

Technical Background Report: Existing Conditions and Alternatives



Eugene-Springfield Metropolitan Area
Public Facilities and Services Plan

April 1999

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Acknowledgments

This report was prepared through the combined efforts of staff from local and state agencies. Technical guidance and information for the report was provided by the following individuals who served on the Technical Advisory Committee (TAC) to update the *Eugene-Springfield Metropolitan Area Public Facilities and Services Plan (PFSP)* and the *Metro Plan Element: Public Utilities, Services, and Facilities*.

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Chapter I: Introduction

This report serves as the technical analysis of an update of the *Eugene-Springfield Metropolitan Area Public Facilities and Services Plan (PFSP)* and the *Metro Plan Element: Public Utilities, Services, and Facilities*. The information contained in the report was provided by an inter-agency Technical Advisory Committee (TAC), named in the Acknowledgments. Lane Council of Governments (LCOG) coordinated the PFSP update and prepared the report. The project was funded by a grant from the Oregon Department of Land Conservation and Development (DLCD) and contributions and in-kind staff participation from the municipal utilities, public works departments, and Rainbow Water District.

This report contains technical information on providing and financing water, wastewater, and stormwater services and facilities in the Eugene-Springfield metropolitan area. Chapter I contains an introduction to the report and describes project background, purpose and objectives; other facilities and services in the *Metro Plan*; and public involvement. Chapter II provides an overview of the study area, including a description of study area boundaries, identification of jurisdictional responsibility for providing water, wastewater, and stormwater facilities and a description of the service areas for these facilities. Chapter III contains the inventory and condition assessment of existing facilities. Chapter IV describes alternative approaches to providing public facilities. Chapter V presents financing tools; existing financing scenarios, issues, and challenges; and alternative financing strategies.

Background

This project is a work task in the *Eugene-Springfield Periodic Review Work Program*, adopted locally and approved by the DLCD in May 1995.

The PFSP outlines the infrastructure requirements involved in serving the level of development anticipated by the *Metro Plan* for water, wastewater, stormwater, and electricity. The *Metro Plan* Element contains findings, goals, and policies pertaining to the full range of urban services (electrical, police, fire, parks, etc.) provided to properties within the metropolitan area. For more information about the *Metro Plan* and periodic review, please refer to the *Eugene-Springfield Periodic Review Work Program*, May 25, 1995.

The metropolitan area's first public facilities plan was adopted in 1987. Since that time, it has not been updated, but functional plans addressing specific public facilities have been adopted and amendments have been adopted to implement refinement plans for the Willakenzie and Gateway areas. This update will reflect existing and projected facilities needs related to development and growth in the metropolitan area, and will incorporate new policies or approaches to public facilities provision derived from other updated plans, such as the stormwater master plans, wetlands plans and *TransPlan*.

Project Purpose and Objectives

The purpose of the project is to ensure that key facilities and services are provided in a timely, orderly, and efficient manner to existing and new population and land uses within the urban growth boundary (UGB).

The objectives of the project are to:

1. Meet the requirements of Statewide Planning Goal 11, *Public Facilities and Services*;
2. Reflect existing and projected facilities needs related to development and growth in the metropolitan area; and
3. Incorporate new policies or approaches to public facilities provision derived from other updated plans, such as stormwater master plans, wetlands plans and *TransPlan*.

Goal 11, “to plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development,” and associated Oregon Administrative Rules (OAR), spell out the legal framework for public facility planning in Oregon. The Goal rules require cities with a population over 2,500 to adopt a public facilities plan for areas within a UGB. The public facility systems that must be addressed are:

1. Water: water sources and the treatment, storage, pumping, and primary distribution systems;
2. Wastewater: treatment facilities and primary collection systems;
3. Stormwater: major drainageways (major trunk lines, streams, ditches, pump stations and retention basins) and outfall locations; and
4. Transportation. Transportation planning is provided in *TransPlan, the Eugene-Springfield Transportation System Plan (TSP)*, which is incorporated into the PFSP by reference. Statewide Planning Goal 12, Transportation Planning, and associated OAR provide that TSPs adopted pursuant to Goal 12 requirements fulfill the requirements for public facilities planning under Goal 11 (OAR 660-012-0000).

The Plan must contain an inventory, projects, and policies. This report addresses the inventory requirements of the law, including an inventory and general assessment of the condition of the public facility systems serving land in the UGB, including: the mapped location of the facility or service area; facility capacity or size; and general assessment of the condition of the facility. As required by the Goal, this report also includes a discussion of the provider’s existing funding mechanisms.

Other Facilities and Services in the *Metro Plan*

A full range of urban facilities and services is eventually provided to all properties inside the city limits of Eugene and Springfield, in accordance with provisions in the *Metro Plan*. Policies related to the provision of these additional services will be discussed in the updated *Eugene-Springfield Metropolitan Area Public Facilities and Services Plan*.

Public Involvement

This project is being conducted consistent with public involvement direction provided in the *Metro Plan*, the *Periodic Review Work Program*, and the *Public Involvement Plan*, approved by the Joint Planning Commission Committee (JPCC) on March 1, 1999.

In accordance with the adopted *Periodic Review Work Program*, public involvement for this work task will use the following tools to meet public involvement objectives.

- ◆ An **Interested Parties Mailing List** will be maintained throughout the process to notify those listed of significant events such as workshops, forums, and public meetings and hearings. The Interested Parties List for Periodic Review was sent the Periodic Review Newsletter, which contains status reports on this project; the newsletter will be used to solicit interest in receiving materials specific to this project (meeting notices, etc.).
- ◆ **Workshops and Drop-in Sessions** will be conducted to keep the public informed about the status of the study and to obtain public input.
- ◆ **Newspaper Ads and News Releases** will be prepared and released to the local media prior to all events.
- ◆ **Flyers, Fact Sheets, and Frequently Asked Questions** papers will be prepared and distributed throughout the process, as needed.
- ◆ **Presentations** by project staff to local citizen and special interest groups will be available on request.
- ◆ **Public Hearings** will be held on the PFSP and all changes to the *Metro Plan* text or diagram.

Technical Advisory Committee

A Technical Advisory Committee (TAC) was formed to provide direction and to make recommendations related to the products of the study. Members of the TAC represent the following local governments and utilities: Eugene Planning, Eugene Public Works, Eugene Water & Electric Board, Metropolitan Wastewater Management Commission, Springfield Planning, Springfield Public Works, Springfield Utility Board, Rainbow Water District, Lane

County Public Works, and Lane County Land Management Division (by mail only). In addition, technical staff from other city departments and agencies were brought into the process at key times to address specific topics.

Chapter II: Overview of the Study Area

This Chapter provides an overview of the study area, including a description of the study area boundaries; identification of jurisdictional responsibility for providing water, wastewater, and stormwater facilities; and a description of the service areas for these facilities.

The Study Area

A Study Area was identified to define the area of service that now exists within the *Metro Plan* boundary, the area within the jurisdiction of the *Metro Plan* (see Map 1). The Study Area includes: land within the UGB plus areas within the *Metro Plan* Boundary for which public facility planning is required either by *Metro Plan* policy (i.e., to urban reserve areas) or by obligations established through the dissolution of water districts outside the UGB; and areas outside the *Metro Plan* boundary that municipal facilities are either located on or serve.

Jurisdictional Responsibility for Water, Wastewater, and Stormwater

In December 1998, the *Metro Plan* was amended to transfer jurisdiction of Glenwood from the City of Eugene to the City of Springfield. The *Metro Plan* now provides that the City of Eugene has general governmental jurisdiction west of Interstate 5 and the City of Springfield has jurisdiction east of Interstate 5. However, the inventory in this report includes Glenwood in the Eugene facility information, consistent with current data availability.

Water Jurisdictional Responsibility

The following municipal utilities and special districts have jurisdictional responsibility for providing water service within the metropolitan UGB:

- ◆ Eugene Water & Electric Board (EWEB)
- ◆ Springfield Utility Board (SUB)
- ◆ Rainbow Water District
- ◆ Santa Clara Water District
- ◆ River Road Water District
- ◆ Glenwood Water District

EWEB and SUB have jurisdictional responsibility throughout Eugene and Springfield, and also supply water outside city limits, mostly within the UGB. The water districts have jurisdictional responsibility within their districts. *Metro Plan* policy states that the cities of Eugene and Springfield and their respective municipal utilities, EWEB and SUB, have ultimate responsibility for providing water service within the UGB.

Wastewater Jurisdictional Responsibility

The following local and regional governments share responsibility for the collection and treatment of wastewater in the metropolitan area:

- ◆ Metropolitan Wastewater Management Commission (MWMC)
- ◆ City of Eugene
- ◆ City of Springfield

MWMC has responsibility for the regional wastewater collection and treatment system. The cities have responsibility for the installation and maintenance of local wastewater sanitary collection systems within their respective municipal boundaries. The local systems are primarily gravity lines that are smaller than 24 inches in diameter, although some of the pump stations and larger lines are also managed by the cities.

MWMC was formed by intergovernmental agreement in 1977 by Eugene, Springfield, and Lane County to provide regional wastewater services within a county service district boundary established by the partner agencies. The agreement specifies the roles of the MWMC, which primarily include: construction, maintenance, and operation of the regional wastewater facilities; financial planning; and determining user charges and connection fees. The agreement also specifies the functions and obligations of the Eugene and Springfield governing bodies, including billing and collection of charges, provision of local wastewater collection and customer contact, and the establishment of local annexation and growth policies. Ancillary to MWMC is the Lane County Metropolitan Wastewater Service District (county service district), which was formed in accordance with Oregon law to provide the bond funds to match federal grants used to construct the Water Pollution Control Facility (Regional Treatment Plant or treatment plant) and other regional facilities. Formation of this district was supported by Eugene, Springfield, and Lane County.

The MWMC is made up of city councilors from Eugene and Springfield, a Lane County Commissioner, and citizens appointed from each jurisdiction. MWMC provides oversight for the Regional Wastewater Program. Staffing and services to MWMC are provided through contracts with Eugene and Springfield. Eugene provides operation and maintenance services and Springfield provides administrative services and intergovernmental coordination. Lane County is a member of MWMC and provides support to the county service district.

Stormwater Jurisdictional Responsibility

The following local governments and special districts have jurisdictional responsibility for the stormwater system in the metropolitan area:

- ◆ City of Eugene
- ◆ City of Springfield
- ◆ Lane County
- ◆ Junction City Water Control District
- ◆ River Road Water Control District

The two cities have jurisdictional responsibility for stormwater within their boundaries. Lane County is responsible for maintenance of open ditches, pipe systems, and catch basins associated with the street system in the unincorporated portions of the metropolitan area. The cities and the county are also responsible for Federal Emergency Management Agency floodplain management programs. Some Springfield stormwater outfalls flow outside of the UGB and are not within city or county jurisdiction for improvement or maintenance.

The Natural Resource Conservation Service (NRCS), the Army Corps of Engineers (Corps), the Bureau of Land Management (BLM), the Junction City Water Control District, and the River Road Water Control District have responsibility for a few drainage channels and wetland systems within the UGB. Eugene maintains Amazon Creek, but most of its reach is within the Corps' jurisdiction.

Water, Wastewater, and Stormwater Service Areas

Water Service Areas

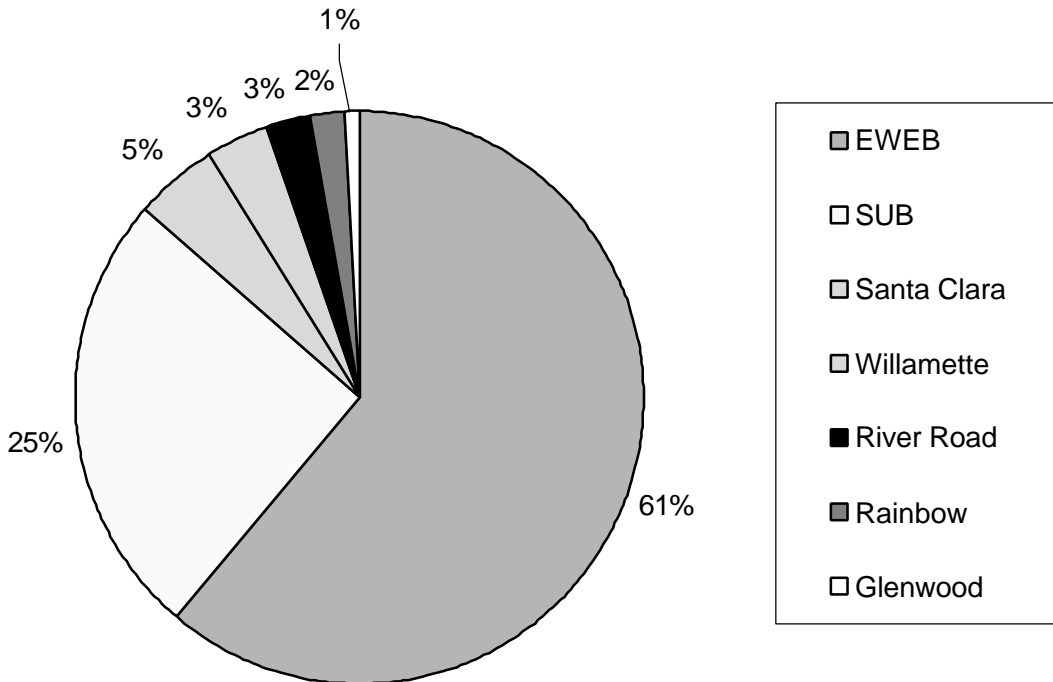
Water service is distributed within the UGB by two municipal utilities, four special service districts, and one private company. The following utilities, districts, and private company provide water within the Study Area (see Map 2).

1. Eugene Water & Electric Board
2. Springfield Utility Board
3. Santa Clara Water District
4. Willamette Water Company
5. River Road Water District
6. Rainbow Water District
7. Glenwood Water District

EWEB and SUB are municipal utilities; Rainbow, Santa Clara, River Road, and Glenwood are domestic water supply districts; and Willamette is a private water company. All of the domestic water districts, except Rainbow, provide water service through contract with EWEB; Willamette Water Company purchases water from EWEB. The Filbert Grove Water Company, which provides service to the Filbert Grove subdivision in southwest Springfield, was purchased by SUB in May 1999. This private system no longer exists. Map 3 shows the existing drinking water system in the Study Area, depicting the primary distribution system of EWEB, SUB, and Rainbow Water District water mains 12 inches and greater and EWEB's Hayden Bridge Intake and Filtration Plant.

A total of 52,310 acres are served with water. Most of this acreage, 61 percent, is served by EWEB, followed by SUB at 25 percent (see Figure 1) . The water districts and private company serve 5 percent or less of the total service area. Areas within the UGB not served with water are generally outside the Eugene and Springfield city limits.

Figure 1: Percentage of Total Acres in Study Area Served by Each Water Provider



Water is provided in the Study Area as follows:

- ◆ EWEB provides water within the Eugene city limits and to some individuals and large users outside the city and UGB, including Lane Community College; the Eugene Airport, Mahlon Sweet Field; and Willamette Water Company. Lane Community College, the airport, and a small portion of the Willamette Water Company in the LCC basin are within the *Metro Plan* boundary. (The remainder of the Willamette Water Company service areas are located outside the jurisdiction of the *Metro Plan*, generally north and south of the community of Goshen.)
- ◆ The Santa Clara and River Road Water Districts contract with EWEB for water supply and distribution to unincorporated land within their service areas. EWEB supplies the water and provides operation and maintenance of the systems. The primary customers of the River Road and Santa Clara Water Districts are residential.
- ◆ SUB provides water within the city limits and to some areas outside the city, including some individual properties within and outside the UGB. In May 1997, SUB purchased the entire Douglas Gardens portion of the Willamette Water Company, outside the UGB. In May 1999, SUB purchased the Filbert Grove Water Company, which served the Filbert Grove subdivision on Harbor Drive in southwest Springfield. This subdivision is located outside the city limits, but is within the UGB.

- ◆ Rainbow Water District provides water within its district, north and west of the City of Springfield.
- ◆ Glenwood, which was previously within Eugene's portion of the UGB, is provided water by EWEB inside the city of Springfield and, in unincorporated areas, by the Glenwood Water District, which contracts with EWEB. EWEB's contract is for water supply and distribution and operation and maintenance of the system. Glenwood Water District's customers are primarily industrial users, which tend to have more consistent demand than residential customers. Information on the Glenwood system is provided in the Eugene section of this report because Glenwood was in Eugene's portion of the UGB at the time this information was prepared.

Wastewater Service Areas

Wastewater service areas include the incorporated city limits of Eugene and Springfield and the River Road-Santa Clara area. The decision to extend wastewater services to the River Road-Santa Clara area was based on groundwater quality concerns related to the failure of septic tanks. Lane County regulates the installation of septic systems in the unincorporated area through an intergovernmental agreement with the State of Oregon. The construction of wastewater interceptors has been completed in the River Road-Santa Clara area, and the County no longer issues septic permits in this area. The City of Eugene is requiring all existing development in the River Road-Santa Clara area to connect to the wastewater system and requires all new development within the UGB to annex to the City of Eugene and connect to the wastewater system.

Stormwater Service Areas

Eugene-Springfield is located in the southern Willamette Valley in the western third of the Upper Willamette Drainage Basin, as shown in Map 9. Drainage in the southern Willamette Valley is a combination of natural and built systems that have evolved over time.

The existing stormwater conveyance system in the metropolitan area is shown in Map 10, including existing pipes 36 inches or larger, open stormwater channels and ditches, and wetlands. Pipes 36 inches and larger were identified as being of metropolitan-wide significance, as they comprise the major collection system for the metropolitan area. The stormwater system for the Eugene-Springfield metropolitan area is comprised of natural and constructed drainageways, both piped and open systems. Within the Eugene and Springfield city limits, stormwater is funneled into a system of curbs, gutters, enclosed pipes, and open drainageways before discharging into the Willamette, McKenzie, and Long Tom Rivers.

Chapter III: Inventory and Condition Assessment

This chapter presents a detailed inventory of water, wastewater, and stormwater facilities in Eugene and Springfield and an assessment of their current condition.

Eugene Water System Inventory and Assessment

Eugene Water System Inventory

The source for all domestic water supply in Eugene's water system is the McKenzie River. Map 4 shows the existing water system serving the Eugene portion of the UGB, including: water mains 12 inches and larger (primary distribution system), reservoirs, and pump stations. EWEB's Hayden Bridge Intake and Filtration Plant is shown in Map 3.

EWEB's water system feeds water through 45-inch and 60-inch transmission mains from the Hayden Bridge Filtration Plant into the system to supply the EWEB service area plus Santa Clara, River Road, and Glenwood Water District service areas. EWEB has 600 miles of distribution mains in its system. Distribution pipes range in size from two inches to 20 inches and predominantly consist of cast and ductile iron. EWEB distribution pipelines deliver water to service areas under various operating conditions to supply peak hour demands, refill, and reservoirs and to supply fire fighting needs. Existing facilities of the River Road, Santa Clara, and Glenwood Water Districts consist solely of a distribution system.

The EWEB storage reservoirs supplement EWEB's Hayden Bridge plant supply during peak demand periods, fires, and emergencies. Storage of 77 million gallons of water is contained in 24 reservoirs, which provide water for *equalizing*, fire, and emergency needs. Two of the reservoirs are outside the UGB. *Equalizing*, or *peaking*, storage means providing the water needed to make up the difference between the supply rate and the daily peak demands. There are approximately 60 million gallons of storage in the base level of EWEB's distribution system. The remaining 17 million gallons are distributed among the reservoirs that exist in the upper service levels. Distribution reservoirs are refilled to optimize water quality and to meet demands. Storage volumes for fire are based on the highest fire flow requirements in a service level for a fixed duration of time. Emergency storage volumes are designed to meet demands during emergencies when the normal supply is interrupted such as for power outages, broken pipelines, or pump station failures.

There are currently 31 pump stations, two at the Hayden Bridge plant, two in the base level, and 27 serving the upper service levels. Two pump stations in the base service level pump water from the storage reservoirs into the base level distribution system. One of these pump stations, the Santa Clara Low Level Pump Station, is important to the base level system to meet both current and future maximum hour demands. Increased use of this pump station will be required if the full volume of the Santa Clara Reservoir is to be used during maximum demand periods.

Eugene Water System Condition Assessment

Basic criteria to assess the condition of the distribution and storage systems are the water system's ability to:

- ◆ Serve peak hourly demands,
- ◆ Supply fire and emergency needs, and
- ◆ Maintain system pressures within a desirable range during peak hour demand conditions and reservoir refill conditions.

Eugene Water System Capacity

The existing water distribution system in Eugene will require expansion in order to serve the land uses designated within the UGB. In recent years, the service areas in the Eugene portion of the UGB have experienced a high growth rate, and EWEB has been connecting between 1,000 and 1,500 new services a year. The all-time, one-day water usage record was set on July 27, 1998, when the system demand was 69.6 million gallons. It is anticipated that by the year 2003, more supply and treatment capacity will be needed.

Water demand can be measured in terms of annual average day demand and maximum day demand (the demands on the water system on the maximum day of use). Since 1980, the annual average day demand for the EWEB system has ranged from a low of 19.5 million gallons per day (mgd) in 1983 to a high of 28.2 mgd in 1987. The maximum day demand for the EWEB system has ranged from a low of 44.4 mgd in 1983 to a high of 69.6 mgd in 1998. Water supply, treatment, and pumping facilities are typically designed to meet maximum day demand.

The rated capacity is what the Oregon Health Division has determined to be the flow rate at which water can be produced at the Hayden Bridge plant on a continuous basis with all facilities in service. As evaluated in the current *EWEB Water System Master Plan*, the rated capacity of the Hayden Bridge plant is 72 mgd with all facilities operational. Based on existing facilities without improvements, the Hayden Bridge plant, with all filters in operation has a rated capacity of 72 mgd in summer, when water quality is good, and 48 mgd in winter, when water quality is poorer.

Eugene Water Distribution System

The pipe system is adequate with routine replacement underway. The distribution system is primarily composed of cast and ductile iron pipe. Polyvinyl Chloride Pipe (plastic) pipe is only used in the two-inch pipe size; and there is some asbestos cement and steel piping that is currently being replaced as part of an ongoing main replacement program.

Eugene Water Treatment

The performance of EWEB's Hayden Bridge plant is considered excellent, based on the quality of existing treated water. The treated water consistently meets and exceeds the quality standards currently in effect.

The majority of the Hayden Bridge plant facilities are 30 to 40 years old. Although some of the equipment has been replaced or renewed, most of the original equipment requires routine maintenance. EWEB has been replacing some of the piping and filter control valves and rebuilding some of the large hydraulic-cylinder operated gate valves. There is only minor leakage or seepage noticed at the concrete wall and slab joints of the filters and basins. Routine maintenance has been required over the years to repair or recaulk the joints. Concrete work appears to be generally in good condition considering the age of the facility. The primary concern with the existing concrete waterholding structures is the deterioration of the original waterstops in concrete wall and floor joints.

The primary process limitation to the capacity of the Hayden Bridge plant is the filters. Plant operation in the current mode of filter rate control has been limiting the *clean filter* maximum capacity at nine mgd in the summer when the raw water is relatively good quality (low turbidity) and six mgd in the winter when the raw water has higher turbidities.

Eugene Reservoirs

All EWEB distribution reservoirs are covered and maintained in good condition. Existing service levels are satisfactory for obtaining proper service pressures throughout the distribution system. Due to geography, there are some isolated areas where water pressure is not optimal, but meets minimum Oregon Health Division codes and regulations.

