Comprehensive Plan Background Reports
Goal 11 – Public Facilities and Services
Section 3: Water Supply, Treatment and Delivery

PLANNING CONTEXT AND EXISTING GOAL

Statewide Planning Goal 11: "*To plan and develop a timely, orderly and efficient arrangement of public facilities and services as a framework for urban and rural development.*"

Statewide Planning Goal 11 requires that cities with more than 2,500 people develop and adopt a public facility plan for areas within an urban growth boundary. The City of Lake Oswego is a full-service city providing police, fire, parks and recreation, water, wastewater, storm water, and street utility service to a resident population of 36,725. Lake Oswego's Public Facilities and Service section of its Comprehensive Plan includes Section 3, Water Treatment and Delivery.

The existing goal states: "*The City shall ensure a reliable and adequate supply of high quality water to meet the existing and future needs of Lake Oswego.*"

EXECUTIVE SUMMARY

The City's water supply, treatment, and transmission systems play a significant role in assuring public health, safety, and economic development potential. This background report describes the current conditions, needs, policy objectives, and goals for the municipal water services provided by the City.

Lake Oswego's water supply, treatment, and transmission system ("Supply System") was developed between 1965 and 1969. With regular maintenance and periodic upgrades, the Supply System has delivered an adequate supply of water to Lake Oswego citizens and to other special water service districts and cities pursuant to intergovernmental cooperative agreements. These agreements provide water outside the City's corporate boundaries on an interruptable basis for emergency and non-emergency use. The other cities and special service districts are:

- City of Tigard
- City of Portland (Alto Park Water District)
- City of West Linn
- Lake Grove Water District
- Rivergrove Water District
- Skylands Water Company
- Glenmorrie Water Cooperative
- Forest Highlands Water District

DRAFT

Between 1967 and 1973, the City acquired permits from the Oregon Water Resources Department ("WRD") to divert water from the Clackamas River for municipal purposes. Permit #S-32410 has a priority date of March 14, 1967, and allows the City to divert up to 50 cubic feet per second (cfs) of water from the river. Permit #S-37839 has a priority date of July 5, 1973, and allows the City to divert up to 9 cfs from the river. On March 24, 1977, the City acquired an additional permit, #S-43246, allowing it to withdraw water from the Willamette River in the amount of 6 cfs. In total, the City holds permits or certificates from WRD authorizing the use of up to 59 cfs of water from the Clackamas River and 6 cfs from the Willamette River.

On November 14, 2001, 25 cfs of Permit #S-32410 was given certificate status (C-78332) by WRD. In 2007, Oregon water law changed to require that any portion of a municipal permit, not having certificate status as of the effective date of the new laws, was subject to a finite period within which the undeveloped portion of the permit must be developed, and subject to a requirement that use of the undeveloped portion will not adversely affect threatened or endangered fish species.

Oregon Department of Fish and Wildlife ("ODFW"), has determined that use of the currently unused portion of permits S-32410 and S-37839 (i.e., 34 cfs) may adversely affect endangered fish and thus will restrict use of these permits when streamflows in the Clackamas River fall below predetermined rates depending upon time of year. The amount of the restriction is proportional to the shortfall in streamflows below the predetermined rate. There is no such restriction attached to the recently extended Willamette permit based on ODFW's determination that development of this permit will not adversely impact endangered fish.

The City has received approval from WRD for additional time to fully develop all water under its Clackamas and Willamette permits out to 2040. Any water under the City's permits undeveloped after that time will be subject to further requests for extension of time pursuant to established procedures under Oregon statute.

Despite a history of regular maintenance and upgrades, the City's Supply System is no longer capable of achieving the goal of "*…ensuring a reliable and adequate supply of high quality water to meet the existing and future needs of Lake Oswego.*" The reasons for this include:

- Obsolete equipment and control technology
- Age and condition of major electrical and mechanical equipment
- Insufficient *firm capacity*[1] to reliably meeting current peak day water demands
- Treatment technology is out of date
- Supply system is vulnerable to seismic events that are likely to occur in the Pacific Northwest

[1] "Firm Capacity" is the maximum amount of water that can be delivered to or from the City's water treatment plant, when the largest pump is offline due to maintenance or malfunction.

