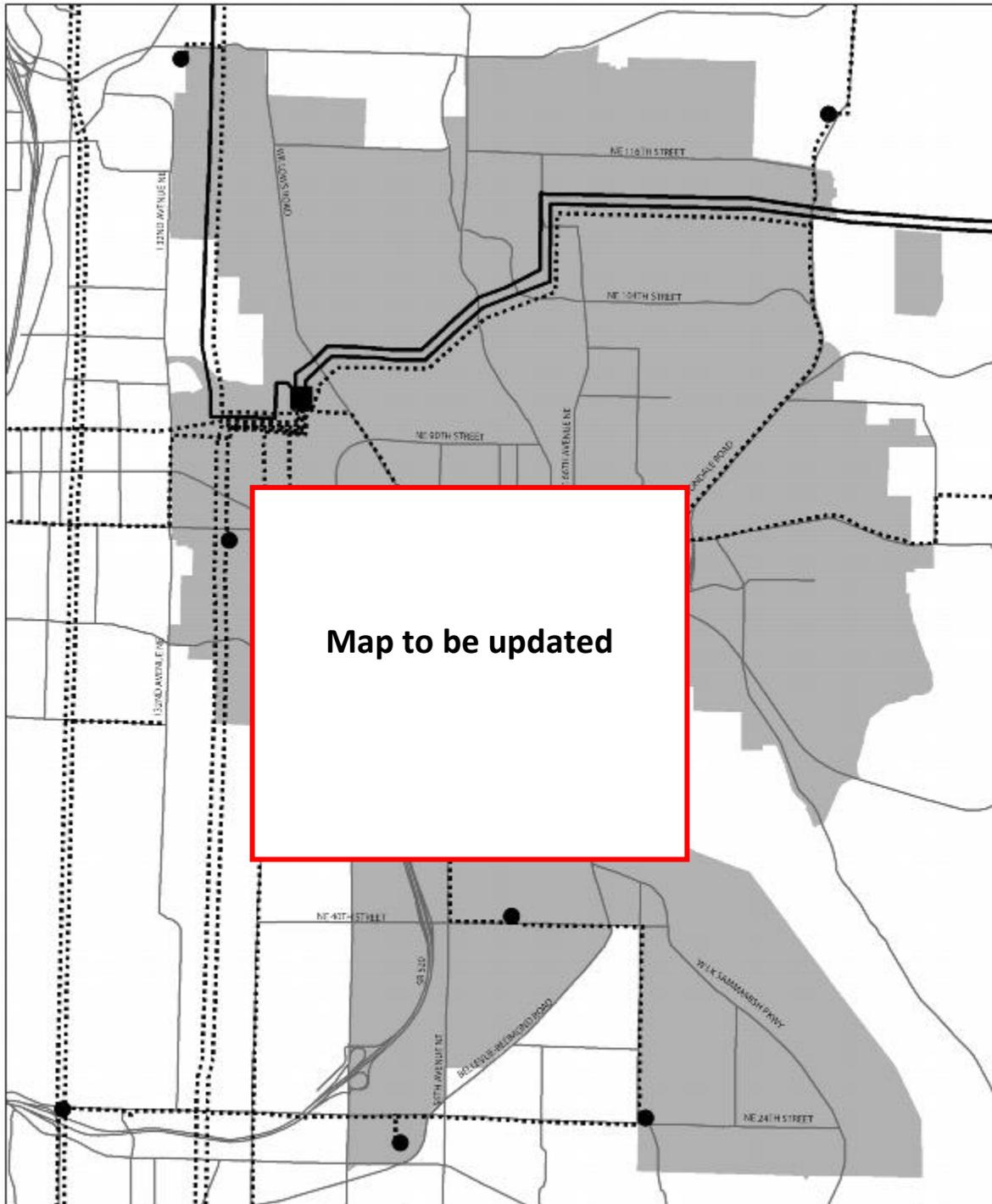
The electrical transmission system is a utility system that fills an essential public need. Therefore, zoning should allow the siting of major transmission lines at or above 115 kilovolt capacity and substation facilities in areas where it is reasonably necessary to provide efficient service. With coordination between the utility and the City in advance of ~~facility the~~ siting, problems of conflicting land uses may be reduced or avoided.