Springfield Water System Inventory and Assessment

Springfield Water System Inventory

The source for all domestic water supply in Springfield's water system is groundwater from existing wells in the McKenzie River and Willamette River aquifers. Map 5 shows SUB's and Rainbow Water District's existing water system serving the Springfield portion of the UGB, including: water supply wells and well fields; water mains 12 inches and larger (primary distribution system); reservoirs; and pump stations.

The SUB and Rainbow systems are divided into three separate service areas: West, located in downtown Springfield, south of Interstate 105 and west of the railroad tracks, running north and south, near 28th Street; East, located east of the 28th Street railroad tracks; and Rainbow/North, or Rainbow Water District/SUB North, located north of Interstate 105. The West and East areas are served only by SUB, and North is served jointly by SUB and Rainbow. Rainbow Water District serves the Menlo Park area that has not been annexed to the city.

The three service areas compliment one another with source and storage. The Weyerhaeuser Wellfield feeds both the East and North service areas. Relative pressures from the three areas are 55 pounds per square inch (psi) in West, 85 psi in East, and 88 psi in North. The pressure is held significantly lower in the West to minimize leakage from older customer plumbing that exists in this area. The West area of the system was purchased from Pacific Power and Light in 1975.

The 33 wells in the system are all active and are primarily located northwest, northeast, and south of the city, with some located outside the UGB (see Map 5). SUB owns 23 wells; Rainbow owns seven wells; and SUB and Rainbow jointly own three wells. The combined developed capacity of the wells is 26.1 mgd. The East SUB system has three sources of supply: the Weyerhaeuser Wellfield, the Thurston Wellfield, and the S.P./Maia Wellfield. The main source of supply for the West SUB system is the Willamette Wellfield at the south end of South 28th Street. In addition to the water from the Willamette Wellfield, some other water enters the West SUB system from the East SUB system through pressure-reducing valves. SUB has an additional well, Sportsway No. 1, on the north edge of Springfield near Interstate 5. Water from the North system enters both the West and East system through pressure reducing valves or metering stations. This water serves north and west Springfield. Rainbow Water District has three wellfields and shares the use of a fourth, the Weyerhaeuser Wellfield, with SUB.

Both the SUB and Rainbow systems are treated by chlorine supplied to all water leaving the wells or wellfields before the water enters the distribution system. No other treatment is provided, although an organics removal plant was constructed at the Weyerhaeuser Wellfield and remains on standby should any contaminants reach the wells due to groundwater contamination on the Weyerhaeuser plant site.

There are eight storage tanks (reservoirs) in the Springfield system, of which SUB owns six and Rainbow Water District owns two. Some of the reservoirs are located outside the UGB. The reservoirs provide a total of 12.7 million gallons of storage. There are five distribution storage reservoirs serving the East SUB service areas. Two are located on South 57th Street and two are located on South 67th Street. There is one small high-elevation reservoir south of Main Street near the east city limits, on South 70th Street. There is one reservoir serving the West system as well as the intertie to the Rainbow system. Rainbow Water District has one distribution storage reservoir, a tank on Kelly Butte, and shares a second reservoir, Moe Hill, with SUB.

There are five pump stations in the SUB and Rainbow Water District service areas. Two pump stations pump water from reservoir to reservoir, two pump water to pressurized service areas, and one pumps water from the distribution system to a reservoir. The pump stations are located at 72nd Street, 67th Street, South Fifth Street, Willamette Heights, and on Kelly Butte.

Springfield Water System Condition Assessment

Springfield Water System Capacity

Together, SUB and Rainbow Water District serve an area of approximately 14,000 acres. As an annual average, the two systems currently provide 11 mgd of drinking water. During a peak use period in the summer, the systems have provided over 23 mgd.

The total production capacity of the 33 wells located in the Springfield area is 26.1 mgd. This capacity provides a modest surplus over the current maximum day demand of 23.9 mgd. A prudent, economical reserve recognizes that the well pumps are subject to mechanical failures or water quality problems that temporarily limit their production. The surplus supply at the wells is

less than 10 percent, which is the minimum recommended by CH2M Hill in the May 1998 draft *Springfield Water System Master Plan*. High usage days, called maximum days, have occurred in the recent past, primarily because of extended periods of hot, dry weather. Existing wells along the Middle Fork of the Willamette River are now being pumped to capacity.

Springfield Water Distribution System

To prepare the master plan for the distribution system, CH2M Hill modeled the performance of SUB and Rainbow's piping system for a variety of conditions. Generally, the piping system is adequate for current conditions but will need replacement as demand increases. These conditions included current peak hour and fire supply conditions; future modeling for the same types of conditions are sections of pipe in both North and East that will require replacement.

Unmetered water losses in the East and North SUB system are near an acceptable level and system pressure is adequate. South of Main Street, SUB is lacking a major east-west supply line. At present, the areas south of Main Street are all supplied by individual lines connected to the line on the north side of Main Street, and to a main in Jasper Road. Circulation in the area will be inadequate in the future and supply reliability will be less than it would be with a major supply line.

The West SUB system needs improvements. Distribution storage is adequate in terms of capacity, but this system contains a substantial amount of pipe installed before 1940. Much of this pipe has been replaced. However, an unacceptable water loss from pipe leakage remains.

Springfield Water Treatment

SUB and Rainbow Water District have excellent quality groundwater for their supply; however, regulations may require further treatment. Due to the excellent water quality, the sole form of treatment applied at the wells is chlorination, followed by a short detention period. This level of treatment complies with current rules. Two new drinking water regulations may require additional treatment. The state and federal Surface Water Treatment Rule (SWTR) requires investigations of groundwater supplies to determine if the quality of water is influenced by nearby rivers. The state may classify wells within three of SUB and Rainbow's wellfields as surface water influenced: the Weyerhaeuser, Thurston, and Willamette Wellfields. If this occurs, additional treatment costing between \$1 million to \$8 million may be needed. The costs depend on the number of wells and the treatment required.

Weyerhaeuser Company installed an organics removal, activated carbon filtration plant for the Weyerhaeuser Wellfield in 1996. Weyerhaeuser installed this plant as an insurance measure, because organic contaminants were detected in Weyerhaeuser's monitoring wells upgradient of the wellfield. No contaminants have reached the wellfield and the plant has remained on standby.

One other new regulation may also affect SUB's and Rainbow's operations. The State of Oregon Uniform Fire Code recently adopted requirements for treatment systems to handle emergency releases of chlorine from gas-chlorination facilities. The Environmental Protection

Agency (EPA) is developing rules that will require utilities to develop Risk Management Plans for handling gas and liquid chlorine. The final nature and implementation of these rules may force SUB to install new chlorination system facilities at the wellfields. The estimated cost for compliance is \$400,000, although the range in cost impact is from zero to \$800,000.

Springfield Reservoirs

The SUB and Rainbow Water District systems currently have eight finished water reservoirs. Their total volume of 12.7 million gallons is adequate to meet overall system needs but as demand continues to grow, more storage will be needed. Levels of service have been designated for the distribution and storage system. The levels of service are pressure zones determined by elevations. Elevation differences require the development of pressure zones to maintain system pressure within accepted low and high ranges. The service levels are as follows: 570 feet, top of first level; 670 feet, top of second level; 870 feet, top of third level; 1,050 feet, top of fourth level. Demand growth is projected for the fourth level service in the East system. As this growth occurs, there will be a need for an additional storage reservoir to provide gravity supply.

Regional Wastewater System Inventory and Assessment

Regional Wastewater System Inventory

Map 6 shows the existing wastewater collection and treatment systems in the Study Area, including existing pipes 24 inches or greater in diameter plus the eight-inch line to the Eugene Airport, and the Regional Wastewater Treatment Plant (also known as the Water Pollution Control Facility or the treatment plant). The MWMC regional wastewater collection and treatment system includes most gravity wastewater lines 24 inches in diameter and larger, several pump stations, the treatment plant, the Biosolids Management Facility, and the Seasonal Industrial Waste Facility.

The treatment plant is located in the River Road area, east of River Road and south of Beltline Highway. The Biosolids Management Facility and Seasonal Industrial Waste Facility are located along Awbrey Lane off of the Northwest Expressway, within Eugene's northwest industrial corridor. The Biosolids Management Facility handles the digested sludge after it is pumped through a four-mile pipeline from the treatment plant. Four facultative sludge lagoons store the digested sludge for three years, and then the material is pumped into asphalt drying beds. After drying, it is reused as a soil nutrient on nearby grass farms.

The regional collection system inventory is included in the discussion of wastewater system inventories in the two cities below.

Regional Wastewater Treatment System Condition Assessment

Regional Wastewater Treatment System Capacity

The *MWMC Master Plan for the Eugene-Springfield Water Pollution Control Facility*, (Master Plan), completed in 1997, provides a comprehensive evaluation of the facility. The *Master Plan* estimates a fully sewerred population within the metropolitan UGB to reach 402,567 by 2040, with a regional population of 443,033 receiving wastewater service at full build-out in 2050. The Master Plan estimates that existing design capacity of the treatment plant can serve all new development in the metropolitan area through at least the year 2020. However, peak wet weather conditions that cause large volumes of stormwater to enter the wastewater collection system constrain the plant from achieving its designed capacity. Wet weather related improvements are needed at the plant and within the collection system to extend the plant's wet weather capacity beyond the year 2007.

The treatment plant, which officially began operation in April 1984, replaced the separate plants previously owned and operated by Eugene and Springfield. At the time of construction, the capacity of the plant was projected to serve the growing metropolitan area for a period of 20 years. However, slower than anticipated growth in the 1980s has extended the design life of the plant by at least 15 years.

The regional Biosolids Management Facility was designed to match biosolids drying and land application to the volume produced by the wastewater treatment plant. However, lower than anticipated solids processing efficiency (primarily due to variable summer weather conditions) is requiring additional improvements at the facility in order to match the design capacity of the treatment plant.

The treatment plant has a dry weather design capacity of 49 mgd. Current actual dry weather flows range from 45 percent to 57 percent of the design capacity. Sufficient treatment capacity exists to meet projected growth throughout the PFSP planning horizon. However, peak wet weather volume of flow, not influent wastewater characteristics, currently constrains the life span of the plant's design capacity. The plant has a wet weather design capacity of 175 mgd. Current maximum monthly wet weather flows reach 85 percent of the design capacity for flow. High levels of wet weather flows are generated by infiltration and inflow (I/I) of stormwater into the sanitary sewer system. Infiltration is a process by which groundwater enters the system through cracks and joints in sewer pipes. Inflow is the process by which stormwater enters the system through improper connections of roof drains and other stormdrainage facilities to the sanitary sewers, and by surface runoff entering through manholes.

Regional Wastewater Treatment Facilities Condition Assessment

The physical condition of the regional wastewater treatment facilities is maintained through equipment replacement programs and major rehabilitation programs funded by MWMC to maintain and extend the life of major regional wastewater collection and treatment infrastructure. Current physical conditions with planned future equipment replacements and ongoing

rehabilitation projects will maintain all regional wastewater facilities in good working order for the duration of the PFSP planning period.

Compliance with regulatory parameters is a good indicator of facility conditions. The treatment plant has always operated in compliance with its National Pollutant Discharge Elimination System (NPDES) permit during wet weather conditions. The mismatch of wet and dry weather treatment plant design is due to the fact that the amount of I/I targeted for removal through collection system rehabilitation to match the wet weather hydraulic capacity has not been achieved. To address this issue, MWMC, Eugene and Springfield are developing a Wet Weather Flow Management Plan (WWFMP) to determine the optimal mix of treatment plant and collection system rehabilitation improvements. Recommended improvements will be incorporated into MWMC, Eugene and Springfield Capital Improvement Programs to extend the wet weather capability of the system.

Since 1990, the amount of sludge produced by the Biosolids Management Facility has exceeded the process capacity of the facility's drying beds. This has occurred because two drying cycles per year are necessary to keep pace with production. Frequently, summer rains prevent two cycles from being achieved. Expansion of the facility's dewatering capacity is needed to extend the capacity of the lagoons beyond the year 2000. MWMC is currently completing designs/engineering, and will construct a mechanical dewatering facility in 1999/2000 that will eliminate the biosolids processing capacity constraint.

The condition of biosolids quality is excellent, and consistently meets or exceeds all federal standards. No degradation of biosolids quality is anticipated over the PFSP planning period.

Eugene Wastewater System Inventory and Assessment

Eugene Wastewater System Inventory

Map 7 shows the existing wastewater system basins in Eugene, the Regional Wastewater Treatment Plant (treatment plant), existing pipes 24 inches or greater in diameter, and the eight inch line to the Eugene Airport.

As of 1998, the wastewater collection system totaled 607 miles in length, with over 20 miles of pressure lines. The collection system consists of 433 miles of eight-inch pipe, and 46 miles of pipe 24 inches or greater in diameter. There are five main collection system areas (system areas) within Eugene's service area, each of which is divided into basins, as follows.

1. Central Eugene: Downtown Westside, Downtown Central, Downtown Amazon, and Downtown Franklin basins
2. Willakenzie: Willakenzie North and South and Willamette River basins
3. Bethel-Danebo: Bethel-Danebo North and South basins
4. Southeast Eugene: Glenwood and Lane Community College basins
5. River Road: River Road, Santa Clara and Highway 99 basins

The system areas are divided into 14 basins, which are further divided into a network of 148 sub-basins. The largest system areas are the Central Eugene, Willakenzie, and Bethel-Danebo areas.

Central Eugene System Area

The Central Eugene system area is served by a network of about 230 miles of lateral, trunk, and wastewater interceptors. Four major wastewater interceptor lines, three major trunk lines, and eight pump stations serve the area. Wastewater is carried to a downstream point near Polk Street at the south bank of the Willamette River. Flow is then routed through a 72-inch interceptor to the treatment plant. The largest pump station in the system is the regional Fillmore station.

Willakenzie System Area

The Willakenzie system area is currently served by over 60 miles of interceptor, trunk, and lateral wastewater lines. The area uses six pump stations, including a new station located off of north Gilham Road on Crimson. The Sterling View pump station was abandoned in 1996. Wastewater in the area flows to the regional Willakenzie pump station and then is pumped via pressure lines across the river to the regional wastewater treatment plant.

Bethel-Danebo System Area

The Bethel-Danebo system area is served by two trunk lines and two regional pump stations and parallel pressure mains. All wastewater from the area flows by gravity to the two regional pump stations and is then pumped through two pressure lines which extend easterly about 3.5 miles along Jessen Drive and Beltline Road en route to the regional wastewater treatment plant.

Southeast Eugene System Area

The Southeast Eugene system area encompasses approximately 3,000 acres of land between Eugene's east ridgeline and the Willamette River and includes the Glenwood and Lane Community College basins. The Laurel Hill area is within this system area. Parts of Glenwood and Laurel Hill are provided wastewater collection service. In 1995, a new Glenwood pump station was constructed along with a force main connected to the East Bank Interceptor. This project required the construction of a pressurized Willamette River crossing and the location of a pump station just south of the river off Franklin Boulevard.

Lane Community College (LCC) is on approximately 320 acres and has over 7,300 students and faculty. The LCC basin, located outside the UGB, does not receive wastewater collection from the City of Eugene. The basin currently uses a self-contained lagoon treatment system. LCC is in the process of modifying its lagoon treatment system due to two primary factors: 1) LCC is in violation of its Department of Environmental Quality (DEQ) effluent permit for discharges into Russell Creek, and 2) LCC anticipates physical expansion of college facilities in the near future. Several alternatives are being considered for

implementing these necessary changes, including a new filtering system, physical redesign of treatment lagoons to increase capacity, and the integration of spray irrigation methods.

River Road System Area

The River Road system area connects to pressure lines on Beltline Road, which also serve the Bethel-Danebo area. The River Road basin is served by major pump stations, interceptors and trunk lines, constructed in 1985. Lateral collection systems to serve existing development are nearly complete. The Santa Clara and Highway 99 industrial basins are also served by a system of gravity and pressure interceptors that are connected to the west Eugene pressure main. City wastewater facilities now serve almost all existing development in the River Road-Santa Clara area (east of the Northwest Expressway).

The Eugene Airport, Mahlon Sweet Field, located outside the UGB and adjacent to the Highway 99 Industrial Basin, receives wastewater collection service from the City of Eugene. There are two pump stations in the area. The Piper pump station, constructed in 1977, is located at the Airport near runway #34. The station has an eight-inch influent line and a four-inch effluent line, which discharges to a gravity influent line to the Airport pump station. The Airport pump station on Greenhill Road was built in 1987 and serves the entire Airport complex except for facilities located at the Piper pump station. The pump station has an eight-inch influent line and a six-inch effluent line, which discharges into the Enid pump station gravity system.

Eugene uses 26 local pump stations that discharge into local interceptors or gravity line systems and four regional pump stations that discharge, either directly or indirectly, through effluent lines into the regional wastewater treatment plant. Regional pump stations include the Fillmore, Terry Street, West Irwin, and Willakenzie.

1. The Fillmore is the largest pump station in the Central Eugene system area. This pump station was constructed in 1960 in conjunction with the west Eugene trunk sewer. The pump station was completely renovated to a modern facility in 1995 and will be capable of serving the Downtown Westside basin well into the future.
2. The Terry Street pump station serves the Bethel South basin. The pump station was constructed in 1985 as the primary station to serve the Westside trunk line, providing increased capacity for the South Basin service area.
3. The West Irwin pump station serves the Bethel North basin. The pump station, constructed in 1965 to serve areas in northwest Eugene annexed a year earlier, was modernized in 1985 and received further modifications to increase capacity in 1998.
4. The Willakenzie pump station serves the Eugene-Springfield area east of the Willamette River, including the East Bank Interceptor, which carries wastewater from the City of Springfield, the Glenwood and Laurel Hill Valley areas, and areas of Eugene north of the Willamette River.

Eugene Wastewater System Condition Assessment

Collection System

Table 3-1 presents an assessment of the general condition of the wastewater collection system in Eugene for pipes 24 inches and larger. The existing system is generally in adequate condition, based on wastewater line inspection results and conveyance capacity.

Table 3-1: Eugene Wastewater Collection System General Condition Assessment

Facility Type	Adequate	Inadequate	Total
24-inches+ Diameter	42 miles	4 miles	46 miles

Source: Eugene Public Works Department, 1998.

The Wet-Weather Flow Management Project, a joint undertaking of Eugene, Springfield, and MWMC, will produce recommendations on the most cost-effective manner to eliminate overflows from the wastewater system into the Willamette River during five-year storm events. The recommendations are to be presented by the consultant, CH2M Hill, in July 1999 with implementation to follow.

The MWMC, with assistance from consultant CH2M Hill, is developing a hydraulic model tool of its regional wastewater system. This model will assist in flow monitoring and the efficient management of collection systems and operation of Eugene’s overall wastewater system.

Approximately 80 percent of the wastewater system has been constructed since 1950. The oldest pipelines were constructed between 1900 and 1905. The Central Eugene system contains all of the older pipelines which may contribute most of the I/I to the Eugene collection system. A *Sewer System Evaluation Survey*, 1978, indicated that about 80 percent of total I/I was contributed by the Central Eugene system.

The Willakenzie system area was annexed to the city in 1960 with a majority of the wastewater system constructed between 1961 and 1964. A large area north of Beltline Road is still not annexed or served by wastewater systems. Major improvements in the system are occurring in the Willakenzie North Basin north of Beltline Road. Since 1992, new wastewater line extensions in this area have been developed off Coburg Road and Gilham Road.

A majority of the north Bethel-Danebo basin area was annexed to the city in 1964. Wastewater systems in the area were designed to allow for phased construction as growth occurs. The 1987 *Metro Plan* projects that more than 40 percent of the city’s growth will occur in this area. Recent development pressures have intensified in southwest Eugene and industrial development has consumed much of the remaining capacity in the west Eugene conveyance system, which was intended to be expanded to meet projected growth demands. The system consists primarily of the West Irwin and Terry Street pump stations and the force mains to the regional wastewater treatment plant.

MWMC has identified the Terry Street pump station as a potential receiving point for new discharges in the Bethel-Danebo area. The discharges will also impact the west Irwin pump station and will accelerate the timeline for expansion of the west Eugene conveyance system. A new Barger-Greenhill pump station is scheduled for completion in 1999, one of the system upgrades in the area. However, this facility is needed to serve a new school and will primarily increase capacity for improvements in the Willow Creek basin and southwest Eugene, and not the Terry Street area. According to the *Master Plan*, modifications to the West Irwin pump station motor and electrical system controls should help resolve the needed capacity increases.

In the River Road-Santa Clara area, Lane County entered into an agreement with the Oregon DEQ in September 1980 to limit future development until an action plan could be prepared to reduce negative impacts of septic systems on groundwater quality. In response to groundwater contamination problems in the surrounding unincorporated lands, the EPA awarded a construction grant to Eugene for a system of interceptor lines. Recent conveyance improvements in the area have occurred in the River Road Basin, including numerous line extensions along River Road and a series of improvements along Prairie Road between 1997 and 1998.

Pump Stations

The Fillmore station, constructed in 1960 in conjunction with the west Eugene trunk sewer, was completely renovated to a modern facility in 1995 and will be capable of serving the Downtown Westside basin well into the future.

The Judkins Point pump station was constructed in 1954 and had a number of problems relating to capacity and pressure line inadequacies. These problems were addressed in 1995 through a full modernization of the facility and the construction and subsequent flow diversion to the new Glenwood pump station. Other pump stations in the Central Eugene system serve small localized areas.

In the Southeast Eugene system area, the Glenwood pump station will serve the greater Glenwood area and Laurel Hill. In addition to these improvements, a second force main and temporary pump station are currently being built in the area with private funding. These facilities have significantly improved capacity for accommodating new developments.

Springfield Wastewater System Inventory and Assessment

Springfield Wastewater System Inventory

The City of Springfield's wastewater collection system consists of seven major interceptors and several miles of collector lines. In total, more than 200 miles of sewer lines are maintained by the city. Map 8 shows the existing wastewater basins in Springfield and existing pipes 24 inches or larger. Springfield operates a total of 18 wastewater pump stations, having abandoned two regional pump stations in 1996. The old Springfield Wastewater Treatment Plant was decommissioned in 1985 and demolished the following year. All wastewater flows are now

conveyed to the regional East Bank Interceptor, which connects with the regional treatment plant in Eugene.

The Springfield wastewater service area is divided into ten major basins that are generally defined by topographic features (see Map 8), as follows.

1. Downtown
2. South A Street
3. Central
4. Main Street
5. North Springfield
6. North Branch
7. Thurston
8. South Springfield
9. Jasper
10. Douglas Gardens

Downtown, South A Street, and Central Basins

These three basins support Springfield's downtown, commercial, and residential core. The Downtown and Central basins comprise the oldest part of the community. The City has replaced or rehabilitated a large portion of the public lines in this area. The private service lines remain a source of I/I to the system, causing capacity problems in the trunk lines during storm events. Portions of the Downtown basin saw the construction in 1998 of the South Springfield Interceptor, consisting of a 48-inch extension from near Mill and Aster Streets, and east to 32nd Street. Portions of the new line follow the railroad tracks downtown and include line segments of between 42 to 48-inches in diameter.

Main Street Basin

Growth in the eastern portion of the basin has been greater than anticipated, placing increasing importance on capacity improvement projects. As much as 500 acres will eventually be added to the basin area as Springfield continues to grow eastward along the McKenzie Highway. Between 1992 and 1993 the City embarked on major improvements along Main Street. These improvements included trunk-line replacement and expansion, and the extension of lines east to 71st Street. In 1992 construction was completed on parallel extensions of trunk lines beginning from 32nd Street and extending east to 54th Street. Additional work along Main Street included the expansion and/or extension of 12-inch lines out to 71st Street in 1993. The Main Street diversion line was recently installed at 42-inches south of Main along 32nd Street.

