SPRINGWATER COMMUNITY PLAN REPORT
PUBLIC FACILITIES PLANS

INTRODUCTION

The purpose of the Springwater Public Facilities Plan (PFP) is to establish a framework for how necessary urban services, water, wastewater, stormwater, and parks, will be developed and maintained as urbanization occurs within the Springwater Plan District.

The Springwater PFP is not intended to be a "stand-alone" PFP; it will amend Volume 2 – Policies Gresham Community Development Plan. After this introduction and a description of the goals, policies and action measures associated with the Springwater District, the following PFP amendments are proposed:

- 10.821 Public Facilities
- 10.822 Water System
- 10.823 Wastewater System
- 10.824 Stormwater Management System
- 10.825 Parks and Recreation System

Transportation infrastructure needs are identified in the Springwater Transportation System Plan, which will amend the citywide Gresham Transportation System Plan.

As required by Title 11 Metro Urban Growth Management Functional Plan, a conceptual level services plan for the provision of water, wastewater, stormwater and parks was developed as part of the *Concept Plan* for the project. Needed facilities for the planned new urban uses were identified, rough cost estimates and likely funding strategies were developed, and maps depicting the general location of public facilities were included.

Subsequent to the development of the *Concept Plan*, the PFP was developed. This document is consistent with the Oregon Administrative Rules, specifically OAR 660-011-0000. Key requirements of the Public Facility Planning Rule (OAR 660-011-0010) include:

660-011-0010

(1) The public facility plan shall contain the following items:
   (a) An inventory and general assessment of the condition of all the significant public facility systems which support the land uses designated in the acknowledged comprehensive plan
   (b) A list of the significant public facility projects which are to support the land uses designated in the acknowledged comprehensive plan. Public facility project descriptions or specifications of these projects as necessary
   (c) Rough cost estimates of each public facility project
   (d) A map or written description of each public facility project's general location or service area
   (e) Policy statement(s) or urban growth management agreement identifying the provider of each public facility system. If there is more than one provider with the authority to provide the system within the area covered by the public facility plan, then the provider of each project shall be designated
   (f) An estimate of when each facility project will be needed

(g) A discussion of the provider's existing funding mechanisms and the ability of these and possible new mechanisms to fund the development of each public facility project or system

There are no airport facilities or gas lines planned as part of the Springwater development (per OAR 660-012-0200(e)). There is one existing high-pressure gas line within the study area along the Hogan Drive – 242nd Avenue corridor.

The Public Facility Planning Rule is intended to implement Statewide Land Use Planning 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."

Specific goal requirements that are relevant to the Springwater urban area include:

- Cities or counties shall develop and adopt a public facility plan for areas within an urban growth boundary containing a population greater than 2,500 persons.
- A "timely, orderly and efficient arrangement" refers to a system or plan that coordinates the type, locations and delivery of public facilities and services in a manner that best supports the existing and proposed land uses.

For each of these urban services, the PFP provides an assessment of existing conditions, a summary of future needs, a financial plan discussion, and recommended goals and policies and action measures. A capital improvements list provides a detailed list of the projects necessary in Springwater to accommodate planned urban development over the next twenty years. Maps showing the locations of the capital improvement projects are also included. The PFP provides a planning-level estimate of facilities required to facilitate the development planned for Springwater. Additional refinement of facility needs, sizing, and anticipated capital cost will occur through the periodic Master Plan updates for each of utilities (water, stormwater, wastewater, and parks).

A key component of the successful implementation of the Public Facilities Plan is the coordination of the multiple government agencies involved in Springwater, most notably the City of Gresham and the City of Damascus. A portion of the Springwater area added to the Urban Growth Boundary in 2002 is located in Clackamas County, and is now part of the newly-incorporated City of Damascus. This area was included in the *Concept Plan* for analysis purposes, although a final decision on who will provide services to this area has not yet been determined.

Providing services in Springwater required developing and implementing capital improvement plans. Future needs are generally divided into short-term and long-term needs. Short-term priorities are established in approved capital improvement plans that usually cover a five-year horizon. The intent of these plans is to establish the phasing sequence for major projects over a five-year period, so that as Year 1 projects are completed, Year 2 projects move forward in the priority list.

Long-range capital improvement needs are determined through master plans that generally have a 20-year planning horizon. System master plans are long-range plans that generally include an analysis of existing conditions, including existing service deficiencies, and analysis of capital improvement needs based on forecast growth projections, and a financing strategy. Updated master plans have been prepared or are being prepared to include projects recommended in the PFP. In general, projects listed in a master plan go through several steps before construction begins, including detailed design and engineering. This work is usually

scheduled through the CIP process. While short-term CIPs are approved legislatively, they are non-binding. Annually, service providers approve funding for specific capital projects through the budget process.

The resources and methods used to build and operate the systems outlined in this PFP are a function of their finance structure. Water, wastewater and stormwater systems are enterprise functions, meaning these services need to be self-supporting. Costs and revenues associated with enterprise functions are dedicated to that service and may not be used for other government functions. The enterprise structure employed for these systems provides a relatively stable financial structure on which to plan and finance capital improvements.

Most capital improvements related to utility services (water, wastewater, stormwater) are financed using a combination of SDC fee revenue – especially for growth-related improvements – and retained earnings from utility operations (rate revenue). Developers can be required to oversize a public improvement to serve other development, but the City must reimburse the developer the portion of the benefit that accrues to the surrounding properties. In the past revenue bonds have been issued to build major improvements, such as new water reservoirs or improvements to the sewage treatment plant, and pledged repayment from these sources. Local improvement districts have also been used to capitalize bond issues for utility improvements.

Park and open space services are accounted for in the General Fund. General fund revenues are discretionary and, therefore, not specifically dedicated. System development charges are collected for capital improvement projects.

It is possible that funding for enhancement of natural resources in Springwater (both acquisition and maintenance) could be incorporated into existing or new SDC funding mechanisms. These could include a combination of stormwater funding for construction of regional detention and water quality facilities, transportation funding for green street swales, or creation of a new utility dedicated to natural resource facilities. Open space acquisition could also be targeted using funds provided through a bond measure that Metro plans to bring before the Region's voters in the fall of 2005.

10.821 PUBLIC FACILITIES

Background

This section addresses water, wastewater, stormwater and park public facilities. It is intended to amend the City's public facilities plans for each facility. Amendments to the Public Facility Plan for transportation are located in a separate amendment to the City's Transportation System Plan.

The Metro Council brought Springwater into the Urban Growth Boundary (UGB) in December 2002. When land is brought into the UGB, Title 11 of the Metro *Urban Growth Management Functional Plan* requires that the added territory be brought into a city's comprehensive plan prior to urbanization with the intent to promote the integration of the new land into existing communities.

Title 11 requires conceptual public facilities plans for each of these services that demonstrate how Springwater can be served. The conceptual plans are to include preliminary cost estimates and funding strategies, including likely financing approaches and maps that show general locations of the public facilities.

Conceptual public facility plans were developed for water, wastewater, stormwater, and parks during the *Concept Plan* phase of the project. The planning area used for development of public facility alternatives included four distinct areas, shown graphically on Figure 1:

- Approximately 1,152 acres of unincorporated Multnomah County which was included in the 2002 Urban Growth Boundary (UGB) expansion. This is the primary area referenced as the "Springwater Site".
- Approximately 140 acres of unincorporated Multnomah County located at the foot of the buttes west of Hogan Road. This area is within Gresham's UGB and its Urban Services Boundary, but planning for urban services has never been provided. This area is also included in the Springwater Site.
- The "Brickworks" site, which is 183 acres of land north of the Springwater area. It is zoned as Heavy Industrial (HI) and is currently within the City of Gresham. It is included in the Springwater Community Planning area to explore redevelopment opportunities in conjunction with the new annexation area.
- Approximately 139 acres located in Clackamas County. This area was also included in the 2002 UGB expansion, and is now part of the newly-incorporated City of Damascus.

The 2002 UGB expansion also included a "Springwater Phase 2" area, which is primarily the area encompassed by the new City of Damascus. Public facility planning conducted as part of this project considered likely service extensions to the Phase 2 area. Potential service provision for the Phase 2/Damascus area is discussed separately for each utility considered in the public facilities plan.

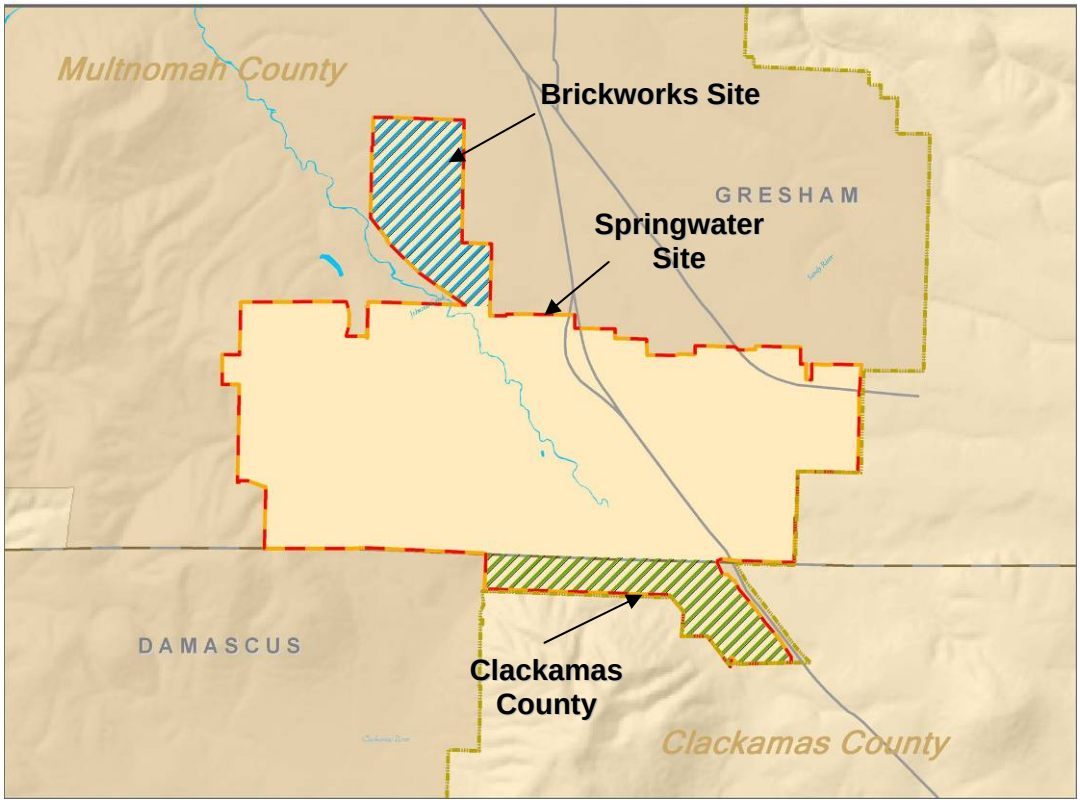

Figure 1. Springwater Planning Area Elements

The general steps in generating the conceptual public facilities plans were:

- Developing an inventory of the existing system
- Performing a needs analysis based on planned future uses
- Developing a conceptual system layout for each planning scenario, including facility needs and cost estimates
- Evaluating each conceptual public facility system with respect to project evaluation criteria
- Creating a preferred public facility alternative based on the preferred land use, transportation, and natural resource concepts and the scenario evaluation results
- Refining facility needs, cost estimates, and funding strategies for the recommended plan

The *Concept Plan* also included the Community Working Group's adoption of plan goals. No specific goals were developed for water, wastewater, stormwater, or parks public facilities. However, evaluation measures associated with these public infrastructure areas were incorporated into evaluation measures for the broader community goals (i.e., create a community, livability, sustainability, etc.).

The *Concept Plan* work was the basis for the Public Facilities Plans that are included in this document. These Public Facilities Plans describe the elements necessary to comply with Statewide Planning Goal 11 and OAR 660-011-0000 necessary to amend the City's Public Facility Plan for each of the public facilities:

660-011-0010

(1) The public facility plan shall contain the following items:

(a) An inventory and general assessment of the condition of all the significant public facility systems which support the land uses designated in the acknowledged comprehensive plan;
(b) A list of the significant public facility projects which are to support the land uses designated in the acknowledged comprehensive plan. Public facility project descriptions or specifications of these projects as necessary;
(c) Rough cost estimates of each public facility project;
(d) A map or written description of each public facility project's general location or service area;
(e) Policy statement(s) or urban growth management agreement identifying the provider of each public facility system. If there is more than one provider with the authority to provide the system within the area covered by the public facility plan, then the provider of each project shall be designated;
(f) An estimate of when each facility project will be needed; and
(g) A discussion of the provider's existing funding mechanisms and the ability of these and possible new mechanisms to fund the development of each public facility project or system.

Service Delivery Overview

Like most rural development in the area, most residents of Springwater are largely responsible for their own water supply, wastewater treatment, and stormwater systems. Water is currently accessed via underground wells and wastewater is primarily treated in subsurface disposal systems. Stormwater runoff is conveyed to natural drainage areas or to drainage ditches adjacent to local roads. There are no public parks in Springwater. A portion of the Springwater Trail – a multi-use regional trail developed as part of Metro's Greenspaces program – runs through the study area adjacent to Johnson Creek.

Future Public Facilities Provider Overview

The Springwater area that was added to the UGB in 2002 lies primarily in unincorporated Multnomah County. The southern portion of Springwater is located in the newly-formed City of Damascus in Clackamas County. The City of Gresham will be responsible for the provision of urban services for areas annexed into Gresham. The portion of Springwater in Clackamas County was included in the Public Facility Plan development for planning purposes, although the ultimate service provider for this area has not been determined.

As part of the 2002 UGB expansion, Metro also added land known as "Springwater Phase 2" that is located entirely within Clackamas County. It is assumed that water service for this area would not be provided by the City of Gresham, as it is unlikely that the Gresham would annex the area. However, the natural drainage of the region slopes toward Gresham, and therefore it may be logical for Gresham to provide wastewater conveyance and treatment for a portion of the Phase 2 area as it currently does for the Cities of Fairview and Wood Village. The portion of the Phase 2 area that drains by gravity to Gresham is known as "Sunshine Valley." The Public Facility Plan for wastewater identifies the infrastructure requirements associated with this scenario as a basis for further intergovernmental discussions regarding logical service providers for the Phase 2 area. It is also assumed that stormwater service for this area would most likely not be provided by the City of Gresham. Because of the natural drainage, however, planning for the area downstream of the Sunshine Valley has utilized the assumption that no additional flow and pollutant will be discharged. A set of planning assumptions has been transmitted to Clackamas County and the City of Damascus. The success of stormwater facilities within the

Gresham boundary will depend directly on whether planning efforts for the Sunshine Valley area adhere to these or more restrictive assumptions.

10.822 WATER SYSTEM

System Description/Condition Assessment

Existing Conditions. The Springwater area is currently rural in nature, with some residential development and limited commercial development. Currently, water supplies in the area are served through individual wells that tap into the groundwater aquifer beneath the Springwater area. In addition, there is no domestic water distribution system in place in Springwater. As the area is developed to the level of urban development proposed in the Concept Plan, Gresham's water distribution system will need to expand to provide service to this area.

The City of Gresham provides water to its customers through a wholesale water supply agreement with the City of Portland Water Bureau (PWB) and an intergovernmental agreement with the Rockwood Water People's Utility District (RWPUD). Water is provided through seven metered connections by the PWB and one metered connection from the RWPUD. In addition to the purchased water, the City plans to use groundwater to supplement the current water supply sources. It is anticipated that the Sunrise Water Authority will serve that portion of Springwater located within Clackamas County.

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Water Distribution. The Springwater water distribution system will be an extension of the City's current distribution system and add to the existing network of pipes, valves, pump stations, and reservoirs. Currently the City is divided into seven service levels that provide water to the various parts of the City. The service levels are supplied either by direct gravity from PWB and RWPUD connections, or through pump stations pumping directly from the PWB conduits or booster pump stations located in the system.

The Springwater planning area abuts three of the City's Service Levels: South Hills, Intermediate, and Lusted. These three service levels will be expanded into the Springwater area. The South Hills Service Level currently comprises of about 533 acres and includes the South Hill Reservoir. This reservoir has a capacity of 2.6 million gallons (MG). Water is supplied to this service level through the Regner Road Pump Station #8 with a current capacity of 2,200 gallons per minute (gpm).

The Intermediate Service Level currently covers approximately 2,977 acres and includes two reservoirs: the Butler Road Reservoir (4.0 MG) and the Regner Reservoir (6.0 MG). This service level is supplied by connections to PWB conduits through the Division Street Pump Station from Conduit #4 with a current capacity of 4,000 gpm and the Main Street Pump Station from Conduit #3 with a current capacity of 3,800 gpm.

The Lusted Service Level is currently about 1,112 acres and is served by the Wheeler Road Reservoir (3.2 MG) and the Lusted Tank (1.2 MG). This service level is supplied through the Powell & Barnes Road Pump Station from Conduit #3 with a current capacity of 1,600 gpm. The Salquist Pump Station has a current capacity of 3,825 gpm and pumps water from the Intermediate Service Level into the Lusted Service Level. The Salquist Pump Station has been constructed with a provision for connecting to a future Conduit #5.

System Analysis

Water demand from the proposed development was generated by applying an estimated demand per acre of new developable land based on the *1998 Water System Master Plan*. The demands for each service level from the *1998 Water System Master Plan* were projected over a 20-year planning horizon. These projected demands were divided by the current service level

acres to obtain a demand per acre for each service level. This value was then used with the new service level areas to estimate the Springwater demand. The area of each new service level did not include land use designated as wildlife preserve, open space, or environmentally-sensitive areas.

Based on the demands projected from the *1998 Water System Master Plan*, the anticipated average day demand generated from the Springwater development totals 1.0 million gallons per day. Table 2 shows the results of this analysis for the three service levels.

Table 2: Projected Springwater demand based on projected flows in existing service levels.

Service Level	Existing Area (acres)	Projected 2025 Average Day Demand (mgd)	Projected 2025 Average Day Demand per Acre (mgd/acre)	New Springwater Area (acres)	Projected Springwater Average Day Demand (mgd)
Lusted	1,112	0.88	0.000795	212	0.17
Intermediate	2,977	3.01	0.001167	535	0.62
South Hills	533	0.91	0.001167	177	0.21
TOTAL	4,622	4.80		924	1.00

Maximum day demands were estimated from the projected average day demands by using a peaking factor of 2.3, the same as the one used in the *1998 Water System Master Plan*.

A new master planning effort is currently underway. Associated with this effort, demand projections are being revised. The Springwater demand projections should be revised based on this new analysis once the information is available.

One difference between Springwater and the existing City is the level of industry anticipated. Industrial customers can have a wide range of water demands and wastewater generation rates. Water demands from large industrial developments can have a significant impact on water infrastructure needs. In addition, industrial customers typically have a higher demand for fire protection. For the Springwater development, fire flow demands for each broad land use type were assumed to be:

- 3,500 gpm for Commercial and Industrial customers
- 1,750 gpm for Medium Density Residential customers
- 2.500 gpm for High Density Residential customers
- 1,750 gpm for Low Density Residential customers with homes larger than 3,600 square feet
- 1,000 gpm for Low Density Residential customers with homes at or less than 3,600 square feet

The following process was used to evaluate water demands associated with Springwater:

- Establish new service level boundaries within the planning area to determine the area to be added to the existing South Hills, Intermediate, and Lusted Service Levels. The shape of the new service levels was determined based on area topography and location to the existing service levels.

