

Springwater Community Plan



Springwater Transportation System Plan

September 20, 2005

City of Gresham

Community & Economic Development Department

– New Communities and Annexation

Department of Environmental Services

Transportation System Plan

INTRODUCTION

The purpose of the Springwater Transportation System Plan (TSP) is to address the transportation needs for new urban community development within the Springwater Plan District. This TSP will be amended to Volume 4 – Transportation System Plan in the Gresham Community Development Plan. Consequently, it is important that this plan works within the framework established by other related state, regional, and local plans. The TSP includes the following sections:

- Planning Framework
- Policies and Action Measures
- System Inventory and Assessment
- Transportation System Alternatives Analysis
- Recommended Transportation System Plan
 - Motor Vehicle Plan
 - Transit Plan
 - Bicycle and Pedestrian Plan
 - Freight Master Plan
 - Other Travel Modes
- Implementation Plan
 - Functional Class changes
 - Street cross-sections
 - Amendments to Street Project List
 - Local Street Connectivity Map
 - Funding needs

Plans for new urban areas must follow the requirements and guidelines of Title 11 of Metro’s Urban Growth Management Functional Plan. Title 11 requires the following concerning transportation:

A conceptual transportation plan consistent with the applicable provisions of the Regional Transportation Plan, Title 6.4 of the Regional Transportation Plan [replaced Title 6 of the Urban Growth Management Functional Plan], and that is also consistent with the protection of natural resources either identified in acknowledged comprehensive plan inventories or as required by Title 3 of the Urban Growth Management Functional Plan. The plan shall, consistent with OAR Chapter 660 Division 11, include preliminary cost estimates and funding strategies, with likely financing approaches.

The TSP shall also include an urban growth diagram...showing...general locations of arterial, collector, and essential streets.

A conceptual facilities and services plan for transportation was developed as part of the *Concept Plan* effort. This effort identified the needed transportation facilities for the new urban district, and developed rough cost estimates and likely funding strategies. The plan also included a map depicting the general location of arterial, collector, and connecting streets and identified functional classifications for streets, a connectivity plan, and a transit plan. A bicycle and trail plan was developed in conjunction with Parks planners, and is presented in the Parks and Open Space component of the Springwater Public Facilities Plan.

PLANNING FRAMEWORK

Background

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 a series of comprehensive plan amendments including maps that address provisions for annexation; housing, commercial, and industrial development; transportation; natural resource protection and enhancement; public facilities and services including parks and open spaces; and schools. The intent of the current planning effort is to prepare Springwater for urbanization and annexation to the City of Gresham.

Planning Context for Transportation

The transportation plan for the Springwater Community Plan was developed in compliance with transportation plans adopted by the State of Oregon, Metro, Multnomah County and the City of Gresham. Specifically, the 2004 Metro Regional Transportation Plan (RTP) established guidelines for spacing between streets, stream crossings, pathways and minimum mobility standards for regional transportation. These guidelines were used as a primary resource to develop the policy framework for the mobility standards and street spacing set forth in the Springwater TSP. For most regions the RTP also provided information about existing and planned transit services, but the RTP did not address transit services in the Springwater region.

In addition to compliance with the RTP, any street connections to US 26 (Mt. Hood Highway) needed to follow the regulations and standards within the 1999 Oregon Department of Transportation (ODOT) Oregon Highway Plan (OHP). The OHP provided performance criteria for any roadways, intersections or grade-separated connections to US 26, and it established the appropriate separation from highway intersection to the nearest local street intersections. Furthermore, review of the Gresham and Multnomah County Transportation System Plans revealed the current street functional class designations for existing streets and highways, any planned pathways or trails, and any planned transportation improvements within or close to the Springwater area that should be included in the basic framework of the new planning area.

Finally, the Plan was guided by citizen input provided through public meetings and open houses held during the planning process, and by the goals and policies developed jointly by the project team and the Springwater Community Working Group (CWG). These goals and policies were adopted by the CWG early in the planning process. The transportation goal is given below. Policies and action measures associated with the transportation element of the Springwater plan are described in the following section.

The Springwater Community will encompass a well-planned transportation system that supports the Springwater Community Plan, while promoting transit, walking and bicycling. Good design can also avoid the effects of heavy traffic on neighborhood safety and the natural environment. A well-connected transportation system using trails, bicycle routes, sidewalks and a variety of street types reinforces a sense of community and provides adequate routes for travel. The site should provide good connections to and from the employment areas and the surrounding community, as well as regional freight and transportation centers.