North Springfield Basin

The North Springfield Basin is mostly developed residential land outside the city limits and within the UGB. Most of the residences and neighborhood businesses have no municipal sewer service but have individual septic systems. This basin and the North Branch basin

were studied in the 1991 North Springfield Sanitary Sewer Study, which outlined service options for the developed and the remaining undeveloped area. Capacity in the East Springfield Interceptor is adequate to serve both the unsewered developed area and the remaining developable land in the basin. Two portions of those facilities identified in this study have been constructed, a pump station to serve study areas 17 through 23, and a dry trunk line to a future pump station that will serve the eastern portion of the basin.

North Branch Basin

The north-end of this basin has significant acreage beyond the city limits (north of the Gateway area), but inside the UGB. In addition, there are 350 acres of unincorporated residential islands adjacent to Interstate-5. The Master Plan outlines two subbasin areas that have been receiving increased improvements: the Gateway Subbasin to the north and the Riverview Subbasin in the south.

Thurston Basin

Lines in this area are generally adequate for existing conditions, considering proposed I/I reductions (1987). The *1980 Springfield Sanitary Sewer Master Plan* (Master Plan) calls for a 15-inch trunk extension east along Thurston Road. This extension has been constructed to the city limits. Much of Springfield's future growth potential is within the Thurston Basin. Up to 270 additional acres could be added as development continues eastward between Thurston Road and McKenzie Highway.

South Springfield Basin

The South Springfield Basin largely consists of lands outside of Springfield city limits but within the UGB. Portions of the basin will use the newly constructed South Springfield Interceptor (1998), consisting of a 48-inch extension from near Mill and Aster Streets, and east to 32nd Street. A segment of the new line follows the railroad tracks downtown and include lines between 42 to 48 inches in diameter. County improvements along South 2nd Street (as accommodated in the County's CIP in fiscal year 1995-1996) have provided the opportunity for City installation of dry lines. Recent improvements in this area include the extension of a five-inch pressure main (dry-line) south towards Dorris Ranch. A new pump station will be necessary in this area before future service is possible. The 1992 SCUSA report refers to this area as Willamette Heights study area.

Jasper and Douglas Gardens Basins

The Jasper Basin largely consists of lands outside of Springfield city limits but within the UGB. The 1980 Master Plan recommended the extension of a 15- to 24-inch trunk line south through the basin following the Springfield-Creswell Highway. The Douglas Gardens basin hosts a segment of the South Springfield Interceptor as it conveys wastewater from lines north and south along South 32nd Street. This area has also seen improvements along the Main Street diversion line south of Main with line expansions constructed to 42-inch diameter piping. In 1997, 27-inch sewers were constructed along south 32nd street and east

along Jasper Road to South 42nd Street. The improvements along Jasper Road are particularly important due to recent development in the area, including two new schools. According to the 1992 *Springfield Comprehensive Urbanization Study and Annexation Plan* (SCUSA) report, all phases of the Jasper Road interceptor will have to be completed before the system can serve the majority of the Douglas Gardens and Jasper basins. The Douglas Gardens Basin is referred to as the West Jasper study area in the SCUSA report.

Springfield Wastewater System Condition Assessment

Conveyance capacity and inflow and infiltration (I/I) ratios are important criteria by which to assess the performance of a wastewater collection system. Conveyance capacity is a function of adequate pipe sizing and measures a system’s ability to move effluent efficiently. Inflow and infiltration ratios express the amount of stormwater entering a sewer system through defective pipes and pipe joints, or through the cross connection of stormwater lines, combined sewers, catch basins or even manhole covers. Such extraneous stormwater entering the wastewater system unnecessarily burdens both conveyance and treatment facilities.

Table 3-2 presents an assessment of the general condition of the wastewater collection system in Springfield for pipes 24 inches and larger. The table shows that Springfield’s wastewater system generally in good condition. Capacity is adequate in each of the basins. Inflow and infiltration is a significant problem in the Downtown/South A basin where older pipe systems allow errant stormwater to enter the wastewater system. Inflow and infiltration in the Thurston and North Springfield basins are also of some concern.

Table 3-2: Springfield Wastewater Collection System General Condition Assessment

Basin	Conveyance Capacity		Inflow/Infiltration Ratio*	
	Adequate	Not Adequate	Peak/Base Flow (MGD)	Storm/Base Flow (MGD)
Main Street	X		1.7	2.0
Thurston	X		4.6	3.0
North Springfield	X		5.1	3.6
North Branch	X		Unknown	Unknown
Downtown/South A	X		11.2	5.7
Jasper/Douglas Gardens	X		1.7	2.0

* **Base Flow** is the normal volume in millions of gallons per day (MGD).
Peak Flow is the highest rate of flow at a given point in time.
Storm Flow is the volume for averaged across the duration of a storm event.

The ratios shown in these columns are a measure of: 1) pipe condition, 2) crossed storm and sanitary sewer connections, and 3) future problem areas.

Peak/Base and Storm/Base ratios greater than 5.0 indicate system problems.

The *Sewer System Evaluation Study* (SSEE) completed in 1980 recommended 256 rehabilitative and correction measures to reduce a severe I/I problem that was overtaxing the city's wastewater system during wet weather. The City of Springfield's I/I program has been guided by the recommendations of the SSEE and by the more detailed recommendations of the *Master Plan*. Springfield is committing \$250,000 annually toward the repair and replacement of wastewater lines, contributing to the removal of excessive I/I. MWMC, with assistance from consultant CH2M Hill, is developing a hydraulic model tool of the regional wastewater system. This model will assist in flow monitoring and the efficient management of collection systems and operation of Springfield's overall wastewater system.

The 1992 SCUSA studied future wastewater facility needs to accommodate future annexations. The study analyzed several unincorporated areas within the Springfield UGB that would likely be annexed and provided urban services over a ten-year period. Of the areas studied, all will require trunk line extensions with the exception of the Menlo Park area. Because wastewater funds are limited, capital improvements will need to be prioritized, linked, and phased over time with annexation.

The SCUSA study estimated that Springfield's wastewater system was capable of accommodating a population of 52,000. The city's population in 1992 when the study was completed was 45,765. Clearly, additional capacity was needed to ensure the city could continue to meet the demands of a growing population and the long-term annexation of urbanized areas served by septic systems.

Springfield has carefully implemented the improvements recommended in the *Master Plan* to develop the capacity to serve its urbanized area. Some of the major projects that were completed include the East and South Springfield Interceptors, and the Main Street Trunk Replacement and Extension. With these projects completed, the capacity to serve all areas of the city has increased significantly.

Eugene Stormwater System Inventory and Assessment

Eugene Stormwater System Inventory

The primary water course that bisects and drains the City of Eugene is the Willamette River. Stormwater runoff discharges to downstream segments of streams, rivers, lakes, and wetlands. The northwest portion of Eugene drains either directly to the river or to tributary streams and channels. The southwest portion of the City drains to Amazon Creek, which joins the Long Tom River both directly and through the Amazon Diversion Channel and Fern Ridge Reservoir.

Map 11 shows the existing stormwater system in Eugene, including major stormwater basins, existing pipes 36 inches or larger, open channels and ditches, wetlands, and outfalls. The City is conducting a basin planning effort that will include an in-depth analysis of, and recommendations for, each of Eugene's seven stormwater basins.

The receiving waters in the Eugene area are generally divided into two systems: the Willamette River drainage system and the Amazon Creek-Long Tom River drainage system.

The Willamette River Drainage System

The segment of the Willamette River between the Coast Fork confluence (near River Mile 187), and the McKenzie River confluence (near River Mile 175), receives stormwater from Eugene. The drainage area to this 12-mile segment is about 2,000 square miles of which less than 1 percent is from the City of Eugene. The Eugene portion of this system contains several waterways that are considered significant receiving waters in their own right. These waterways include Delta Ponds, Debrick Slough, and Dodson Slough.

Other natural waterways that flow into the Willamette River downstream of the McKenzie River confluence include Flat Creek and Spring Creek. Most of these waterways have been modified somewhat to enhance conveyance capabilities. Additionally, major stormwater control facilities have been constructed to direct flow to the river. These constructed waterways include the Eugene Millrace, North Beltline Floodway, and Q Street Channel. Drainage from a small area in northeast Eugene is conveyed through a pipe and into an open waterway before discharging to the McKenzie River. Stormwater from areas adjacent to the Willamette River drains directly to the river via overland flow or small ditches and swales. The Willamette River Drainage System contains the following stormwater basins:

- ◆ Willamette River Basin
- ◆ Laurel Hill Basin
- ◆ Willakenzie Basin
- ◆ A portion of the River Road-Santa Clara Basin

Willamette River Basin

The location of the UGB within this basin forms three distinct areas. The central section lies within the UGB and is characterized by dense urban development, including the downtown center and the University of Oregon (about 3,500 acres). There are few remaining vacant parcels and, as a result, future development is not expected to significantly increase urban stormwater runoff volumes and pollutant discharges. The Willamette River and its riparian corridor are the main natural resource features in this section. Stormwater runoff in this section is expected to contain pollutants associated with commercial and high-density residential land uses.

The central section is flanked on either end by non-UGB areas (3,500 acres). The southern end of the basin contains physical features that are unique from the rest of the basin, including steep slopes, highly erodible soils, slow permeability rates, and some urban-type development such as Lane Community College. Water quality is generally good with a variety of natural resource habitats, including forested, riparian, and wetlands. This area could pose significant water quality impacts, particularly through erosion and sedimentation during construction activities, if it is ever included in the UGB, annexed to the city, and developed to urban uses.

The northern end of the basin is flat and within the 100-year floodplain. Soils in this area have high permeability rates and are conducive to infiltration facilities. Water quality is generally good; the confluence of the Willamette and McKenzie Rivers provide high-quality wildlife habitat. Due to previous and existing sand and gravel operations, the northern end also contains opportunities for managing downstream drainage impacts through facilities to store and treat stormwater runoff.

The South Hills ridgeline trail, the Willamette River bike path, the riverside park system, the University of Oregon, and Lane Community College are excellent examples of integrating recreational and educational uses into stormwater-related features. The confluence of the Willamette and McKenzie Rivers provide future recreational opportunities.

Laurel Hill Basin

The Laurel Hill Basin is approximately 800 acres and is located entirely within the UGB. Low-density residential is the predominant land use and is located primarily in the valley bottom and along the western hillsides. New development is expected to significantly contribute to the amount of stormwater runoff due to the fact that 57 percent of the land in the basin is vacant.

The topography is characterized by steep slopes forming a U shape around a narrow, flat valley bottom. Most of the remaining vacant and buildable land is located in the steep hillside areas; these soils will be highly susceptible to erosion and sedimentation impacts during construction activities.

Most of the soils in the basin are highly erodible, have low permeability rates, and high runoff potential. The groundwater table is relatively deep throughout the Basin. Upland coniferous forest is the predominant vegetative community and there are few riparian-wetland resources.

Water quality conditions are good due to the limited amount and type of existing urban residential development. There are two main water courses both originating in the headwater areas of the hillsides and draining north toward the Willamette River. The Glenwood Slough collects the drainage from these water courses and carries it into the Willamette River.

Willakenzie Basin

The Willakenzie Basin is located in the northeast corner of the study area and is approximately 7,300 acres in size. One fifth of the basin is located outside the UGB. Approximately 80 percent of the area within the UGB is developed or committed to urban uses with low-density residential being the primary land use. Most of the remaining vacant parcels are located along the northern and northeastern perimeter.

The basin is flat, except for Gillespie Butte, with moderate- to well-drained soils. Relative to other basins, there is a significant number of major traffic corridors in this basin, including I-5, Beltline Highway, Delta Highway, I-105, and Coburg Road.

This is the only basin that lies east of the Willamette River and receives a significant amount of urban stormwater runoff from outside its jurisdictional limits. About 5,000 acres of west Springfield drains through the Basin via the Q Street Canal. In addition, a portion of the northeast corner of the basin provides aquifer recharge to an active SUB wellhead for Springfield's drinking water.

The basin is bounded on the south, west, and north sides by the Willamette and McKenzie Rivers and on the east side by Interstate 5. The primary drainage features are the Q Street Canal, Dodson Slough, Debrick Slough, and the North Beltline Floodway. Other notable hydrological features include the Delta Ponds, Ayers Pond, and other remnant borrow pits along the Willamette and McKenzie Rivers.

River Road-Santa Clara Basin

The River Road-Santa Clara Basin is the second largest of Eugene's drainage basins with a catchment area of 10,400 acres, nearly 42 percent of which is located outside the UGB. Most of this area also lies outside the city limits. The basin is generally flat and contains moderate- to well-drained soils. About 70 percent of the area in the UGB is developed or otherwise committed to urban uses. Existing land use patterns include low-density residential to the east, industrial in the center, and agriculture in the west. The most unique aspect of this basin is that it contains few developed storm drain facilities (even though it is highly urbanized) while experiencing few drainage and flooding problems. This characteristic is primarily due to the predominance of well-drained soils and the presence of open-water systems.

The basin is located at the northwest corner of the Eugene-Springfield metropolitan area and is bounded by the Willamette River to the east, Awbrey-Beacon Streets to the north, and the Eugene Airport to the west. There are five major drainage courses in the basin including Flat Creek, Spring Creek, Crow Creek, the Santa Clara Waterway, and the A-1 Channel. Each of these courses generally flows in a southeast-to-northwest direction.

The Amazon Creek-Long Tom River Drainage System

The Amazon Creek-Long Tom River drainage system originates in the hills south of Eugene and flows through the southeastern and western portion of the City, draining over 21 square miles of the City as shown on Map 11. Willow Creek is a principal tributary to Amazon Creek, discharging into it near West 11th Avenue and Beltline Road. Most of the flow from Amazon Creek is diverted by a weir system through the 3.8-mile long Amazon Diversion Channel, discharging directly into Fern Ridge Reservoir. Remaining flow follows the original stream course downstream of the weir and flows into the Long Tom River. This is commonly referred to as the A channel. The A Channel is fed by a series of channels known as the A1, A2, and A3 Channels. The Amazon Creek system west of Garfield Street is contiguous with a remnant

wetland system throughout west Eugene. Most of this wetland system is now under the jurisdiction of BLM as part of the *West Eugene Wetlands Plan (WEWP)*.

The Amazon Creek-Long Tom River Drainage System contains the following basins:

- ◆ Amazon Creek/Ridgeline Basin
- ◆ Willow Creek Basin
- ◆ Bethel-Danebo Basin
- ◆ A portion of the River Road-Santa Clara Basin

Amazon Creek/Ridgeline Basin

Amazon Creek/Ridgeline basin is the largest of Eugene's drainage basins with a catchment area of approximately 11,400 acres, 94 percent of which are within the UGB.¹ Approximately 78% of the basin is developed or committed to urban uses. Most of the remaining vacant lands are located in the upper and lower reaches of the basin. A high concentration of urban uses: low density residential, strip commercial, and heavy manufacturing, is sandwiched between rich natural resource areas. Most of the basin contains thick, clay soils, which are highly erodible when disturbed.

The lay of the land varies significantly from steep, forested hillsides to flat, low-lying valleys. Amazon Creek, with its headwaters originating at Spencer Butte, is the principal drainage feature in Eugene's system, running approximately 12 miles through the Study Area. Significant natural resources are primarily concentrated at either end of the basin. The upper reaches contain upland forests and headwater streams and wetlands; the lower basin contains extensive remnants of the Willamette Valley Wet Prairies including nine rare plant and animal species.

Bethel-Danebo Basin

The Bethel-Danebo basin is the third largest of Eugene's drainage basins, with a total catchment area of 9,318 acres, of which one-third is located outside the UGB. About 75 percent of the UGB area is developed or otherwise committed to urban uses. The primary drainage features include: historic Amazon Creek, the A2 and A3 channels, Marshall Ditch, and the Beltline Channel. Primary existing land uses are heavy manufacturing, low-density residential, and agriculture.

A unique aspect of the basin is the significant modifications to its drainage pattern over time. The basin was once part of the overall Willamette River-Amazon Creek drainage system; but it is now affected by flows from the Willamette River only during very large storms as a result of blocked flows by Highway 99, River Road, and the Northwest Expressway.

¹ There are three locations, approximately 350 acres, along the ridgeline of the south hills where runoff does not flow into Amazon Creek basin. Spencer Butte Park is the largest of these. These areas were included in the Amazon Creek Basin Plan because they are relatively small and close to Amazon Creek Basin.

Similarly, most of the flow from Amazon Creek has been diverted away from this basin into Fern Ridge Reservoir.

In spite of these hydrologic changes, the basin contains significant remnants of wet prairie wetlands (in the west Eugene wetlands system) that, at one time, covered over 90 percent of the basin. The presence of wetlands is due to the extreme flat topography; thick, heavy clay soils; and abundant rainfall. Most of the wetlands have been converted to agricultural or urban uses.

Willow Creek Basin

The Willow Creek Basin is the most rural of the major drainage basins, with nearly 70 percent of the land in vacant, timber, agriculture or natural resource protection. It is located at the southwest corner of the Eugene-Springfield metropolitan area and is approximately 2,567 acres in size and is the second smallest of the seven city-wide basins; 54 percent of its area is located outside the UGB and within the urban reserve area. Willow Creek and its tributaries are the primary drainage features in the basin. The basin is the most physically diverse of all the basins with steep hillsides, low-lying flatlands, extensive wetlands and forests, and significant rare plant and animal species.

The pace and extent of new development in the basin is likely to increase due to the recent increase of commercial and industrial development, which is expected to continue in this area. There has been limited urban development in the basin since the *Metro Plan* was adopted in 1987, and new information with stormwater management implications has been generated about waterways, wetlands, and rare plant populations. The basin's physical characteristics present both challenges and opportunities for managing the expected increase in stormwater runoff and pollutants in a manner that meets the goals and policies of *Comprehensive Stormwater Management Plan* (CSWMP), adopted by the City of Eugene in 1993.

Design of Existing Drainage System in Eugene

Pipes

There are over 475 miles of enclosed pipe, more than 7,200 catch basins, 2,000 pipe inlet/outlets, and almost 7,000 manholes in the Eugene system (see Map 11). Normally, the minimum pipe size used in the City's drainage system is 12 inches, except for catch basin connector pipes, which may be ten inches. Although pipes as large as 94 inches were installed in the past, the maximum pipe size installed today is generally less than 72 inches. The largest pipe in the City's system is the Polk Street storm sewer. The main interceptor is a 94-inch concrete culvert that was originally built in 1909 to serve as a wastewater bypass but was separated from the sanitary system in the early seventies. Open channels are encouraged where pipes larger than 72 inches would be required.

Open Channels

In addition to Amazon Creek, there are about 33 miles of major open channels, including: the Q Street Floodway; North Beltline Floodway; West Beltline Floodway; Roosevelt Channel; Marshall Street Ditch; and the A, A1, A2, and A3 Channels of Amazon Creek. Many of the open channels were constructed from previous natural drainages. There are also over 37 miles of roadside ditches and culverts collecting runoff that is frequently funneled into the piped system before it enters major open channels.

Other drainage features in the City include several open channels with limited flood control function, natural waterways, and a system of wetlands, most notably the Mill Race, Alton Baker Park Canoe Canal, and Patterson Slough. These features primarily serve active and passive recreational functions but also provide limited water quality and flood storage roles.

Natural Waterways

Pipes and open channels have been successful at preventing floods, but have drastically altered the natural system, resulting in the loss of natural resources. There are a limited number of drainage features in the City that can be considered natural waterways. The best example is the upper reaches of Willow Creek; others are numerous headwater tributaries in the South Hills, some of the upper reaches of Amazon Creek and, to a lesser degree, Augusta Creek, Flat Creek, and Spring Creek, and interconnected ponds and wetlands.

Many of the wetlands are in the floodplain and serve as flood conveyance corridors. They also serve as flood storage areas, which hold and slowly release floodwaters. Wetlands can store a considerable amount of rainfall and delay runoff, preventing minor floods or lessening the severity of major floods in downstream areas. As an urban stormwater tool, wetlands vegetation filters and traps sediments, debris, and chemical nutrients that would otherwise pollute or accelerate filling of aquatic systems.

Historically, wetland functions and other natural resource values were considered only minimally when designing and maintaining the stormwater system. Until recently, there was limited information as to the location and role these areas play in Eugene's stormwater system. Two studies that have been conducted to identify wetlands and riparian areas are the *Metropolitan Natural Resources Special Study (NRSS) March 1991 Draft*, and the WEWP, December 1992.

The NRSS took a metropolitan-wide approach to natural resource identification, primarily focusing on wildlife habitat areas. The total acreage of all sites, excluding the Willamette and McKenzie River corridors, is approximately 12,151 acres, of which 12,033 are located within the UGB. Of these, 1,211 acres were identified as wetlands, 930 acres as riparian areas, and 10,010 acres as uplands.

The WEWP covers the 8,000-acre West Eugene Wetlands Study Area. Approximately 1,307 acres of wetlands have been identified in the study area. The WEWP designates 1,019 acres for protection and 288 acres for development. Approximately 1,400 acres have been acquired by

BLM, the Nature Conservancy, City of Eugene, Lane County, and the Oregon Department of Transportation for protection and restoration projects.

Eugene Stormwater System Condition Assessment

Table 3-3 is a draft summary of the total number of pipe and open channel segments recently modeled by the City of Eugene (1998); the number/percentage of the total number of segments that are expected to be deficient; and the number/percentage of deficient segments that are expected to fail only as a result of future development. This summary indicates the extent of the problems that are expected as a result of future development.

Springfield Stormwater System Inventory and Assessment

Springfield Stormwater System Inventory

Springfield is bordered by the Middle Fork Willamette River to the south, and the McKenzie River to the north. Urban stormwater in the southern portion of the city makes its way to the Willamette River through a series of piped and open drainage systems. Likewise, stormwater runoff from the northern parts of the city makes its way to the McKenzie River. Parts of the city drain to a major open drainageway, the Q Street Channel, which crosses under I-5 into Eugene and ultimately drains to the Willamette River.

Springfield's stormwater system is a complex network of piped systems, created channels, and natural waterways that convey urban runoff to the rivers. The city maintains more than 180 miles of piped stormwater facilities and an additional 20 miles of open channel drainageways. Two major studies, the *Storm Drainage Study for East Springfield* (1979), and the *West Springfield Drainage Master Plan* (1983) have provided direction for the development of Springfield's system. The East Springfield Study describes four major basins east of 42nd Street. The West Springfield study area was sufficiently large and complex that 12 geographic areas were described west of 42nd Street. The *Cedar Creek Drainage Study* (1984) and various studies of the Springfield Mill Race have provided additional stormwater analysis of these two important drainage facilities.

Map 12 shows the existing stormwater system in Springfield, including major stormwater basins, existing pipes 36 inches or larger, open channels and ditches, wetlands, detention ponds, and outfalls.

Open Channels, Detention/Retention Ponds, and Dry Wells

In the past, stormwater planning often called for the phasing out of roadside ditches in urban areas. The *West Springfield Drainage Master Plan*, for example, called for replacing smaller ditches with underground pipes to decrease maintenance costs. The Plan recommended that only the largest open channels be retained. Since the 1980s however, it has been recognized that open drainage systems can actually reduce overall infrastructure costs and provide natural stormwater

treatment capability in addition to conveyance. Consequently, the City has abandoned past plans for widespread piping.

The National Pollutant Discharge Elimination System (NPDES) component of the federal Clean Water Act (CWA) has caused a new awareness of importance improving the quality of stormwater runoff before releasing it into streams and rivers. Like other communities, Springfield recognizes that drainage systems should provide more than just conveyance of surface runoff. In order to meet water quality standards established through the CWA, stormwater systems must also provide erosion control and treatment of runoff from streets, roof drains, and other impervious areas. Also, Springfield's system should recharge stormwater into the ground where appropriate. To this end, Springfield requires most new developments be constructed with detention/retention ponds, drywells, vegetated swales, and other systems for filtration and recharge of runoff. In addition, five stormwater quality detention/retention ponds ranging in size from one to two acres have been built in the past four years to slow the rate of runoff and filter it before release into receiving waters.