- Define pipe networks and projected flows for the land use concepts developed during planning. The networks were designed to provide as much system looping as possible, and to locate mains in existing or proposed road right-of-way to the greatest extent possible.
- Determine the pipe size for the distribution network in Springwater.
- Evaluate the system to determine whether adequate fire protection is available.
- Evaluate the system to determine whether adequate storage is available.

Based on these assumptions, Table 3 below shows the general system components required for the Springwater area. These are also shown in Figure 2.

Table 3: Springwater water system facilities

New Facilities	
Total Length of New Pipe (LF)	
12-inch diameter (LF)	39,100
16-inch diameter (LF)	47,036
18-inch diameter (LF)	19,858
New Pressure Reducing Valves	3
New Wheeler Road Reservoir (MG)	3.2
New South Hills Reservoir (MG)	2.6
Upgrades to Existing Facilities	
Replace 8-inch with 12-inch diameter (LF)	290
Replace 12-inch with 16-inch diameter (LF)	1,330
New Pumps at Regner Pump Station	2 @ 1,100 gpm each

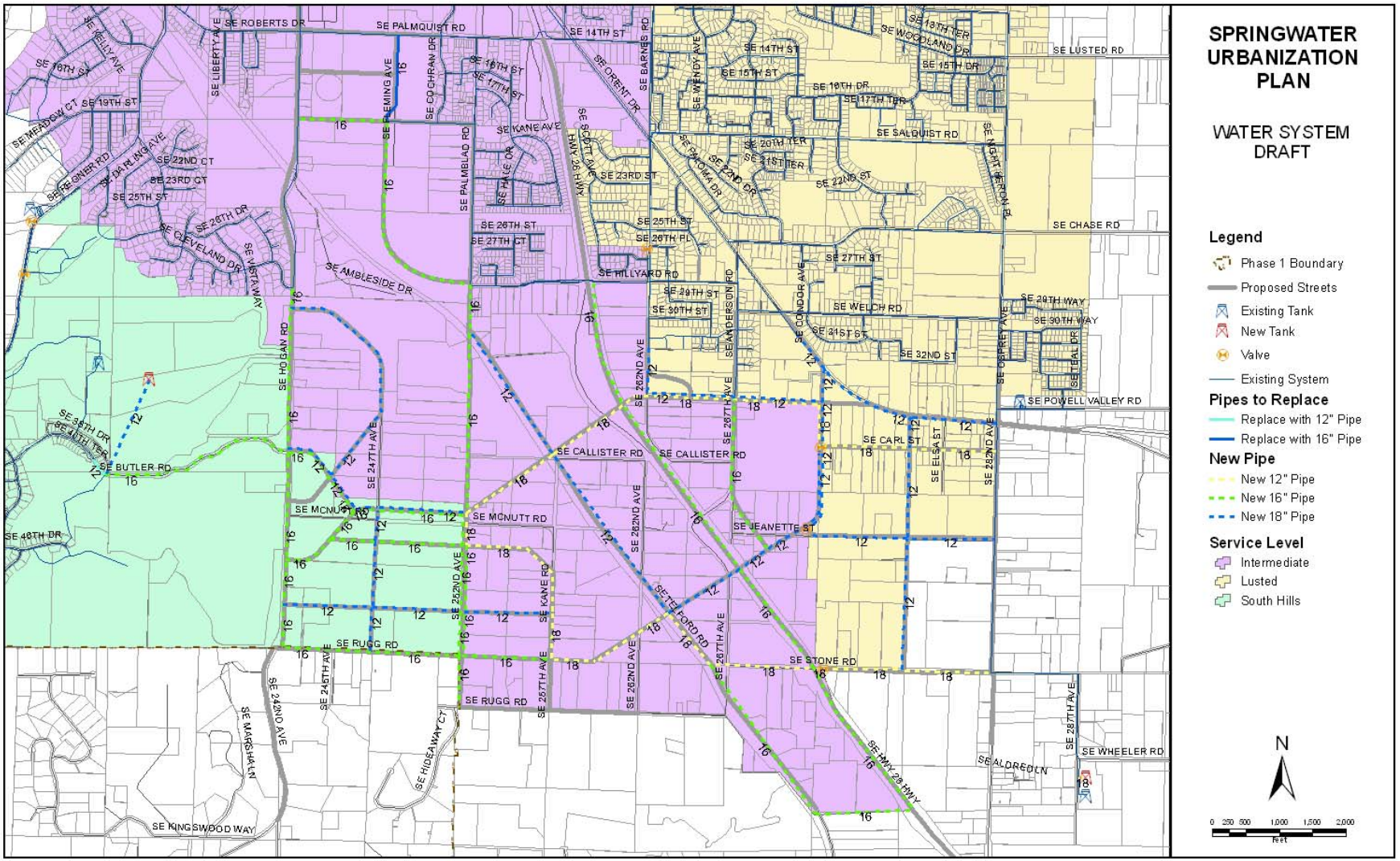


Figure 2 – Proposed Water System Improvements

Summary of Future Needs

Based on the analysis of the proposed water distribution system, recommendations for water system improvements were developed. These recommendations include a distribution network to serve the Springwater community, and improvements to existing infrastructure in the City to provide additional flow to Springwater from the City's current sources. To maintain consistency with the City's current practices, parallel piping is provided in areas adjacent to two pressure zones to minimize the use of pressure reducing valves (PRVs) where possible. Improvements are summarized below.

- The Springwater system is divided into three service levels – extensions of the South Hills, Intermediate, and Lusted service levels. Within each service level there is a network of distribution mains ranging in size from 12-inch to 18-inch. These mains are looped to the maximum extent possible.
- Existing 8-inch and 12-inch mains in two areas will need to be upsized to accommodate the demands anticipated in Springwater.
- Two new pumps will need to be added to Regner Pump Station. These pumps are to be of similar capacity to those existing at the pump station (1,100 gpm capacity).
- Two new reservoirs will be required. One will be located near and of a similar size as the existing South Hills Reservoir (2.6 MG) and the other will be located near and of the same size as the existing Wheeler Reservoir (3.2 MG). Controls at the Regner, Barnes, and Salquist Pump Stations will have to be modified to incorporate these new tanks.

No provisions are included in the recommended plan to serve the Phase 2 Springwater area. The City of Gresham is participating in ongoing discussions with Clackamas County, the City of Damascus, and the Sunrise Water Authority to determine the appropriate service provider for the Phase 2 area.

Recommended capital improvements and associated costs are shown in Table 4 on the following page. Costs are based on the annexation subareas described in the Summary Report.

Table 4. Projected Water System Costs

Annexation Subarea	Timing (Years)	Springwater Service Level	Length of Pipe (ft)	Storage (MG)	Other Facilities	Total Project Cost	Funding Source
1	0-5	Intermediate	5,966	0.0		$ 1,061,000	SDC/Local
2	0-5	South Hills	4,806	2.6	2 New Pumps	$ 7,545,700[1]	SDC/Local
3a	0-5	Intermediate	2,402	0.0		$ 427,200	SDC/Local
3b1	0-5	Intermediate	4,420	0.0		$ 589,500	SDC/Local
3b2	6-20	Intermediate	9,453	0.0		$ 1,515,500	SDC/Local
4a1	6-20	South Hills	8,885	0.0		$ 1,559,200	SDC/Local
4a2	6-20	Intermediate	2,530	0.0		$ 506,300	SDC/Local
4b	6-20	South Hills	9,882	0.0		$ 1,566,800	SDC/Local
4c	6-20	Intermediate	6,898	0.0		$ 1,227,400	SDC/Local
5a	0-5	Intermediate	3,179	0.0		$ 593,200	SDC/Local
5b1	0-5	Lusted	3,296	0.0		$ 439,600	SDC/Local
5b2	6-20	Lusted	6,102	0.0		$ 1,166,900	SDC/Local
5c	6-20	Lusted	8,028	0.0	1 New PRV	$ 1,279,100	SDC/Local
6a	6-20	Intermediate	5,918	0.0		$ 922,100	SDC/Local
6b1	6-20	Intermediate	2,592	0.0		$ 345,700	SDC/Local
6b2	6-20	Lusted	5,504	0.0	1 New PRV	$ 817,100	SDC/Local
7a	6-20	Intermediate	5,824	0.0		$ 1,039,800	SDC/Local
7b	6-20	Lusted	4,474	0.0	1 New PRV	$ 846,500	SDC/Local
8a	6-20	Intermediate	762	0.0		$ 135,500	SDC/Local
8b	6-20	Intermediate	6,694	0.0		$ 1,190,400	SDC/Local
Wheeler Res	6-20	Lusted	380	3.2		$ 7,615,000	
TOTAL PROJECT COST						$32,389,500	

Costs based on ENR 20-City Construction Cost Index (CCI) of 7297

1. Includes land acquisition of 3 acres at $150,000/acre, plus 14% administrative markup

Funding Plan

The following discussion presents the envisioned strategy for funding water service extensions in Springwater. Gresham relies on developer contributions, system development charges (SDCs) and retained earnings from the utility to finance expansion. In the past, Gresham has borrowed against future utility revenues to finance major improvements in storage and transmission facilities.

Depending on the location of initial development, it may be difficult for Gresham to finance water system improvements in the short-term. Funding needs will be minimized if the initial development all occurs within a single service area, and is close to an existing water storage tank. Over the long-term, assuming the City adopts adequate SDCs to cover the required capital improvement projects, SDCs should generate enough revenue from within Springwater to capitalize system improvements.

Gresham has recently undertaken a separate effort to evaluate water and wastewater SDCs. This project is examining options for both city-wide and area-specific SDCs, and will make recommendations regarding potential changes to the existing SDC methodology, especially in the improvement fee, to ensure that the fee is adequate to recover forecast capital improvement needs in Springwater.

Goals, Policies and Action Measures

Goals and Policies. Applicable goals and policies that relate to the provision of public facilities in the existing comprehensive plan for the City of Gresham also apply to the Springwater PFP.

Action Measures.

1. Implement recommendations of the Water and Wastewater SDC study being conducted concurrently with the completion of this PFP.

2. Update the SDC improvement project list to include relevant near-term projects.

3. Continue to coordinate with the Clackamas County, the City of Damascus, the Sunrise Water Authority, and other stakeholders to establish plan for providing water service for the Phase 2 area.

4. Review options to incorporate a “purple pipe” system where water reuse is encouraged and promoted.

10.823 WASTEWATER SYSTEM

System Description/Condition Assessment

Existing Conditions. The Springwater area is currently rural in nature, with some residential development and limited commercial development. Sanitary sewage generated in the Springwater area is currently treated by on-site subsurface disposal systems. When the area is developed to the level of urban development proposed in the Concept Plan, this type of treatment will not be adequate.

The City of Gresham owns and operates a wastewater treatment facility that treats wastewater for over 107,000 residents, businesses, and industries in the City, as well as the Cities of Fairview and Wood Village. Wastewater receives a high level of secondary treatment at the City's facility on NE Sandy Boulevard and is discharged to the Columbia River. Due to the topography of Springwater, all wastewater generated from the urban development would naturally drain by gravity to the existing wastewater treatment plant.

For planning purposes, it was assumed that all wastewater generated in Springwater would be conveyed to the City of Gresham's existing collection system and ultimately to the City's treatment plant. A portion of the Springwater study area is within the new City of Damascus and Clackamas County (as shown in Figure 1) and therefore could potentially be served by conveying wastewater to the County's treatment plant operated by Water Environment Services of Clackamas County. This option, however, would require pumping to lift wastewater into the County's existing collection system. The City of Damascus potentially could provide wastewater services via creation of a new wastewater utility. Final determination of the appropriate service provider for the Clackamas County portion of Springwater will be determined as the Damascus urban planning efforts are completed.

Sewage Collection. The proposed sewage collection system will be a network of pipes used to convey wastewater from the Springwater planning area to the City's existing system. In general, the most cost-effective and reliable method of conveying wastewater is to locate new pipes in existing or proposed road right-of-way, to use gravity conveyance of wastewater to the greatest extent possible, and to minimize the number of stream crossings.

The Springwater planning area abuts three sewage collection basins in the City of Gresham: Johnson Creek basin, East basin, and Kelly Creek basin. The Johnson Creek basin comprises 4,040 acres and includes the area roughly east of Powell Boulevard from the western City limits to 252nd on the east. This basin is served by a main interceptor (Johnson Creek interceptor) that follows the alignment of the Springwater trail. The interceptor ranges in size from 15- to 42-inches in diameter, and terminates at approximately the intersection of 252nd and Telford Road. Wastewater from this interceptor discharges to the Linneman Pump Station, which conveys the wastewater through a force main and into the main interceptors that deliver wastewater to the treatment plant. Because the Springwater area naturally drains to the Johnson Creek interceptor, and because the 2001*Wastewater System Master Plan* showed significant capacity limitations in the upstream portions of interceptors in the East and Kelly Creek basins, alternatives involving routing flow from Springwater through these basins were not examined.

Analysis of in the 2001 *Wastewater System Master Plan* showed that upstream of Regner Road, the Johnson Creek interceptor has just adequate capacity to serve existing residents through build-out of the service area. Downstream of Regner Road the size of the interceptor increases significantly, ranging from 30 inches immediately downstream of Regner Road to 42

inches upstream of the Linneman Pump Station. Preliminary analysis in the Master Plan indicated that this portion of the interceptor can accept up to 10 cubic feet per second (cfs) of additional flow (from outside of the current service area) without exceeding the hydraulic capacity of the system. The Master Plan indicated that additional improvements would be required in the Linneman Pump Station and downstream force main and interceptors to the treatment plant to accommodate additional flows from outside of the current service area.

System Analysis

Sewage flows from the proposed development were generated by applying unit flow factors to various land use types, and adding infiltration and inflow (I/I) associated with the 1 in 5 year rainfall event. This "design storm" is established in the Oregon Administrative Rules (OAR) 340-041-120 sections 13 and 14 as the minimum condition under which the City must be able to convey and treat wastewater with no overflows. Unit flow factors and I/I assumptions were similar to the 2001 *Master Plan* and the 2004 *Pleasant Valley Master Plan.*

The primary difference between Springwater and the existing City is the level of industry anticipated. Industrial customers can have a wide range of water demands and wastewater generation rates. Wastewater discharges from large industrial developments can have a significant impact on wastewater infrastructure needs. However, these high discharges are often accompanied by high water and wastewater charges for industrial customers, and therefore many large industries employ on-site water conservation measures which reduce the volume of wastewater discharged.

A large discharger in Springwater would also present a potential opportunity for the City to implement a small-scale reuse program and provide reclaimed water to other industrial customers in Springwater; for example, public uses in and adjacent to Springwater (public parks, the Persimmon golf course, etc.), or agricultural uses in Damascus. Wastewater from such a large discharger (or several large dischargers in close proximity) could be treated in a small package treatment facility. With appropriate treatment to meet the State of Oregon's requirements for reclaimed water quality, effluent from such a treatment plant could be used to offset local water demands through direct reuse, or possibly through aquifer storage and recovery (ASR). Solids from the treatment facility would enter the sewer system for conveyance to and treatment at the City's existing wastewater treatment plant. Pursuing these opportunities, either through onsite conservation programs with individual industries or through a local reuse program, is consistent with the objective of providing a sustainable development in Springwater. Planned infrastructure was sized based on average industrial discharge rates. This assumption reflects a balance between high volume wastewater dischargers and ultimate implementation of some level of local greater recycling or small-scale effluent reuse.

The following process was used to evaluate wastewater needs associated with Springwater:

- Establish sewershed boundaries (sewer service sub-areas) within the planning area to define areas tributary to the model nodes (manholes). The shape of the sewersheds was determined based on projected future land use and area topography.
- Define pipe networks and projected flows for each of the three land use concepts developed during planning. The networks were designed to use gravity for conveyance to the greatest extent possible, and to locate sewers in existing or proposed road right-of-way to the greatest extent possible.

- Determine pipe size and slope for the three collection system networks associated with the three land use concepts.
- Compare alternatives based on evaluation criteria established in project goals and policies.
- Apply evaluation results to selected Concept Plan land use and transportation network to develop final recommendations for wastewater system improvements.

The three land use scenarios resulted in similar wastewater system needs and costs.

Summary of Future Needs

Based on the analysis of the three sewer system scenarios and the final Concept Plan map, recommendations for sewer system improvements were developed. These recommendations include a gravity collection system to serve the Springwater community, and improvements to existing infrastructure in the City to convey the additional flow from Springwater to the City's treatment plant. Improvements are summarized below and shown in Figure 3.

- The backbone of the Springwater collection system is the extension of the Johnson Creek interceptor along Telford road. The interceptor will extend from the terminus of the existing system at 252nd/Telford Road to approximately Stone Road/Telford Road. The interceptor size will range in diameter from 12 inches at Stone Road to 21 inches at the connection to the existing system.
- A series of 8-inch to 18-inch gravity sewers will convey wastewater from the development areas to the interceptor extension. These new sewers will be routed in existing or proposed roadways.
- Two new 8-inch collectors are required to facilitate proposed development on the Brickworks site.
- Several new sewers will discharge directly to the existing Johnson Creek interceptor. These include the collectors from the Village Center area, the residential neighborhood north of the Village Center.
- Downstream of discharges into the Johnson Creek interceptor, several existing pipes will need to upsized from 15 inches to 21 inches in diameter. These upgrades include pipes 3655-4-001, 3654-4-160, 3654-4-150, 3554-4-220, 3554-4-160, 3554-4-150, and 3554-4-140.
- The capacity of the Linneman Pump Station will need to be increased by 7.2 cfs (4.7 mgd) to provide adequate capacity for flows from Springwater. This is in addition to the capacity increase at Linneman required due to growth within the city limits and the addition of Pleasant Valley.
- A second, parallel 18-inch force main will need to be added downstream of the Linneman Pump Station to maintain acceptable velocities when flows from Springwater and Pleasant Valley are added to the system.

Preliminary infrastructure improvements to serve Springwater Phase 2 (southwest of the current planning area) were developed. These improvements are based on the assumption that all of the area that drains by gravity from Springwater will be served by the City of Gresham. The topography in the Phase 2 area results in gravity wastewater flow being conveyed along Sunshine Creek. The location of the Sunshine Creek drainage area within Damascus/Springwater Phase 2 is shown in Figure 4. It is anticipated that flow from the Phase

2 area would enter the Springwater system at approximately the intersection of 252nd and Rugg Road. In order for the City of Gresham to provide service to this area, the main interceptor through Springwater would need to be upsized, and a new interceptor provided to route this flow from approximately the intersection of 252nd and Telford Road to the treatment plant. An alignment study for this new interceptor would need to be provided in the future to determine the optimal routing of such an interceptor.

Additional capacity at the City's wastewater treatment plant on NE Sandy Boulevard will also need to be allocated to flow generated in Springwater. Planning for future wastewater treatment improvements are addressed in the City's Wastewater Facility Plan.