UT-61 Recognize the current Electrical Facilities Plan, authored by Puget Sound Energy as the facility plan for electrical utilities serving Redmond and the vicinity. Use this plan, where it is consistent with Redmond's land use goals, as a guide in identifying and preserving utility corridors and locating electrical facilities.

UT-62 Allow electrical ~~utility-distribution~~ facilities as a permitted use where appropriate to ensure that land is available for the siting of electrical DISTRIBUTION SYSTEM COMPONENTS facilities.



Note: Staff recommends keeping the staff-recommended change as-is, so all electrical facilities fall within the policy's direction to make land available for facility siting.



Map to be updated

Legend

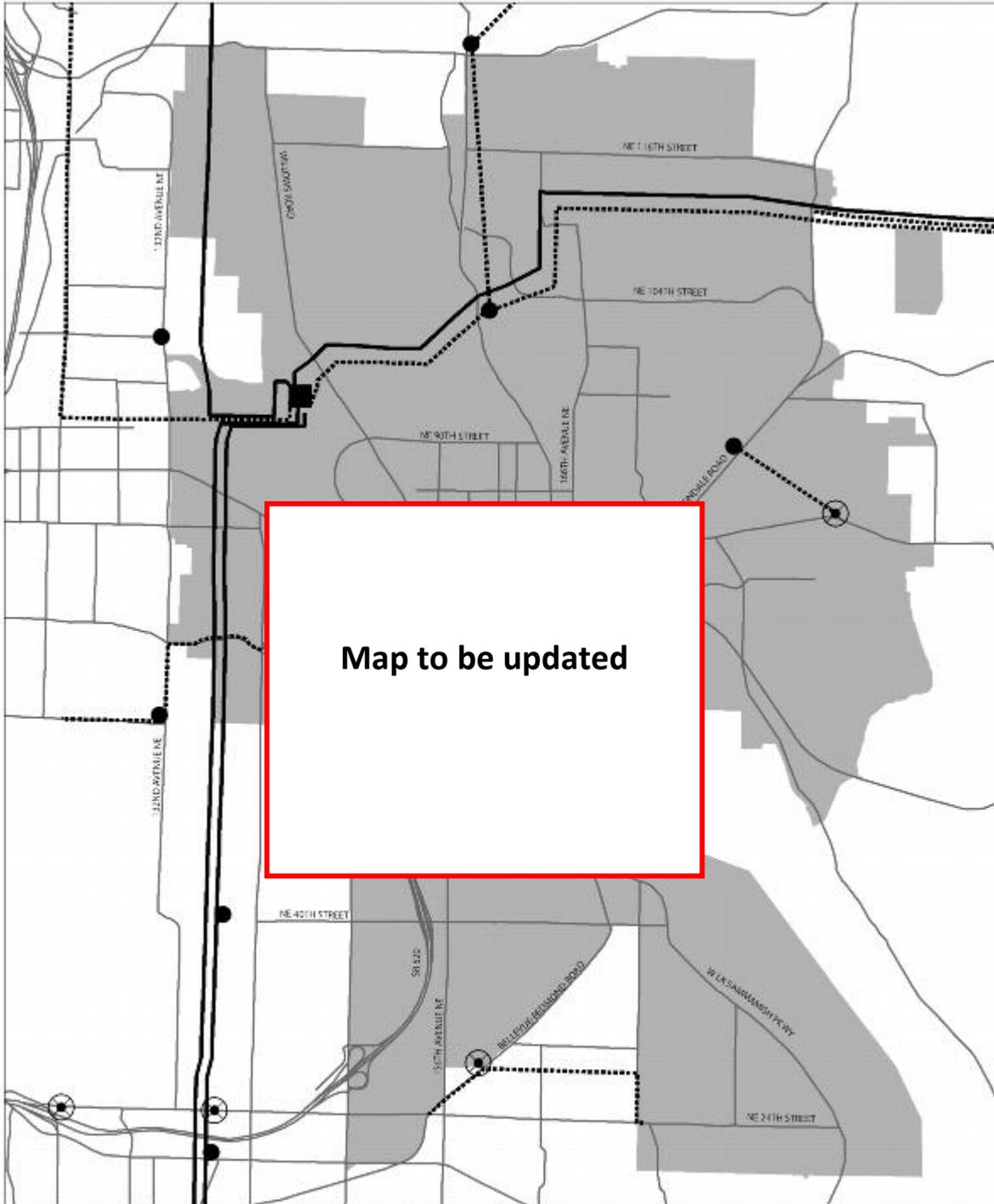
<p>Electric Station Type</p> <ul style="list-style-type: none"> ■ Transmission ● Distribution 	<p>Electric Lines Size</p> <ul style="list-style-type: none"> 115 KV ———— 230 KV
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**MAP UT-1
Existing Electrical Facilities**