Springfield is subject to the new stormwater regulations implemented through NPDES Phase II, effective October 24, 1999. These regulations will require adoption of "best management practices" designed to reduce the pollutants contained in runoff. Many of these management practices have already been implemented through erosion control and pretreatment requirements the city now places on development. Others will be achieved through protection and proper maintenance of open drainage systems and associated riparian areas and wetlands.

Natural Waterways and Wetlands

Springfield's stormwater basins drain to both developed and undeveloped open waterways. Developed and maintainable routes include facilities such as the Mill Race, the Q Street Floodway, the Soil and Conservation Service (SCS) Channel #6 and the Weyerhaeuser outfall. These are waterways that have been modified and enhanced for the purpose of stormwater conveyance. They are accessible by city crews for maintenance.

Other open drainageways are natural remnants of old creeks and sloughs that once flowed more freely through the Springfield area. These facilities have not been developed or significantly altered to provide adequate urban stormwater functions. These are not always accessible for maintenance and some flow beyond Springfield's jurisdictional authority. The undeveloped waterways have not been enhanced to allow greater capacity because until recently, state administrative rules prevented cities from developing stormwater facilities outside their UGBs. With the exception of the Mill Race, which is almost entirely owned by Springfield, the inability to either protect or develop drainageways outside the UGB has hampered Springfield's ability to adequately meet the needs of some areas within its urban growth area. These natural drainageways outside of the City's jurisdiction include:

- ◆ Springfield Mill Race (South Springfield),
- ◆ Cedar Creek (East Springfield),
- ◆ Irving Slough (Hayden Bridge North Springfield),

Table 3-3: Eugene Stormwater System General Condition Assessment

Basin Name	No. of Segments Modeled	Segments Expected to be Flooded under Existing and Future Land Use Conditions			Segments Expected to be Flooded under Future Land Use Conditions Only		
		No. of flooded segments	Length of flooded segments	% of total number of segments	No. of flooded segments	Length of flooded segments	% of total number of segments
Amazon Creek Tributaries	181	59	173,500 LF pipe segments and 1,550 LF open channel	33%	12	6,936 LF pipe segments	7%
Bethel –Danebo	160	14	3,247 LF pipe segments and 6,670 LF open channel	9%	5	1,873 LF pipe segments and 1,360 LF open channel	3%
Willakenzie	162	7*	49 LF pipe segments and 4,740 LF open channel	4%	2*	1540 LF open channel	1%
Santa Clara and River Road	to be determined	to be determined			to be determined		
Willamette River	21	1	700 LF pipe segments	5%	0	N/A	0%
Willow Creek	51	39	744 LF pipe segments and 21,850 LF open channel segments and one bridge	76%	5	179 LF pipe segments and 2,688 LF open channel	10%
Glenwood-Riverview Augusta only	50	22	840 LF pipe segments and 2,320 LF open channel	44%	5	493 LF pipe segments and 450 LF open channel	10%

*The flooding problems caused by high water level in the Willamette River are not included in the table.

- ◆ Maple Island Slough, (North Gateway),
- ◆ Jasper Slough (Jasper South Springfield), and
- ◆ The creek system in the Mahogany Lane area (Mountaingate, Jasper/Natron).

Wetlands and natural riparian areas also are part of the City's stormwater management system. They provide flood attenuation, groundwater recharge, erosion and sediment control, and detention/retention functions. Although not recognized in past stormwater plans, wetlands and riparian areas must be protected and managed to meet NPDES permit requirements and protect life and property from extreme fluctuations in stormwater flows. Therefore, these resource areas are being factored into current city efforts to update stormwater management plans.

Stormwater Basins

There are nine major stormwater basins that have been identified for the purposes of this study. These include the four basins described in the *Storm Drainage Study for East Springfield* and five other basins identified for this study by combining the elements of the 12 geographic areas called out in the *West Springfield Drainage Master Plan*. These are described below.

Cedar Creek Basin

The basin is approximately 518 acres in size and located in east Springfield between 60th and 79th Streets. It is characterized by steep, partially developed slopes draining onto a more flat developed area. The runoff is carried to Cedar Creek via three piped drainage systems, then north through open channels to several discharge points into tributaries of the McKenzie River. The collection system consists of small diameter pipes in areas where streets have curbs and gutters, and ditches along unimproved roads.

Weyerhaeuser Outfall Basin

This 2,003-acre basin from 42nd Street to 60th Street is conveyed to the west by interceptors running parallel to Main Street. Weyerhaeuser's pulp and paper mill operation is collected by a privately owned drainage system and is discharged into the McKenzie River along with the 42nd Street and 48th Street systems.

West Springfield 'Q' Street Basin

The west Springfield basin extends from Interstate 5 east to 42nd Street, both north and south of Main Street. Similar to the system east of 42nd Street, a combination of natural, undeveloped drainage ditches and a closed pipe network provide drainage to the area. The basin is approximately 1,779 acres. This system is generally adequate with minor flooding during storm events.

West Springfield Hayden Bridge Basin

This basin covers approximately 762 acres. The area generally north of Marcola Road/Hayden Bridge Road between 5th Street and 42nd Street is developed residential area

outside city limits. The drainage system is at county level of development, with drywells and ditches. Piped systems, where they are in place, outfall into undeveloped low areas and natural drainageways (Irving Slough), which is affected by farm practices of leveling and filling land for later development. Large storms flood the areas below the floodplain.

North Gateway Basin

The North Gateway Basin includes 269 acres bounded by Interstate 5 to the west, and the McKenzie River to the east, Maple Island Slough to the north, and Game Farm Road to the south. The general slope of land is in a north-northwesterly direction toward the McKenzie River, with the highest elevations found along the eastern boundary. Present land uses include industrial, residential, and agricultural uses. Much of the agricultural lands in the area are planned for light industrial development.

Stormwater systems within the basin are comprised of a combination of natural and constructed drainageways. Two large systems were developed for the light industrial and the undeveloped medium-density residential areas within the basin. One pretreatment facility was constructed in conjunction with the Sony public facilities projects, and a second is planned north of a proposed Sports Center development. Both of these drainage systems flow into the Maple Island Slough.

'Q' Street Floodway Basin

There are 2,272 acres in this basin. The floodway channel was a SCS project for flood control and serves the core area of Springfield north and south of the Eugene/Springfield Highway, from Interstate 5 to 42nd Street. The main channel is a well-established open drainageway flowing into the Willamette River near the Ferry Street Bridge. Several of the sub-basins contributing to this channel have a history of minor flooding. The basin is comprised of an aging piped system with curb and gutter streets with catch basins.

Mill Race Basin

This 314-acre basin contains industrial and farm land south of the Union Pacific Railroad from Mill Street to its inlet at the Willamette River (South 36th Street). The basin is bounded by the Mill Race to the west and south and has received limited improvements for stormwater drainage capacity. General drainage occurs in a southerly direction toward the Mill Race. Zoning primarily supports single-family residential development. The Mill Race itself has been the subject of much study and control based on its significance historically and as a water resource. As a drainage facility, it provides a functional and usable system.

Jasper Basin

This basin, with 346 acres located between South 32nd and South 42nd Streets, is a residential basin largely outside the city limits. A developed trunk system and pre-treatment facility was constructed with the Jasper Road Improvements in 1997. The remaining land is at county level of development, with drywells and ditches. Piped systems, where in place,

outfall into undeveloped low areas and natural drainageways (Jasper Slough). This receiving area is also subject to farm practices of leveling and filling land for later development. The developed land from South 42nd Street to roughly the terminus of Rocky Point Drive is served by the large piped system in Clearwater Lane flowing to the Willamette River.

Mountaingate, Jasper/Natron Basin

This is an undeveloped basin comprised of residential, industrial, and farm land in and out of the Springfield UGB. The receiving water for this basin is the creek in the vicinity of Mahogany Lane. The basin has not been studied and the condition of the drainageway is unknown.

West Kelley Butte/Willamette Basin

This minor residential area south of Centennial Boulevard, east of Interstate 5 to the crest of Kelley Butte, has a developed pipe system with several piped outfalls to the Willamette River or the canoe channel paralleling the river. This basin is approximately 352 acres.

Springfield Stormwater System Condition Assessment

Table 3-4 assesses the conveyance capacity at present and at future buildout. Conveyance capacity is also evaluated for the ability to handle two-year and ten-year storm events. As the table shows, all basins within the system are capable draining two-year storm events. In a ten-year event, the Cedar Creek, Hayden Bridge, Q Street Floodway, and Jasper basins do not function adequately. Table 3-4 also analyzes the conveyance capacity needed to accommodate two-year and 10-year events in the future when anticipated buildout of the land has occurred. As can be seen, several drainage basins are likely to be overwhelmed as buildout occurs.

Outfall capacity is a measure of a stream or drainageway's ability to absorb stormwater runoff. Table 3-4 shows that Cedar Creek and the West Springfield Hayden Bridge basins are deemed inadequate to absorb even two-year events. The Jasper basin fails in a ten-year event.

Outfall control refers to having jurisdictional control (through ownership, easement, or agreement) over a stormwater outfall that protects the facility from activity that might impact its capacity. Table 3-4 shows those basins where the city has control and where it does not have jurisdiction. Cedar Creek and the West Springfield/Hayden Bridge basins have outfalls outside of the city's control. Other basins have more than one outfall, some of which are outside city control.

Water quality is a critical element of Springfield's condition assessment analysis. Staff have estimated the percentage of runoff volume that is being pre-treated for each basin. Where known water quality deficiencies exist, these are shown on Table 3-4.

Table 3-4 Springfield Stormwater System General Condition Assessment

Basin	Conveyance Capacity (Storm Events)				Outfall Capacity ¹ (Storm Events)		Outfall Control ²		Water Quality	
	Present		Buildout						Pretreated (%)	Known Water Quality Deficiency ³
	2-yr Event	10-yr Event	2-yr Event	10-yr Event	2-yr Event	10-yr Event	City	UGB		
Cedar Creek	Y	N	N	N	N	N	N	N	<10%	✓
Weyerhaeuser Outfall	Y	Y	Y	Y	Y	Y	Y	Y	<10%	
West Springfield/Q Street	Y	Y	Y	Y	Y	Y	Y	Y	<10%	
West Springfield/Hayden Bridge	Y	N	N	N	N	N	N	N	20%	
North Gateway	Y	Y	Y	Y	Y	Y	Y/N ⁴	N	50%	
Q Street Floodway	Y	N	Y	N	Y	Y	Y	N	<10%	
Mill Race	Y	Y	Y	Y	Y	Y	Y	Y	20%	✓
Jasper	Y	N	N	N	Y	N	Y/N ⁴	N	40%	
Mountaingate, Jasper /Natron	Y	Y	N	N	Y	Unk	Y/N ⁴	N	0%	
West Kelly Butte/Willamette	Y	Y	Y	Y	Y	Y	Y	Y	<10%	

¹Outfall capacity is a measure of the receiving body’s ability to absorb and convey runoff.

²Outfall control refers to having jurisdictional control (through ownership, easement, or agreement) over a stormwater outfall that protects the facility from activity that might impact its capacity.

³Does not meet one or more water quality standards as defined in DEQ section 303(d) Water Quality Act.

⁴Multiple outfalls, some of which the city does not control.

Y indicates an adequate condition for a category.

N indicates an inadequate condition for a category.

Chapter IV: Alternative Approaches to Providing Public Facilities

This chapter discusses possible policy tools to help communities use their Public Facility Plans to more effectively manage growth and provides examples from other communities.

Policy Tools

- **Regional Urban Service Standards** – Regional urban standards can include minimum levels of service (LOS) for transportation, wastewater, water, drainage, and parks. They can also include requirements for planning and siting of facilities (e.g., this tool is intended to address differences in the size and location of streets, pipes, and schools as areas grow). Establishing regional standards can address service gaps, uncoordinated extensions, and funding shortfalls. Regional standards are intended to improve planning for growth and foster cooperation among service providers. They can reduce the cost of infrastructure extensions and justify system development charges. The standards also can address how to fund those improvements so that levels of service are consistent throughout the region. The standards can also address how neighboring systems interconnect.

Implementing regional urban services standards requires:

- 1) Promoting benefits of standards to service providers and their customers; providing a forum to discuss setting those standards.
- 2) Setting facility standards. The purpose of the standards is to stop spillover impacts (re: redevelopment) and encourage fully served development. An example of a service standard is LOS “D” for major roads, which indicates stable flow, speeds considerably affected, and high-density traffic delay at signals of 25-40 seconds.
- 3) Creating funding sources. A major problem in providing adequate services is differences in the ability to fund improvements across jurisdictions.

Potential Effects:

- 1) More consistent levels of service.
- 2) Sharing of financial resources. Some jurisdictions lack the financial resources to provide adequate levels of service. Regional standards might include changes in the way funds are collected and disbursed.
- 3) Enhanced ability to manage growth. Regional coordination to managing growth will avoid shifting negative impacts or undesirable uses to neighboring jurisdictions.
- 4) Removing incentives to develop where standards are lower.
- 5) Potential for increased housing costs. Depending on how improvements are financed, increasing service requirements could increase housing prices and reduce the availability of housing for lower-income households.

Issues to Consider:

- 1) The size of the region. Could be as small as the UGB or include several cities.
 - 2) Setting public facility requirements can be difficult in terms of reconciling different standards.
 - 3) Deciding how to fund required improvements can be complicated. The cost of extending services to new development may be difficult for some service providers.
- **Adequate Public Facilities Requirements (APFRs)** – An APFR establishes criteria to prohibit development except where adequate public facilities are available. An APFR is used to encourage better monitoring of urban service levels, and make clear the levels of service that must be available before development happens. APFRs contain two essential components: 1) identification of the types and levels of service that are needed to permit new development, and 2) a clear policy about when the public facilities have to be in place relative to the impact of development. APFRs typically include minimum required levels of service for water, sewer, drainage, and traffic flow. They may also specify requirements for schools, fire, police, parks, sidewalks, bicycle paths, and transit. Through the APFR process, local governments can withhold or delay approval of developments in areas where adequate urban services are unavailable. It is imperative to define the term *adequate*, which usually means using LOS standards to measure acceptable performance levels. Communities typically include adequate public facilities reviews as part of their routine development review process. Some jurisdictions require that adequate LOS must be in place upon completion of a project. Others only require that improvements to facilities are planned to bring service up to required levels within a specified period.

Implementing APFRs requires:

- 1) An ordinance (and most likely a map) that indicates the required existing or planned levels of urban service.
- 2) Coordination among planning agencies and service providers to ensure growth management goals are met. Implementation of the APFR cannot be done in isolation by one jurisdiction.
- 3) A system in place to measure and monitor the levels of public services.
- 4) A permit process to evaluate levels of public services for proposed projects.

Potential Effects:

- 1) Reduce amount of development that lacks adequate urban services.
- 2) Encourage infill development in areas already served by public facilities.
- 3) Direct development to areas that already have some urban services.
- 4) Shift development to other jurisdictions with lower standards.

Issues to Consider:

- 1) The impacts of a set of requirements can be difficult to predict. May want to start with a small set of requirements.

- 2) Requiring high service levels may discourage certain types of development (e.g., setting high standards to eliminate traffic congestion in urban areas could discourage higher density development that other policies may encourage).
 - 3) The development approval will be more complicated because of the difficulty in predicting the effect of a proposed project on LOS for various public facilities.
 - 4) APFRs will place new demands on capital improvement budgets as service providers will need to ensure that new development is served by adequate public facilities.
 - 5) APFRs can be combined with other policies to focus improvements in certain areas (e.g., Public Investment Plans (see below)).
 - 6) APFRs encourage the creation of equitable system development charges (SDCs) to fund needed improvements by providing more detail about the types and levels of urban services that will be needed.
- **Focused Public Investment Plans and Public Investment Areas** – A focused public investment plan (FPIP) shows the location and timing of planned public facilities improvements and identifies specific areas called public investment areas (PIAs) where improvements will be focused. The idea behind PIAs is to coordinate and concentrate investments for urban services such as sewer, wastewater, drainage, streets, parks, and schools to provide full-serviced land for development. Inside these PIAs, local agencies take responsibility for providing all off-site public facilities. An FPIP includes an analysis of the types of services that are needed for a PIA and their costs. This analysis can be the basis for establishing SDCs.

Implementing an FPIP requires:

- 1) Identifying public investment areas.
- 2) Changing capital improvement programs and public facility plans to reflect priorities to focus improvements in the PIAs to provide fully serviced land for development.
- 3) Adopting policies and ordinances to implement the FPIP.

Potential Effects:

- 1) Decrease the amount of dispersed development lacking adequate urban services.
- 2) Increase the density of development in growing areas.
- 3) Encourage infill and redevelopment.
- 4) Improve local control over capital budgets.

Issues to Consider:

- 1) Choosing the size of the PIAs requires good forecasts of future growth rates.
- 2) The politics of locating PIAs can be complicated (i.e., changing public facility plans can impact landowners' plans for development).
- 3) A successful FPIP requires close cooperation among service providers. The purpose of the FPIP is to coordinate service extensions to a full range of services.
- 4) The system must respond to changes in the real estate market. PIAs must be flexible enough to react to the demand for different types of development in different locations.

- 5) Clear rules for development outside the PIAs are needed.
 - 6) Modifying SDCs. FPIPs provide detailed information about the level of service and the timing for providing those services. This information can be used to establish equitable SDCs that reflect the actual cost of the improvements.
- **Annexation Plans** – Annexation plans allow a city or a district to get approval in a single election for a series of annexations that can be put into effect individually. The *Metro Plan* states that annexation to a city is the method by which water and wastewater services will be provided. Other annexation methods are used by cities and districts to allow development and the extension of services.

Implementing an Annexation Plan requires:

- 1) State law (ORS 195.220) requires that an annexation plan address the following issues: the timing and sequence of an annexation; local standards of urban services required as a condition of annexation; a schedule for providing urban services to annexed territory; the effect on existing urban service providers, including the effects on the tax base and budget of each provider; and the long -term benefits of the annexation plan.
- 2) Negotiate intergovernmental agreements with affected jurisdictions. All urban service providers in an annexation plan area must be a party to an urban service agreement.
- 3) Public education and outreach.
- 4) Public hearing. A public hearing must be held prior to final adoption of an annexation plan.
- 5) Public vote. After adopting an annexation plan, a jurisdiction must submit the plan to its own voters and to the voters of the property being annexed. A cumulative majority of both votes is necessary to certify an annexation.

Potential Effects:

- 1) Address the economic viability of special districts. The financial impact to a special district of annexation is usually reduced assessed valuation. If it is not viable for a district to continue serving the various customers, then an alternative course, such as consolidation or dissolution, must be considered.
- 2) Encourage creation of long-term master plans. An annexation plan could establish a schedule for annexations and service area adjustments. Cities, counties, and special districts can use this schedule as a basis for public facilities plans and capital improvement programs.
- 3) Clarify the costs and benefits of annexation. An annexation plan explains the benefits and incentives for annexation and provides a credible cost estimate.
- 4) Encourage collaboration among service providers.

Issues to Consider:

- 1) Information. A lot of data are required to make a decision about territory, levels of service, and fiscal impacts.
- 2) The urban service agreements must address issues such as service level changes, levels of service, and fiscal impacts.
- 3) Credibility and plan adoption. It is important to build credibility from a city and territory perspective, for the data and cost-benefit analysis that explains the types of services and the revenue and taxation impacts.
- 4) Tax differential. A phased-in or reduced tax rate until a full range of urban services can be provided may make annexation more acceptable.
- 5) Residents' concerns. A public outreach program is necessary to address questions and concerns from city and territory residents.

Examples From Other Communities

Washington County, Oregon

Washington County's Community Development Code identifies public facilities and services that are necessary at a minimum level to accommodate particular development. This provision applies only to the Urban Unincorporated Area and in a limited sense to land outside the UGB. This provision applies to land divisions, new construction, expansions, and changes in use, with exemptions for very large lot divisions and proposal of minor impact.

Medford, Oregon

In the past, the City of Medford identified specific "limited service areas" where development is permitted only if adequate public facilities are in place. The City also attempted to constrain the city limits in 1990 when no annexations were allowed. The City is revising its LOS requirements as part of its Transportation System Plan. Currently, the Comprehensive Plan includes transportation LOS requirements that say "arterial streets shall be designed and improved so that the minimum overall performance during peak travel periods should be 'service level D.' Land use designations and development should not cause this minimum level of service to be exceeded during peak hours."

Petaluma, California

The City requires specific area plans for large newly developing areas or key infill sites. The plans are financed by developers or property owners. No development in these designated areas can proceed without a plan in place. The plan would study future development and all the infrastructure needs and costs. The funds for the infrastructure installation often come from the developers, sometimes by bonding their properties. According to Kurt Yeiter, current City of Eugene planner and former City of Petaluma planner, the method worked well as the City received well-planned areas, at very little cost to the City.

State of Florida

The State of Florida requires that all local governments in the state have “concurrency” standards to ensure the availability of public facilities concurrently with the development creating the demand. The comprehensive plan for each local government must include level of service (LOS) standards to ensure that adequate public facility capacity will be provided for future development and for the purposes of issuing development permits. Local governments must establish LOS standards for seven mandatory public facilities and services: wastewater, water, drainage, solid waste, roads, mass transit, and parks and recreation.

Montgomery County, Maryland

Montgomery County’s Adequate Public Facility (APF) regulations were adopted in 1973 as a part of the subdivision regulations. A preliminary plan of subdivision may not be approved unless the Planning Board determines that public facilities will be adequate. The County Council establishes by resolution, after a public hearing, guidelines for determining the adequacy of public facilities. These guidelines are based on an analysis of current growth and the amount of additional growth that can be accommodated by existing and programmed public facilities.

State of Washington

A planning goal of the Washington State Growth Management Act (GMA) is to ensure that public facilities and services necessary to support development shall be adequate to serve development at the time it is available for occupancy and use without decreasing current service levels below locally established minimum standards. Public facilities are defined as including streets, roads, highways, sidewalks, street and road lighting systems, traffic signals, domestic water systems, stormwater and wastewater systems, parks and recreational facilities, and schools.

Sources:

Planning, Growth, and Public Facilities: A Primer for Local Officials. Eric Damian Kelly, 1993.

Tools of the Trade. Transportation and Growth Management Program, Oregon Department of Transportation, Oregon Department of Land Conservation and Development, 1995.

City of Medford Comprehensive Plan

Survey and Analysis of Selected Adequate Public Facilities Requirements. Transportation and Growth Management Program, Oregon Department of Transportation, Oregon Department of Land Conservation and Development, May 1995.

E-mail from Kurt Yeiter, Senior Planner, City of Eugene through Oregon Planner’s Network Research.

Chapter V:

Public Facility Financing

This chapter discusses financing tools now used by the metropolitan jurisdictions, financing scenarios, issues and challenges, and alternative financing strategies for water, wastewater, and stormwater infrastructure systems. Transportation system financing is covered in *TransPlan*.

Financing Tools

There are eight basic sources of financing that jurisdictions in the metro area have available to fund system operations and maintenance and capital projects: user fees, assessments, development fees, property taxes, grants and loans, bonds, short-term debt, and private financing. Each source has some legal limitations on how the funds can be used and by whom. For example, SDCs cannot be used to fund operations and maintenance, and County Road Fund money can only be used for road-related projects.

Measures 5 and 50 place legal constraints on the manner in which jurisdictions finance infrastructure. When applicable, these constraints are discussed in the appropriate sections.

User Fees

User fees are the primary source of funding for operating costs and capital expenditures. There are fixed and variable portions of most user fees. User fees fund operations and maintenance activities, system rehabilitation, and capital expansion over the short or long term.