Recommended capital improvements and associated costs are shown in Table 5. Pipe costs are based on the Tabula 1.0 Conveyance System Cost Estimation software made available by King County, Washington. Costs are based on an Engineering News Record (ENR) 20-City Construction Cost Index (CCI) of 7297.

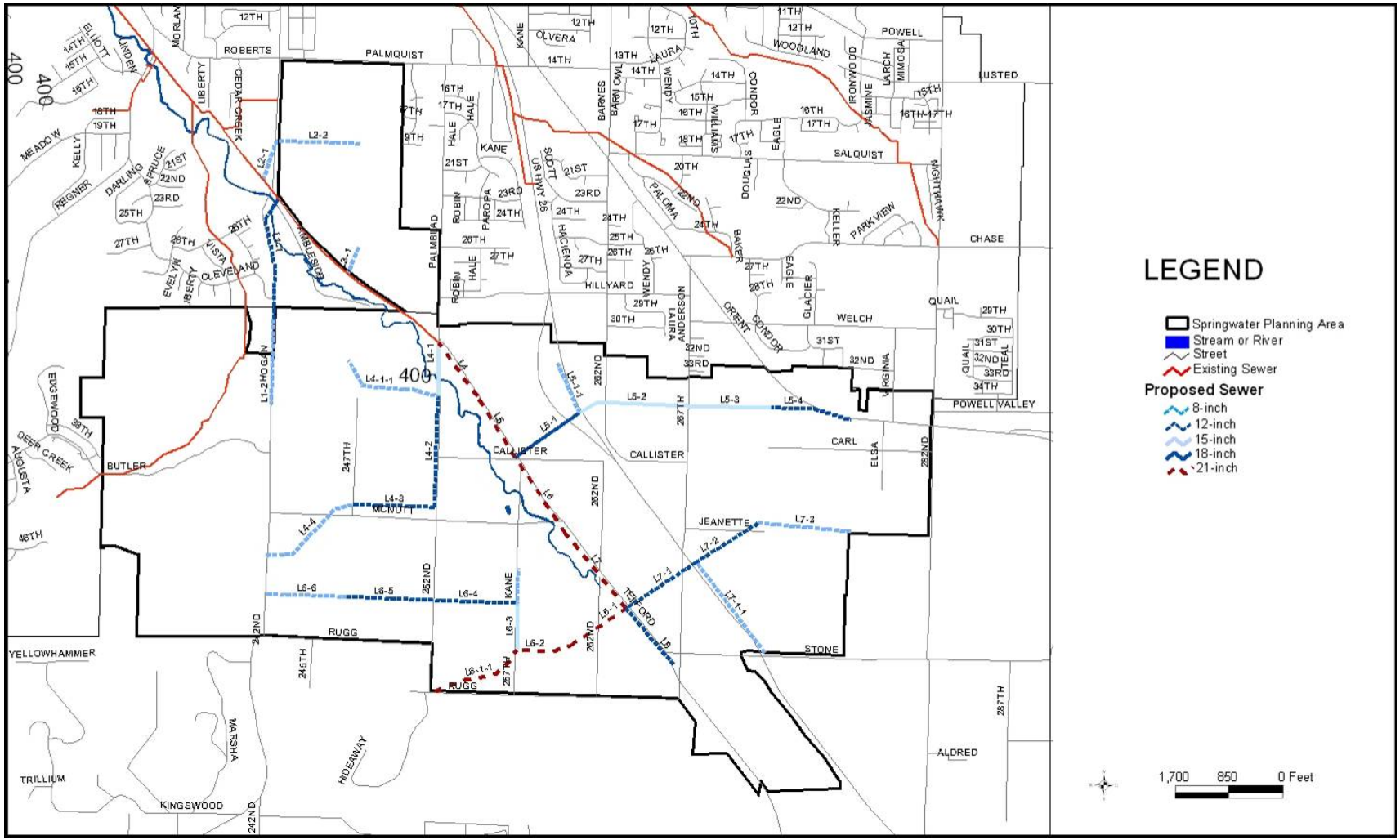


Figure 3 – Proposed Sewer System Improvements

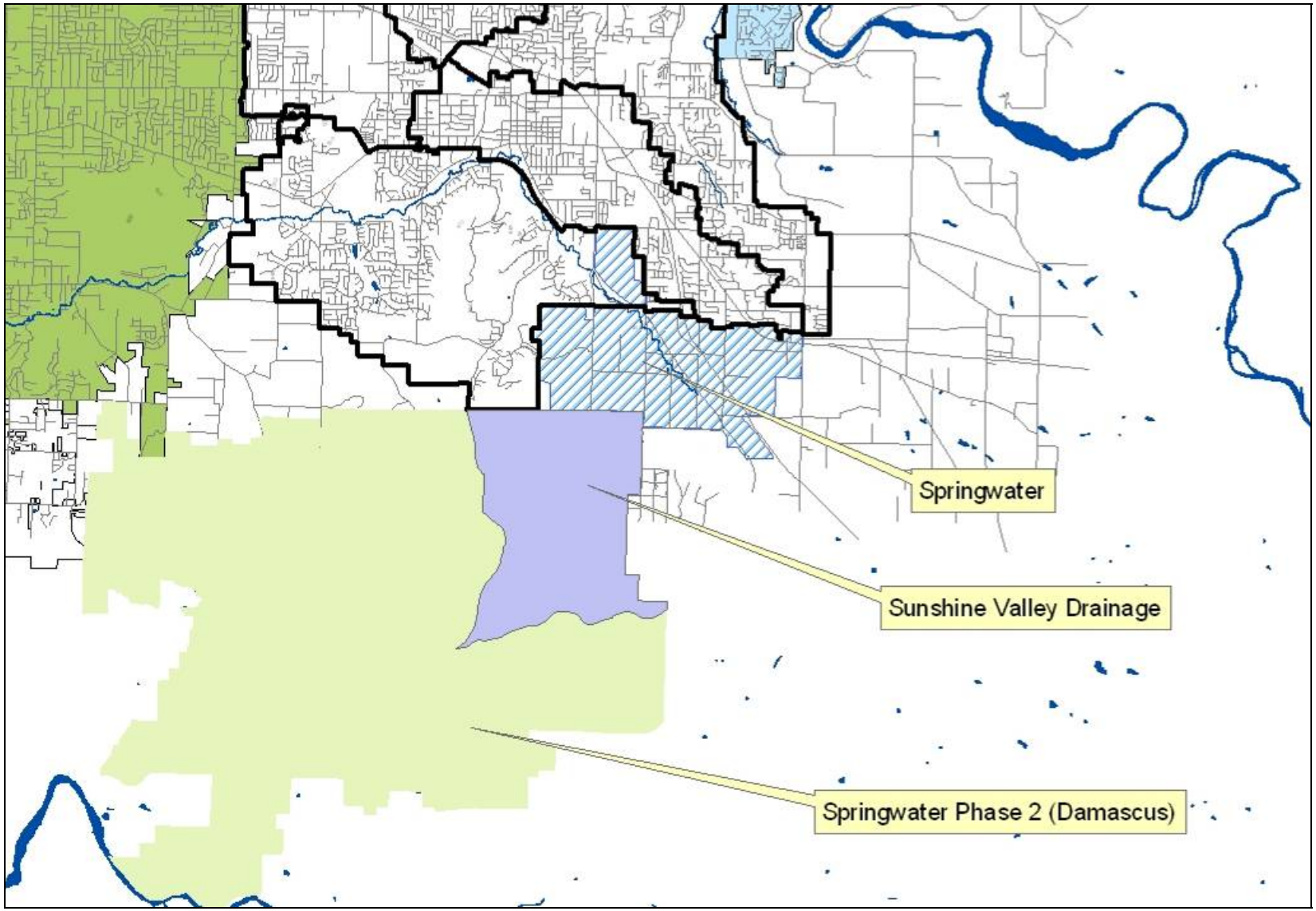


Figure 4 – Springwater Phase 2 and Sunshine Valley Drainage Area

Table 5. Capital Costs of Wastewater Collection and Conveyance Improvements[1]

Pipe ID	Pipe Length (ft)	Pipe Size (in)	Timing (years)	Total Project Cost	Responsible Jurisdiction	Funding Source
New Pipes in Springwater						
L6-1-1	1525.5	21	6-20	$ 1,325,100	Damascus	SDC/Local
L6-2	864	21	6-20	$ 1,108,600	Gresham	SDC/Local
L6-3	738	15	6-20	$ 582,300	Gresham	SDC/Local
L6-1	1,066	21	6-20	$ 691,500	Gresham	SDC/Local
L8	1,178	12	6-20	$ 671,500	Gresham	SDC/Local
L7	1,524	21	6-20	$ 1,126,600	Gresham	SDC/Local
L7-1	1,337	12	6-20	$ 756,200	Gresham	SDC/Local
L7-1-1	1,817	8	6-20	$ 923,900	Gresham	SDC/Local
L7-3	1,490	8	6-20	$ 582,800	Gresham	SDC/Local
L7-2	1,169	12	6-20	$ 525,500	Gresham	SDC/Local
L5-4	1,294	12	6-20	$ 581,600	Gresham	SDC/Local
L5-3	1,333	15	6-20	$ 670,200	Gresham	SDC/Local
L5-2	1,777	15	6-20	$ 893,200	Gresham	SDC/Local
L5-1	1,243	18	1-5	$ 671,600	Gresham	SDC/Local
L6	1,467	21	1-5	$ 868,400	Gresham	SDC/Local
L5	1,126	21	1-5	$ 666,800	Gresham	SDC/Local
L4-4	1,712	8	6-20	$ 669,700	Gresham	SDC/Local
L4-3	1,293	12	6-20	$ 581,000	Gresham	SDC/Local
L6-6	1,261	8	6-20	$ 493,400	Gresham	SDC/Local
L6-5	1,368	12	6-20	$ 614,800	Gresham	SDC/Local
L6-4	1,363	12	6-20	$ 528,600	Gresham	SDC/Local
L4-2	1,765	12	1-5	$ 793,500	Gresham	SDC/Local
L4-1	893	15	1-5	$ 583,500	Gresham	SDC/Local
L4	1,107	21	6-20	$ 655,400	Gresham	SDC/Local
L4-1-1	1,681	8	6-20	$ 657,600	Gresham	SDC/Local
L1-2	1,355	8	6-20	$ 530,200	Gresham	SDC/Local
L1-1	2,175	12	6-20	$ 977,700	Gresham	SDC/Local
L6-2-1	550	8	6-20	$ 180,200	Gresham	SDC/Local
L5-1-1	865	8	6-20	$ 338,500	Gresham	SDC/Local
New Pipes in Existing City Limits						
L3-1	458	8	6-20	$ 232,900	Gresham	SDC/Local
L2-2	1,336	8	6-20	$ 522,700	Gresham	SDC/Local
L2-1	693	8	6-20	$ 352,700	Gresham	SDC/Local
Subtotal Springwater Planning Area				***$ 21,358,200***		
Offsite Upgrades						
Linneman Pump Station Upgrade			6-20	$ 2,033,500	Gresham	SDC/Local
Parallel Force Main			6-20	$ 1,836,100	Gresham	SDC/Local
Upsize Existing Pipes			6-20	$ 1,486,000	Gresham	SDC/Local
Subtotal Offsite Improvements				***$ 5,355,600***		
Total Wastewater Improvements				***$ 26,713,800***		

1. Does not include Wastewater Treatment Plan infrastructure required by Springwater.

Additional future needs include:

- Updating the City's Master Plan to include both capital improvements within Springwater and capital improvements downstream in the City's existing system required as a result of development in Springwater.
- Updating the City's sewer SDC improvement fees to provide adequate funding for improvements resulting from development in Springwater.
- Determining the appropriate service provider for the portion of Springwater Phase 1 located in Clackamas County.
- Coordinating with the City of Damascus regarding wastewater system planning and design guidelines for the portion of the study area in Damascus (south of Rugg/Stone roads).
- Continuing to investigate the opportunity for wastewater reuse through satellite wastewater treatment systems in Springwater. Satellite wastewater treatment is becoming more cost-effective for onsite treatment of sanitary wastewater from large industrial sites. There could be multiple benefits of satellite treatment in Springwater, including:
    - Providing irrigation water for public parks or other public areas (schools, government facilities, etc.)
    - Providing flow augmentation in Johnson Creek
    - Providing irrigation water for nursery or agricultural land outside of the study area in exchange for water rights

In addition to these benefits, satellite treatment and effluent reuse is consistent with the desire to make Springwater a green development. Use of satellite or onsite treatment could even be incorporated in a public demonstration project in a highly visible area such as the Village Center to educate the public and further promote sustainable development in the community. The Master Plan should include provisions to allow the City to evaluate the viability of satellite treatment and effluent reuse associated with the unique needs and features of developments in Springwater.

Funding Plan

The following discussion presents the envisioned strategy for funding wastewater service extensions in Springwater. Gresham relies on developer contributions, system development charges (SDCs) and retained earnings from the utility to finance expansion. In the past, Gresham has borrowed against future utility revenues to finance major improvements in wastewater treatment capacity. This approach required wastewater rate increases for existing customers to finance these improvements. The City has not utilized this capital investment acquisition strategy to finance new pipelines or pipeline capacity projects.

Depending on the location of initial development, it may be difficult for Gresham to finance wastewater system improvements in the short term. There are no initial strategic investments that must occur prior to any wastewater system expansion in Springwater. However, since the closest connection to the existing gravity sewer system is in the northwest portion of the study area, parts of Springwater adjacent or close to this existing system would be the easiest to fund in the short term. Furthermore, the main interceptor through Springwater will be along Telford

road. If initial development occurs in the southeastern portion of the Plan District (away from the existing system) or toward the eastern or western boundaries of the Plan District (away from Telford), the cost of initial system improvements will increase and may be difficult for the City to fund in the short term. Over the long term, assuming the City adopts adequate SDCs to cover the required capital improvement projects, SDCs should generate enough revenue from within Springwater to capitalize system improvements.

Gresham has recently undertaken a separate effort to evaluate water and wastewater SDCs. This project is examining options for both city-wide and area-specific SDCs, and will make recommendations regarding potential changes to the existing SDC methodology, especially in the improvement fee, to ensure that the fee is adequate to recover forecast capital improvement needs in Springwater.

Goals, Policies and Action Measures

Goals and Policies. Applicable goals and policies that relate to the provision of public facilities in the existing comprehensive plan for the City of Gresham also apply to the Springwater PFP.

Action Measures.

1. Implement recommendations of the Wastewater SDC study being conducted concurrently with the completion of this PFP.
2. Continue to coordinate with the City of Damascus and/or Water Environment Services of Clackamas County to determine the appropriate service provider for Sunshine Valley.
3. If Gresham is to provide treatment for any portion of flow from the City of Damascus, participate with City of Damascus and/or Water Environment Services of Clackamas County on an alignment study to identify the appropriate alignment for a new interceptor to convey wastewater to Gresham's wastewater treatment plant.
4. Conclude Gresham and Clackamas County negotiations for service agreements for the portion of Springwater Phase 1 located in Clackamas County. Regardless of the solution, the agreement needs to comply with provisions of ORS 195 that relate to urban service providers.
5. Investigate wastewater discharge or non-potable water demands as industries begin to locate in Springwater to assess the potential for a water reuse program.
6. Initiate discussions with the Oregon Department of Environmental Quality (DEQ) to investigate the regulatory precedence for or requirements associated with using treated effluent for environmental benefits such as streamflow augmentation and aquifer recharge.

10.824 STORMWATER MANAGEMENT SYSTEM

System Description/Condition Assessment

Existing Conditions. Springwater is a rural area where stormwater is currently conveyed overland in ditches to natural drainages. Natural drainages include approximately 2.5 miles of Johnson Creek (ODFW reaches 16 through 19), and eight tributaries, four each on the northeast and southwest sides of the mainstem Johnson Creek. Drainage ditches next to public roadways convey runoff from road surfaces, and in some cases from adjacent private properties, to natural stream systems. Some stream channels are in good condition, although many are degraded. Predominant soils in the area include Cascade Silt Loam, Wolent Silt Loam, Powell Silt Loam, and Wapato Silt Loam. These are generally considered hydric soils with poor drainage characteristics. Many properties in Springwater have been tiled to drain the native wetland prairies for farming. Some riparian habitat has been removed, predominantly in flat areas where farming is prevalent.

Design Criteria. Regional stormwater management facilities (detention ponds) were designed to include adequate volume for water quality, flood control, and channel stability. The water quality volume is defined as 1/3 of the two-year storm. The flood control volume includes the additional volume of runoff under developed conditions from the 10-year nuisance storm (146-hour storm event). The channel stability volume includes additional volume required to limit release rates to less than the geomorphically significant flow (i.e., flow capable of moving sediment). In this case, the channel stability volume was 50% of the two-year storm under existing conditions. Swales, swale culverts, and drainage channels were designed to carry the 10-year nuisance storm. Stream crossings were designed to convey the 100-year storm for streets identified as arterials and collectors. All other stream crossings were designed to carry the 10-year nuisance storm.

Planned Improvements. Springwater is a rural area where historical drainage practices have resulted in a significantly altered watershed and have had a dramatic adverse impact on watershed health, especially in riparian areas. The recommended stormwater system for Springwater is intended to minimize the impact of development and maintain or restore watershed functionality using the goals and recommendations described below.

Stormwater management in Springwater is based on green practices that include both onsite stormwater management and public infrastructure facilities. Both components use techniques and processes that mimic natural hydrology to the greatest extent practical, reducing impacts of runoff to pre-development conditions, or improving over current conditions.

Rather than routing runoff to underground pipes for conveyance, runoff will be conveyed through green street swales and swale culverts, or through drainage channels in areas that do not drain to roadways. Vegetated swales located between the roadway and sidewalks and drainage channels located along environmentally sensitive resource areas (ESRAs) will slow the flow of runoff and also provide some infiltration, reducing the quantity of stormwater that must be managed in regional facilities. Figure 5 shows the proposed location of CIP swales, swale culverts, and drainage channels. These swales and drainage channels will generally have an 8-foot top width, 2-foot bottom width, and 4:1 side slope. In areas where the standard swale geometry does not provide adequate capacity, a 10-foot top width will be provided. Approximately 150,000 lineal feet of swale and drainage channel improvements are recommended.