Notes:
This map depicts electrical facilities as of 2006. For updates or more information contact Puget Sound Energy

File name: g:\planning\comp_plan\arcgis\2006maps\UT-1ExistingElectrical.mxd

SCALE IN FEET
 1,250 0 1,250 2,500
 EFFECTIVE: 10/19/2004



Legend

Electric Stations Type

-  Transmission
-  Transmission Switch
-  Distribution

Electric Lines Size

-  115 KV
-  230 KV

**MAP UT- 2
Proposed Electrical Facilities**

Notes:
This map depicts new or upgraded electrical facilities proposed as of 2006. For updates or more information contact Puget Sound Energy.

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N

SCALE IN FEET
1,300 0 1,300 2,600

EFFECTIVE: 10/19/2004

UT-63 Coordinate with Puget Sound Energy or ANYts successor when considering land use designations or new development in the vicinity of proposed facility locations that might affect the suitability of the designated areas for location of facilities.

CitizensCommunity members have a high regard for maintaining the forested appearance of the City of Redmond. Professional arborists have expressed concern that excessive pruning around electrical lines can kill or weaken trees. While the City of Redmond values safe and reliable electrical power, which requires proper pruning and appropriate removal of vegetation, at the same time, care must be taken to minimize damage to and the loss of trees. It is preferable to reduce the use of herbicides to control such growth as this can contaminate surface and groundwater.



Puget Sound Energy trail under power lines

UT-64 Encourage pruning of trees to direct growth away from overhead utility lines, education about proper placement and choice of landscape plants, and encourage phased replacement of vegetation located improperly in the right-of-way. To the extent possible, maintain ecological functions and values when managing vegetation located in critical areas.

UT-65 Ensure that pruning of trees necessary for safe and reliable utility service is performed in an aesthetic manner to the greatest extent possible and performed according to professional arboricultural specifications and standards.

UT-66 Discourage the use of herbicides to control vegetative growth around utility facilities, encourage alternative methods such as mowing or selective treatment, and encourage more environmentally friendly herbicides.

There have been a number of studies that have examined possible health effects of extremely low frequency (ELF) electric and magnetic fields (EMF) which are generated by power lines, household wiring, and appliances. Many are statistical incidence studies, not controlled laboratory studies. Even with controlled laboratory studies, results have been mixed and do not clearly point to a connection between ELF/EMF

and health effect. Since some evidence indicates there may be an effect on the body, but at present the effect is not sufficiently linked with a particular result, the risk remains undefined.

Facility siting and design standards, many of which are presently used by electrical utilities, can reduce exposure to ELF/EMF. Transmission line configurations affect field strength. Reverse phasing, a method of running current in opposite directions, may result in magnetic field reductions. Magnetic field strength also falls off dramatically as distance increases. Any of these known and acceptable low-cost methods can be used to reduce ELF/EMF exposure without placing an undue burden on the electrical provider.

UT-67 Require designs that incorporate known and accepted low-cost technological methods of reducing magnetic fields or the exposure to them when siting high-voltage electrical facilities until further research provides more information on the health effects of electromagnetic fields. Methods may include:

- ◆ Line configurations that reduce field strength.
- ◆ Sufficient right-of-way widths.
- ◆ Sufficient height of lines from the ground for high voltage transmission facilities.

UT-68 Periodically review the state of scientific research on ELF/EMF and modify policies and regulations, if warranted, by changing knowledge or if new State or federal regulation requires changes.