The ability to increase user fees is limited primarily by issues of affordability and comparison with rates charged by other jurisdictions in Oregon. The ability to sell debt backed by user fees may also be affected if those fees are already high or have an unusually large capital component. Conversely, if issuing debt replaces the existing capital component of a user fee, the resulting consistency in annual debt service requirements may help stabilize those user fees.

System customers, rather than property owners, pay user fees. This focuses the cost of the system to those receiving direct benefit in the form of service. The amount of revenue collected is sensitive to total usage.

Assessments

Assessments traditionally have been used to charge benefiting properties for system extensions. In a broader sense, if an *assessment* were used for operations or rehabilitation activities, it would be equivalent to user fees, but could be charged to system users on some other basis (flat rate per account, by user class, age of collector system, or location) in addition to water usage.

Assessments are typically one-time charges, rather than monthly charges like wastewater user fees. Local Improvement Districts (LIDs) are a means of assisting benefiting properties in financing needed capital improvements through the formation of special assessment districts. Under Ballot Measure 5, assessments on property owners can either be paid in full or financed over a minimum term of ten years.

The revenue produced by assessments depends on the number of projects constructed in a year. However, the total amount to be recovered by an assessment must be related to the costs of the service planned or provided in the assessment district. Due to Ballot Measure 5, the total amount

that can be recovered through assessments against property is limited to actual costs of engineering, construction, and financing of capital improvements. Other forms of *assessments* that are charged to system users, rather than directly to individuals solely on the basis of ownership of property, appear to fall outside the scope of Measures 5 and 50.

Development Fees

Development fees can be collected at virtually all points in the development process, from preliminary planning to occupancy and connection to the infrastructure. The fees or charges generally relate to the impact of development.

- ***System Development Charges:*** SDCs are based on a formula related to the cost of providing increased capacity in city services to serve new development (improvement component) and/or the cost to *buy in* to existing excess system capacity (reimbursement component). State statutes limit the use of the improvement component of the SDC to capital projects that expand system capacity. The reimbursement component must also be used to fund capital projects, but without the added requirement that those projects also expand system capacity. SDC revenues are the most variable revenue source because they are related to the level of development occurring each year.
- ***Impact Credit Bank:*** This is probably the most innovative of any funding mechanisms currently used in the Metro area. The City of Eugene manages a wetland mitigation bank. Wetland (and stormwater) projects in west Eugene are funded by revenues from the sale of mitigation credits to developers. The bank system performs the mitigation requirements for individual users where the details of compensation are planned, constructed, and maintained by a public agency. To satisfy individual impact requirements, users simply have to buy mitigation credits from the bank, thus eliminating uncertainty and saving valuable time and resources that would otherwise have to be satisfied by each individual obtaining a wetland permit.
- ***Hookup/Connection Fees, Permits, Land Use Fees:*** To the extent that these fees attempt to recover the incremental system cost due to the development, they are considered a development fee. These fees may not result *directly* in financing capital improvements; however, if these fees are not currently covering the full cost of the activity associated with the fee, there may be an opportunity to shift funding. For example, if the cost of a building permit does not currently reflect the true cost associated with the service, and the fee were increased to reflect the true cost, these additional revenues could be considered a *new* financing source. Although the cities are attempting to capture the full administrative cost of development assistance, (e.g., building permits, connection charges), the extent of meeting full cost recovery goals is not known at this time.

Property Taxes

Property taxes are the main source of revenue in the cities' general funds, but are used only to a limited extent to support public infrastructure. Property taxes are used as a revenue source for operations as well as repayment of long-term debt. There are two ways in which property tax levies can be used to finance capital improvements: 1) a capital serial levy or 2) to secure general obligation bonds.

Measure 50 requires that property tax increases must be passed at either a general election (November of even numbered years), or at an election with a 50 percent voter turnout. This

double majority requirement has significantly affected the ability of local governments to use property taxes to finance capital improvements.

Grants and Loans

The major sources of outside funding for water, wastewater, and stormwater projects are:

- ***Lane County Road Fund:*** Financed by state gas taxes and federal timber receipts. Funds can be used for the stormwater components of road projects.
- ***Oregon Department of Economic Development (OEDD) -- Special Public Works Fund (SPWF):*** The State, through lottery proceeds passed through the OEDD, has provided grants and loans to local government to construct, improve, and repair public infrastructure in support of local economic development and job creation.
- ***Oregon Department of Environmental Quality (DEQ) -- State Revolving Fund (SRF):*** The DEQ provides low-interest loans to local governments for the construction of stormwater facilities and wastewater treatment and collection facilities to reduce groundwater pollution.
- ***U.S. Economic Development Administration (EDA) -- Public Works and Infrastructure Development Grants:*** The program provides grants to promote long-term economic development and assist in the construction of public works and development facilities needed to initiate and encourage the retention of permanent jobs in the private sector to areas experiencing severe economic distress.
- ***U.S. Bureau of Land Management -- Land and Water Conservation Fund (LWCF):*** LWCF funds are used locally to purchase or improve lands within the west Eugene wetlands complex.

Increasingly, the majority of public works projects are being funded locally, in contrast to the recent past when most were funded by state and federal grants. While a portion of an OEDD or EDA funding package may include grants, all of these programs are primarily loan programs. The primary advantage of these loan programs is in the lower interest paid on the borrowed funds. This lower interest rate is then passed on to individual property owners through lower user fees or assessments.

Bonds

Bonds provide a mechanism for obtaining immediate capital financing of infrastructure projects. Repayment of funds from approved bonds is obtained from other revenue sources over a longer period of time. A bond is a formalized agreement by which the bond issuer (borrower) promises to repay the bond purchaser (lender) a certain amount of money at a stated rate of interest on a certain date. Government debt can be incurred at interest rates that are lower than commercial rates because the interest is generally exempt from state and federal income taxes.

Measure 50 places additional limits on bonded debt, some of which had been exempt under Measure 5. For debt that had been exempt, “capital construction” now excludes reasonably anticipated maintenance and repairs, supplies and equipment not intrinsic to the structure, and furnishings (except those noted). The bond levy may be imposed for no more than the expected useful life of the project.

There are seven types of bonds available to municipalities and special districts: general obligation, revenue, assessment, tax increment, nonprofit corporation, refunding, and certificates of participation.

- **General Obligation Bonds:** General obligation (GO) bonds are usually those secured by the issuer's promise to levy a property tax to pay the bonded debt principal and interest. They can typically be sold at a lower rate of interest than any other bonds. GO bonds require voter approval, and proceeds may be used only for capital construction and improvements.
- **Revenue Bonds:** While generally bearing a higher interest rate than GO bonds, revenue bonds are secured by a commitment of system user fees or facility revenues, and fees can be increased if needed to pay debt sources.
- **Assessment Bonds (Bancroft Bonds):** Benefited properties are assessed to pay for a portion of the cost of local improvements. After the assessment procedure has been completed, owners of assessed properties have the right to apply to pay their assessment (exceeding \$25) over a period as determined by the municipality, with ten years as the minimum. Assessment bonds are sold by the issuer in an amount equal to the unpaid assessments. The issuer may pledge the city's full faith and credit.
- **Tax Increment:** Urban renewal agencies may issue urban renewal revenue bonds which are backed by tax increment revenues or by an area-wide urban renewal levy (under Measure 50 for *grandfathered* districts). The urban renewal agency may, upon adoption of an appropriate urban renewal plan, cause the county assessing official to freeze the values of taxable property within the urban renewal project area. The tax levy applied to the difference between the frozen value and any increase in value of the property located in the project area may be used to repay bonds, along with any allowable area-wide tax levy under Measure 50.
- **Nonprofit Corporation:** As traditional methods of financing capital construction become more limited, there may be an increase in financing through nonprofit corporations created to issue tax-exempt obligations on behalf of the municipality. The proceeds of the nonprofit corporation's bonds are then loaned or otherwise made available to the local government unit.
- **Refunding Bonds:** Current refunding bonds may be sold at a lower interest rate than the bonds outstanding and the proceeds used to redeem outstanding bonds, thus allowing the issuer to continue to pay the original debt at lower interest rates or, alternatively, allowing the debt service on the original bonds to be spread over a longer period of time.

Advance refunding bonds may be issued in advance of maturity or date of redemption. Proceeds from the sale of the advance refunding bonds are placed in an escrow account and invested so there is sufficient money to pay bondholders at the earliest possible call or redemption date.

- **Certificates of Participation or Lease Purchase Revenue Bonds:** Certificates of participation (COPs) are a financing technique for facilities, property and/or equipment that utilizes the leasing power of local governments. Unlike General Obligation Bonds, no new tax levy is authorized; therefore, there is no voter approval requirement. In general, COPs represent *participation* in a tax-exempt lease, which is an agreement between a municipal government and a bank trust department or governmental agency, usually the former. Revenues to pay the COPs can come from a number of sources depending on the type of project financed. For example, COPs issued to finance a community facility or convention center may be paid back from the revenues generated by the facility that are not needed for

operations, and special taxes such as hotel/motel taxes or business license fees. When the COPs are retired, the local government owns the project.

Short-Term Debt

There are three types of short-term debt: (1) tax and revenue anticipation notes, (2) bond anticipation notes and warrants (Bancroft), and (3) public improvement notes. In all cases, short-term debt is incurred based upon, and secured by, anticipated future revenues and a line of credit. Issuing short-term notes allows the issuer to delay long-term financing until the market is more stable.

Private Financing

Private financing refers to individuals that obtain their own financing for components of the system for which they are responsible. This is usually referred to as the *on-lot* or *private* portion of the system. Direct contributions from developers are also considered a private financing source.

In the case of industrial wastewater, the MWMC has adopted minimum standards for industrial effluent quality. To implement these standards, the cities of Eugene and Springfield have local ordinances requiring a number of firms to pre-treat their effluent prior to discharge into the regional system. This has the effect of privatizing the higher wastewater costs that this discharge would have created had it entered the public system, and focuses that cost on the appropriate user class.

Existing Financing Scenarios

Financing scenarios vary by agency and infrastructure system. In general, ongoing operations and maintenance and rehabilitation are funded primarily by user fees, while system expansion is funded primarily by assessments and SDCs (see Table 5-1).

Existing Agency Financing Strategies

The following summarizes how each jurisdiction generally handles infrastructure funding.

- ***City of Eugene:*** Public infrastructure improvements are financed by a combination of assessments, bonds, short-term debt, user fees, and SDCs. The major source of funds available for capital projects are dedicated funds. Dedicated funds must be used for a particular purpose. The City's Wetland Mitigation Bank Fund, and the Stormwater and Wastewater Utilities Fund, are supported primarily by user fees. The Road Fund is supported by state gas taxes and transfers from the Lane County Road Fund. SDCs and assessments are paid by properties benefiting from or creating the need for infrastructure expansion. Projects that are not supported by dedicated revenue, such as off-street bike paths, are financed by a transfer from the General Fund, which is funded by property taxes and other general revenue sources. The City may receive direct funding for projects from other jurisdictions or through grants and donations.

Table 5-1: Existing Financing Sources

	User fees	Assess-ments	Development fees	Property tax	Grants/loans	Bonds	Short-term debt	Private finance
WATER								
EWEB								
O&M	X							
Rehabilitation	X		X			X	X	
Expansion	X		X			X	X	X
SUB								
O&M	X							
Rehabilitation	X		X					
Expansion	X		X					X
Rainbow								
O&M	X							
Rehabilitation	X							
Expansion	X							X
WASTEWATER								
City of Eugene								
O&M	X							
Rehabilitation	X		X		X		X	
Expansion	X	X	X	X	X	X	X	X
City of Springfield								
O&M	X							
Rehabilitation	X		X					
Expansion	X	X	X	X	X			X
MWMC								
O&M	X							
Rehabilitation	X		X					
Expansion	X		X	X				

Table 5-1: Existing Financing Sources

	User fees	Assess- ments	Development fees	Property tax	Grants/ loans	Bonds	Short-term debt	Private finance
STORMWATER								
City of Eugene								
O&M	X							
Rehabilitation Expansion	X		X				X	
	X		X					X
City of Springfield								
O&M	X							
Rehabilitation Expansion	X		X					
	X		X					X
Lane County								
O&M								
Rehabilitation Expansion					X			
					X			

- ***City of Springfield:*** The City of Springfield has SDCs for growth-related wastewater and stormwater improvements, and a wastewater user fee for system expansion, extension, and repair. The City has received grants and loans administered through the Community Development Block Grant program, the Oregon Economic Development Department's Special Public Works Fund, and the federal Economic Development Administration. The City issued revenue bonds secured by appropriations such as wastewater user fees and general obligation bonds issued with approval of the voters.
- ***Eugene Water & Electric Board (EWEB):*** About 90 percent of EWEB's water system revenues are from user fees. EWEB collects both reimbursement and improvement SDCs. EWEB currently has outstanding water and electric revenue bonds and serves as the billing agent for the City of Eugene's wastewater and stormwater fees.
- ***Rainbow Water District:*** Rainbow Water District supports operation and maintenance through user fees and capital improvements through SDCs and user fees.
- ***Springfield Utility Board (SUB):*** User fees and Development/Redevelopment Charges (SDCs) cover the majority of funding needs for Springfield's water system. The SDCs have both reimbursement improvement components. No grants have been received in recent years and there is no perceived need for alternative financing sources in the near future.
- ***Lane County:*** County Road Fund money is used for road projects, including the stormwater component of road improvements on county roads, and roads within the UGB, and outside the city limits.
- ***Metropolitan Wastewater Management Commission:*** The MWMC funds the operation and administration of the Eugene-Springfield Regional Wastewater Treatment Plant. this funding is supported by user fees and SDCs.

Water System Financing

Water is supplied within the UGB by two municipal utilities (EWEB, SUB) and four water districts (Rainbow, Santa Clara, River Road, and Glenwood). The Santa Clara, River Road, and Glenwood water districts contract with the EWEB for water supply and operation and maintenance services.

- ***User Fees:*** The majority of water system operations and maintenance costs are funded through user fees.
- ***Development Fees:*** SDCs are used by EWEB, SUB, and Rainbow as a means of charging new development for their share of water system capacity. The SDCs include reimbursement and improvement components.
- ***Bonds:*** EWEB currently has outstanding water revenue bonds and revenue refunding bonds.
- ***Private Financing:*** Developers/homeowners are responsible for paying the cost of the on-lot extension of the water line.

Wastewater System Financing

The cities provide local wastewater collection services and the MWMC owns and operates the Eugene-Springfield Regional Wastewater Treatment Plant.

- **User Fees:** The user fee rate structure includes fixed costs (base rate) and variable costs based on degree of usage. Fees collected through the wastewater program enable the cities to provide wastewater services to area residents and manage wastewater construction projects.

Wastewater service fees are billed to all users connected to the Eugene-Springfield Regional Wastewater Treatment Plant. The wastewater fee has two components: 1) a regional component set by MWMC and 2) a local component set by the cities.

The regional charges have a fixed amount per account that contributes to various shared costs and a flow-based rate that recovers costs in relation to volume of demand created by the customer. The regional rate also has higher flow-based rates for customers that place an additional demand on the treatment plant through higher strength wastewater discharge. This rate *surcharge* provides a means of recovering the higher operating costs to treat high strength effluent from those specific users.

The cities' collection systems are more impacted by the volume of effluent that users discharge and less by the characteristics of that effluent. The local portion of the wastewater user fee is based only on the flow created by the user.

- **Assessments:** Assessments traditionally have been used by the cities to charge benefiting properties for the extension of the wastewater collection system.
- **Development Fees:** Eugene, Springfield, and the MWMC all have SDCs with forward-looking (improvement) and reimbursement components.
- **Property Taxes:** Transfers from the General Funds are used to fill gaps in funding and to repay long-term debt.
- **Grants and Loans:** State grants and loans have been used to fund wastewater projects. The main sources have been the OEDD Special Public Works Fund and the DEQ State Revolving Fund. Both the regional WPCF and the River Road-Santa Clara interceptor system were constructed through assistance from Environmental Protection Agency (EPA) grant programs.
- **Private Financing:** In some cases, individuals are required to obtain their own financing for components of the wastewater for which they are responsible. In Eugene and Springfield, property owners are responsible for installing and financing their own wastewater service to the service connection on a lateral wastewater. Property owners are also responsible for costs associated with decommissioning existing septic systems when connecting with the city wastewater system.

Stormwater System Financing

The cities of Eugene and Springfield have stormwater user fees and SDCs based on impervious surface. In both cities, the majority of funds for preservation and maintenance projects come from user fees. Major upgrades, capacity enhancements, and new capital facilities are funded primarily by SDCs and user fees.

The County deals with road-related stormwater on county roads inside the city limits and in unincorporated areas of the UGB. If the facilities can be tied directly to road runoff, the County constructs and maintains piped systems and ditches with County Road Funds. If the drainage

facility is off the right-of-way, the County does not maintain or improve it unless the runoff is jeopardizing the safety or integrity of the road. Otherwise, they advise constituents that any problems or disputes are civil matters to be handled by adjacent property owners. If the County is adding storm pipe to a road project, it is sized based on the runoff expected from the right-of-way. If the pipe is to handle more than that, others are approached, like a city or drainage district, for example, to pay for the upsizing. Only rarely does one come forward to pay. The County Board may consider a storm drainage utility fee and/or SDC at some point in the future.

- **User Fees:** The user fee rate structure used by the City of Eugene includes three components: an impervious surface calculation, a street-related component, and an administrative charge. The City of Springfield's rate structure includes an impervious surface calculation and administrative charge. The fees are used to fund all types of stormwater projects.
- **Assessments:** The use of assessments for stormwater projects is rare.
- **Development Fees:** SDCs are used to fund major upgrades, capacity enhancement, and new capital facilities.

The City of Eugene has a Wetland Mitigation Bank Fund (Bank). The fund provides for the enhancement, restoration, or creation of wetlands on various sites in west Eugene. The purpose of the Bank is to provide replacement wetlands for those designated wetlands that are filled or destroyed during development, in order to meet federal *no net loss* criteria. If a property to be developed contains designated wetlands, developers may either preserve or mitigate wetlands on-site, or purchase replacement wetlands through acquiring mitigation credits through the Bank. The Bank fund is supported by the sale of these mitigation credits. Initial support for the program was provided by the federal BLM. As mitigation wetlands replace federally designated wetlands, they are subject to federal non-degradation standards, and are not considered part of the city's stormwater drainage program.

- **Grants and Loans:** The County's Road Fund can be used to pay for road-related (including stormwater) projects. The majority of the County's Road Fund is financed by state gas taxes and federal timber receipts.
- **Private Financing:** Developers and homeowners may construct on-site stormwater facilities, such as dry wells, and may be eligible for a reduction of their stormwater user fee.

Financing Issues And Challenges

There are several issues and challenges that jurisdictions are facing, or expect to face, that may impact the cost or ability to finance infrastructure.

Increased Densities

There are some potential financing challenges related to increased development densities (through infill and redevelopment).

- **Stormwater:** Using natural drainage systems or preserving existing natural systems generally takes up more land than the typical piped stormwater system. When pipes are used, it allows the owner to continue the use of the surface area.

- **Wastewater:** There may be isolated areas where a major change in density would create a capacity problem. An extreme example would be Hyundai. A capacity problem may also be a result of the age of the system and infiltration. In addition to ongoing system rehabilitation, there may be areas where *helper* pipes will be necessary.

Aging Systems

The cost implications of an aging wastewater infrastructure system are being addressed on a regional basis. The Cities of Eugene and Springfield, and the MWMC, are reviewing the implications of an aging wastewater collection system on both the capacity of the treatment plant, and the financial resources of the community. There could be significant cost implications to rehabilitating the collection system, including the private costs of system-wide repair of the piping on individual lots.

Endangered Species

The potential listing of coho salmon and steelhead as endangered species is likely to result in stricter water quality regulations leading to higher water, wastewater, and stormwater infrastructure costs.

Citizen Tax Initiatives

The current climate of citizen resistance to tax and fee increases could affect further the ability to pass bond levies, and other revenue-generating initiatives. Measure 50, for instance, restricts the ability of governments to pass property tax measures until general elections or elections receiving a 50 percent turnout. Other measures that restrict government's ability to raise fees or taxes have been circulated as initiative petitions recently and may be placed on the ballot at a future election.

National Pollutant Discharge Elimination System (NPDES): Springfield and Lane County

Springfield and Lane County will need to meet the federal CWA and EPA's NPDES requirements related to the discharge of stormwater pollutants within the next few years. This will increase the revenue requirements for all aspects of the stormwater system. The experience of the City of Eugene indicates that costs could increase by as much as 60 percent.

Shifting Responsibility of Development Costs

Jurisdictions are increasingly shifting the cost of development to those that directly benefit from the new infrastructure. While there are many benefits to this approach, there have been concerns raised regarding the affect on housing affordability, as well as the overall political acceptability.

Alternative Financing Strategies

Jurisdictions are considering alternative ways of financing infrastructure. The following summarizes the possible alternative financing strategies:

- **Tax increment financing:** Urban Renewal Districts could be phased in to areas targeted for infrastructure improvements. As development occurs, and the taxes increase, the difference could be used to fund the needed improvements and the district could shift to a new geographic area.

- **Impact credit banks:** Impact credit banks internalize the cost of mitigating impacts by creating a bank of impact credits that can be bought and sold. The banking concept also can be used to attain/maintain a predetermined level of resource quality by limiting the total number of credits, (i.e., each credit would equal a particular amount of pollution, and the total amount of credits would equal the total allowable pollution or impact).
- **Expansion of SDC usage:** In some cases, SDCs are not being used to their fullest potential. For example, the City of Eugene is exploring ways that SDCs could be used to fund stormwater *quality* projects. Although legally defensible, there are no jurisdictions in the area using SDCs to fund this component of the stormwater system. Eugene is also in the process of reviewing all SDCs to determine whether full cost recovery goals are being met.
- **Private financing:** There are many ways private sources can participate in supporting public infrastructure. Developers commonly pay for a portion of the infrastructure needed for their development, whether on-site or off-site. Property owners pay for many of the on-site improvements to the infrastructure system, including opting to make on-site stormwater improvements.
- **Real estate transfer tax:** The tax is based on the sales value of residential, commercial, and industrial property. The tax generates funds primarily from new development.
- **Basin-specific financing:** Basin-specific financing focuses the responsibility for the cost of the system on a user group within a defined geographic area—in this case a drainage basin.

Appendix A
Service Availability Within Nodal Development Areas

Introduction

TransPlan (the Eugene-Springfield Regional Transportation System Plan) encourages the development of three types of high density residential, commercial and employment centers or “nodes” throughout the metropolitan area. The potential nodes are shown on the *TransPlan* map, *Nodal Development Areas proposed for the Eugene-Springfield Metro Area*, contained in this appendix.

Service Availability within Nodal Developmental Areas

Through the PFP service questionnaires, more detailed information on various service issues and constraints were identified for specific nodal development areas. This information has been compiled below and is organized by city, node number, and service type.

Springfield:

- 9C:** Water: needs large diameter transmission main.
- 9H:** Wastewater: constrained because of lack of sewer lines.
Stormwater: limited capacity; lack of control of outfall locations.
Water: water transmission and “looping” system required for dependable and adequate fire protection.
Electric: this area is currently outside the city limits of Springfield, but there are facilities adjacent to the area.
- 7B:** Water: water transmission and “looping” system required for dependable and adequate fire protection. This node is overall constrained due to traffic issues as well as drainage issues.
- 9K:** Stormwater: very limited capacity for stormwater runoff. Hillside areas are hard to serve with detention and pre-treatment. Cedar Creek drainage system already has problems.
Water: water transmission and “looping” system required for dependable and adequate fire protection.
- 9J:** Stormwater: limited capacity; lack of control of outfall locations.
Water: no water within several miles. Cost of \$41 million to extend water services.
Electric: capacity to serve, but would have to extend distribution system into this area.
- 7C to 9C:** Electric: SUB has ample capacity to serve these nodes and the area, but will be looking in this location for the placement of a distribution substation. This area is approximately the midpoint between two substations: one located at 1925 Laura Street and the other located at 635 South 42nd Street. The siting of a substation would serve the immediate area’s load, as well as being a backup source to either the Jasper or Laura Street Substations.