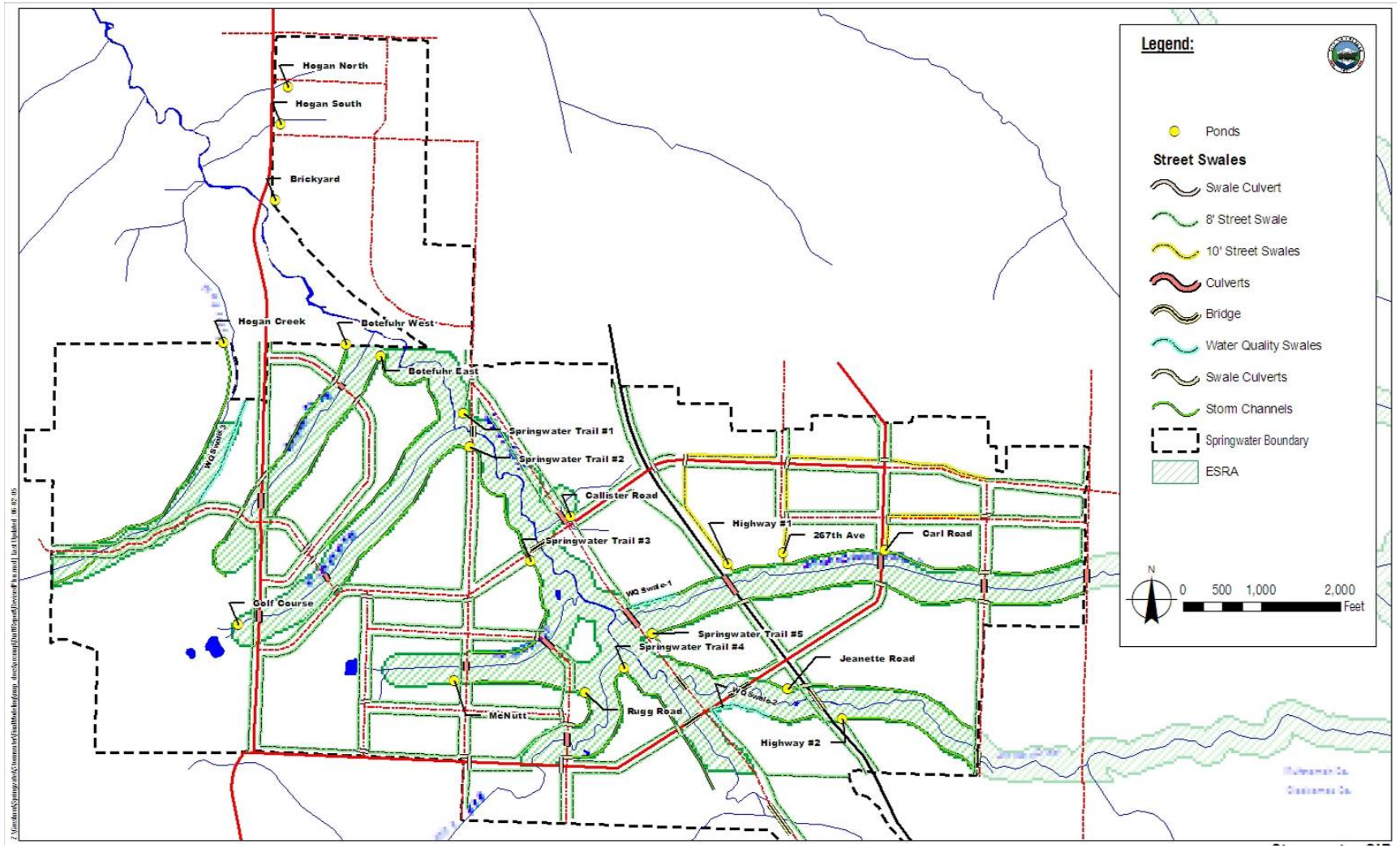


Figure 5. Proposed Stormwater Facilities

Twenty-one stream crossings have been identified. These crossings will be a combination of reinforced concrete box culverts, circular culverts, and bridges. All crossings were assumed to provide fish passage. Costs of the culverts or bridges have not been included in the stormwater CIP but will be included in the transportation CIP.

Regional facilities will control the flow of runoff back to the streams in order to regulate the rate and volume of flow entering the stream. In addition, vegetation in the facility will improve water quality by "polishing" the runoff to remove excessive sediment and pollutants[1]. Twenty two new regional stormwater facilities have been identified for the Springwater planning area, as shown in Figure 5. Most (20) of the regional facilities are currently planned to be ponds, and two facilities (located on or adjacent to the mainstem of Johnson Creek) will be dedicated water quality treatment swales. The 22 new facilities includes two facilities in the Brickworks area in the existing City limits, one facility at the base of the Persimmon Country Club, and 19 facilities within the area added as part of the 2002 Urban Growth Boundary expansion. All of the proposed facilities are located in Multnomah County. The facilities range in size from 4 acre-feet to 22 acre-feet, providing volume for flood control, channel stability enhancement, and water quality enhancement.

Siting for the stormwater facilities is an important consideration; by optimizing the location of facilities, the City's investment can be used to maximize public benefit. All of the facilities are located in proposed ESRAs, and acquisition of the property for these facilities will provide the additional benefit of promoting natural resource enhancement or restoration. For example, the ESRA in the vicinity of the Highway #1 regional facility and the drainage channel immediately upstream along the North Fork Johnson Creek has been identified for riparian rehabilitation, and the Highway #2 pond could be developed as part of the Johnson Creek/ Highway 26 wetland complex and floodplain reconnection project identified in the Natural Resource Management Plan. As specific stormwater projects are designed and implemented, the City should refine the stormwater conveyance, detention, and treatment facilities to maximize the opportunity to acquire ESRAs through the stormwater management program and to support implementation of the Natural Resource Management Plan. One of the facilities is located adjacent to a proposed Community Park location north of the Village Center, and could be used to promote public education regarding stormwater management and watershed protection issues. Two of the facilities (Springwater Trail #2 and #3) are located adjacent to the Village Center Loop Trail. Land acquisition costs for these facilities could be offset by Parks department purchase of the ESRA adjoining the trail.

With proper maintenance, the drainage channels will provide water quality treatment prior to discharge of stormwater to the regional facilities. However, if maintenance proves to be difficult due to the location of the drainage channels, appropriate treatment will be provided in the regional facilities. This allows for a wide variety of vegetation in the drainage channels, to ease the City's ability to maintain the facilities.

Costs associated with the public stormwater infrastructure recommended in Springwater are shown in Tables 6 and 7 below. Costs are based on the annexation subareas described in the Summary Report. These costs were developed using the same unit cost assumptions as used in the Pleasant Valley Stormwater Master Plan, and are based on an ENR 20-City Construction Cost Index (CCI) of 7297. Land acquisition costs are included for the regional detention facilities, and vary depending on whether or not the facility is located in an ESRA. Costs

[1] Pleasant Valley Implementation Plan Report, December 2003.

associated with stream crossings (culverts and bridges shown on Figure 5) are included in transportation CIP costs[2]. The total cost of recommend stormwater improvements in Springwater is $27.7 million.

Table 6. Regional Stormwater Facility Cost Summary

Pond Name	Total Volume (CY)		Cost Estimate	Timing	Jurisdiction	Funding Source
267th Ave	30,336	$	2,418,400	6-20	Gresham	SDC/Local
Carl Road	17,041	$	1,368,000	6-20	Gresham	SDC/Local
Jeanette Road	20,946	$	1,676,600	6-20	Gresham	SDC/Local
Highway #2	6,804	$	558,400	6-20	Gresham	SDC/Local
Highway #1	25,601	$	2,044,300	6-20	Gresham	SDC/Local
Hogan South	14,868	$	1,196,300	6-20	Gresham	SDC/Local
McNutt	16,192	$	1,672,200	6-20	Gresham	SDC/Local
Springwater Trail #4	10,343	$	838,400	6-20	Gresham	SDC/Local
Golf Course	14,588	$	1,174,100	6-20	Gresham	SDC/Local
Springwater Trail #3	9,869	$	800,900	6-20	Gresham	SDC/Local
Hogan North	20,827	$	1,667,200	6-20	Gresham	SDC/Local
Callister Road	19,410	$	1,555,300	6-20	Gresham	SDC/Local
Rugg Road	19,955	$	1,598,300	6-20	Gresham	SDC/Local
Springwater Trail #2	8,468	$	690,100	0-5	Gresham	SDC/Local
Springwater Trail #1	18,226	$	1,461,600	0-5	Gresham	SDC/Local
Hogan Creek	7,641	$	624,600	6-20	Gresham	SDC/Local
Botefuhr West	10,878	$	880,700	0-5	Gresham	SDC/Local
Botefuhr East	5,904	$	487,200	0-5	Gresham	SDC/Local
Springwater Trail #5	16,508	$	1,325,900	6-20	Gresham	SDC/Local
Brickyard	14,071	$	1,133,200	6-20	Gresham	SDC/Local
	308,476	**$**	**25,172,000**			

[2] Costs were calculated for informational purposes, and are included in the Reference Documents.

Table 7. CIP Swale and Drainage Channel Cost Summary

8' Top Width Swale Cost Summary

Annex Area	Length	Total Cost ($)	Timing (years)	Jurisdiction	Funding Source
1	179	$ 3,000	6-20	Gresham	SDC/Local
2	8,249	$ 136,500	6-20	Gresham	SDC/Local
3a	5,676	$ 93,900	6-20	Gresham	SDC/Local
3b1	8,783	$ 145,300	0-5	Gresham	SDC/Local
3b2	12,339	$ 204,100	0-5	Gresham	SDC/Local
4a	4,385	$ 72,500	6-20	Gresham	SDC/Local
4b	9,437	$ 156,100	6-20	Gresham	SDC/Local
4c	7,332	$ 121,300	6-20	Gresham	SDC/Local
5a	7,706	$ 127,500	0-5	Gresham	SDC/Local
5b	9,041	$ 149,500	0-5	Gresham	SDC/Local
5c	10,396	$ 172,000	6-20	Gresham	SDC/Local
6a	2,930	$ 48,500	6-20	Gresham	SDC/Local
6b	6,164	$ 102,000	6-20	Gresham	SDC/Local
7a	3,489	$ 57,700	6-20	Gresham	SDC/Local
8a	3,534	$ 58,500	6-20	Damascus	SDC/Local
8b	1,354	$ 22,400	6-20	Damascus	SDC/Local
		$ 1,670,800			

10' Top Width Swale Cost Summary

Annex Area	Length	Total Cost ($)	Timing (years)	Jurisdiction	Funding Source
5b	4,814	$ 93,000	0-5	Gresham	SDC/Local
5c	2,815	$ 54,400	6-20	Gresham	SDC/Local
6a	93	$ 1,800	6-20	Gresham	SDC/Local
		$ 149,200			

Drainage Channels

Annex Area	Length	Total Cost ($)	Timing (years)	Jurisdiction	Funding Source
2	4,125	$ 74,600	6-20	Gresham	SDC/Local
3a	4,080	$ 73,800	6-20	Gresham	SDC/Local
3b1	6,644	$ 120,100	0-5	Gresham	SDC/Local
3b2	3,380	$ 61,100	0-5	Gresham	SDC/Local
4a	1,702	$ 30,800	6-20	Gresham	SDC/Local
4c	3,839	$ 69,400	6-20	Gresham	SDC/Local
5b	1,451	$ 26,300	0-5	Gresham	SDC/Local
5c	2,258	$ 40,800	6-20	Gresham	SDC/Local
6a	3,485	$ 63,000	6-20	Gresham	SDC/Local
6b	3,811	$ 68,900	6-20	Gresham	SDC/Local
7a	2,575	$ 46,600	6-20	Gresham	SDC/Local
7b	3,449	$ 62,400	6-20	Gresham	SDC/Local
		$ 737,808			

Onsite Practices. Onsite stormwater management in Springwater requires green development practices. Green development practices are a set of techniques that mimic and incorporate the predevelopment hydrology of a site into future development. Green development practices

include site management techniques that minimize (1) disturbance to existing soils, tree canopy, and other sensitive natural resource features and (2) impervious surfaces, to reduce the production of surface runoff. They also manage runoff through techniques that use natural areas and landscaping to treat, retain, attenuate, and infiltrate stormwater within each development site instead of using traditional piped collection and conveyance systems. Stormwater management plans relying on green development practices accommodate onsite facilities using the hydrology processes of infiltration to soil and evapotranspiration to atmosphere.[3]

An approved Stormwater Management Plan will be required under the new Springwater code. Stormwater management plans provide a mechanism for the City to review how development proposals for stormwater facilities meet the requirements for onsite stormwater management practices. The intention is that the stormwater management plans be submitted and approved along with site plan or preliminary development plat approval. Stormwater management considerations should be included in the City's business recruitment program for Springwater.

Summary of Future Needs

- Coordination is needed between Gresham and the new City of Damascus regarding stormwater system planning and design guidelines for the portion of the study area in Damascus (south of Rugg/Stone roads). A consistent approach regarding stormwater conveyance standards, development setbacks, allowed uses in ESRAs, and other issues related to stormwater management should be identified in an intergovernmental agreement.
- Modification of the SDC improvement fee may be necessary to fund required improvements in Springwater.
- Purchase of properties required for regional stormwater management facilities should transpire as soon as the Master Plan is completed, adequate funding is secured, and successful acquisition negotiations completed.
- The City of Gresham will not be responsible for NPDES and TMDL compliance for Springwater until areas are annexed to the City. Prior to annexation, regulatory permitting requirements need to be addressed.

Funding Plan

The following discussion presents the envisioned strategy for funding stormwater service extensions in Springwater. Gresham relies on developer contributions, system development charges (SDCs) and retained earnings from the utility to finance expansion. In the past, Gresham has borrowed against future utility revenues to finance major improvements in stormwater facilities needs.

Depending on the location of initial development, it may be difficult for Gresham to finance stormwater system improvements in the short term. There are no initial strategic investments that must occur prior to any stormwater system development in Springwater. However, since the likely initial annexation areas are located to the east and west of Johnson Creek adjacent to the existing City limits, the City may want to prioritize the Springwater Trail Ponds #1 and #2 for early funding. Likewise, CIP swales located along 252nd should be prioritized for early funding to support the potential annexation of these areas.

[3] Pleasant Valley Stormwater Master Plan, CH2M Hill, July 2004.

Goals, Policies, and Action Measures

Goal: The City of Gresham shall manage stormwater to minimize impacts on localized and downstream flooding and protect water quality and aquatic habitat.

Policies: The following policies are made part of this plan:

1. Manage stormwater through green development practices that rely on infiltration, bio-retention and evapotranspiration or other processes that enhance the natural hydrologic system.
2. Incorporate green streets designs as described in Metro's handbook entitled *Green Streets: Innovative Solutions for Stormwater and Stream Crossings* and as designed in the Pleasant Valley Plan District area.
3. Design culvert improvements for existing and proposed stream crossings to eliminate barriers to fish passage.
4. Ensure that the quantity of stormwater after development will be equal to or less than the quantity of stormwater before development, wherever practicable.
5. Ensure that the quality of stormwater after development will be equal to or better than the quality of stormwater before development, wherever practicable.
6. Design public stormwater facilities using approaches that integrate stormwater vegetation such as swales, trees, vegetated planters and wetlands.
7. Prohibit the encroachment of structures and other permanent improvements over public and private stormwater facilities and within public stormwater easements, drainage ways, creeks, streams, seasonal waterways, seeps and springs.
8. Develop equitable funding mechanisms to implement a CIP for the stormwater management system and provide adequate funding for stormwater management facility maintenance.

Action Measures:

1. Implement an SDC policy to provide adequate funding for stormwater facilities in Springwater.
2. Review stormwater utility rates and modify as appropriate to support maintenance of facilities in Springwater.
3. Coordinate with the Parks Division to ensure that development of the Village Center Loop trail is adequately protective of natural resources.
4. Look for opportunities to enhance natural resource areas through the construction and maintenance of stormwater facilities.
5. Update the City's onsite stormwater management program to address land use types in Springwater.
6. Coordinate with the Parks Division to investigate the option of combining drainage channels and multi-use trails if the Employee Loop trail is located along stream corridors.

10.805 PARKS, OPEN SPACE AND TRAILS SYSTEM

System Description/Condition Assessment
There are currently no parks in Springwater. There is one trail – the Springwater Trail – which bisects the planning area. Both regional and site conditions directly affect the potential of parks, open space, and trails in Springwater. These regional and site conditions are described below.

Regional Connections. The expansion of the Urban Growth Boundary places Springwater at the southeast gateway into the Portland metro area, within a short drive of over 1.5 million residents. Major population centers include: Downtown Portland (14 miles to the west), downtown Gresham (2 miles to the north), and downtown Sandy (9 miles to the southeast). Primary regional access routes include US Highway 26, Hogan Road running north-south through Springwater, and Butler Road which is planned to connect Springwater to Pleasant Valley.

Regional Natural Connections. The buttes and Johnson Creek create a very diverse landscape throughout the region. Intertwined with the natural features are several regional trails that have been outlined by Metro's Trails Master Plan. Their pattern, along with the open space that has been assembled, is directly correlated to the creeks and buttes in the region. Listed below are several of the regional trails that will potentially link to Springwater's local trail system. Major trails include the following:

- **Springwater Trail**, the nation's 499th rail to trails conversion, is one of the most significant trails in the state connecting west from the study area to Milwaukie, OR. It is planned to extend east beyond the study area to Estacada and the Mt. Hood National Forest to connect to the Pacific Coast Trail.

- **40 Mile Loop Trail**, which was part of the original Olmsted Brothers Master Plan, will be located less than a mile to the northeast of the study area along Beaver Creek creating a 160 mile continuous trail.

- The proposed **East Buttes Loop Trail**, which will be located directly to the west of the study area, will connect the Springwater Trail to the **Scouter Mountain Trail** and will loop back to the Springwater. Unlike the Springwater Trail, both of these trails travel along butte peaks offering more intensive hiking.