Electrically powered busses and cars exist currently on the market. ~~There is a potential for individual autos and delivery truck/van fleets to be electrically powered as battery technology is rapidly advancing.~~ These vehicles cause no emissions harmful to air quality at the point of vehicle usage, although there may be increased environmental effects at the location where the electrical energy is generated. The change in technology or the use of existing electric vehicle systems will result in infrastructure changes. Redmond should continue seek to ADAPT TO NEWER AND CLEANER TECHNOLOGIES ~~assist the change in technology~~ as conditions warrant.

UT-69 ~~Facilitate efforts to develop an electric recharging infrastructure for electrically powered vehicles. This may include:~~Implement electric vehicle charging stations infrastructure to help encourage the deployment of electric vehicles USING PUBLIC AND PRIVATE FACILITIES throughout the central Puget Sound region.

~~◆Updating regulations to deal with the new technology.~~

~~◆Taking a lead in or cooperating with other jurisdictions in converting to electrically powered government vehicles.~~

Transition the City's fleet AWAY FROM FOSSIL FUELS from gasoline New 13 to alternatives such as electric and, hybrid vehicles.

UT-70 ~~Consider allowing development of an electrical bus/trolley infrastructure as a method to improve air quality.~~

H. Natural Gas

Natural gas energy and facilities Inventory of Conditions and Future Needs

~~PSE, Puget Sound Energy~~, a private utility providing natural gas service to ~~six five~~ counties within the Puget Sound region, is the provider of natural gas within the City of Redmond and the surrounding annexation area. ~~PSE Puget Sound Energy~~ purchases natural gas from a number of sources which is transported to the Redmond area via a high pressure pipeline system operated by Williams Northwest Pipeline and takes delivery of the gas at the Redmond Gate Station. ~~and pipes it to this area via a high pressure pipe system, the Northwest Pipeline. As the natural gas reaches its destination, it enters the Redmond Gate Station.~~ The pressure is reduced, an odorant is added for safety, and the gas is metered. The pressure is further reduced at limiting stations, district regulators, and at individual meters. Present delivery systems within the City of Redmond have enough capacity to meet current demand.

Map UT-3 shows the location of natural gas facilities.