Other goals that guided the Springwater planning process included the following:

Create a Community. *The Springwater Community shall be an economically and environmentally sustainable community.* The primary focus of the plan will be on providing a high number of industrial and industrial related jobs that enhance the economic viability of Gresham, the greater East County region and its citizens. Industrial and employment lands will be complemented with a village center and housing support and will be carefully integrated with the upper Johnson Creek system. Sustainable “green” building and development practices will enhance the community’s unique character, while supporting the protection and restoration of the area’s natural resources.

Sustainability. *The Springwater Community shall foster sustainability through encouraging businesses, industries and homes that are built with and practice good environmental stewardship.* This shall be accomplished through “green” practices that provide for energy-efficiency, water conservation, reduced pollution, and avoid environmentally harmful materials and processes. The Springwater Community shall strive to be a model for successful sustainable industrial development. Development shall also preserve, restore and enhance natural resources by meeting or exceeding local and regional standards. Land uses, transportation systems and natural resources shall be carefully integrated and balanced.

Economic Development. *The Springwater Community shall provide industrial land that will generate a variety of family wage job opportunities.* Job creation will focus on correcting the imbalance between the number of households and the number of jobs in the East Metro region and increasing the City’s economic strength. The plan will actively encourage businesses with an interest in sustainability and protecting the community’s rich natural resources. Springwater will include a village center that can serve residents, employees and businesses.

Livability. *The Springwater Community shall have a high quality of life.* This will be accomplished through compact and sustainable development; a range of housing choices; walkable neighborhoods; access to natural resource areas and open spaces for employees in the community; preservation of natural resources; and a variety of transportation choices. The community will encompass a village center, or series of village centers that provide needed services for employees and residents in an attractive and human-scale environment. A range of housing choices will be provided within close proximity to services and/or employment areas. Overall, the community will be a unique environment that creates a sense of place both for residences and businesses, and acts as economic attractor.

Natural Resources. *The plan will preserve, protect and enhance natural resources.* It will define, protect, restore and enhance significant natural resources, including stream corridors, wetlands, and forested areas. Resource areas will provide the basis for identifying development constraints as well as serving as open space amenities for the Springwater Community. Resource protection and enhancement will be a shared responsibility of property owners, developers and governments.

Rural Route Impacts. *The plan will support and maintain transportation system primarily served by urban or regional facilities that seeks to minimize potential impacts on rural roads east of 282nd Avenue.* As directed by a joint resolution with Multnomah County, the city’s new plan for the Springwater Community will identify appropriate land use and transportation elements that seek to keep the new travel demands generated within Springwater from intruding onto county maintained rural highways and roads east of 282nd Avenue. Specifically, this principle applies primarily to commute traffic and other types of trips that do not have origins or destinations within the rural areas. The plan will strive to serve regional trips via regional routes, including US Highway 26.

POLICIES AND ACTION MEASURES

The goal for the Springwater transportation system was developed through a collaborative process involving the project team members, community working group, and other project stakeholders. The overall goal of providing “...**a well-planned transportation system that supports the Springwater community while promoting transit, walking, and bicycling**” was described in the previous section. Along with this goal, several policy statements and action measures were developed.

Policies

1. Identify improvements to Highway 26 that enhance access and mobility to and through the Springwater Community plan area to support industrial and employment development. Design elements are to be compatible and supportive of the Springwater Community Plan.
2. Incorporate the North/South Transportation Study recommendations to identify better connections between Springwater and I-84 and I-205.
3. Incorporate Green Street 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.
4. Develop transportation corridors and associated right-of-way widths for Green Street swales.
5. Create streets for people as well as cars.
6. Encourage alternative modes of transportation within the Springwater community.
7. Provide good connectivity and access to practical destinations.
8. Provide safe and convenient access to and from employment areas, including freight access.
9. Incorporate adequate public safety access.
10. Provide public transit options, such as bus, van, streetcar and/or light rail within the Springwater community and for east/west and north/south connections to the greater region.
11. Consider traffic impacts on surrounding rural areas and existing City of Gresham neighborhoods.
12. Provide pedestrian and bicycle connections within the Springwater community and to the greater region.
13. Plan roads to accommodate the movement of goods and services (truck traffic).
14. Consider environmental barriers and constraints.
15. Address existing transportation safety issues.
16. Identify and promote the quality and level of telecommunication services needed to serve the industrial and other uses in the Springwater Community.