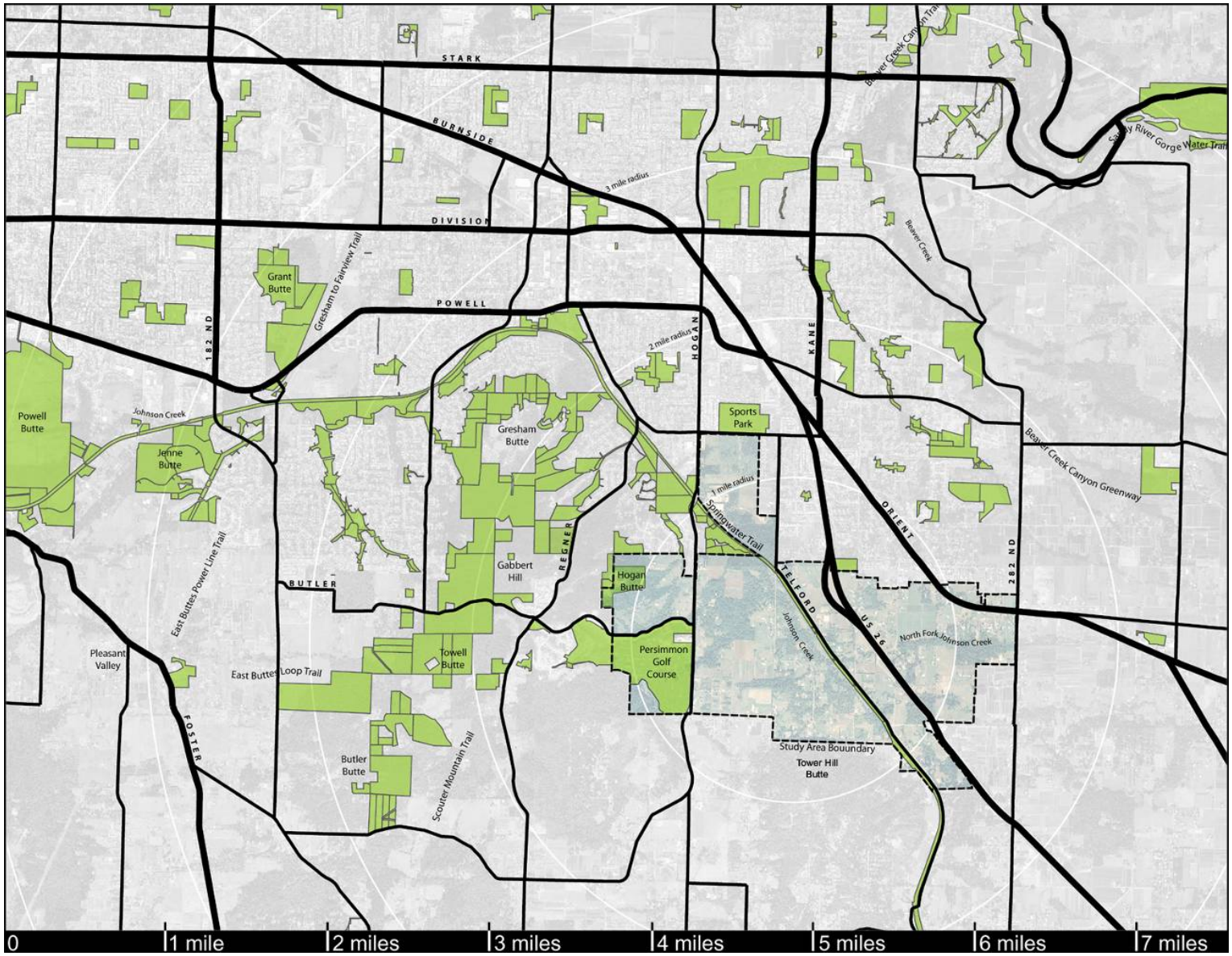


Figure 7. Regional Access and Open Space Diagram

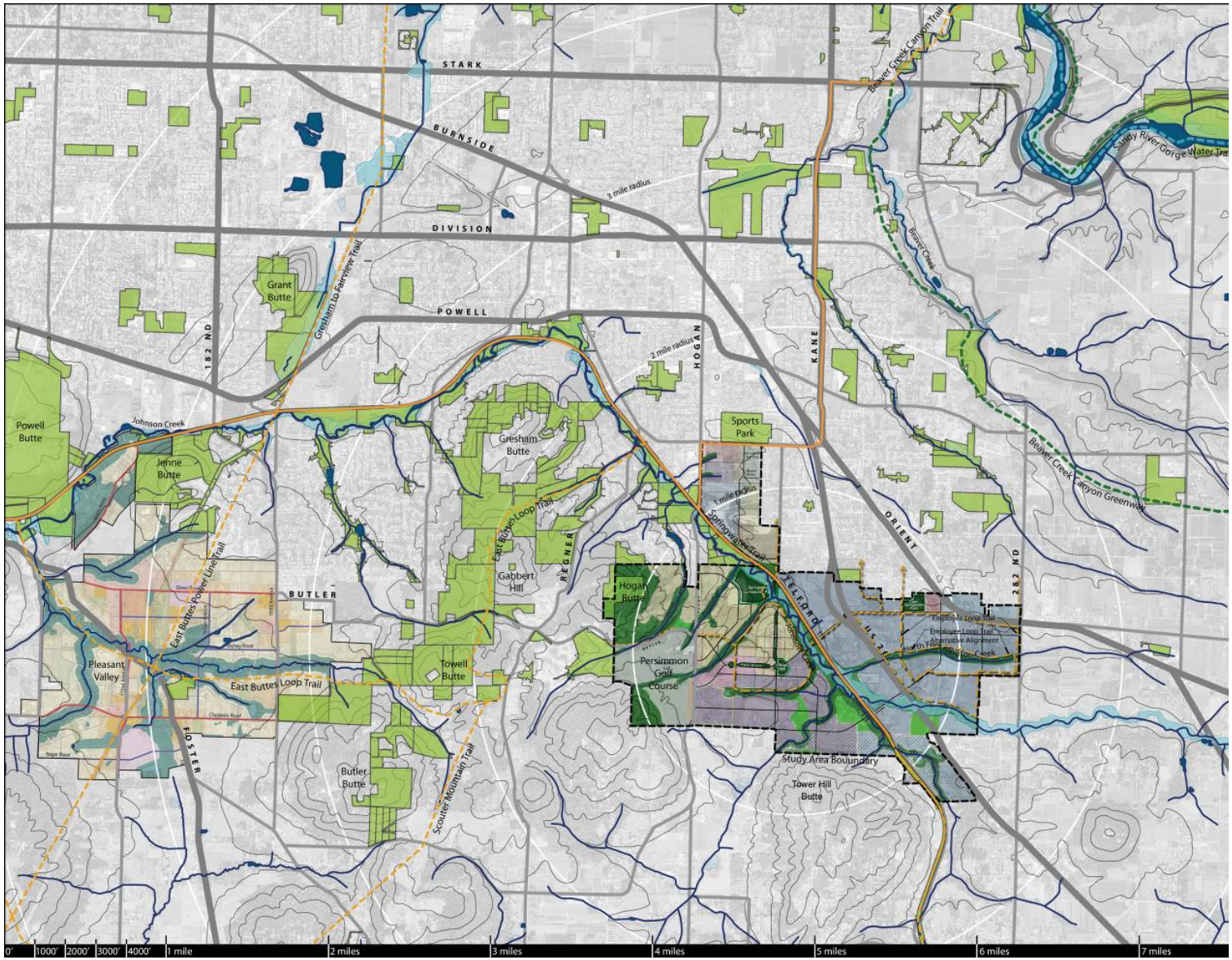


Figure 8. Regional Natural Connections and Trails Diagram

Natural Features. The physical features of the site can easily be seen in the topographic map below. Johnson Creek is the lowest elevation in Springwater, with the east and west portions of the site sloping down toward it. The best views in the area are from the high points between tributaries of the buttes surrounding the site. Looking into the site the best views are from the buttes to the west and south. In addition to these long views, incidental views into the creeks occur frequently along corridors. Specific natural features in the study area include:

- **Buttes** – Hogan Butte is the only butte actually in the study area. Along with the two other buttes to the south it forms an impressive backdrop for views out of Springwater and creates the potential for trails and view points into the study area from their summits.
- **Johnson Creek and Tributaries** – The corridors define the low points on the map below. It is easy to see how the creek corridors have divided the districts into several smaller parcels, especially Johnson Creek and the east-west division it creates.
- **Forested Areas** – The most significant forested areas are along the creek corridors. However there are several forest stands that are important to habitat, recreational activities and educational opportunities outside the creek corridors that should be considered for possible open space acquisition. The graphic below shows the five most significant stands outside the creek corridors. See the Springwater Natural Resources Report for more information.

Parks and Open Space. There are several parks and open space areas adjacent to Springwater. These are described below.

- **Sports Community Park** is a 33.35 acre youth recreation facility within a 30-minute walk of most future residents of Springwater and will help meet future active recreation needs for the district.

- **Southeast Neighborhood Park** is an undeveloped 6.15 acre neighborhood park located directly north of the project boundary adjacent to US 26.

- **Southeast Community Park** is an undeveloped 10 acre community park that may be developed in conjunction with a proposed school adjacent to the site.

- There is a large amount of **open space along the Springwater Corridor** directly to the northwest of the study area, which will play into the overall open space system for Springwater. Most of this land is owned by the City of Gresham and Metro.

- **Persimmon Golf Course**, while privately owned, offers a visual amenity as well as a recreational opportunity not serviced by the City. Connections to it from adjacent neighborhoods could expand the open space system beyond the public parks open space and trail system.

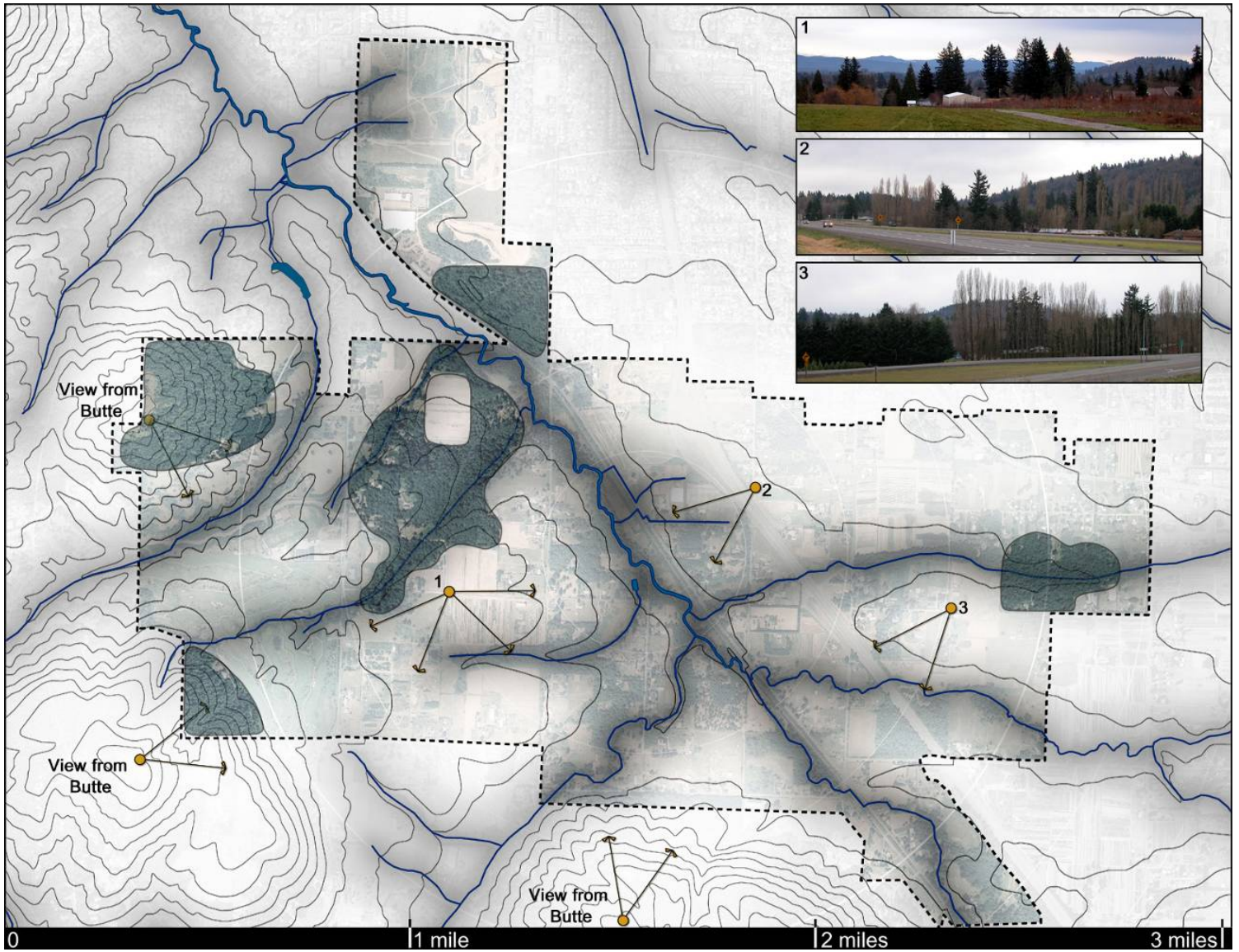


Figure 9. Natural Features and View Corridors Diagram

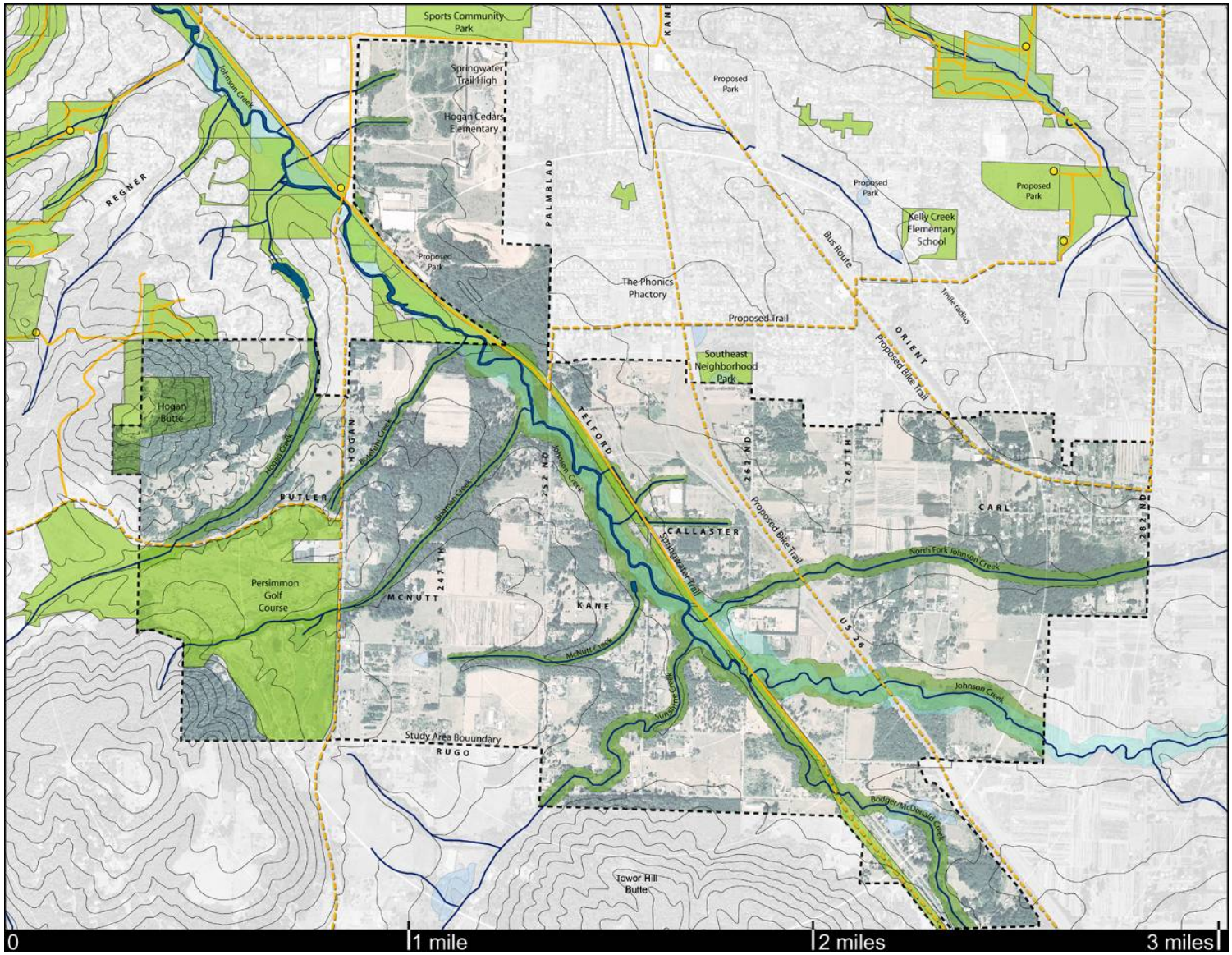


Figure 10. Local Parks, Open Space and Trail Connections Diagram

System Analysis

Springwater Levels of Service

Parks, open space and trails standards are intended to facilitate the creation of public amenities for the enjoyment of passive and active recreational activities by the residents and employees of a particular area. This plan has made recommendations for the level at which each type of amenity is offered based on comparisons to national standards and benchmarks created by the National Recreation and Park Association, and Gresham's previous master planning documents.

Level of Service or LOS is the tool by which the amount of a particular park type is measured to meet the needs of the community. It is calculated by dividing the area, number or length of an amenity by the number of residents in the same district. LOS is usually calculated as a total (usually acres) per 1000 residents.

Springwater Standards

The following LOS recommendations and resulting amenity totals have created the framework by which parks and open space have been allocated in the Springwater district. Park placement and sizing has been considered in reference to the total acres or miles of amenities listed below. Because there has been a range of housing population proposed for Springwater the resulting park amenities has also been listed as a range. These totals are a reference point based on the land use planning process's best estimate for an eventual total build-out for the district. As Springwater develops, the parks department will have to balance funding resources with existing and future demands to implement the master plan as closely as possible.

The following table is based on the City of Gresham's adopted list of park types, open spaces and trails, but has been modified for the needs and conditions of Springwater. The totals are based on estimated population ranges of 2,500 to 3,500 households and 17,000 employees at final build-out.[4]

Table 8. Springwater Parks, Open Space, and Trails Level of Service

Facility	Size/Placement	Benchmark	Total Acres/Miles
Neighborhood Park	.25 to 13 acres, within ¼ mile of residents being served.	1.3 acres/ 1000 residents	8.80 - 12.30 acres
Community Park	5 to 50 acres for active recreation, but may be smaller for alternative functions.	2 acres/ 1000 residents including employees equaling .32 residents.	24.40 – 29.80 acres
Open Space	Varies	10 acres/ 1000 residents including employees equaling .32 residents.	121.90 – 148.90 acres
Trails and Connectors	Connections from neighborhoods and employment centers to all major green space and civic amenities.	Based on 1/2 mile walk radius from neighborhoods and employment centers.	Estimated 6.2 miles

Modifications to Springwater's Standards from Gresham's Adopted Standards

The following items have been modified or added from the City of Gresham's Standards because of the unique development conditions of Springwater.

[4] To calculate total residents, households are multiplied by 2.7 residents per household.

- **Removal of Urban Plazas** – Gresham's standards define urban plazas as a separate category without a specific LOS assigned to it. Because of the low densities in Springwater the category was removed. However, in the Village Center, a plaza and park block will be considered a neighborhood park and the size allocated for each will be removed from the overall neighborhood parkland available.

- **LOS Calculation for Community Park** – Based on the population range being proposed in Springwater, an LOS of 2 acres per 1000 residents would create 13.5- 18.0 acres of community park. A park this size would not support many of the land intensive activities usually associated with community parks, nor would it allow for any facilities to support the 17,000 employees expected to be working in the district. By including employees in the LOS calculation as being equivalent to 0.32 residents, the available area of community park land increases to a size able to support a nature-oriented community park and an employee-focused adult sports park.

- **LOS Calculation for Open Space** –Much like the community park calculation, the area of land available for protection of natural resources and for trail connectivity is limited using the existing residential LOS calculation. By including employees in the LOS calculation as being equivalent to 0.32 residents, open space will be able to be preserved in residential and employee districts to provide trail connections and natural resource protection. The comparison to Pleasant Valley, provided as an appendix, illustrates the need for including employees in the calculation. By using the 0.32 resident equivalents for employees, the total acreage for open space in Springwater is comparable to the total acreage that will be provided for the primarily residential Pleasant Valley district.

Neighborhood parks

General Description

The purpose of neighborhood parks is to provide access to basic recreation opportunities for nearby residents of all ages and contribute to neighborhood identity. They should be located within biking and walking distance of all users. Neighborhood parks may be urban plazas in denser areas to provide space for community events. Neighborhood parks include the following general characteristics:

- Size and Location: 0.25 - 13 acres, within ¼ mile of residents being served.

- May include: a children's play area, a multi-purpose paved area, non-organized sports facilities, seating, picnic areas, paths, public art, permanent restrooms, and community gardens.