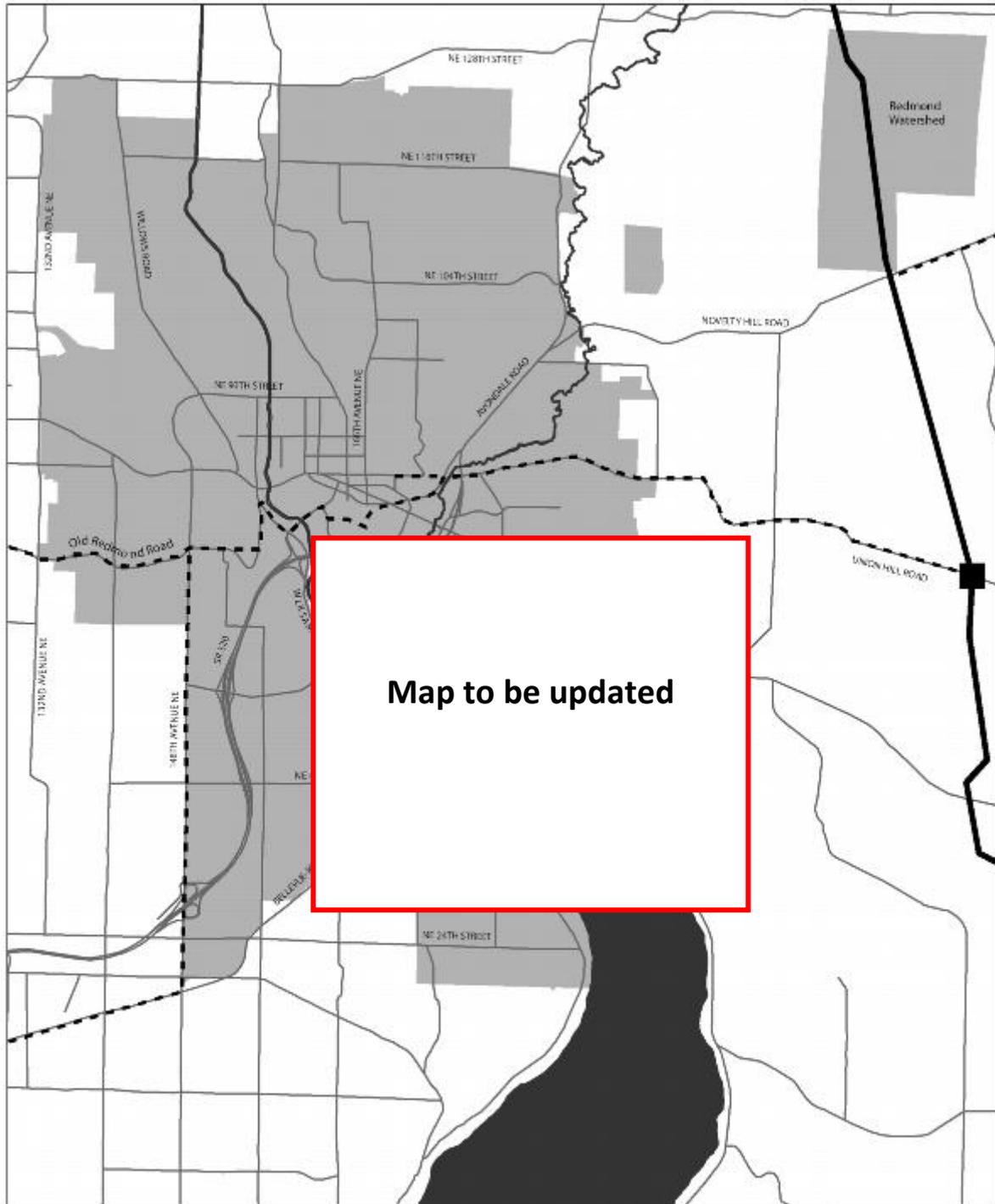
Facilities

Direct heating by BURNING natural gas is more efficient than certain types of electrical heating because there is a loss of energy during both production and transmission of electricity. Redmond can encourage energy efficiency by facilitating conversion to natural gas through such efforts as a timely and simplified permit processing and reasonable permitting fees.

Some PERSONAL individual and mass transIT portation vehicles are designed to be fueled by natural gas and there is a potential for conversion of others ~~types of vehicles~~ to natural gas. These vehicles give off substantially cleaner emissions and their use would improve air quality. In addition, natural gas delivery technologies do not use underground storage tanks, thus avoiding an environmental concern associated with OTHER FOSSIL FUELED gasoline-powered vehicles.

~~Present technologies are producing and using methane from sewage treatment and landfills. A greater percentage of the natural gas source may come from renewable resources as technology advances the use of biomass production.~~

UT-71 Encourage and provide opportunities to convert existing homes or businesses TO NATURAL GAS from oil and LESS-EFFICIENT electric space and water heating ~~to natural gas~~ EQUIPMENT.



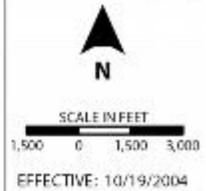
Legend

- - - Natural Gas High Pressure Mains
- Northwest Gas Pipeline
- Gate Stations

**MAP UT-3
Natural Gas Facilities**

Notes:
This map depicts natural gas facilities as of 2006. For updates or more information contact Puget Sound Energy

File name: g:\planning\comp-plan\arcgis\2006map\UT-3Natural Gas.mxd



UT-72 Facilitate efforts to develop a natural gas fuel infrastructure. This may

include:

- ◆ Updating regulations to ~~deal with~~address the this new technology.
- ◆ ~~Cooperating with the t~~Training of fire and police ~~to deal with the personnel~~ so they are well versed with this technology.
- ◆ Taking ~~a lead in~~leadership or cooperating with other jurisdictions in building a natural gas fueling facility for government vehicles.
- ◆ ~~Allowing-Identifying~~ areas for the potential siting of biomass production facility.