Eugene:

For water service, a more thorough analysis is needed to determine availability for individual sites within nodes. Due to nature of fire flows being on a case-by-case basis and analysis, it is too difficult to assess nodes on a broad basis. Fire flow is site specific; all nodes have capability of adequate fire flow, but some sites within the nodes may require more infrastructure upgrades than others.

4F: Wastewater: needs the Barger/Green Hill interceptor constructed before service can be provided. The City has included this project in their CIP for year 2002, but actual construction will depend on request for development and the completion of the new street alignment in the area.

Water: portion of node cannot be served due to existing facilities not readily adjacent to area. Service is available based on EWEB policies and procedures.

1B,1E,1D,1H,1F,1G,2B,2C: Wastewater: These nodes are in the Downtown and Amazon basins which do currently experience surcharging of the collection system during heavy rainfall events. The City is improving the present conditions by completing sewer rehabilitation projects in the higher flow basins. Therefore it is recommended that the above nodes be held back from higher flow development until the I/I reduction program has a larger impact and more is learned about this collection system was flow monitoring and TV inspection.

8A: Wastewater: This node requires that the Franklin interceptor be constructed from the Glenwood pump station to the east. There is currently no time table or funding allocation for this project.

6A: Wastewater: This node needs the pipe extension from the new Crimson pump station west. This would allow for the abandonment of the existing private pump station currently serving the development in the area.

6B: Wastewater: This node would require the Coburg Road extension, County Farm Road, the Farm Road pump station and pipe extension to the east. There is currently no time table or funding allocation for these projects.

4F, 3B, 3D, 3E: Stormwater: wetlands have either been identified or there is potential they could be present. If present, fill permits and mitigation would be necessary.

4E: Stormwater: CIP needed to correct existing BD6 problems – may not be adequate with more intense uses. More analysis necessary.

3H and 3I: Stormwater: there are a number of Amazon Creek segments deficient under existing/future conditions. If not evaluated for higher uses, the proposed CIPs may not be adequate. (AM 39, 42).

1G: Stormwater: same as 3H and 3I. (CIP 15a and 15b). Hydraulic modeling may be necessary to determine stormwater capacities for this and other nodes in Eugene. More so than other services, the stormwater system has a range of options and considerable flexibility for meeting urban service needs.

The following table reflects the current status of service availability for all of the proposed nodes. Where no service issues were identified, the node was listed as having “*no known service constraints.*” Nodes located primarily in urbanizable areas (outside city limits) are also indicated.

Service Availability Within Nodal Development Areas

NODE CODE	NODE NAME	OUTSIDE CITY LIMITS	UTILITY SERVICES	SERVICE AVAILABILITY
1B	5 th and Blair		--	No known service constraints
1C	West 11 th and Chambers		--	No known service constraints
1D	South Bank		--	No known service constraints
1E	Downtown Eugene		--	No known service constraints
1F	18 th and Willamette		--	No known service constraints
1G	Hilyard and Agate		Electric	Short-term
1H	Riverfront Research Park		--	No known service constraints
1J	University of Oregon		--	No known service constraints
2A	28 th and Friendly		--	No known service constraints
2B	29 th and Willamette		--	No known service constraints
2C	30 th and Amazon		--	No known service constraints
3A	West 11 th and Terry		--	No known service constraints
3B	West 11 th and Crow Road	✓	Stormwater	Long-term
3C	Willow Creek Industrial		Electric, Wastewater	Short-term
			Stormwater	Long-term
3D	Willow Creek Residential		Electric, Wastewater	Short-term
3E	West 11 th and Beltline		--	No known service constraints
3F	West 11 th and Bailey Hill		Stormwater, Water	Short-term
3G	West 18 th and Churchill		--	No known service constraints
3H	West 11 th and City View		--	No known service constraints
3I	West 18 th and Chambers		--	No known service constraints
4D	Barger and Highway 99		--	No known service constraints
4E	Gilbert		--	No known service constraints
4F	West Royal	✓	Electric, Water Stormwater, Wastewater	Short-term
4G	Royal at Danebo		Electric, Stormwater	Short-term
5A	River Road and Spring Creek	✓	--	No known service constraints
5C	Santa Clara Square		--	No known service constraints
5D	River Road at Beltline South		--	No known service constraints

NODE CODE	NODE NAME	OUTSIDE CITY LIMITS	UTILITY/ SERVICE	SERVICE AVAILABILITY
5E	Maxwell and NW Expressway	✓	--	No known service constraints
5F	Lower River Road		--	No known service constraints
6A	Ayres Road		Electric, Stormwater Wastewater	Short-term
6B	Coburg and Armitage	✓	Electric, Water, Wastewater	Short-term
6D	Coburg and Chad		Electric	Short-term
6E	Chad Employment		Electric	Short-term
6F	Sheldon Plaza		--	No known service constraints
6G	Willagillespie		--	No known service constraints
6H	Valley River		--	No known service constraints
6I	Country Club Road		--	No known service constraints
6J	Oakway and Coburg		--	No known service constraints
6K	Chase Gardens		Water	Short-term
7A	Gateway Special Light Industrial		--	No known service constraints
7B	Gateway and Beltline	✓	Water, Wastewater	Short-term
7C	Pierce Trust Marcola		--	No known service constraints
7D	Harlow		--	No known service constraints
8A	Glenwood—Franklin		Wastewater	Short-term
8B	Downtown Springfield		--	No known service constraints
9A	Mohawk		--	No known service constraints
9B	14 th and Main		--	No known service constraints
9C	28 th and Main—North		Electric, Water, Wastewater	Short-term
9D	42 nd and Main		--	No known service constraints
9F	48 th and Main		--	No known service constraints
9G	58 th and Main		Stormwater	Short-term
9H	Jasper Residential—North	✓	Electric, Water	Short-term
			Stormwater, Wastewater	Long-term
9J	Jasper Employment	✓	Electric, Stormwater	Short-term
			Water, Wastewater	Long-term
9K	Thurston Residential		Water, Electric	Short-term
			Stormwater	Long-term

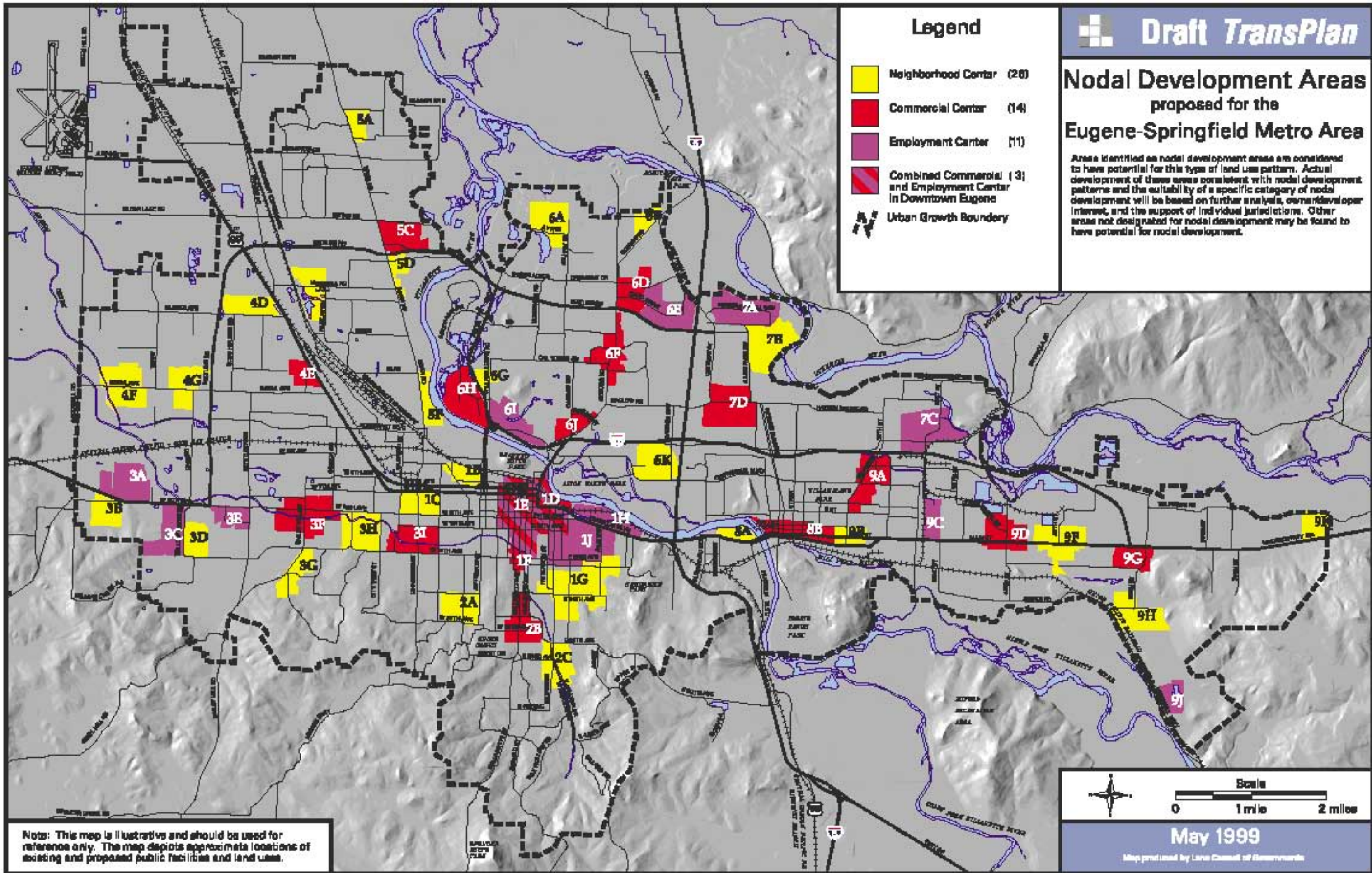
Source: Lane Council of Governments, 1998.

**Nodal Development Areas
proposed for the
Eugene-Springfield Metro Area**

Areas identified as nodal development areas are considered to have potential for this type of land use pattern. Actual development of these areas consistent with nodal development patterns and the suitability of a specific category of nodal development will be based on further analysis, owner/developer interest, and the support of individual jurisdictions. Other areas not designated for nodal development may be found to have potential for nodal development.

Legend

- Neighborhood Center (28)
- Commercial Center (14)
- Employment Center (11)
- Combined Commercial (3) and Employment Center in Downtown Eugene
- Urban Growth Boundary



Notes: This map is illustrative and should be used for reference only. The map depicts approximate locations of existing and proposed public facilities and land uses.

Scale
0 1 mile 2 miles

May 1999

Map produced by Lisa Caswell of Gannett Fleming







Study Area

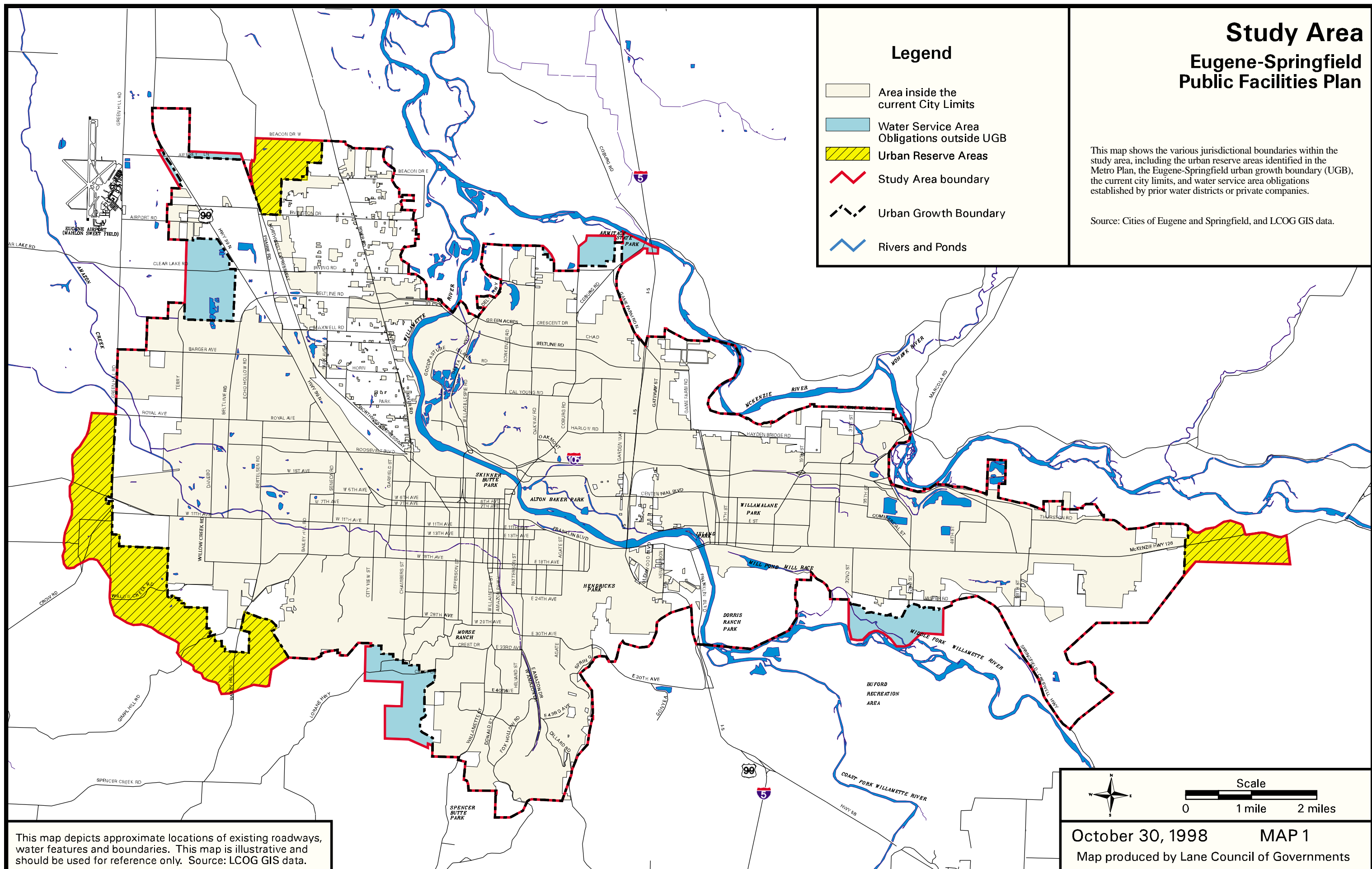
Eugene-Springfield Public Facilities Plan

This map shows the various jurisdictional boundaries within the study area, including the urban reserve areas identified in the Metro Plan, the Eugene-Springfield urban growth boundary (UGB), the current city limits, and water service area obligations established by prior water districts or private companies.

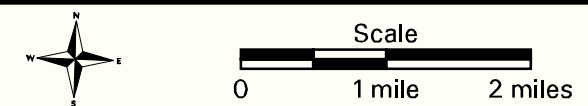
Source: Cities of Eugene and Springfield, and LCOG GIS data.

Legend

-  Area inside the current City Limits
-  Water Service Area Obligations outside UGB
-  Urban Reserve Areas
-  Study Area boundary
-  Urban Growth Boundary
-  Rivers and Ponds



This map depicts approximate locations of existing roadways, water features and boundaries. This map is illustrative and should be used for reference only. Source: LCOG GIS data.



October 30, 1998 MAP 1
 Map produced by Lane Council of Governments






Existing Water Service Areas Eugene-Springfield Public Facilities Plan

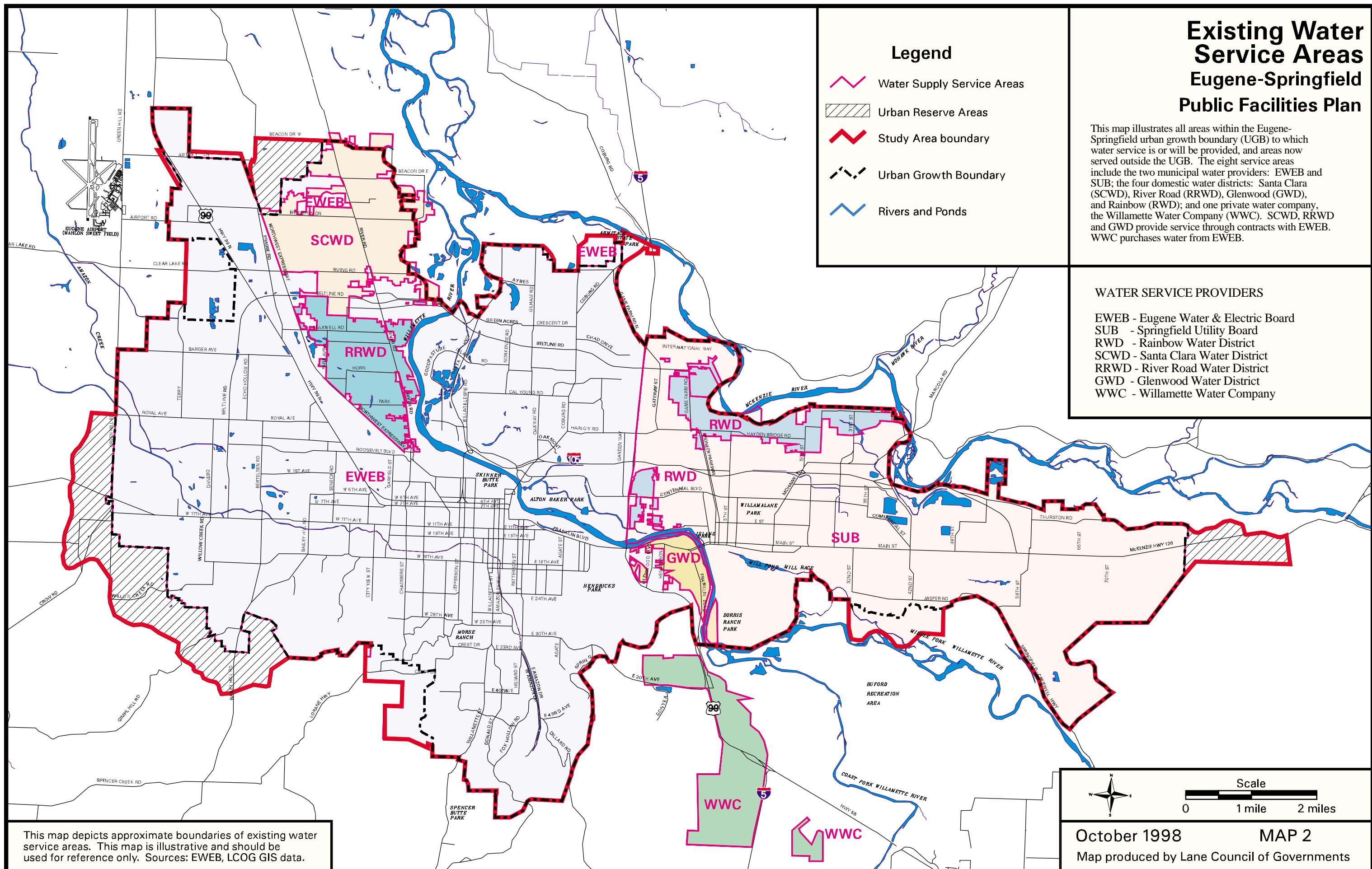
This map illustrates all areas within the Eugene-Springfield urban growth boundary (UGB) to which water service is or will be provided, and areas now served outside the UGB. The eight service areas include the two municipal water providers: EWEB and SUB; the four domestic water districts: Santa Clara (SCWD), River Road (RRWD), Glenwood (GWD), and Rainbow (RWD); and one private water company, the Willamette Water Company (WWC). SCWD, RRWD and GWD provide service through contracts with EWEB. WWC purchases water from EWEB.

WATER SERVICE PROVIDERS

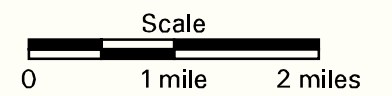
- EWEB - Eugene Water & Electric Board
- SUB - Springfield Utility Board
- RWD - Rainbow Water District
- SCWD - Santa Clara Water District
- RRWD - River Road Water District
- GWD - Glenwood Water District
- WWC - Willamette Water Company

Legend

-  Water Supply Service Areas
-  Urban Reserve Areas
-  Study Area boundary
-  Urban Growth Boundary
-  Rivers and Ponds



This map depicts approximate boundaries of existing water service areas. This map is illustrative and should be used for reference only. Sources: EWEB, LCOG GIS data.









October 1998 MAP 2
Map produced by Lane Council of Governments

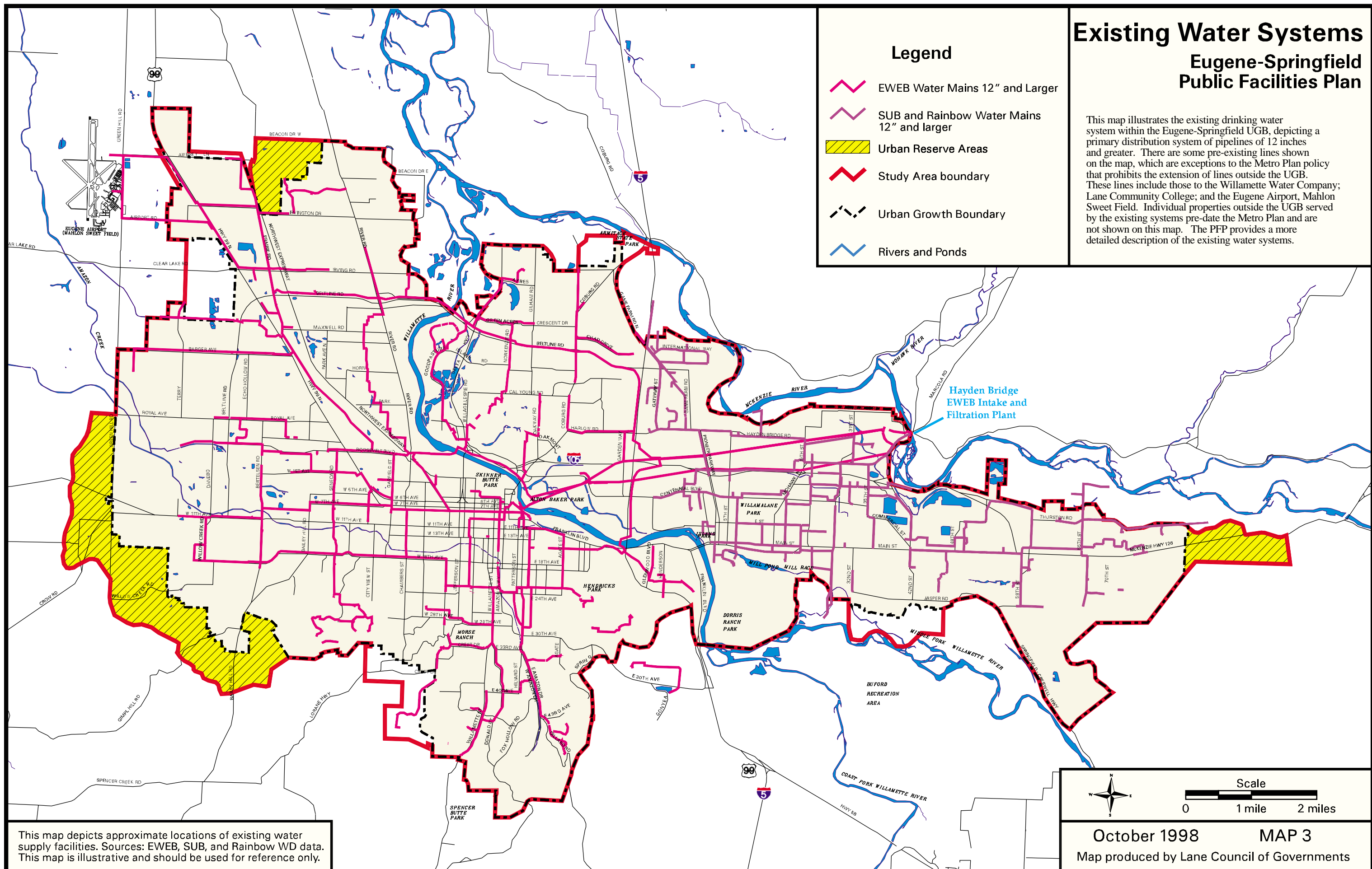
Existing Water Systems

Eugene-Springfield Public Facilities Plan

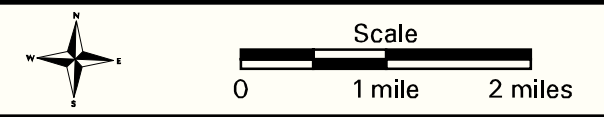
This map illustrates the existing drinking water system within the Eugene-Springfield UGB, depicting a primary distribution system of pipelines of 12 inches and greater. There are some pre-existing lines shown on the map, which are exceptions to the Metro Plan policy that prohibits the extension of lines outside the UGB. These lines include those to the Willamette Water Company; Lane Community College; and the Eugene Airport, Mahlon Sweet Field. Individual properties outside the UGB served by the existing systems pre-date the Metro Plan and are not shown on this map. The PFP provides a more detailed description of the existing water systems.