- River intake pump station structure is deteriorating
- Climate change and changing environmental laws and regulations

In the last decade Lake Oswego's Supply System planning has been guided by its 2001 Water Master Plan ("WMP") and 2007 Water Management and Conservation Plan ("WMCP"),and various other studies and intergovernmental agreements. In 2008, the City entered into an agreement with the City of Tigard to create the Lake Oswego Tigard Water Partnership. The partnership followed a comprehensive analysis of supply alternatives that revealed a joint system with Tigard would produce considerably lower cost and environmental impacts than Lake Oswego making needed system improvements on its own. The partnership is now central to the City's water planning as it prepares to bring Tigard on to its system by 2016.

WATER: EXISTING CONDITIONS

Did you know?

1. The City draws its water supply from the Clackamas River
2. The water treatment plant is located in West Linn.
3. The Lake Oswego treatment plant serves as West Linn's primary back up water supply.
4. There are over 250 miles of water transmission and distribution mains
5. There are five other water providers within Lake Oswego's Urban Services Boundary.
6. The City's water treatment and delivery system includes 13 pump stations, 15 water storage reservoirs, and 25 pressure reducing stations and other facilities.
7. In a recent survey, 93% of Lake Oswego customers said they were "very satisfied" or "satisfied" with their drinking water.
8. The Oregon Department of Health requires a minimum water pressure of 20 pounds per square inch (psi). Lake Oswego's existing system is designed to deliver water at a maximum and minimum of 80 psi and 40 psi respectively.
9. The City holds three groundwater registrations and a groundwater use permit and is allowed to use 1.63 mgd of groundwater for municipal use. Currently only one permit is used for irrigation on Luscher Farm.

Changes since the 1994 Comprehensive Plan:

1. Lake Oswego endorsed the partnership with the City of Tigard to jointly plan, fund, construct, and operate an expanded water supply system, beginning July 2016.
2. 1996 Amendments to the Safe Drinking Water Act resulted in the City upgrading its water treatment plant to assure compliance with the new regulations.
3. The Stafford Basin was recently designated as an Urban Reserve area.
4. Lake Oswego hired a Water Conservation Specialist, and began implementing a comprehensive water conservation program aimed at lowering water usage throughout the community. Efforts have included consumer water audits, toilet rebates, washing machine rebates, water conservation kits and the establishment of a tiered water pricing structure to further encourage changes in

DRAFT

consumptive behaviors for all customer classes. The 1997 PFP is based on a population forecast for 45,000 in 2020.[2]

The City of Lake Oswego supplies water within its urban services boundary (USB), including all land within the City limits as well. Its wholesale customers include the following water districts: Forest Highlands, Lake Grove, Rivergrove, Skylands, Glenmorrie, and Alto Park. The City also supplies water to the cities of Tigard, Portland, and West Linn. All supplies to special water districts and cities are interruptable. This area includes approximately 13,000 service connections and about 40,000 people, commercial establishments, public facilities, schools, irrigation accounts, and wholesale customers. Lake Oswego's source of municipal water is the Clackamas River. Its water intake is located about ¾ mile upstream from the Willamette River in Gladstone. The water is treated at the City's treatment facility in West Linn. The treated water is then pumped through a large pipeline through the community to the Waluga Reservoir near the City's western boundary on the north side of Oswego Lake and to the Southside Reservoir near the center of the City on the south side of Oswego Lake. Water from these two reservoirs is distributed to Lake Oswego retail and wholesale customers.

There are several documents that will inform the water treatment and delivery goal in the revised Comprehensive Plan. In 2006, the City worked with CH2MHill and GSI Water Solutions to initiate Lake Oswego's first Water Management and Conservation Plan (WMCP). The Plan is a living document that will evolve over time in response to a variety of inputs including aging infrastructure, climate change, environmental regulation, and state water policy. The WMCP describes water management, water conservation, and programs to guide the wise use and stewardship of the City's water supply. As a result of this work, the City has conducted a comprehensive audit of its water utility and is implementing recommendations stemming from the conduct of that work. For example, the City is undertaking an accelerated large-meter calibration and replacement program and developed more robust database query and reporting capabilities to provide more frequent and accurate accounting of water production and use within our community. The WMCP includes five-year benchmarks and other measures, which should be considered in the updated Comprehensive Plan. A 2010 update was done; however, it has not yet been approved by WRD and the 2007 version remains the operative document.