17. Create a transportation system that enhances mobility, reliability, and convenient connections to regional destinations.

Action Measures

1. Continue to work with other regional stakeholders to identify and implement improved North/South connections which would provide access from Springwater to I-84 and I-205.
2. Implement recommended changes to the City’s Transportation System Plan, and plan for funding requirements associated with transportation improvements.
3. Coordinate Springwater development with recommendations from the US 26 Access Study, and provide an implementation strategy that maximizes industrial development opportunities in Springwater.
4. Adopt a future street plan and street connectivity standards that meet regional and local connectivity requirements.
5. Work with TriMet to develop a plan for Springwater that provides connection to local regional centers, with service through the industrial areas and Village Center.
6. Complete a future CIP Joint Study with Multnomah County to evaluate Access Management Control along 282nd to lessen the impacts on this facility and retain its rural character.
7. Identify all arterial and collector projects that are not currently in the RTP and submit a project list for inclusion in a RTP amendment.

SYSTEM INVENTORY AND ASSESSMENT

Transportation Facility Identification and Classification

The study area for the Springwater transportation system extends beyond the boundary of the plan area by approximately one-half mile to include key arterial and collector streets within the current City of Gresham. This allows for consideration of changes to local street performance, and a more appropriate design of the interface between the new urban area and the existing city neighborhoods. The Reference Documents for the Springwater Community Plan include a detailed inventory of the Springwater transportation system.

The existing roadway network within the study area has mostly rural characteristics. The arterials are generally fast moving with most intersections either having no traffic control or two-way stop sign control. Based on current development patterns, the majority of trips from the study area will travel to the north and to the west. Highway 26 is the only major facility that traverses the study area. This highway connects Gresham with both Portland (to the west) and Sandy (to the southeast). The nearest major freeway facility in the area is Interstate 84, which travels east-west about 5 miles north of the study area.

The City’s street functional classifications coordinate with classifications adopted by Multnomah County, Metro, and ODOT. Table 1 lists the functional classification definitions for the City. The Gresham Transportation System Plan contains additional detail regarding the functional street classifications. Based on this classification system, a number of facilities within or near the study area qualify as either arterials or principal arterials.

Table 1 – Street Functional Parameter Classification Definitions

<i>Street Classification</i>	<i>Volume</i>	<i>Design Speed</i>	<i>Travel Lanes</i>
Principal Arterial	35,000 to 60,000	45 to 55	4 to 6
Arterial	15,000 to 40,000	35 to 45	4
Boulevard	15,000 to 40,000	25 to 35	4
Collector	10,000 to 20,000	25 to 35	2
Community Street	3,500 to 10,000	25 to 35	2

Source: City of Gresham Transportation System Plan, 2002

Within the study area, Highway 26 carries high volumes of traffic at high speeds with two travel lanes in either direction. ODOT classifies the roadway as a Principal Arterial and Expressway with minimal side street access. To the north of the study area, Highway 26 slows as it enters the urban portion of Gresham, where it changes to a principal arterial facility through Gresham and into Portland with more frequent direct land access. At the north end of the study area, Highway 26 changes names and continues westward as Powell Boulevard. This facility (Powell Boulevard) has been transferred to the city. Metro classifies Highway 26 as a Rural Arterial south of Gresham City limits and as a Major Arterial within the City limits.

Table 2 presents ODOT historical traffic volume data on Highway 26 southeast of Powell Valley Road. This table shows a steady increase in traffic volumes along Highway 26 in the past ten years. Overall, a twenty percent increase exists in traffic volumes between 1993 and 2003, or about two percent per year on average.