- Typically would not include off-street parking.

Plan Recommendations

Use the available neighborhood park area to create a unique identity for the Village Center. Two park blocks are proposed along the north-south and east-west axis of the Village Center. These will connect to a Village Center Park and Plaza that will serve as the primary public park for the district.

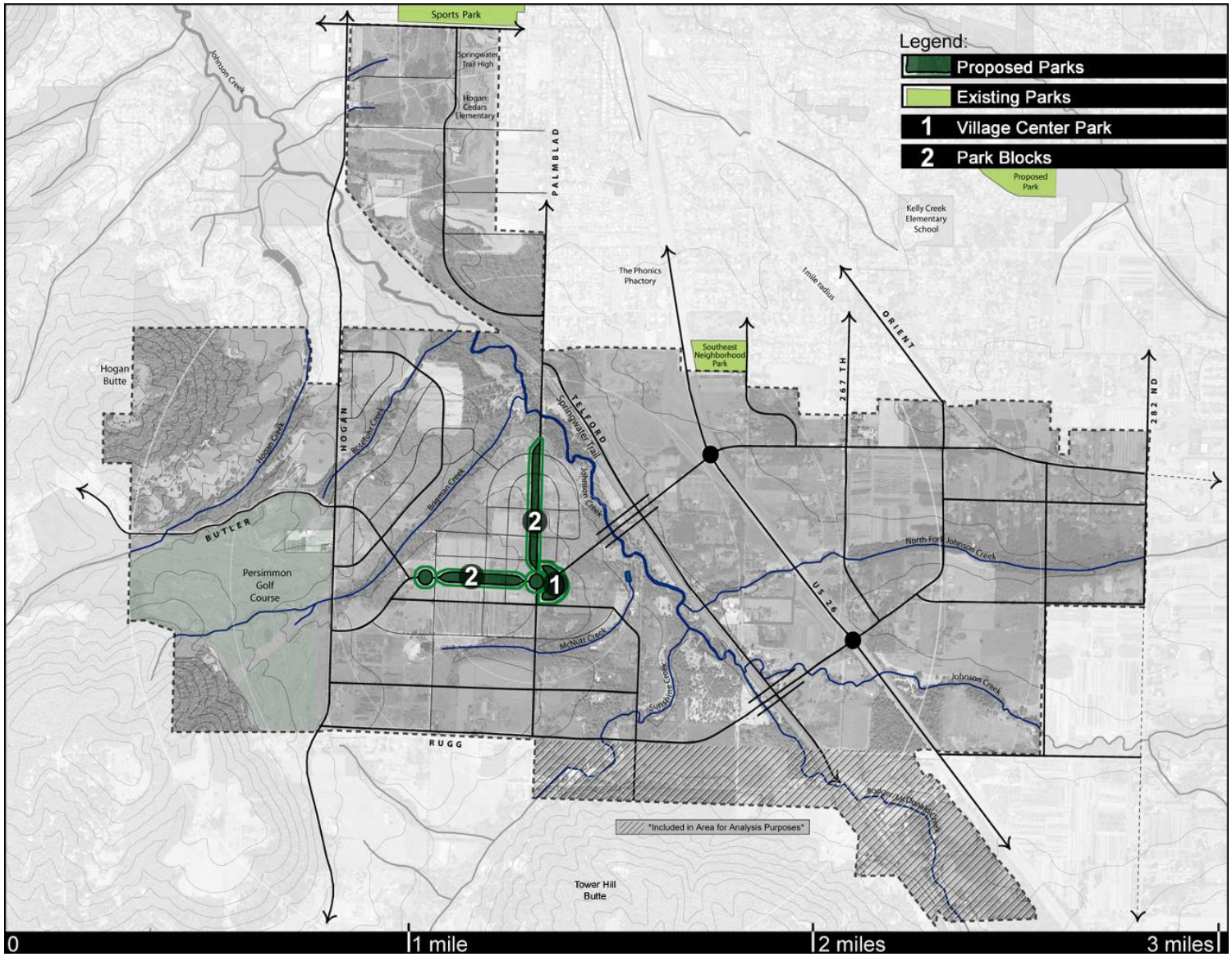


Figure 11. Proposed Neighborhood Parks Diagram

Park Blocks

The west end of the east-west park block is located at the highest point in the Village Center. From this point there is an unobstructed view of Mt. Hood across the project area. Through selective planting, it is envisioned that this view is preserved along the length of the park blocks. The east-west park blocks will be surrounded by mixed-use and commercial uses, in contrast to the north-south park blocks, which will be bordered primarily by dense residential housing. These blocks will define a linear center for the Village Center and a pedestrian way through the heart of the district.

South Park Blocks, Portland

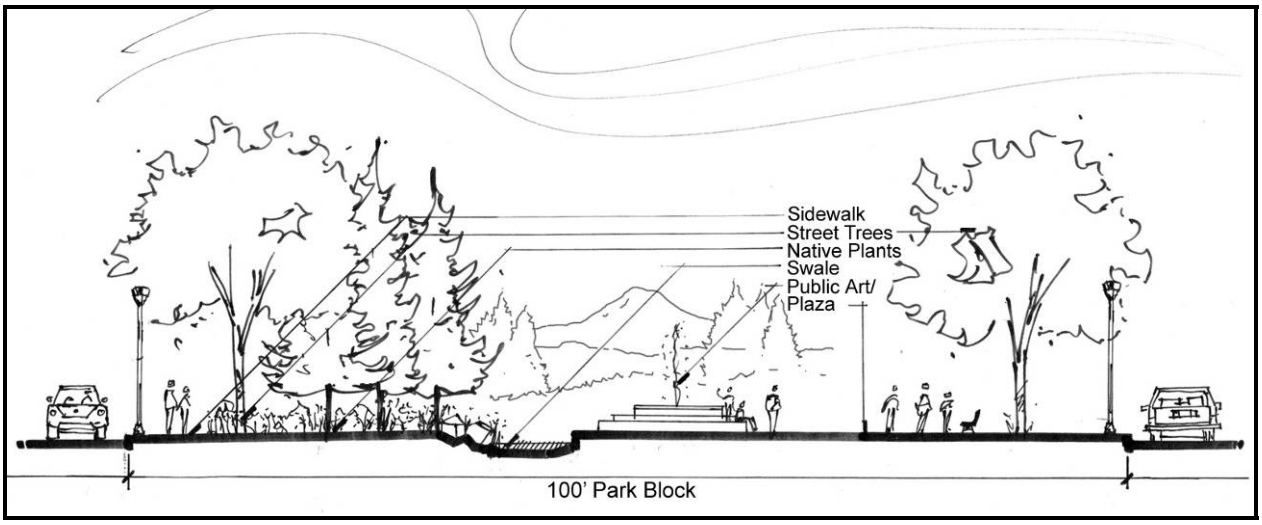
Size: approximately 100' curb to curb.

Program Elements: seating, small performance space, public art, pedestrian walks, children's play equipment, and small-scale sports facilities such as basketball and bocce ball.

Potential Synergies:

- Stormwater Management – look for opportunities to incorporate best management practices into the park blocks.

- Transportation – bicycle transportation may be incorporated into the park blocks.



Typical Park Block Section

Village Center Park and Plaza

It is proposed that the Village Center Park and Plaza will be located at the intersection of the north-south and east-west park blocks. They will help to create the identity for the Village Center and should be named accordingly. The plaza should be located adjacent to the densest development in the Village Center creating a transition into the larger neighborhood park site.

View to Mt. Hood from proposed Village Center Park site

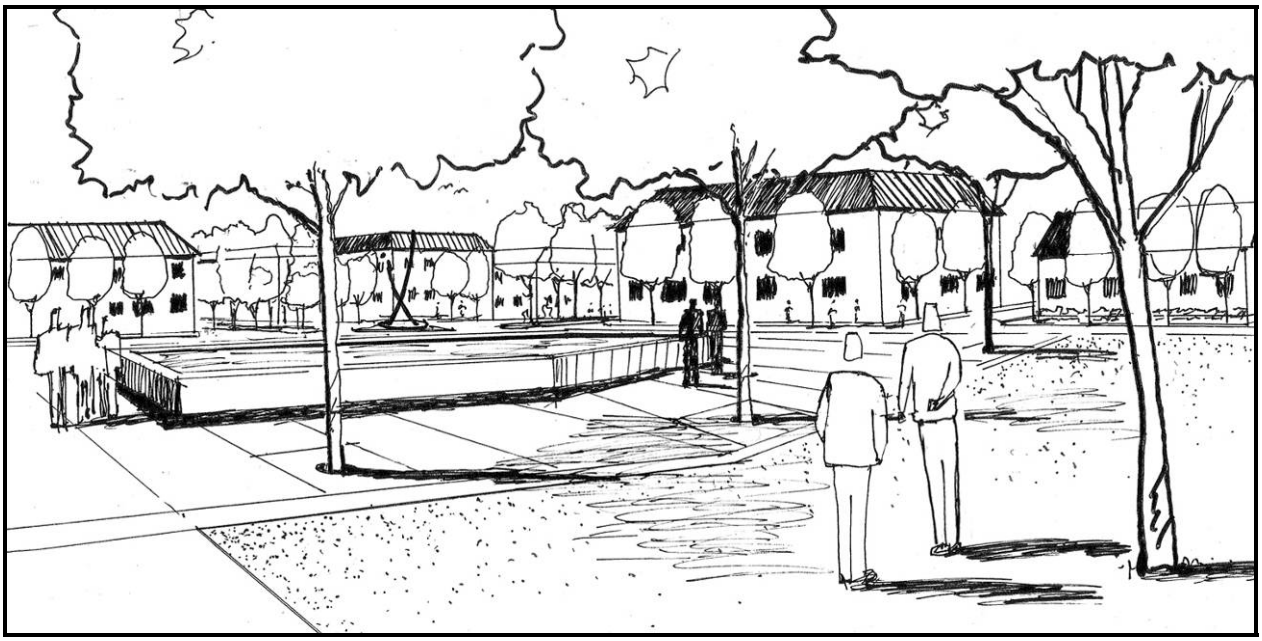
Size: 3-5 acres plus a ½ acre plaza.

Program Elements: multi-use plaza, seating, public art, pedestrian walks, permanent restrooms, children's play equipment, and non-organized sports facilities.

Potential Synergies:

- Stormwater Management – look for potential regional detention facilities to be located adjacent or inside the park site.

- School Sites – if an elementary school is located in the Springwater district, locating it adjacent to the park could eliminate the need for another play area adjacent to the school.



Village Center Park Character Sketch

Community Parks

General Description

The purpose of a community park is to provide active and passive recreational opportunities for all city residents and employees. Community parks accommodate larger group activities, provide a variety of accessible recreation opportunities for all age groups, offer environmental education opportunities, serve the recreational needs of families, and create opportunities for community social activities. Characteristics of community parks include:

- Size: 5 to 50 acres in size

- May include: children's play area, competitive sports facilities, off-street parking, permanent restrooms, public art, group picnic areas, natural areas, paths, botanical gardens, community centers, amphitheaters, festival space, swimming pools, and interpretive facilities

Plan Recommendations

Create two new community parks, located adjacent to natural resources and/or in areas with good vehicular accessibility. The nature-oriented Springwater Community Park is envisioned to be located along the Johnson Creek Corridor and adjacent to the residential districts. It will provide two youth sports fields, and a regionally-significant natural park area, providing interpretive educational opportunities. The athletic facility-oriented East Springwater Park will be located east of US. 26, and will provide two to three adult sports fields for employee recreational opportunities as well as facilities for the adjacent neighborhood to the north.

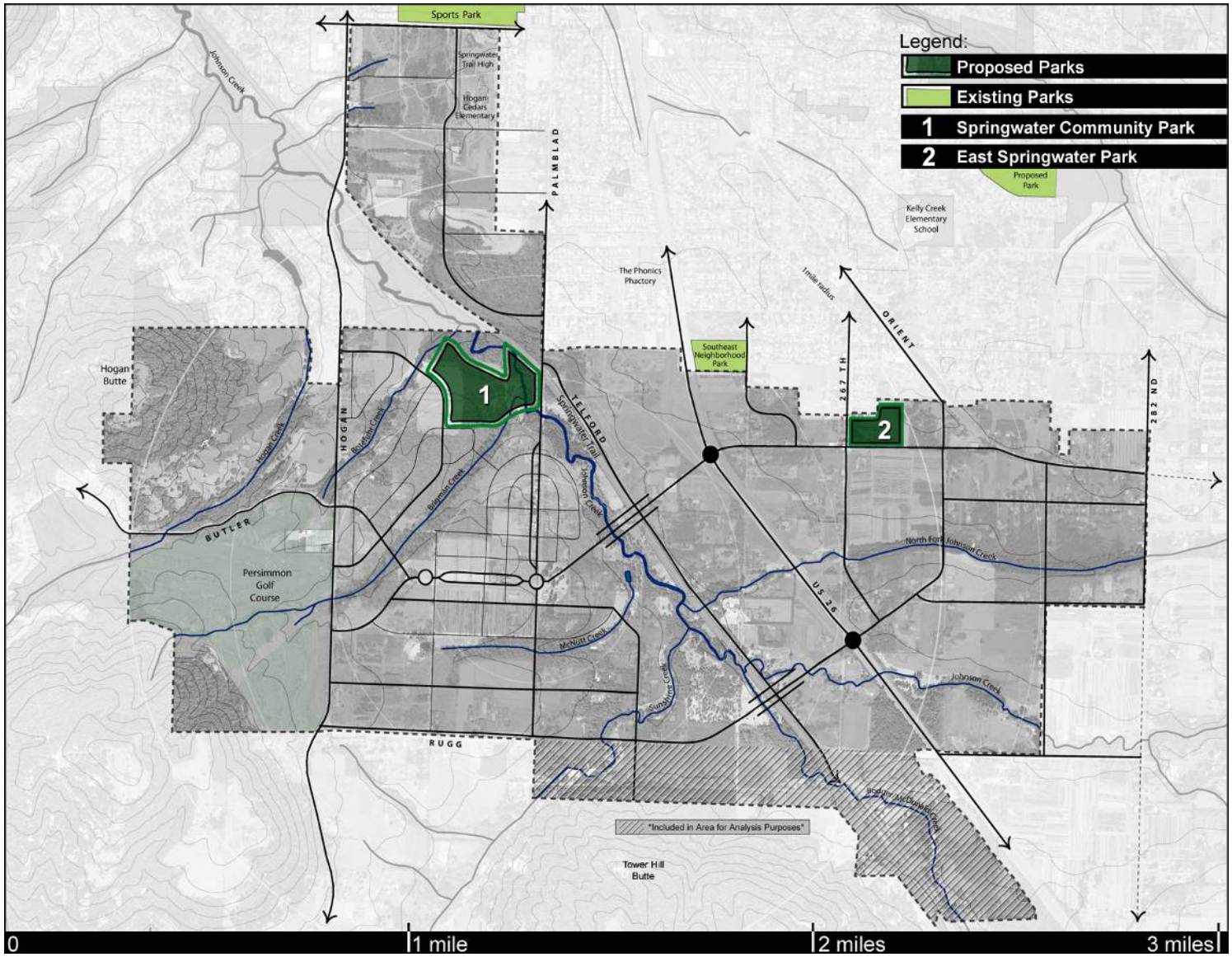


Figure 12. Proposed Community Parks Diagram

Springwater Community Park

The proposed Springwater Community Park is intended to tie together open space, trails, and interpretive opportunities into a respectful and educational encounter with the natural environment. By locating the park along the Johnson Creek and Springwater Trail corridor, visitors would be able to enjoy the natural features of the district and become informed of the challenges facing the overall watershed. It is envisioned that this park become the identity of the district. The larger district goals of sustainability should be expressed in the design and implementation of the park.

Fairview Community Park, Fairview

Size: 20-25 acres

Program Elements: Two youth sports fields in the upland area of the park, children's play area, off-street parking, permanent restrooms, public art, group picnic areas, interpretive trails, nature center, and amphitheater

Potential Synergies:

- Stormwater Management - look for potential regional detention facilites to be located adjacent or inside the park site.
- School Sites – if an elementary school is located in the Springwater district, locating it adjacent to the park would eliminate the need for another play area adjacent to the school.

East Springwater Park

A new community park on the east side of US 26 will serve the existing neighborhood to the north of the project boundary and the future employee population to be concentrated to the south of the proposed park location. The park is intended to be a community-wide resource with organized sports fields for adults and youth, and therefore be accessible by pedestrians, bicyclists and motorists.

East Delta Park, Portland

Size: 5-10 acres

Program Elements: Two to three adult/youth sports fields, off-street parking, permanent restrooms, seating, pedestrian walks, and children's play equipment

Open Space

General Description

The purpose of open space, greenways and corridors is for the protection and restoration of natural and scenic resources, and the creation of nature-oriented outdoor recreation and trail-oriented activities. It provides opportunities for rest and relaxation, protects valuable natural resources, protects wildlife, and contributes to the environmental health of the community. By preserving and providing access to open space the surrounding property becomes more valuable because of the amenities and views that are created. Characteristics of open space are as follows:

- Large enough to protect resources and support recreational activities.

- May include trails, trailhead amenities (bicycle racks, picnic areas, portable restrooms, and trash enclosures), benches, and interpretive signs.

Plan Recommendations

There will be 121.90 – 148.90 acres of Parks funded open space available for purchase based on the LOS recommendations discussed earlier in this section. While this does not limit the total amount of open space that could be acquired in the district, it does give a reasonable goal to be achieved through various funding strategies. Some of this open space will have to be used for the creation of trail corridors.The natural resource assessment has also identified 383 acres of Environmental Resource Area and additional wildlife corridors and natural areas Realistically,

not all of this land will be able to be acquired. The following guidelines have been developed to determine which areas have the highest priority for acquisition when funds become available:

1. Acquire land that contributes to the recreational goals of the district.
2. Acquire land that has the highest natural resource significance that is outside of regulation, including areas with high restoration potential and proposed habitat connections.
3. Acquire land that has the highest natural resource significance that is inside of regulation, including creek corridors, wetlands, upland forests and buttes.

Potential Synergies:

- Stormwater Management - look for potential regional detention facilites to be located adjacent to or in open space.
- Identity – the open space which surrounds the entrance of US. 26 into the urban growth boundary could be enhanced to create a gateway feature into the larger metro area.

The following map and following list have been developed as an outline for open space acquisition and are based on the guidelines discussed on the previous page. The blue line on the map highlights the area that is the focus of open space acquisition for recreational opportunities and includes a large portion of the most valuable natural resources in the district. The list below describes the acquisition hierarchy for the entire district based on recreational and natural resource value. Consult the Springwater Natural Resources Report for further descriptions of natural resource value and potential when making acquisition decisions.

1. Areas along the Johnson Creek and Springwater Trail Corridor, which have the highest resource significance and are part of the trail corridor.

2. The McNutt and Brigman Creek Corridors, which will have the Village Center Loop Trail paralleling them.

3. Wildlife corridors and other natural resources that also have recreational or identity value for the district.

4. The connection from Botefuhr to Hogan Creek, which will provide lowland to upland habitat connectivity and serve as a trail link along Butler.