In 2007, an engineering and financial analysis, jointly funded by the cities of Lake Oswego and Tigard was completed. The report titled "Joint Water Supply System Analysis" ("JWSSA") evaluated supply alternatives, costs, and benefits of a possible water supply partnership between the two communities. The study concluded that substantial benefits would accrue to the two cities by jointly planning, funding, constructing and operating expanded water supply and treatment facilities currently owned by Lake Oswego. Upon endorsing the agreement in 2008, the two cities embarked on a multi-year program to

[2] The Water Management and Conservation Plan includes these projections: 2019: Lake Oswego City Limits - 35,670, Lake Oswego Outside City Limits and Within USB 8,090; 2030: Lake Oswego City Limits - 37,700, Lake Oswego Outside City Limits and Within USB 9,580

DRAFT

complete the planning, permitting, design, and construction of six key facilities needed to accommodate both cities current and future water supply needs. These new and/or expanded facilities consist of:

- A new river intake pump station (RIPS) in Gladstone,
- A new 42-inch diameter raw water pipeline (RWP) connecting the RIPS to the City's water treatment plant in West Linn,
- An expansion and modernization of Lake Oswego's water treatment plant (WTP) from a 16 million gallon per day (mgd) direct filtration plant to a 38 mgd, ballasted flocculation plant with ozone.
- A new 48-inch diameter finished water pipeline (FWP) connecting the WTP to a proposed new 3.5 million gallon (MG) reservoir.
- A new 3.5 MG water storage reservoir near Waluga Park in Lake Oswego (WR2).
- A new dual-capacity water pump station - Bonita Pump Station (BPS) in Tigard.

Ballasted flocculation, high rate filtration and ozone will replace the out-of-date, direct filtration process currently existing at the WTP. This change in treatment technology assures the City will continue to meet or exceed all current EPA drinking water regulations and will position the City to be able to respond to future changes in incoming water quality or drinking water regulations. This treatment process also provides a higher degree of treatment reliability due to its robust, multi-process approach to water treatment that can reduce or remove a wide variety of currently unregulated compounds such as pharmaceuticals and personal care products.

The Public Facility Plan (PFP) for water services is also a key support document for the Comprehensive Plan update. The PFP addresses the wastewater, water, surface water, and transportation facilities needed to support the land uses designated by the Comprehensive Plan. Lake Oswego last updated its PFP in 1997. As part of periodic review and the current Comprehensive Plan Update, the City will revise the existing PFP to be consistent with recent master planning and other efforts.

The City must also consider new environmental regulations, current population projections, , climate change, land use, and advancements in water treatment and delivery. A summary of the current regulatory requirements can be found in Table 1 on p. 8.

DRAFT

SUMMARY OF EMERGING ISSUES, CHALLENGES, AND TRENDS

- **Aging Infrastructure:**

One of the most immediate challenges facing the Lake Oswego water delivery system is the replacement of aging infrastructure. Despite past investments and ongoing maintenance, the system and most facilities are nearing the end of their expected life. Lake Oswego's water facilities are too old and undersized to continue to reliably and economically serve the community's needs**.**

- **Reliable Capacity:**

While the maximum pumping and treatment capacity of its facilities is 16 mgd, its firm capacity (the amount that can be pumped and treated with a large pump out of service) is only 12mgd. In hot summer months, usage can approach and exceed this limit, requiring the system to work around the clock to keep up with demand.

- **Regulatory Challenges for Water Treatment:**

Public health concerns associated with drinking water supplies from surface water and groundwater sources continue to influence policy makers and regulators in all levels of government. Balanced against the public's expectations for safe drinking water are the realities of shrinking budgets and costs to repair, replace and renew aging infrastructure. Significant new regulations promulgated under the 1996 amendments to the Safe Drinking Water Act (SDWA) placed a significant burden on community water systems nationwide as federal and state shares of funding for local improvements dropped precipitously. New challenges on the horizon for municipal treatment systems include potential regulation of Hexavalent Chromium (21st most abundant element in the earth's crust), Perchlorate (sources include solid rocket fuel, fireworks, and explosives), and Nitrosamines – nitrogen containing molecules that are produced naturally in the body but can also be found in foods such as bacon, milk, and beer. Each of these compounds if ingested have potential negative health effects and current treatment options are limited.