Legend

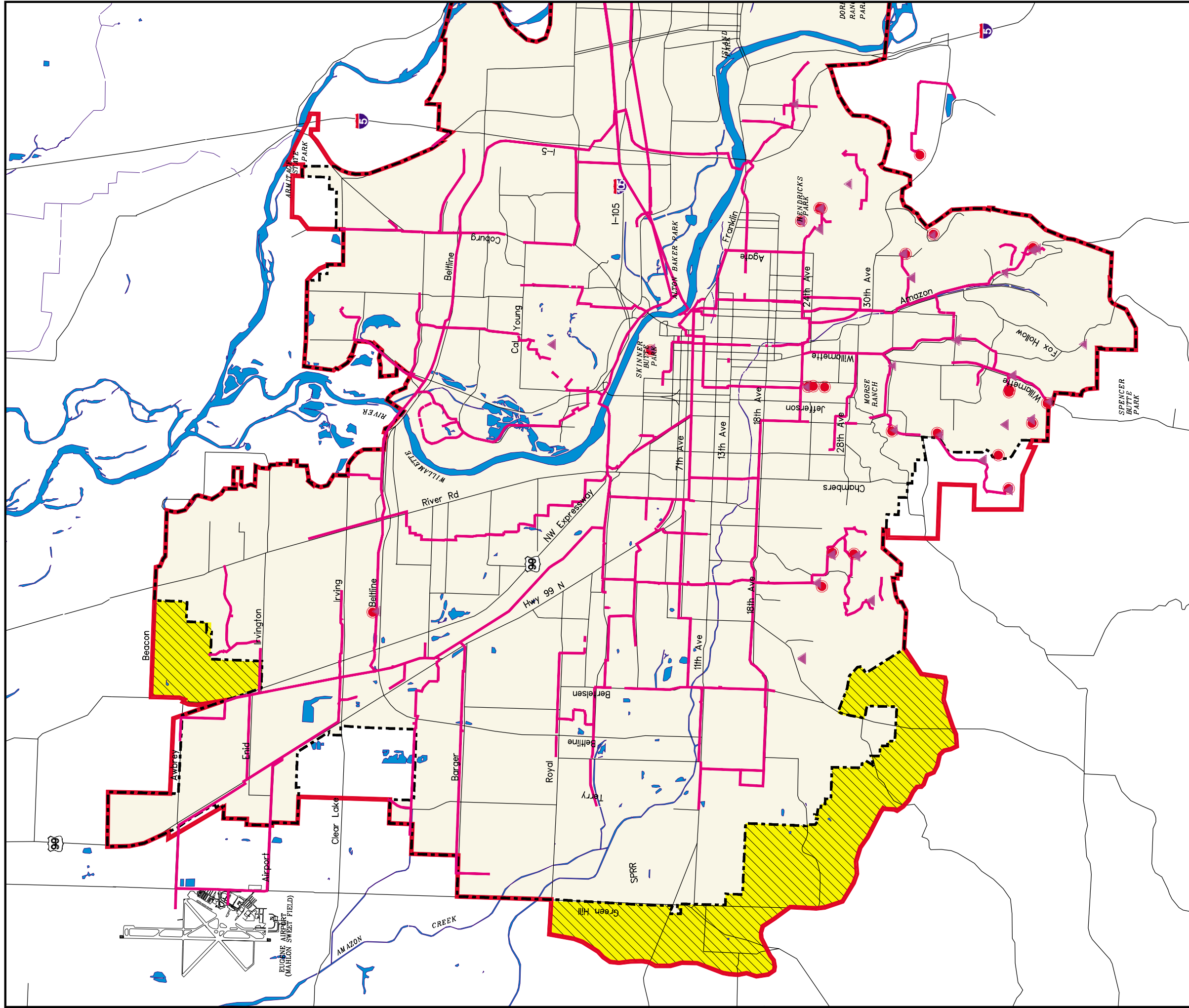
-  EWEB Water Mains 12" and Larger
-  SUB and Rainbow Water Mains 12" and larger
-  Urban Reserve Areas
-  Study Area boundary
-  Urban Growth Boundary
-  Rivers and Ponds



This map depicts approximate locations of existing water supply facilities. Sources: EWEB, SUB, and Rainbow WD data. This map is illustrative and should be used for reference only.



October 1998 MAP 3
Map produced by Lane Council of Governments



Existing Water System In Eugene

Eugene-Springfield Public Facilities Plan

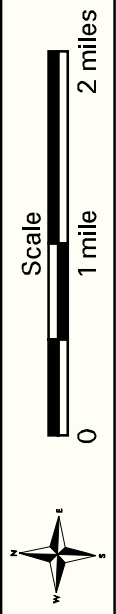
Legend

- EWEB Reservoirs
- ▲ EWEB Pump Stations
- └─┘ EWEB Water Mains 12" and Larger
- Urban Reserve Areas
- └─┘ Study Area boundary
- Urban Growth Boundary
- └─┘ Rivers and Ponds

This map depicts approximate locations of existing water supply facilities. Sources: EWEB, SUB & Rainbow W/D data. This map is illustrative and should be used for reference only.

Existing Water System in Eugene

This map illustrates the existing water system within the Eugene portion of the urban growth boundary, including the storage reservoirs, pumping stations, and primary distribution system. Service to the Eugene Airport, Lane Community College, and the Willamette Water Company is also shown on this map. EWEB's water intake and treatment facility is shown on Map 3.











October 1998 MAP 4
Map produced by Lane Council of Governments

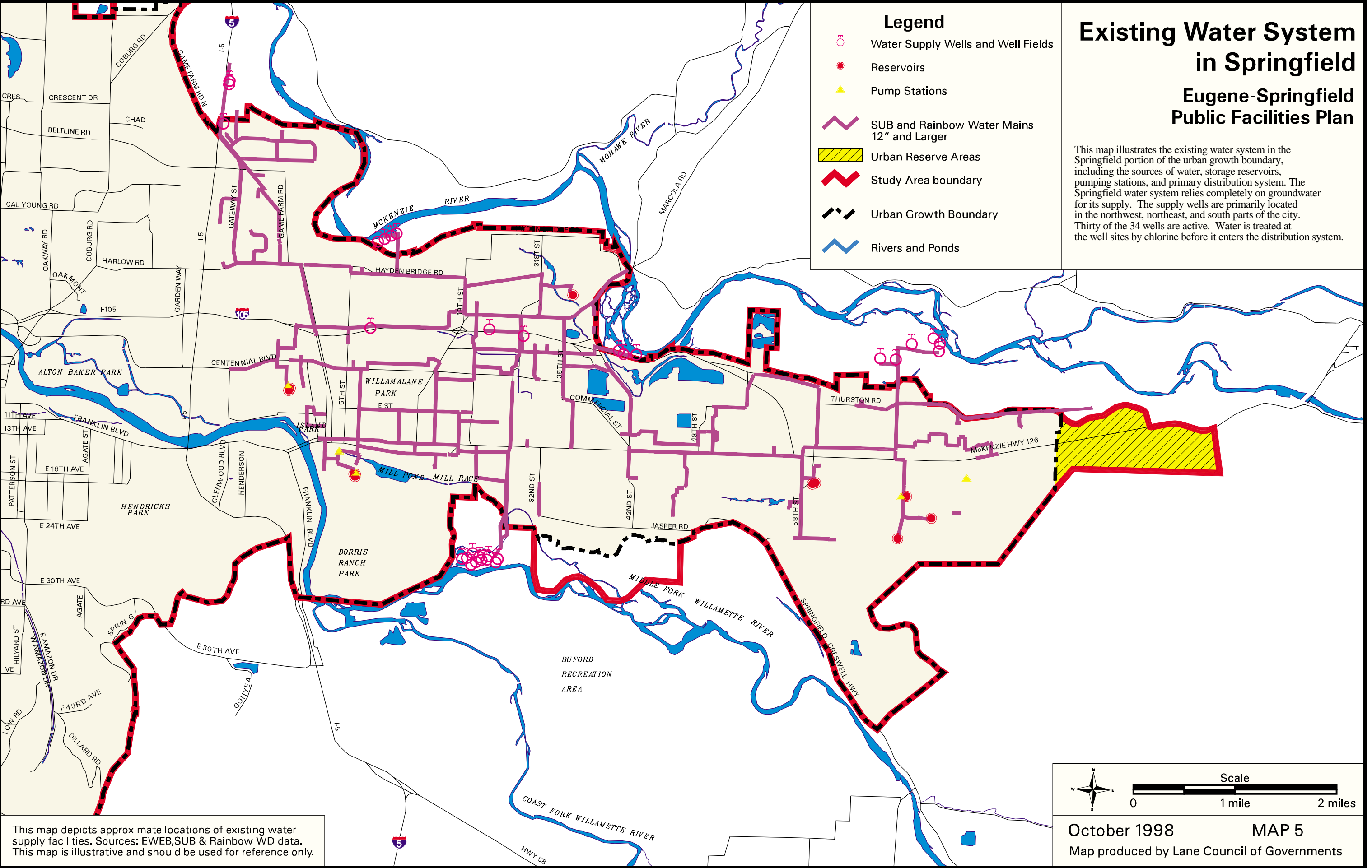
Existing Water System in Springfield

Eugene-Springfield Public Facilities Plan

This map illustrates the existing water system in the Springfield portion of the urban growth boundary, including the sources of water, storage reservoirs, pumping stations, and primary distribution system. The Springfield water system relies completely on groundwater for its supply. The supply wells are primarily located in the northwest, northeast, and south parts of the city. Thirty of the 34 wells are active. Water is treated at the well sites by chlorine before it enters the distribution system.

Legend

-  Water Supply Wells and Well Fields
-  Reservoirs
-  Pump Stations
-  SUB and Rainbow Water Mains 12" and Larger
-  Urban Reserve Areas
-  Study Area boundary
-  Urban Growth Boundary
-  Rivers and Ponds



This map depicts approximate locations of existing water supply facilities. Sources: EWEB, SUB & Rainbow WD data. This map is illustrative and should be used for reference only.

Scale
0 1 mile 2 miles

October 1998 MAP 5
Map produced by Lane Council of Governments



Existing Wastewater Collection and Treatment Systems

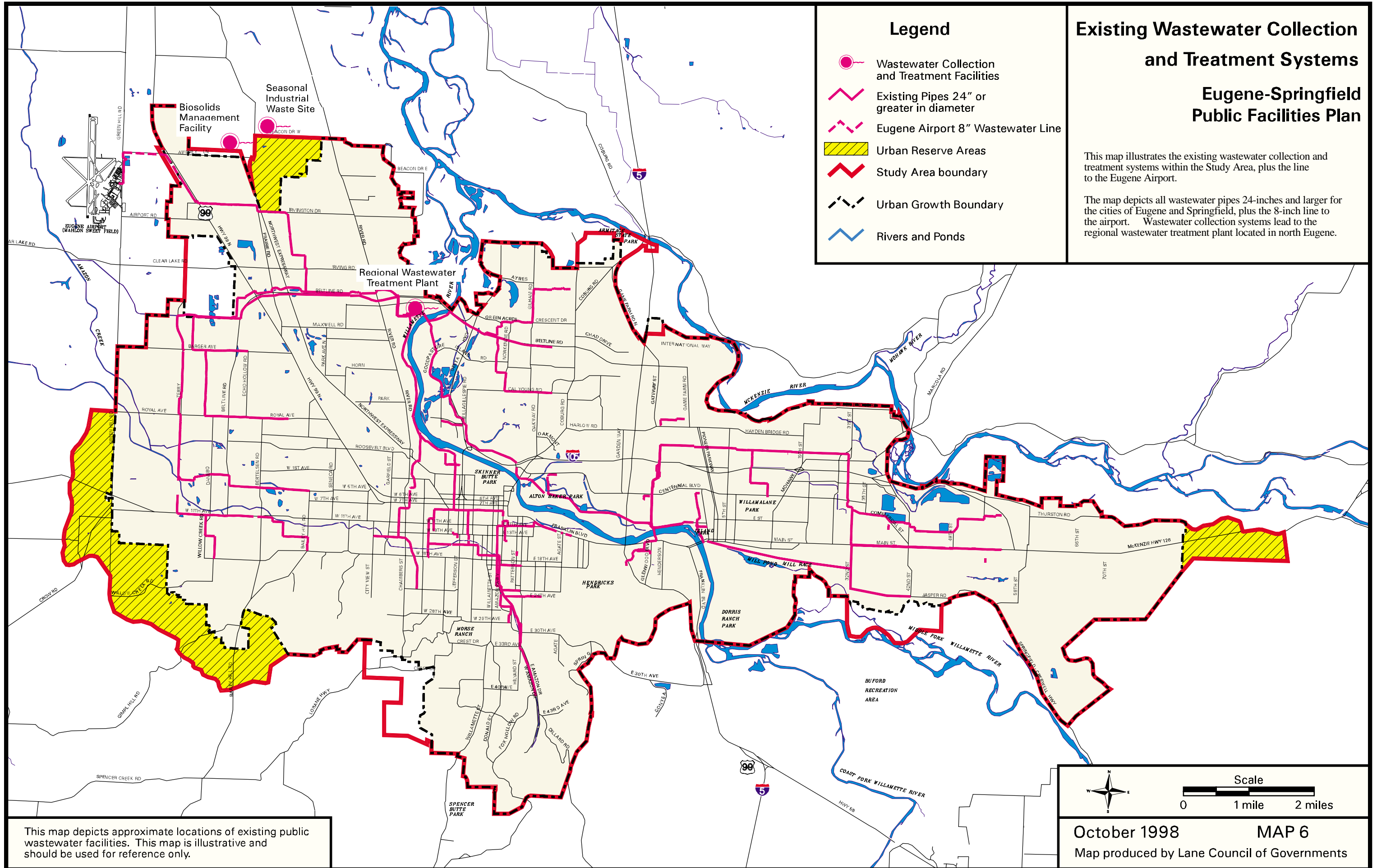
Eugene-Springfield Public Facilities Plan

This map illustrates the existing wastewater collection and treatment systems within the Study Area, plus the line to the Eugene Airport.

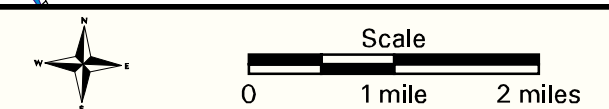
The map depicts all wastewater pipes 24-inches and larger for the cities of Eugene and Springfield, plus the 8-inch line to the airport. Wastewater collection systems lead to the regional wastewater treatment plant located in north Eugene.

Legend

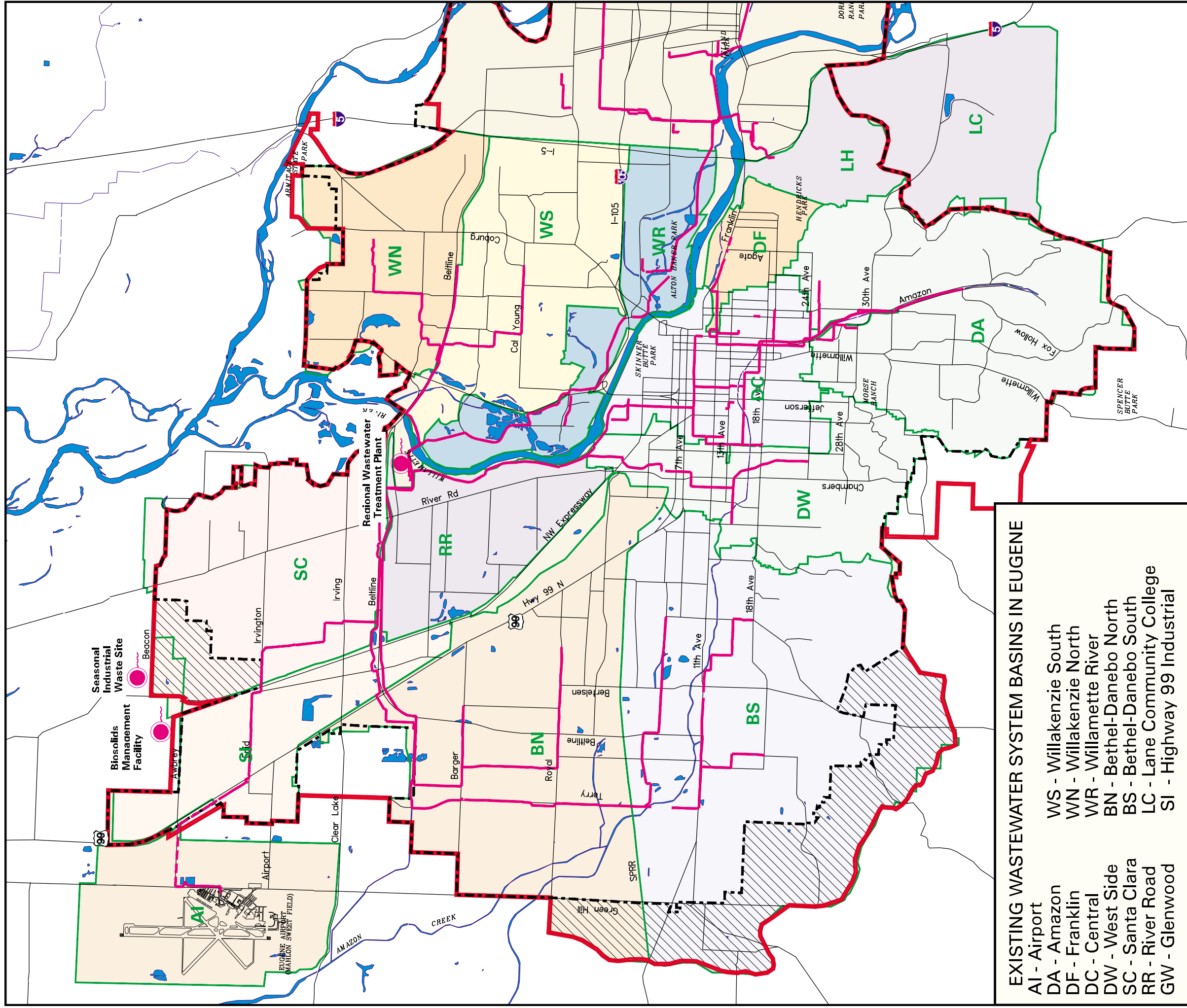
-  Wastewater Collection and Treatment Facilities
-  Existing Pipes 24" or greater in diameter
-  Eugene Airport 8" Wastewater Line
-  Urban Reserve Areas
-  Study Area boundary
-  Urban Growth Boundary
-  Rivers and Ponds



This map depicts approximate locations of existing public wastewater facilities. This map is illustrative and should be used for reference only.



October 1998 MAP 6
Map produced by Lane Council of Governments

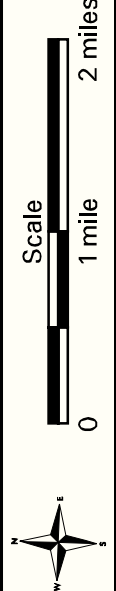


EXISTING WASTEWATER SYSTEM BASINS IN EUGENE

- AI - Airport
- DA - Amazon
- DF - Franklin
- DC - Central
- DW - West Side
- SC - Santa Clara
- RR - River Road
- GW - Glenwood
- WS - Willakenzie South
- WN - Willakenzie North
- WR - Willamette River
- BN - Bethel-Danebo North
- BS - Bethel-Danebo South
- LC - Lane Community College
- SI - Highway 99 Industrial

Existing Wastewater and Collection Treatment System

This map illustrates the existing wastewater collection and treatment system within the study area, including the Eugene Airport. The map depicts wastewater facilities, including pump stations, pipes of 24-inches and larger and the pipe to the Eugene Airport. The piping system leads to the regional wastewater treatment plant located in north Eugene. Eugene's fifteen wastewater basins are also shown. Delineating basin areas is important because it minimizes transport costs and assists with future planning efforts.