5. The wetland and forested area along US 26, which will serve as a gateway and identity to the larger metro region, as well as being an important wetland habitat along the Johnson Creek Corridor.

6. All other wildlife connections and natural resources that fall outside of regulation.

7. All other creek corridors, concentrating on those with the highest natural resources value.

8. Upland forests and Buttes with steep slopes.

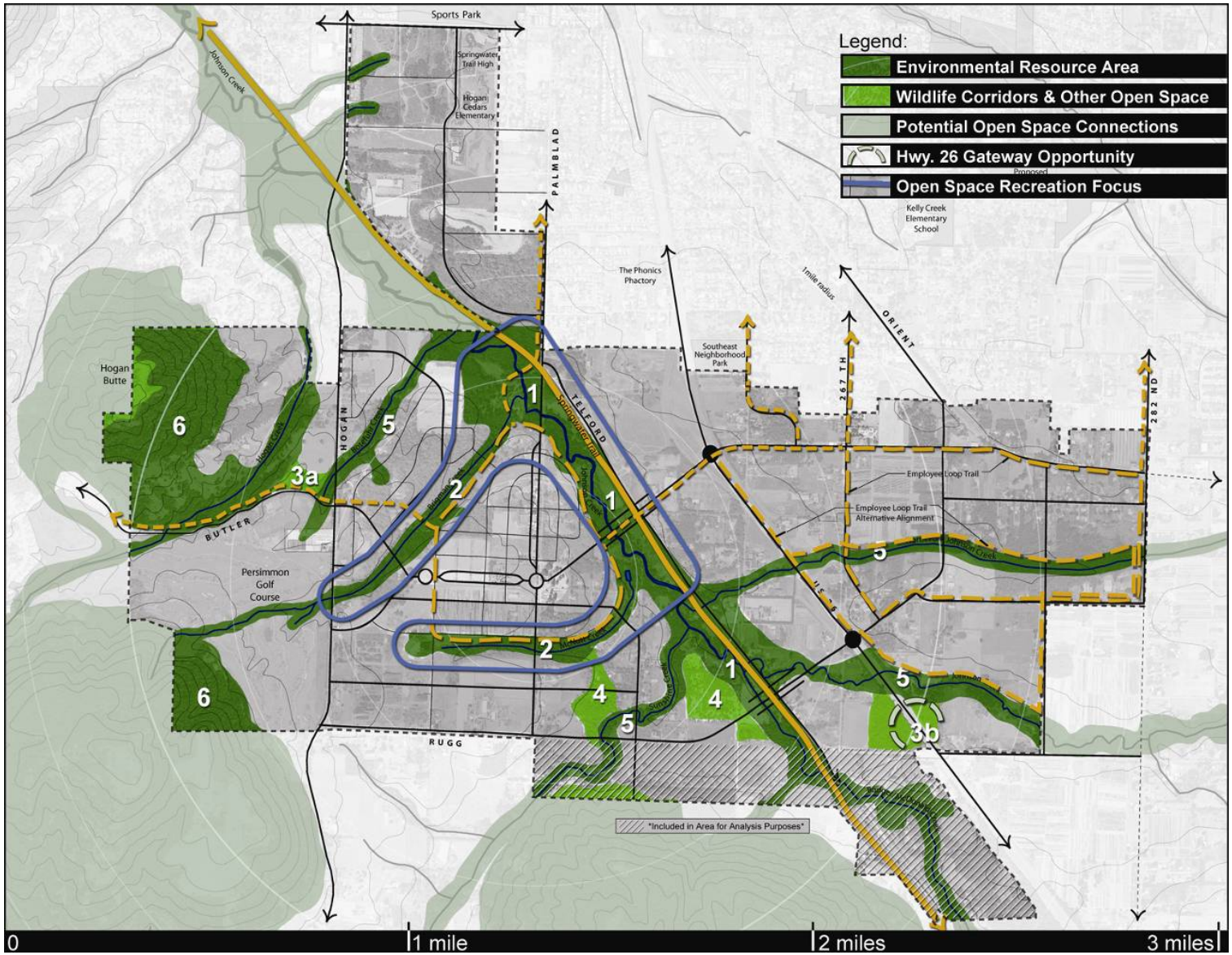


Figure 13. Proposed Open Space and Acquisition Hierarchy Diagram

Trails System

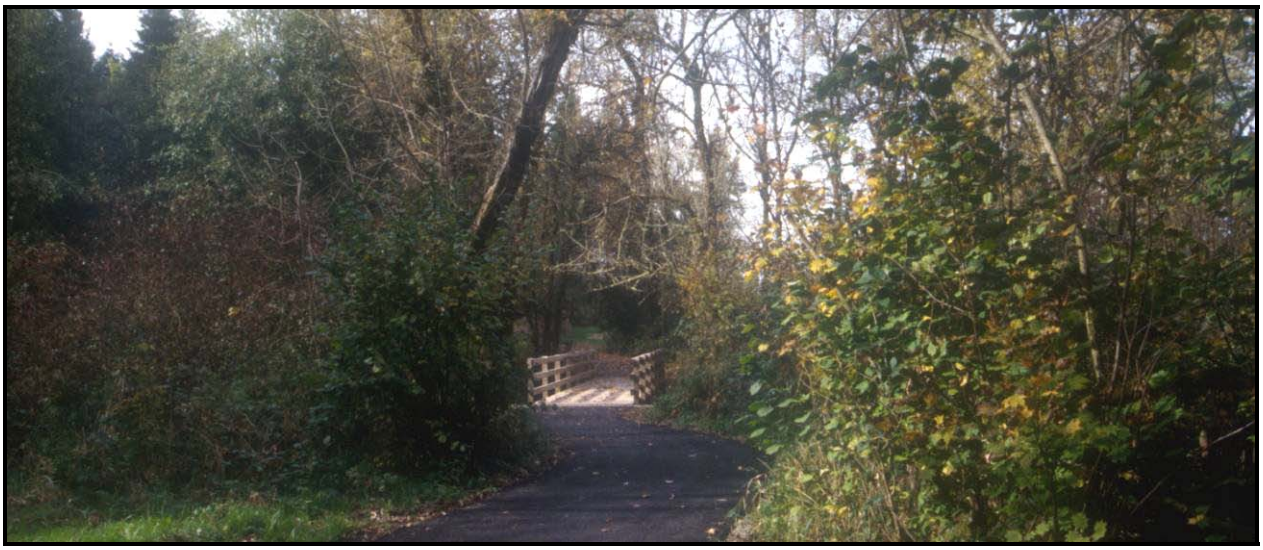
General Description

The purpose of the trail system is to interconnect parks and open spaces; to maximize access to programs and facilities; to promote physical fitness and health for a variety of users; to encourage social interaction and community pride; and to provide opportunities for rest and relaxation within natural settings through trail-related recreation. These trails also serve to reduce auto-dependency and enhance connections to transit facilities; to link open space amenities with homes, workplaces and other community facilities; and to provide outdoor classroom opportunities for environmental education. Trail characteristics are described below.

- Multi-purpose trails are intended for a broad range of non-motorized uses such as bicycles, wheelchairs, strollers and horseback riding as well as pedestrian uses such as walking, hiking and running. Multi-purpose trails are 10-12 feet wide with 2-foot wide shoulders.

- Walking/hiking trails are intended for specific activities. Some of these trails may be single-use trails restricted to pedestrian use only due to steep slopes, erosive soils, or other sensitive environmental considerations. Walking/hiking trails are 4-6 feet wide with 2-foot wide shoulders

- To the extent possible, trail construction will comply with Metro's Green Trails handbook.



Noble Woods Park – Hillsboro, OR

Plan Recommendations

Create a Village Center Loop Trail to the west of US. 26 which will follow creek corridors at an appropriate distance to maximize pedestrian experience. This trail should work in conjunction with the vehicular network where roads parallel creek corridors, and be located inside of purchased open space.

Create an Employee Loop Trail to the east of US. 26 which either follows the road network or runs parallel to stream corridors.

Create connections:

- East Buttes Loop Trail to the west along Butler Road
- The existing schools and Sports Park to the north of the Springwater Community either along Palmblad or through the proposed development west of Palmblad.
- The existing neighborhoods to the north of the Springwater Community.
- Beaver Creek Trail to the North East along 282nd.
- The Village Center and Employee Loops by crossing US. 26.

The trail system could also include a connection from Butler Road to the Cedar Lake subdivision along the Hogan Creek corridor, however this option would be pursued through private development rather than as a part of the City of Gresham's capital improvement program.

Potential Synergies:

- Wastewater Management – Look for potential pedestrian bridge crossings that could be combined with wastewater and other utilities. Specifically, a combined bridge crossing over Johnson Creek between the Hogan Cedars and Springwater Community Park may be needed.
- Stormwater Management – If the Employee Loop Trail is constructed adjacent to streams, investigate opportunities for combining stormwater conveyance and management with the multi-use trail.

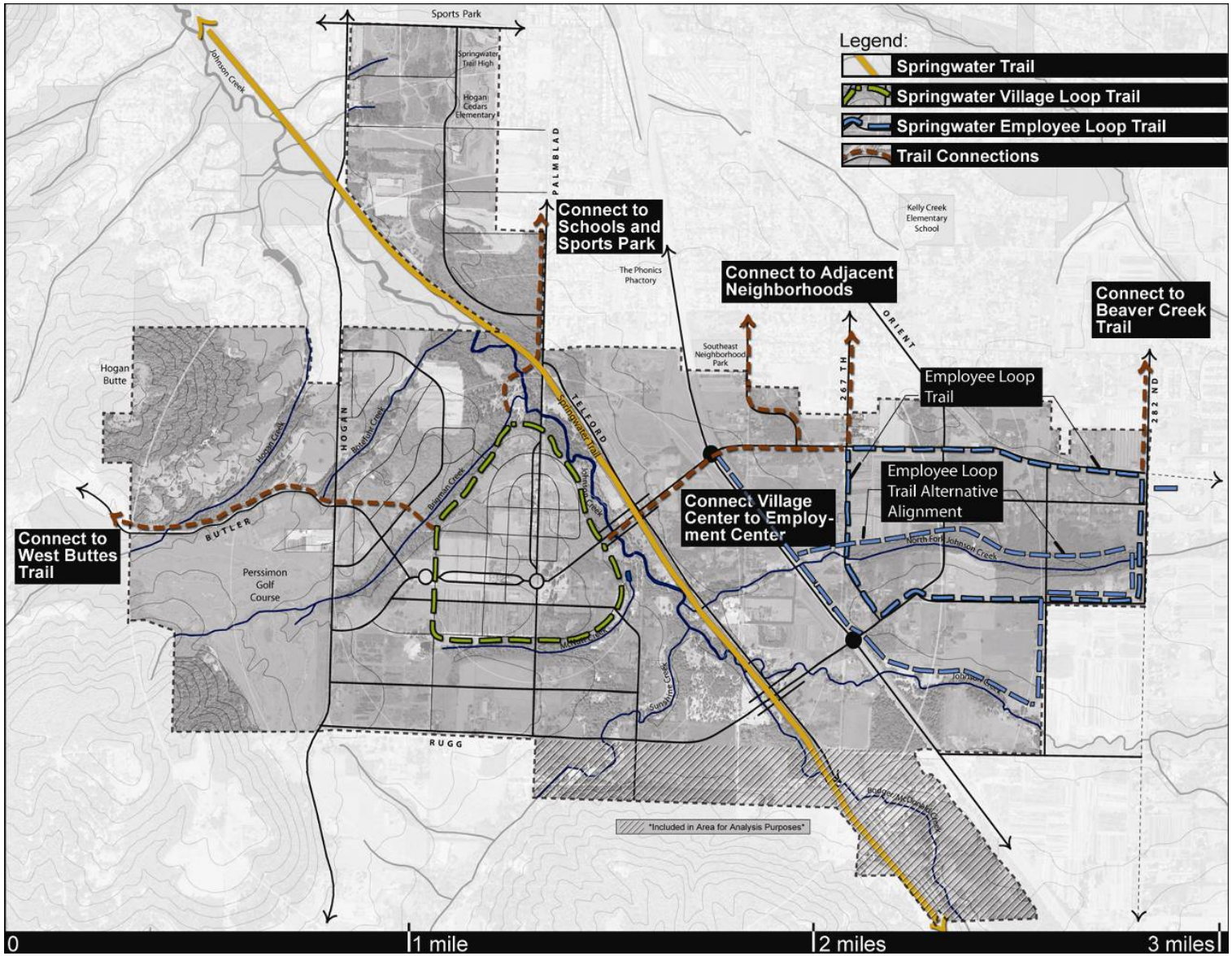
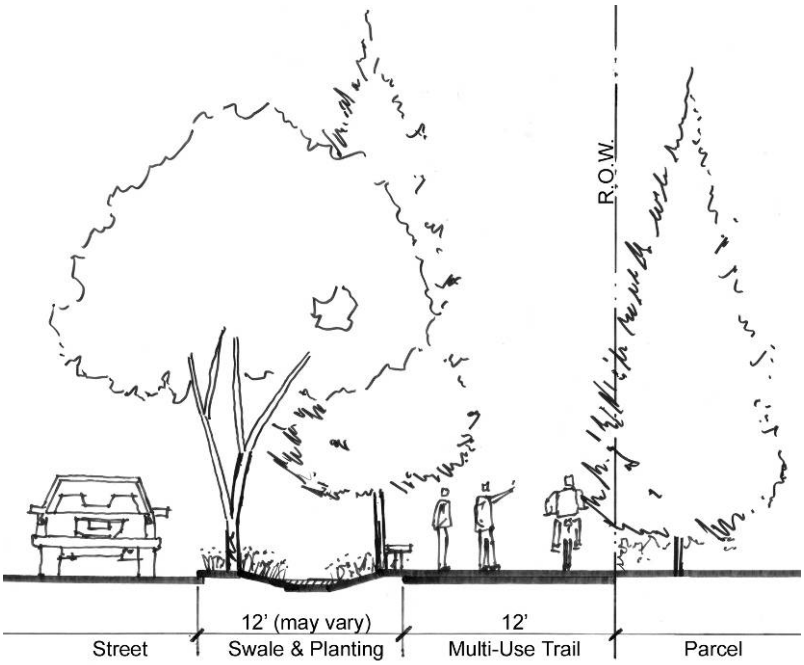


Figure 14. Proposed Trails Diagram

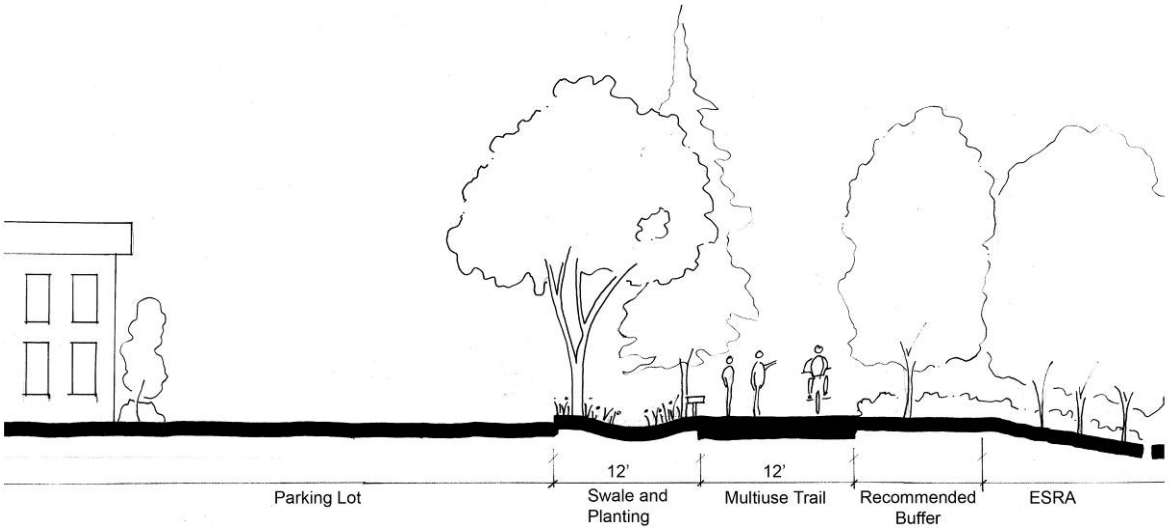
Employee Loop Trail

Two options are under consideration for the trail system east of US. 26. For one the trail system would exclusively follow the road network, the other would abut the ESRA areas parallel to the stream corridors along the north folk and main stem of Johnson Creek and along the road network as necessary for connectivity. The first graphic below illustrates the conceptual implementation of the trail in relationship to the road and swale in the road network option. The swale corridor will be increased by 4 feet to allow for a more informal planting palette of native species, distinguishing the street edge as a special corridor. The trail itself will be a 12-foot wide multi-use corridor adjacent to the swale and property line. Property owners along the corridor should be encouraged to enhance the trail with native plantings in the setback area adjacent to the trail. In areas with few driveways, the on-street bicycle network can be consolidated into the multi-use trail to reduce the amount of R.O.W. needed.

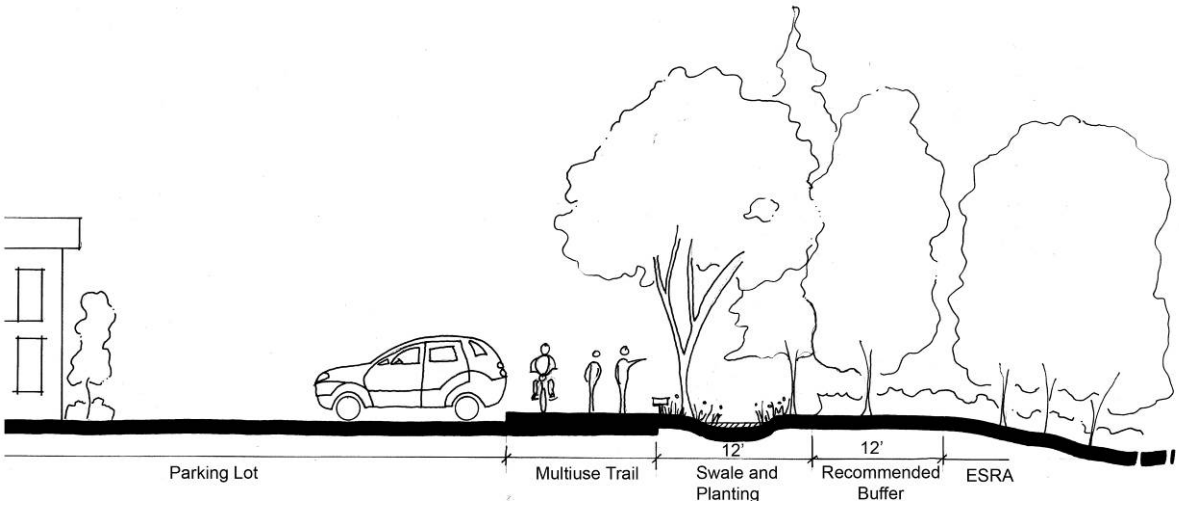


Conceptual Section of Employee Loop Trail Adjacent to Road

The following two graphics both illustrate the trail cross section in the second optional alignment adjacent to Johnson Creek or the North Fork of Johnson Creek. The first section illustrates a stormwater swale and landscaped area between private development and the proposed trail location. The second section shows the trail immediately adjacent to private development with the stormwater swale adjacent to the stream and potential stream buffers. The first section allows for easier stormwater conveyance to the swales, while the second option could allow the swale to function as a buffer between the trail and the adjacent ESRA. It is possible that the stormwater conveyance/treatment channel could be constructed under the trail in a form of subgrade filtration facility, however for planning purposes the swale and trail remain separate in both options shown below.