Table 2 – Historical Traffic Volumes on Hwy 26, Southeast of Powell Valley Road

Year	Average Daily Traffic	Percent of ADT			Percent Annual Growth
		Max Day	Max Hour	30 th Hour	
1993	32,408	124%	10.5%	9.7%	N/A
1994	33,641	122%	10.6%	9.7%	3.8
1995	34,413	123%	10.2%	9.6%	2.3
1996	35,755	121%	10.1%	9.5%	3.8
1997	36,258	124%	10.3%	9.6%	1.4
1998	36,275	124%	10.2%	9.5%	0.5
1999	36,677	125%	10.1%	9.5%	1.1
2000	37,168	124%	9.9%	9.4%	1.3
2001	37,504	125%	10.1%	9.3%	1.0
2002	38,790	125%	9.8%	9.2%	3.4

In addition to average daily traffic by year, ODOT has also provided average weekday traffic by month. Table 3 presents this information and illustrates that the summer months of June, July and August experience the highest average weekday traffic volumes. During the winter, only the month of December has slightly higher than average traffic volumes. The Springwater Transportation study uses traffic counts taken in November 2003, which is very close to the average month for the year.

Table 3 –Traffic Volumes (2002) by Month on Hwy 26, Southeast of Powell Valley Road

Month	Average Weekday Traffic	Percent of ADT
January	36,043	93
February	38,260	99
March	37,949	98
April	38,533	99
May	39,463	102
June	41,265	106
July	41,398	107
August	41,625	107
September	40,388	104
October	39,344	101
November	38,314	99
December	39,786	103

While Highway 26 is the only state facility within the study area, there are other important facilities that run either through or near the study area. The roles that each of these facilities play in providing access to and from the study area is described below.

Burnside Road runs generally from the northwest to the southeast within the City of Gresham. To the west of Gresham, Burnside Road continues all the way to Portland. At Powell Boulevard near the north end of the study area, Burnside Road changes names to Highway 26. Gresham classifies Burnside as a Principal Arterial and Metro classifies it as a Major Arterial. Daily volumes range from 27,000 west of Hogan Road to 38,000 within the study area (2000 data). Burnside Road is designated as a National Highway System (NHS) freight route between US 26 and I-84.

Hogan Drive/242nd Avenue is a two to five lane roadway through the study area. To the north, Hogan Drive provides access to I-84 through Wood Village. Within the study area, it is classified as a Rural Arterial by Multnomah County. It is classified by Gresham as an Arterial in the study area and by Metro as a Minor Arterial (south of Palmquist Road). North of Palmquist Road Metro classifies it as a Principal Arterial and south of the study area it is classified as a Rural Arterial. Daily traffic volumes range from 28,000 north of Division Street to 12,000 south of Powell Boulevard (2000 data).

Orient Drive generally runs parallel to Highway 26 through the study area. It is classified by Multnomah County as a Major Arterial west of Elsa Street and as a Rural Arterial to the east. Gresham classifies it as an Arterial just north of the study area and Metro classifies it as a Rural Arterial in the study area. Daily volumes near US 26 observed at 11,000 vehicles in 2000. It also can service over-sized freight vehicles that cannot travel on US 26.

257th Drive/Kane Road runs north-south. The south end of the roadway begins near the study area and continues north through Troutdale to Interstate 84. Gresham classifies it as an Arterial and Metro classifies it as a Major Arterial. There is also a disconnected section of Kane Road in the study area classified as a Rural Collector by Multnomah County (described below).

282nd Avenue runs north-south in the study area as a Rural Collector. This roadway connects to the north to Troutdale. It is classified as a Community Street by Gresham and is not classified by Metro.

Palmblad Road/252nd runs north-south through the study area as a Rural Collector. It is classified as a Community Street by Gresham and is not classified by Metro.

Palmquist Road runs east-west along the very north edge of the study area, but is not classified by Multnomah County west of US 26. East of US 26, the newly constructed segment up to Orient Drive is designated by the county as a major arterial. It provides access between Powell Boulevard to the northwest and US 26 to the east. It is classified by Gresham as a Collector west of US 26 and as a Community Street east of US 26. Metro classifies it as a Collector of Regional Significance (between Regner Road and US 26).

Butler Road runs east-west in the west end of the study area as a Neighborhood Collector. The roadway provides access between Hogan Drive and 190th Avenue to the west into Pleasant Valley. It is classified by Gresham as a Collector and by Metro as a Collector of Regional Significance.

McNutt Road is a Rural Collector connecting 252nd Avenue with Kane Road. It is not classified by Gresham or Metro.

Kane Road is a Rural Collector that starts at McNutt Road and ends at the county line. It is not classified by Gresham or Metro.