March 1999
 Map produced by Lane Council of Governments

Existing Wastewater Collection and Treatment System in Eugene
Eugene-Springfield Public Facilities Plan

Legend







- Wastewater Collection and Treatment Facilities
- Existing Pipes 24" or greater in diameter
- Eugene Airport 8" Wastewater Line
- Urban Reserve Areas
- Study Area boundary
- Urban Growth Boundary
- Rivers and Ponds

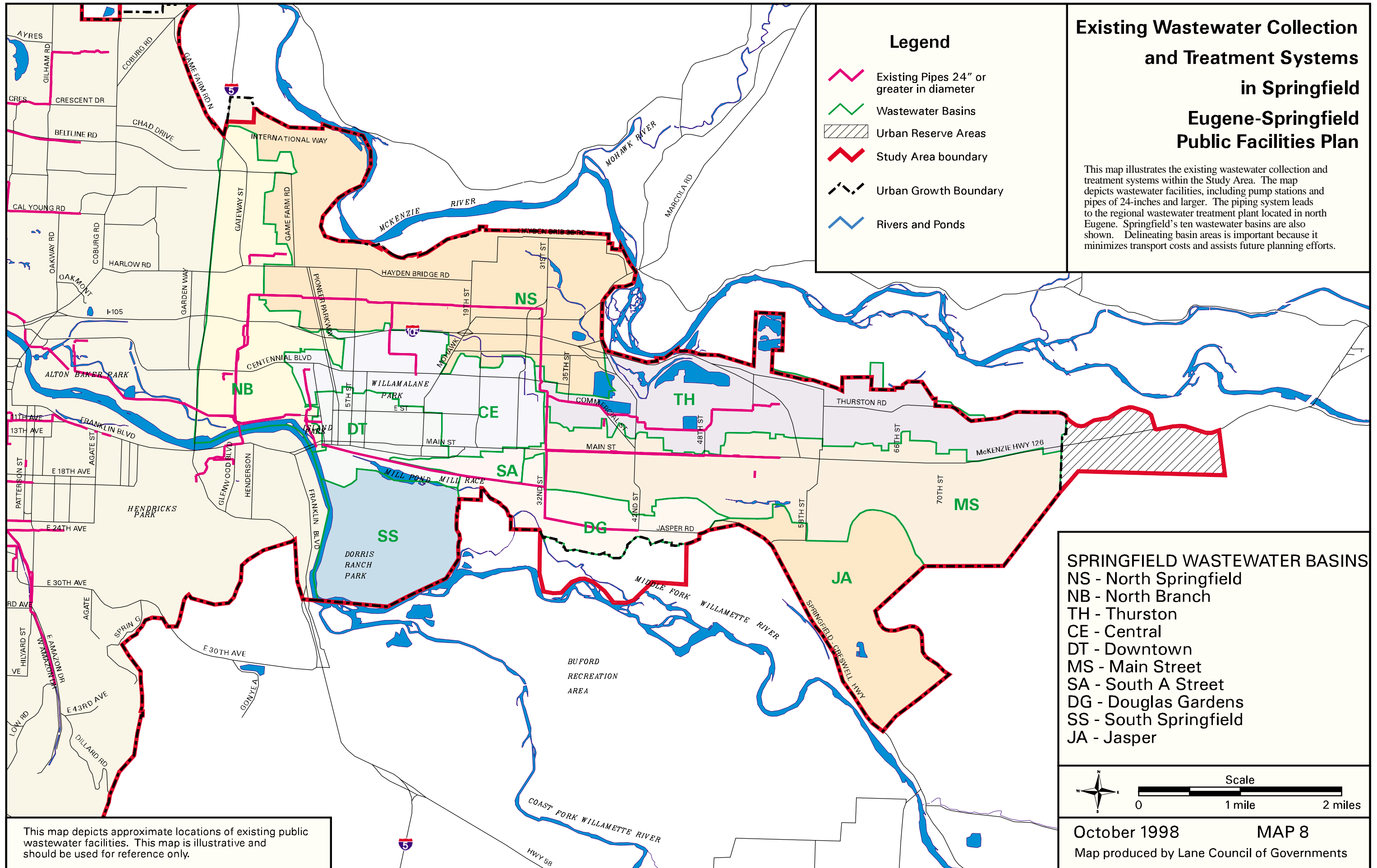
This map depicts approximate locations of existing public wastewater facilities. This map is illustrative and should be used for reference only.

Existing Wastewater Collection and Treatment Systems in Springfield Eugene-Springfield Public Facilities Plan

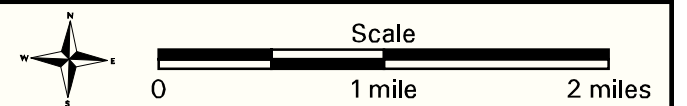
This map illustrates the existing wastewater collection and treatment systems within the Study Area. The map depicts wastewater facilities, including pump stations and pipes of 24-inches and larger. The piping system leads to the regional wastewater treatment plant located in north Eugene. Springfield's ten wastewater basins are also shown. Delineating basin areas is important because it minimizes transport costs and assists future planning efforts.

Legend

-  Existing Pipes 24" or greater in diameter
-  Wastewater Basins
-  Urban Reserve Areas
-  Study Area boundary
-  Urban Growth Boundary
-  Rivers and Ponds

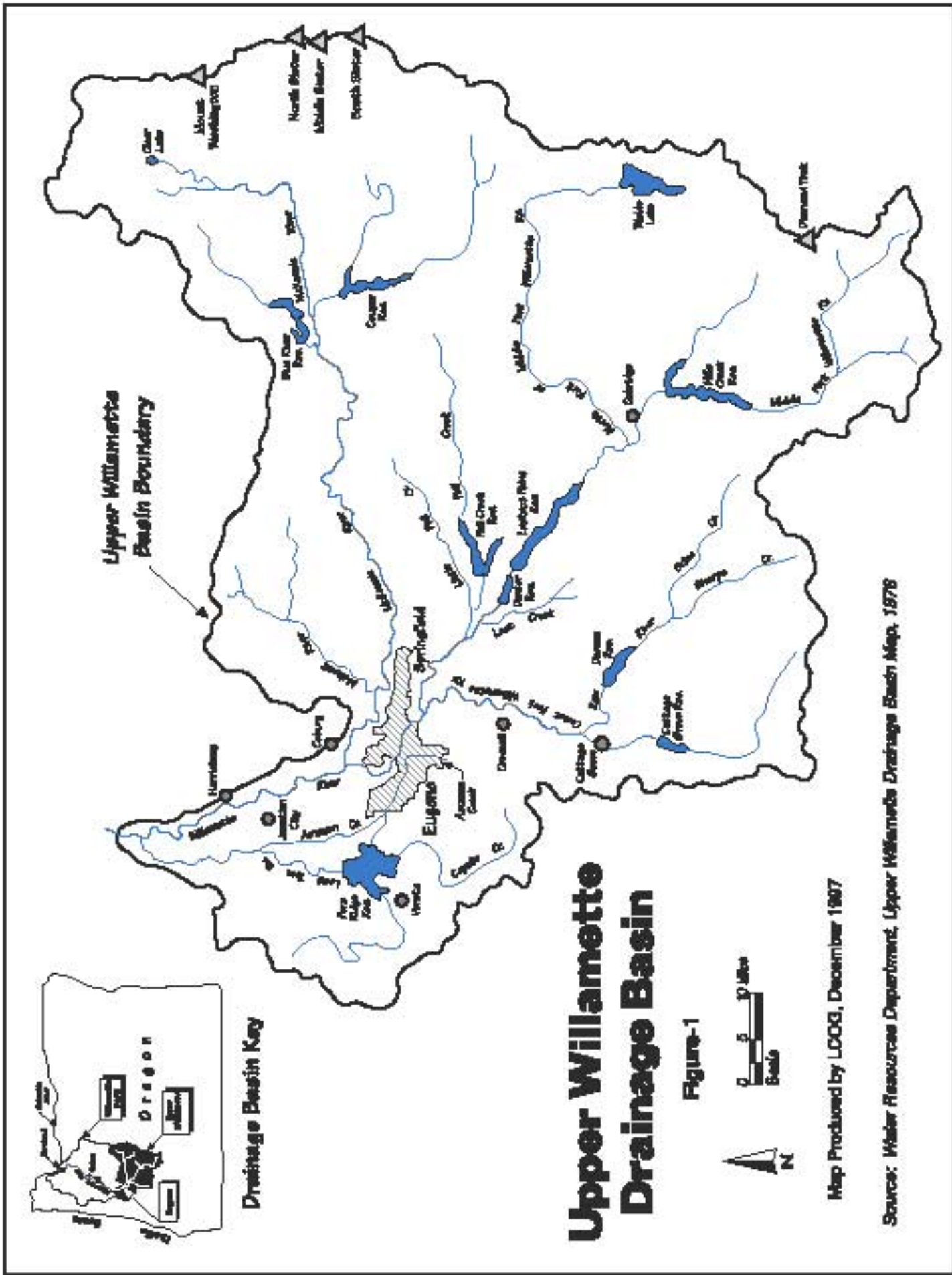


- ### SPRINGFIELD WASTEWATER BASINS
- NS - North Springfield
 - NB - North Branch
 - TH - Thurston
 - CE - Central
 - DT - Downtown
 - MS - Main Street
 - SA - South A Street
 - DG - Douglas Gardens
 - SS - South Springfield
 - JA - Jasper



This map depicts approximate locations of existing public wastewater facilities. This map is illustrative and should be used for reference only.

October 1998 MAP 8
Map produced by Lane Council of Governments










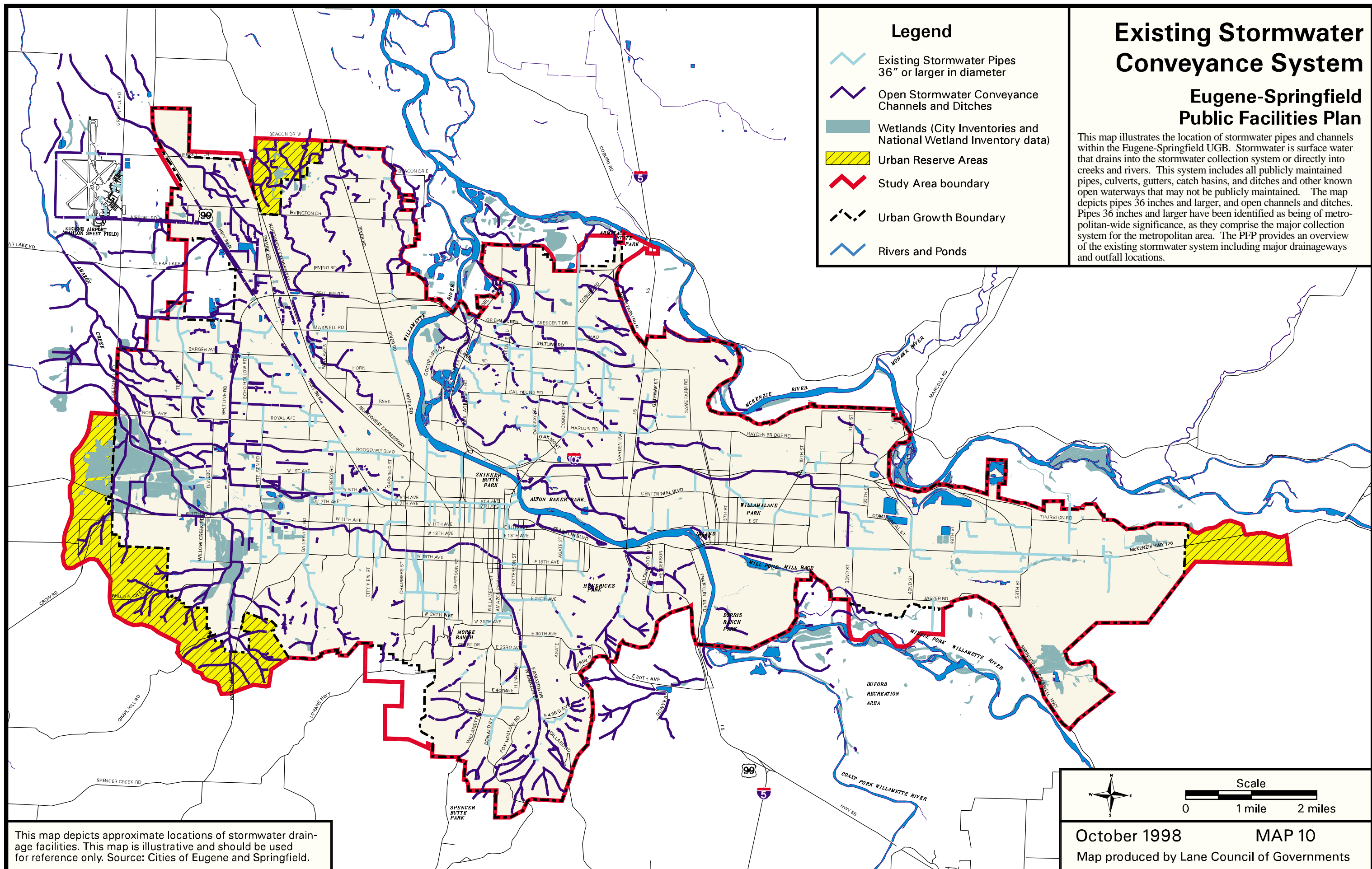
Existing Stormwater Conveyance System

Eugene-Springfield Public Facilities Plan


This map illustrates the location of stormwater pipes and channels within the Eugene-Springfield UGB. Stormwater is surface water that drains into the stormwater collection system or directly into creeks and rivers. This system includes all publicly maintained pipes, culverts, gutters, catch basins, and ditches and other known open waterways that may not be publicly maintained. The map depicts pipes 36 inches and larger, and open channels and ditches. Pipes 36 inches and larger have been identified as being of metropolitan-wide significance, as they comprise the major collection system for the metropolitan area. The PFP provides an overview of the existing stormwater system including major drainageways and outfall locations.

Legend

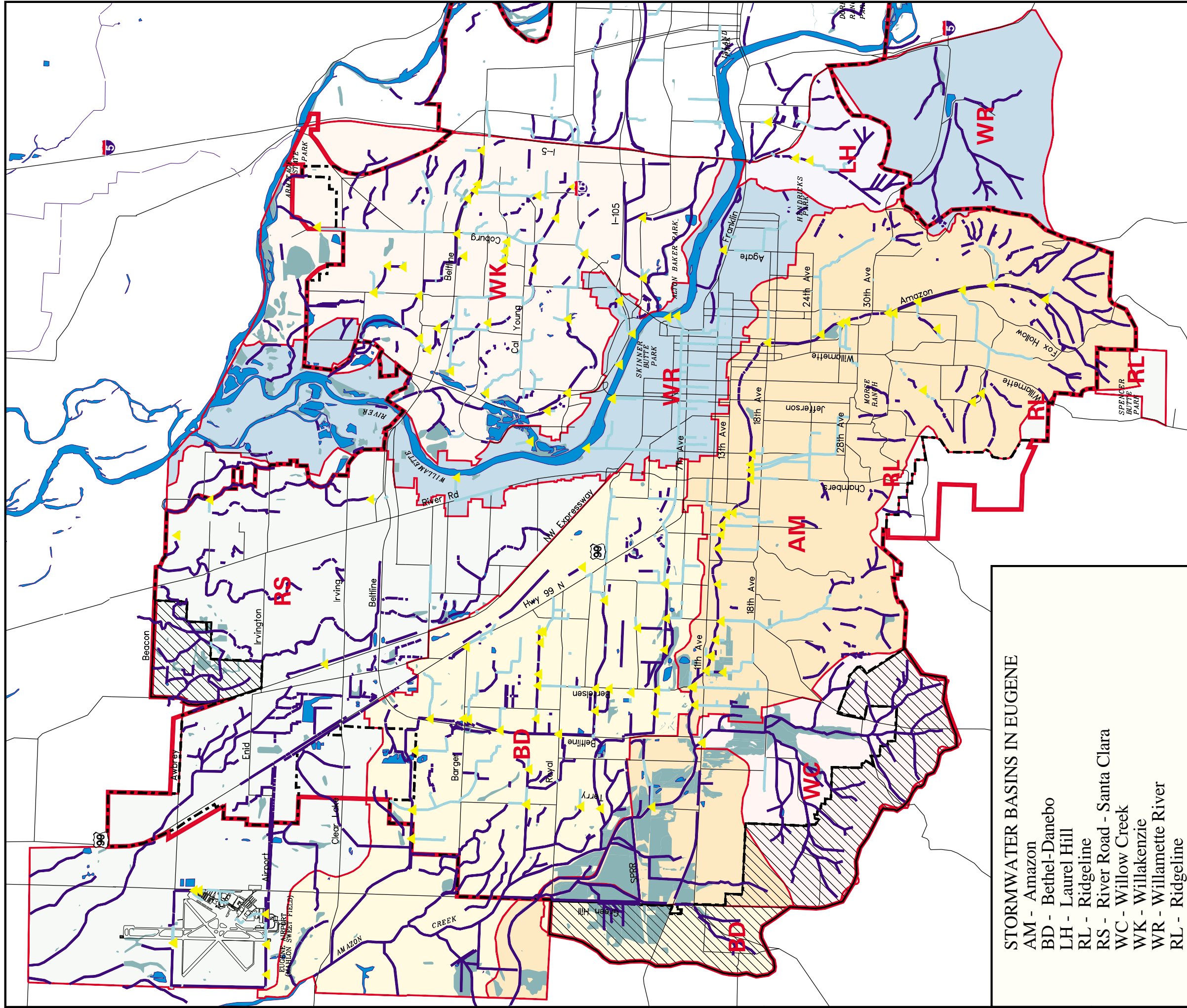
-  Existing Stormwater Pipes 36" or larger in diameter
-  Open Stormwater Conveyance Channels and Ditches
-  Wetlands (City Inventories and National Wetland Inventory data)
-  Urban Reserve Areas
-  Study Area boundary
-  Urban Growth Boundary
-  Rivers and Ponds



This map depicts approximate locations of stormwater drainage facilities. This map is illustrative and should be used for reference only. Source: Cities of Eugene and Springfield.

Scale
 0 1 mile 2 miles

October 1998 MAP 10
 Map produced by Lane Council of Governments

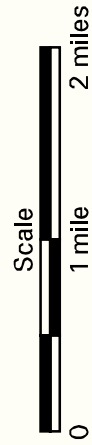


STORMWATER BASINS IN EUGENE

- AM - Amazon
- BD - Bethel-Danebo
- LH - Laurel Hill
- RL - Ridge Line
- RS - River Road - Santa Clara
- WC - Willow Creek
- WK - Willakenzie
- WR - Willamette River
- RL - Ridge Line

Existing Stormwater System in Eugene

This map illustrates the stormwater conveyance system within the Eugene portion of the UGB. Stormwater is surface water that drains into the stormwater collection system or directly into creeks and rivers. This system includes all publicly maintained pipes, culverts, gutters, catch basins, and ditches, as well as open waterways that may not be publicly maintained. The map depicts major stormwater basins, stormwater pipes 36 inches and larger, and open channels and ditches. Pipes 36 inches and larger have been identified as being of metropolitan-wide significance, as they comprise the major collection system for the metropolitan area. The PPP provides an overview of the existing stormwater system including major drainageways, and outfall locations.



March 1999

MAP 11

Map produced by Lane Council of Governments

Existing Stormwater System in Eugene

Eugene-Springfield Public Facilities Plan

Legend

- Major Stormwater Basins
- Existing Stormwater Pipes 36" or larger in diameter
- Open Stormwater Conveyance Channels and Ditches
- Wetlands (City Inventories and National Wetland Inventory data)
- Stormwater Outfalls
- Urban Reserve Areas
- Study Area boundary
- Urban Growth Boundary
- Rivers and Ponds










This map depicts approximate locations of stormwater drainage facilities. This map is illustrative and should be used for reference only. Source: Cities of Eugene and Springfield.

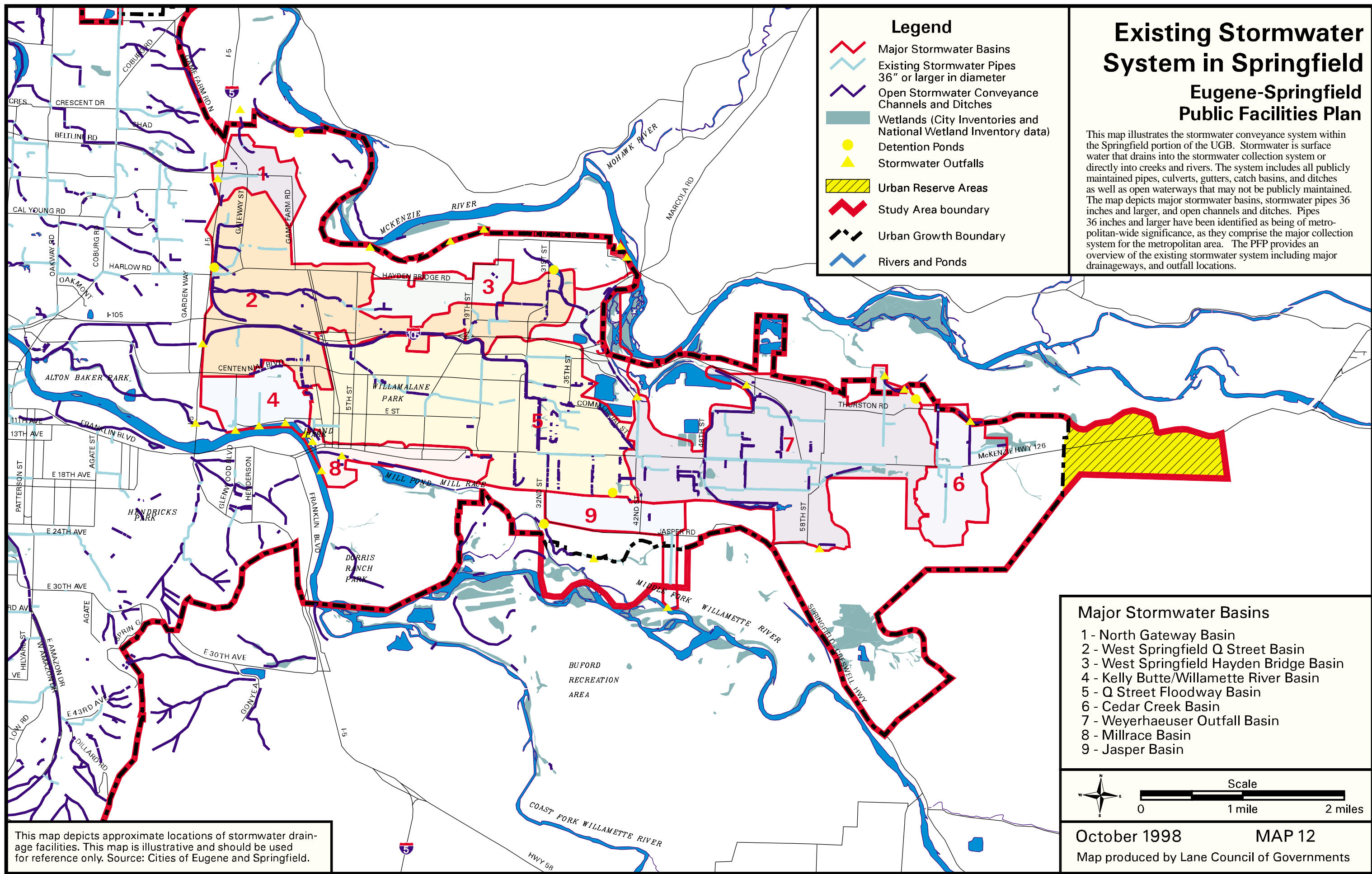
Existing Stormwater System in Springfield

Eugene-Springfield Public Facilities Plan

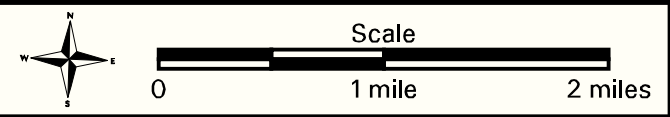
This map illustrates the stormwater conveyance system within the Springfield portion of the UGB. Stormwater is surface water that drains into the stormwater collection system or directly into creeks and rivers. The system includes all publicly maintained pipes, culverts, gutters, catch basins, and ditches as well as open waterways that may not be publicly maintained. The map depicts major stormwater basins, stormwater pipes 36 inches and larger, and open channels and ditches. Pipes 36 inches and larger have been identified as being of metropolitan-wide significance, as they comprise the major collection system for the metropolitan area. The PFP provides an overview of the existing stormwater system including major drainageways, and outfall locations.

Legend

-  Major Stormwater Basins
-  Existing Stormwater Pipes 36" or larger in diameter
-  Open Stormwater Conveyance Channels and Ditches
-  Wetlands (City Inventories and National Wetland Inventory data)
-  Detention Ponds
-  Stormwater Outfalls
-  Urban Reserve Areas
-  Study Area boundary
-  Urban Growth Boundary
-  Rivers and Ponds



- Major Stormwater Basins**
- 1 - North Gateway Basin
 - 2 - West Springfield Q Street Basin
 - 3 - West Springfield Hayden Bridge Basin
 - 4 - Kelly Butte/Willamette River Basin
 - 5 - Q Street Floodway Basin
 - 6 - Cedar Creek Basin
 - 7 - Weyerhaeuser Outfall Basin
 - 8 - Millrace Basin
 - 9 - Jasper Basin



This map depicts approximate locations of stormwater drainage facilities. This map is illustrative and should be used for reference only. Source: Cities of Eugene and Springfield.

October 1998 MAP 12
Map produced by Lane Council of Governments