Conceptual Section of Employee Loop Trail Adjacent to ESRA – Option 1



Conceptual Section of Employee Loop Trail Adjacent to ESRA – Option 2

The Employee Loop Trail alignment options(Roadside and Streamside) are under continuing investigation. The following considerations will be weighed in selection of the final location of the Employee Loop Trail:

- **Maintenance:** The selection of the roadside vs. streamside alignment option has potential implications for on-going maintenance responsibilities and practices. The roadside option could result in shared maintenance responsibilities between parks and transportation divisions within the City, while the streamside option and its more complex natural area maintenance requirements requires specialized expertise that could be developed in the Parks and Recreation Division. The approach to maintenance practices in the roadside option are pathway litter patrol and conventional landscape maintenance. The streamside option would require litter patrol and a carefully-considered vegetation management plan for habitat preservation and enhancement goals.

- **Trail R.O.W. Acquisition:** The evaluation of the acquisition costs for trail ROW alignment options is on-going. The roadside trail has the advantage of being incorporated in the Street ROW acquisition effort, while the streamside option would require a separate negotiation.

- **Implementation Cost:** Trails along creeks are potentially more costly to implement because of environmental restrictions and access limitations.

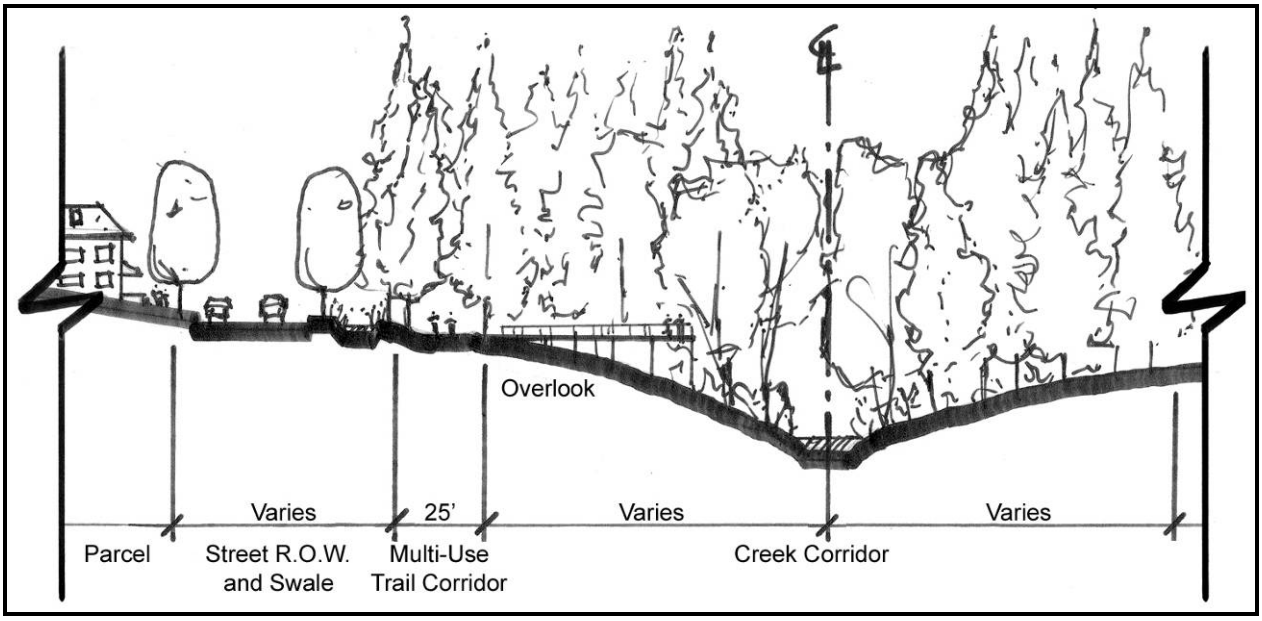
- **Connectivity:** Both the roadside and streamside trail alignment options offer similar connections to surrounding neighborhoods and the broader Gresham community. The primary difference in this evaluation is that the streamside option greatly enhances trail users connections to the natural environment over the roadside alignment.

Village Center Loop Trail

To the west of US. 26 the trail system will follow creek corridors to create a roughly 1 mile trail loop. The following graphic illustrates the trail between a protected creek corridor and the street ROW.

As conceived, the Village Center Loop Trail and the vehicular road network will be an integrated plan with a single-loaded road fronting most of the loop trail as shown in the Conceptual Trail Section Adjacent to ROW below. The trail corridor in both sections is a linear 25-foot corridor in which a 12-foot wide multi-use trail will meander though. The width of the corridor may have to be increased in special conditions to maintain a 5% longitudinal slope along the trail. At special points along the trail an overlook can be provided to allow better views into the protected corridor. Creation of the overlook should create the least impact possible.

Integrating trails with environmentally sensitive resource areas requires striking a balance between public recreational access and preserving the integrity of the resource. When implementing the trails, designers should reference the Springwater Natural Resources Plan and the Metro Green Trails Handbook for characteristics of protected areas to be considered during trail design.



Implementation

Parks and Open Space Acquisition, Development, and Maintenance Costs

The following cost estimate provides recommended capital improvement plan-level budget estimates for the recommended park, trail, and open space facilities. These are based on current planning level acquisition costs used by the City of Gresham, and on ultimate development of Springwater to accommodate 17,000 employees and 3,500 households. The funding source for all projects will be SDC's.

Table 9. Capital Improvement Costs of Park, Open Space, and Trail Facilities

Facility	Quantity	Acquisition Cost	Development Cost	Total Cost	Responsible Jurisdiction	Timing (Years)
Village Center Park and Park Blocks (12.3 Ac.)						
Village Center Park and Plaza	4.4 Ac.	$880,000	$1,188,000	$2,068,000	Gresham	0-5
North-South Park Blocks	3.75 Ac.	$750,000	$1,012,500	$1,762,500	Gresham	0-5
East-West Park Blocks	4.15 Ac.	$830,000	$1,120,500	$1,950,500	Gresham	0-5
Community Parks (29.8 Ac.)						
Springwater Community Park	20.0 Ac.	$4,000,000	$11,200,000	$15,200,000	Gresham	6-20
East Springwater Park	9.8 Ac.	$1,960,000	$5,488,000	$7,448,000	Gresham	6-20
Open Space (148.9 Ac.)						
Johnson Creek	66.0 Ac.	$2,640,000	$660,000	$3,300,000	Gresham	6-20
Brigman Creek	11.0 Ac.	$440,000	$110,000	$550,000	Gresham	6-20
McNutt Creek	12.9 Ac.	$516,000	$129,000	$645,000	Gresham	6-20
Hogan Creek	6.5 Ac.	$260,000	$65,000	$325,000	Gresham	6-20
Botefuhr Creek	5.0 Ac.	$200,000	$50,000	$250,000	Gresham	6-20
Sunshine Creek	7.0 Ac.	$280,000	$70,000	$350,000	Gresham	6-20
North Fork Johnson Creek	10.5 Ac.	$420,000	$105,000	$525,000	Gresham	6-20
Bodger/McDonald Creek	12.0 Ac.	$480,000	$120,000	$600,000	Gresham	6-20
Hogan Butte	18.0 Ac.	$720,000	$180,000	$900,000	Gresham	6-20
Multi-Use Trails (6.2 Mi.)						
Village Center Loop Trail	1.65 Mi.	$495,000	$742,500	$1,237,500	Gresham	6-20
Employee Loop Trail	2.2 Mi.	$660,000	$990,000	$1,650,000	Gresham	6-20
Butler Trail	0.75 Mi.	$225,000	$337,500	$562,500	Gresham	6-20
Palmblad North	0.5 Mi.	$150,000	$225,000	$375,000	Gresham	6-20
Village Loop to E. Springwater Pk.	0.65 Mi.	$195,000	$292,500	$487,500	Gresham	6-20
Barnes Road North	0.25 Mi.	$75,000	$112,500	$187,500	Gresham	6-20
267th North	0.1 Mi.	$30,000	$45,000	$75,000	Gresham	6-20
282nd North	0.1 Mi.	$30,000	$45,000	$75,000	Gresham	6-20
Pedestrian/Bicycle Bridges (3)						
Butler Trail (Brigman Creek)	1	N/A	$250,000	$250,000	Gresham	6-20

Palmblad North (Brigman Creek)	1	N/A	$250,000	$250,000	Gresham	6-20
Palmblad North (Johnson Creek)	1	N/A	$250,000	$250,000	Gresham	6-20
Total		$16,236,000	$25,038,000	$41,274,000		

These costs are based on the unit acquisition costs listed below. Annual maintenance costs are also given.

Unit Acquisition Costs

Facility	Acquisition	Development
Neighborhood Park:	$200,000/Ac.	$270,000/Ac.
Community Park:	$200,000/Ac.	$560,000/Ac.
Open Space:	$40,000/Ac.	$10,000/Ac.
Multi-Use Trail:	$300,000/Mi.	$450,000/Mi.
Ped/Bicycle Bridge:	N/A (Located in Open Space)	$250,000 Average

Annual Maintenance Costs

Neighborhood Park	$5,360/Ac.
Community Parks	$7,146/Ac.
Open Space	$715/Ac.
Multi-Use Trails	$8,933/Mi.
Pedestrian/Bicycle Bridges	$600/Br.

Neighborhood Park	$65,928
Community Parks	$212,951
Open Space	$106,464
Multi-Use Trails	$55,385
Pedestrian/Bicycle Bridges	$1,800
Total Maintenance Cost	$442,528

Summary of Future Needs

Parks, trails and open space will be an integral park of the Springwater community design; serving to enhance economic growth, strengthen community bonds and protect natural resources. Three new parks will be created to serve residents and employees in Springwater. A neighborhood park, located adjacent to the highest residential populations, will be integrated into the Village Center and will consist of a plaza, park blocks, and central park. Two new community parks located adjacent to natural resources and/or in areas with good vehicular accessibility are also included in the plan. The first community park, located along the Johnson Creek Corridor and adjacent to the residential developments, will provide two youth sports fields and a regionally significant natural park area, providing interpretive educational opportunities. The second, east of US 26, will provide two to three adult sports fields for employee recreation. Trails have also been identified to provide pedestrian recreational opportunities and access to features inside and outside of the study area including existing neighborhoods and regional trails to the north and west. Acquisition of 121.90 – 148.90 acres of open space will be based on recreation need and environmental resource criteria, and will be used to preserve natural resources and create pedestrian and wildlife connectivity throughout the district.

Funding Strategies

There will be several options for the funding of the Springwater parks, open space and trails system. Traditional methods such as system development charges, grants and land dedication should be considered in concert with a variety of alternative funding strategies to purchase as well as maintain the system. All capital improvement projects should consider future

maintenance strategies before they are implemented to ensure a high level of quality and safety for park users.

The following approaches have been summarized as possible funding strategies for implementing the parks, open space and trails recommendations outlined in this document:

- Continue to use System Development Charges (SDCs) for land acquisition and construction, and adjust them as necessary to fully fund park development. Residential and employment districts should be explored because the park LOS for Springwater has been adjusted to provide land for both user groups.

- Grants and donations should continue to be used whenever possible. Numerous programs exist at the state and federal level to assist with natural resource related planning efforts, especially if those planning efforts are related to natural hazard mitigation strategies. In addition to opportunities to obtain funding for the protection and restoration of habitats, opportunities to obtain public open space as part of a hazard mitigation/prevention strategy are available.

- In lieu of charging SDCs, require Turn Key Development of park facilities by developers to eliminate the city's financial burden of constructing the facility. Developers would construct facilities to City specifications, and then turn over to the City as a completed neighborhood park; trail segment or urban plaza after the development is completed.

- In the event that property tax revenues anticipated from annexation are not sufficient to cover the increased cost of parks maintenance associated with the parks, trails, and open space proposed for Springwater, the option of a park maintenance fee or operating levy could be considered as a condition of annexation.

- Consider establishing a Landscape Assessment District (LAD) overlay zone to provide maintenance and construction budgets for the proposed parks in the districts. This district or districts will provide parks funds for Springwater without taxing the rest of the city to implement the new district.

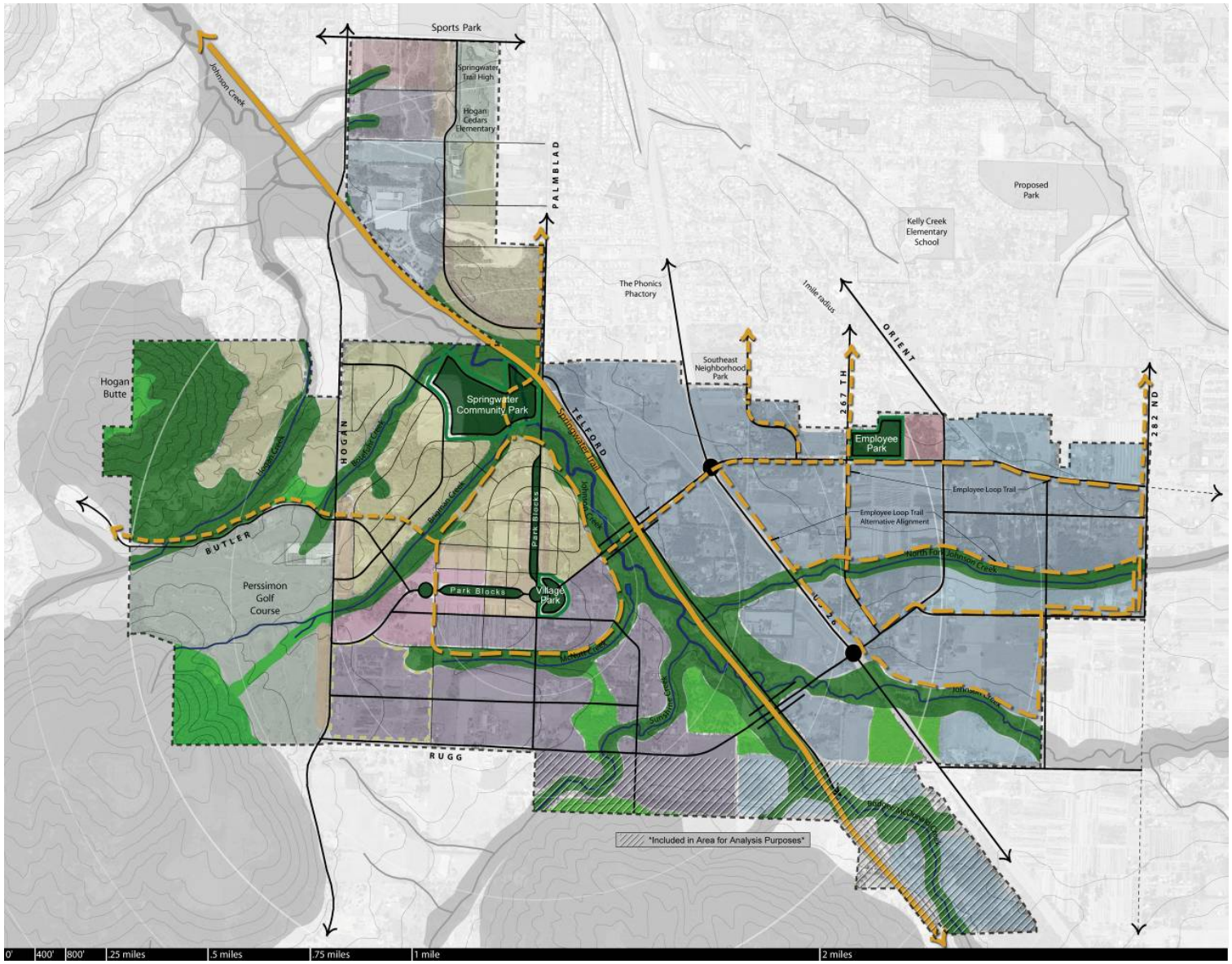


Figure 15. Parks, Open Space and Trails Plan

- On a smaller scale, a homeowner's association model could be implemented around neighborhood parks for the maintenance of the park as well as the neighborhood landscape including medians and parkways.

- On all trails, parks and open space projects look **for synergies** with other government agencies to share in funding facilities. Possible partnerships could be made on stormwater management, transportation, and school projects.

- User fees could help support more specialized recreational facilities such as interpretive trails or centers located within the Springwater Community Park.

- As a maintenance alternative, businesses should be encouraged to participate in an adopt-a-trail or similar sponsorship programs for parks and trails in the district.

- A non-profit trust is a specialized model which would work as a public/private partnership to raise funds for parks maintenance and development in the district.

- The acquisition of park and open space in the district could be tied to a city-wide General Obligation Bond Measure. This would be most appropriate for open space and natural resources which are regionally significant, such as the Johnson Creek Corridor.

Goal, Policies and Action Measures

Goal: An interconnected system of parks, trails, and open space shall be an integral part of the community design, serving to enhance economic growth, strengthen community bonds and protect natural resources.

Policies: The following policies are made part of this plan:

1. Parks, open space and trails shall be implemented to help promote a sense of place with respect to the community's cultural and natural history by building upon Springwater's unique characteristics and location, such as the Johnson Creek corridor and views to Mt. Hood.

2. Parks, open space and trails implementation shall recognize the importance of the upper Johnson Creek system for Gresham, the Portland Metro region and the Willamette Valley.

3. The parks, open space and trails system shall work with other civic improvements such as schools, transportation and stormwater management to consolidate budgets, maintenance and implementation of facilities.

4. The parks, trails and open spaces system shall create interpretive educational opportunities that allow residents to experience and understand the diverse ecosystem that they are a part of.

5. The maintenance and implementation of parks, open space and trails shall encourage the planting and preservation of native plant and tree species.

6. Parks and trails shall be implemented to enhance and protect natural resources.

7. Trails and corridors shall create connections to the Springwater and other regional trail systems as well as links between residential, employment and civic destinations inside and outside of the district.

8. Parks and trails shall be located within a ½ mile of their users, and shall help to create an identity for the neighborhood, which they serve, including dense neighborhoods.

9. Open space shall preserve, restore and enhance natural resources as well as support the other parks and recreation objectives of the community.

Action Measures: The following actions should be taken to implement this plan:

1. When implementing any recommendation, reference all other master plans created as part of the Springwater planning study and look for opportunities for synergies between other city agencies, such as shared park/school sites, regional stormwater management facilities, and trail corridors along transportation routes.

2. Expand on recommended park facilities programs to meet the needs of the future residents by holding community workshops and planning days to involve the community in the design process.

3. Look for state and federal funding strategies to help preserve natural resources beyond that open space which will be purchased through Parks fees.

4. Implement park facility recommendations concurrent with residential and industrial development to meet the needs of the users as they arrive.

5. Review and select from the two alignment options for the employee loop trail east of Highway 26, and modify Transportation System Plan to reflect recommended trail alignment.