- **Changing Demographics**

As residents of the community age, expectations for the quality and costs of water will also change. Elderly consumers are likely to be more interested in emerging contaminants from a health perspective because larger percentages of the elderly may be immunocompromised. Treatment costs to remove these contaminants from our raw water supplies will be expensive. Communities such as Lake Oswego experiencing slow or negative growth, increased housing costs, and shrinking birth rates will have fewer rate payers across whom to spread rising capital and operating costs, thus holding the potential for higher water rates. Higher water rates will disproportionately impact the elderly on fixed incomes or families whose maximum earning years are behind them. Rate-base growth through water supply partnerships with other communities may be one strategy to realize economies of scale and thus reduce the growth of rate increases needed for fixed operating costs such as debt service and capital expenses.

- **Regionalization and Source Reliability**

In 1996 the City became a member of the Regional Water Providers Consortium (RWPC), an intergovernmental organization comprised of twenty-three water provider entities and including Metro. Since that time the City has demonstrated its commitment to being a regional partner with other water providers on water supply issues. In addition to the partnership with the RWPC, Lake Oswego also partners with other cities and water supply districts that use the Clackamas River for their drinking water supplies. For more than a decade, the Clackamas River Water Providers (CRWP) have jointly funded and managed significant activities in the Clackamas watershed including:

- ✓ Annual monitoring and data collection on the presence of giardia and cryptosporidium (pathogenic organisms) in the river as required under the SDWA.
- ✓ Several watershed assessments identifying sources of pollutants, general watershed health, water quality parameters such as total organic carbon, pH, dissolved oxygen and alkalinity.

DRAFT

- ✓ Public outreach in Clackamas County regarding issues in the watershed.
- ✓ Funding activities of the Clackamas River Basin Council.
- ✓ Stream flow monitoring and data collection.
- ✓ Pesticide/herbicide sampling and analyses conducted in partnership with the USGS.
- ✓ Development of a comprehensive computer model of the river from Rivermill Dam to the mouth.
- ✓ Water availability studies and water rights evaluations.

Of increasing importance to water providers today are risks of supply interruption due to natural disaster or terrorist acts. Access to an alternate source of supply and system redundancy is a critical strategy that responds to these risks. The "Regional Transmission and Storage Strategy" (RTSS) commissioned by the RWPC in 1998, was developed in response to these concerns expressed by the region's water suppliers. The recommended strategy of linking supply sources e.g., Bull Run, Willamette, Clackamas and Trask/Barney Reservoir system relies on a network of large diameter transmission mains capable of moving water throughout the region: north to south, east to west. One proposed east/west linkage is comprised of a large diameter main that would connect the Clackamas River source with the Trask River/Barney Reservoir source and the Willamette River source (at the time of the RTSS study still undeveloped). The report suggests the best opportunity for developing these linkages will be realized through local partnerships. Interconnections to other sources of supply will require advance planning, possible new governmental entities and significant capital expenditures.

With a growing understanding of water as a shared regional natural resource, it is increasingly important for the city to consider the environmental and societal cost of new water supply as part of its planning and management efforts. Current issues regarding the City's sources of supply include:

- ✓ The Clackamas River is home to several species of threatened and endangered salmon as well as potentially sensitive species like the Pacific Lamprey and Bull Trout. Recent changes to Oregon Water Law as it pertains to municipal diversions will increase pressure on diverters to efficiently and effectively manage demand and reduce waste as a condition precedent to increased diversions under existing withdrawal permits.
- ✓ The "highest and best use" of scarce water supplies will drive the decision-making process regarding the allocation of water in the State for the foreseeable future.
- ✓ In August of 2012 the Oregon Water Resources Commission will adopt an Integrated Water Resources Plan that considers human needs as well as in-stream needs. The Integrated Water Resources Strategy calls for improving the integration of water information in land use planning, and encouraging regional approaches to water resource planning (partnering with Tigard provides a model for this type of cooperation), identifying water related research needs, undertaking place-based integrated water resource planning, increasing water use efficiency, and improving watershed health and safety (our efforts with the CRWP provides an excellent example of cooperative agreements being leveraged to improve watershed health).