Alternative Energy

Alternative e Energy sources THAT PROVIDE AN ALTERNATIVE TO CARBON-BASED FUELS provide many benefits. Renewable energy can create new jobs and promote economic development. Alternative energy can provide a hedge against rising fuel prices and add to the reliability of the electricity grid. Solar and wind technology are emissions-free, making them attractive from an environmental standpoint, since use of carbon-based fuels contribute to climate change. Additionally, applications of renewable energy (and energy conservation) can enhance the disaster resiliency of the community and individual structures.

PSE is incorporating wind generation technology to meet future demand and is assessing the use of other alternative energy generation technologies, such as solar. There is ALSO a possibility THAT of -biomass production (the burning of methane or organic products to produce energy) MAY BECOME ECONOMICALLY VIABLE in the long-term future.

Present technologies are producing and using methane from sewage treatment and landfills. A greater percentage of the natural gas source may come from renewable resources as technology advances the use of biomass production.

New 14 Promote, support, and increase the use of clean, alternative energy by:

- ◆ Advocating for the development of renewable energy sources;
- ◆ Facilitating the development of on-site renewable energy; and
- ◆ Providing incentives for development incorporating renewable energy.

UT-733 Strongly support the development of innovative technologies such as alternative fuels THAT ADVANCE SUSTAINABILITY PRINCIPLES. and ~~emergent telecommunications technology.~~

Energy Efficiency

America represents roughly five percent of the world's population but consumes about 25% of the world's energy. An awareness of energy conservation PRACTICES can help make a positive impact thereby allowing individuals and businesses to be more efficient in their energy consumption. Home, school, office, government and industrial environments all benefit from cost-saving and energy saving innovations. Studies show that energy conservation at the local level has been quantified as tons of air pollutants avoided and dollars saved. This can be accomplished in the home by using energy efficient lighting, PROGRAMMABLE THERMOSTATS or by simply turning lights off when leaving a room.

Driving eco-friendly cars and using transit are other ways to save energy. For businesses, it could mean conducting energy audits AND REVIEWING OPERATIONAL PROCEDURES OR PROCESSES to ensure efficient energy consumption THAT to maximize energy cost savings. It could also mean purchasing only Energy Star equipment and appliances for business operations. Conserving energy allows the efficient consumption of energy resources. The community benefit is less contamination of the land, water and air, and support for a sustainable lifestyle.

New 15 Support an affordable, efficient and secure energy supply that increases the development and use of renewable and less carbon-intensive sources and that minimizes demand and consumption.

New 16 Promote decreased energy consumption and enhanced energy efficiency throughout the City's building stock.

New 17 Explore methods to increase the opportunities for individuals to realize greater energy efficiencies in their use of the built environment.

New 18 Promote the development of energy management technologies as part of efficiently meeting the City's energy needs through techniques such as benchmarking buildings for energy performance, optimizing input energy requirements and initiating incentive programs for net-zero energy structures.

New 19 Require energy audits when buildings transfer ownership to disclose energy consumption to future building owners.

New 20 Develop strategies for recruiting businesses that contribute to local energy conservation efforts.

New 21 Develop an energy conservation awareness program that:

- Educates residents on the benefits of energy conservation;

- Educates the public on the energy benefits of having trees and planting trees;
- Educates business owners and employers in long-term savings from energy efficient investments; and
- Assists businesses with identification of funding assistance for energy upgrades, retrofits and new technology.

UT-7458 Reduce energy consumption and encourage conservation of energy resources through measures such as:

- ◆ Supporting trip-reducing or transit-oriented land use.
- SupportING community use of alternative fuel vehicles
- ◆ Using alternative-fuel City vehicles.
- ◆ Requiring installation of street trees and parking landscape.
- ◆ Allowing clustering with common wall construction.
- ◆ Encouraging the use of “Green” roofs OR REFLECTIVE ROOFING MATERIALS THAT REDUCE THE HEAT ISLAND EFFECT.
- ◆ Encouraging building design with natural solar gain for heating.
- PROMOTING ENERGY EFFICIENT DESIGN INCLUDING SITING, BUILDING ENVELOPE AND USE OF NATURAL LIGHT
- PROVIDING TOOLS THAT HELP RESIDENTS AND BUSINESSES QUANTIFY THE EFFECTIVENESS OF THEIR CONSERVATION EFFORTS