SUSTAINABILITY CONSIDERATIONS

DRAFT

The Water Management and Conservation Plan (WMCP) includes adopted benchmarks that should be considered in establishing or updating sustainability indicators and goals. Begun in 2007, the City continues to provide opportunities for residents to learn about how to reduce water use and waste, rebates for installing water efficient fixtures, leak detection services and other support for water conservation. The proposed new facilities for the Lake Oswego-Tigard water partnership will incorporate a variety of energy saving features including high efficiency lighting, pumps, photovoltaics, green roofs, and low maintenance materials of construction.

RECOMMENDED PLAN UPDATES AND POLICY QUESTIONS TO CONSIDER

Recommended Plan Updates

1. Preserve and protect the City's existing water rights permits.
2. Ensure adequate revenues are derived from the delivery and measurement of water to perpetuate the system, provide for operation and maintenance expenses, capital construction, and preserve the financial integrity of the utility.
3. Promote the principles of sustainability in the planning, design, construction, and operation of the municipal water system.
4. Review, consider and re-affirm existing policies, goals and objectives or replace as necessary to assure relevance to current conditions and to guide subsequent decision making.
5. Maintain regional and subregional relationships with other agencies concerned about regional water supply planning and management.
6. Water Treatment and Delivery goals should be updated to reflect current population projections of the City of Lake Oswego and the City of Tigard.
7. Continuing pursuing recommendations from the WMCP.
8. Update the 2001 Water System Master Plan
9. Engineering staff has recommended a proposed amendment to Section 3- Water Treatment & Delivery to: "Ensure provision of high quality water in sufficient quantity for all uses and to protect the health, safety, and welfare of the Community."

Policy Questions

1. Should financial policies of the water utility include a requirement to establish a sinking fund for future capital replacement as a strategy to mitigate future rate spikes?
2. Should the City encourage or facilitate the dissolution of water districts operating within its USB in furtherance of the goals and intent of Senate Bill 122 that cities should ultimately be the provider of urban services?

Table 1. Regulatory Context and Key Documents

Key Document Name	Date	What is it?

DRAFT

Key Document Name	Date	What is it?
Emergency Response Plan (ERP) and Vulnerability Assessment (VA)	Last updated in 2004. Required by OAR 333 Division 61 to be updated every 5 years. Recommended an update of the ERP with the new plant will need to update the ERP.	The ERP identifies planning and actions to be taken during an emergency that will maintain the quantity and quality of water, protect employees, minimize inconvenience to the public and preserve property.
Water Management and Conservation Plan	May 2007. Approved by the state in 2008.	Required by the Oregon Water Resources Department. 1) Satisfies OAR Chapter 690, Division 86. Includes all elements under OAR690-086-0125. 2) Also presents planned water conservation programs for the City.
Hazardous Materials Management Plan		An inventory of water treatment chemicals currently in use at the City's WTP. Contains recommendations for storage, handling, and first aid in the event of a spill.
Emergency Operations Plan (EOP)	Spills citywide included	
Water System Master Plan	January 2001	Policy document that guides the planning, design, financing and construction of water system facilities to support economic development, current and future community water supply needs for public health, safety and welfare. Includes population forecasts, water demands, planning criteria to evaluate expansions, identify improvements to support growth and development, analyze water scenarios for urban reserve areas, evaluate long-term sources of supply.
City of Lake Oswego and the Tigard Water Service Area Joint Water Supply System Analysis Draft Report	July 2007	Provides analysis, scenarios, and recommendations for a water partnership between Lake Oswego and Tigard.

DRAFT

Key Document Name	Date	What is it?
Lake Oswego Tigard Supply Facilities Capital Improvement Plan	November 2010	The Plan outlines the funding and construction needs for the Partnership initial expansion of facilities and is an exhibit to the IGA with Tigard

DRAFT