Telford Road is a Rural Collector that runs from northwest to southeast through the study area. It is not classified by either Gresham or Metro, but will likely serve as a key route in the development of the Springwater area.

262nd Avenue is disconnected in the study area. The north portion (north of Highway 26) is a Rural Collector and becomes a Collector in Gresham (Barnes Road) and the south portion is a Rural Local. Within the study area, neither portion is classified by either Gresham or Metro.

267th Avenue is also disconnected in the study area, however, both portions are Rural Collectors. The north portion (north of Highway 26) becomes a Collector in Gresham, but neither portion is classified by either Gresham or Metro within the study area.

In understanding the classification and assessment of traffic facilities in the study area, it is important to note that the State of Oregon has different performance standards for the arterial networks than the City of Gresham. The State bases their standards on the volume-to-capacity ratio for the facility, while the City bases their standard on an intersection analysis, with LOS D being identified as the minimum preferred condition. For example, the intersection of Powell Boulevard/Burnside is approaching the city's minimum Level of Service (LOS) standard. The maximum volume-to-capacity ratio on Highway 26 for the study area ranges from 0.90 to 0.99.

Traffic Safety

Information on the crash history at intersections near the study area was provided by the City of Gresham. When taken as a whole, the total crashes at the study intersections increased from 171 in 2000 to 222 in 2002, while the number of injuries remained at approximately 125. Although there were no fatalities in either 2000 or 2002, the year 2001 saw two fatalities.

The collision rate analysis within the study area identified one intersection as a potential safety concern. The Orient Drive/257th Avenue/Palmquist Road intersection historically had higher than average crash rates. The recently completed street improvements for these intersections should reduce the propensity for crashes in the future. The only other location with a notable crash rate was at 242nd Avenue and Rugg

Road with 0.5 crashes per million entering vehicles. The crashes at this unsignalized, three-leg intersection are presumed to occur as vehicles make a left from a slow moving Rugg Road onto the fast moving 242nd Avenue.

Intersection Analysis

The intersection performance was evaluated at study area intersections that had known operational issues, or were expected to be key gateways for the community. The analysis followed the 2000 Highway Capacity Manual (HCM) methods for determining the Level of Service thresholds, and the volume-to-capacity ratios for each location. The LOS thresholds as defined in the 2000 HCM are listed in Table 4.

Table 4 – 2000 Highway Capacity Manual Thresholds

Level of Service	Control Delay per Vehicle (seconds)	
	Unsignalized	Signalized
A	<10	<10
B	>10 and <15	>10 and <20
C	>15 and <25	>20 and <35
D	>25 and <35	>35 and <55
E	>35 and <50	>55 and <80
F	>50	>80

Currently, all of the signalized intersections in the study area operate at an acceptable level of service (LOS D or better). This threshold is consistent with the City of Gresham and Multnomah County’s minimum accepted conditions during peak hours. The afternoon/evening peak hour condition at the Burnside Road intersection at Powell Boulevard is approaching the minimum acceptable threshold. Further growth within the study area or the general East Multnomah County region is likely to exceed the planned capacity at this location in the near future.

Three locations controlled by two-way stop signs operate at poor levels of service (LOS E or LOS F) for the minor street approaches. These locations are: Highway 26 at Stone Road, Highway 26 at 267th Avenue, and Orient Drive at 14th Street.

Freight Routes

In the vicinity of the study area, 242nd Avenue (to just south of Palmquist Road) and Orient Drive are classified by Metro as Road Connectors and Highway 26 is classified as a Main Roadway Route. There is also a proposed Road Connector linking 242nd Avenue to Highway 26 just north of the existing Gresham City limits. ODOT classifies only Highway 26 as a Statewide Highway in the study area. The current NHS freight route includes Highway 26, Burnside Road, and 181st Avenue to I-84. A secondary freight route is shown on 242nd Avenue between Burnside Road and Glisan Street, then heading west to 207th Avenue and then north to I-84.

ODOT has an automatic traffic recorder (ATR) station on Highway 26 just south of Powell Valley Road. Trucks account for 4.5 percent of the total average daily vehicle volume at that location, where trucks are defined as any vehicle greater than two axles or four wheels.

Bicycle and Pedestrian Network

Within the study area, there is one regional multi-use path (Springwater Trail) and one major roadway with a dedicated bicycle lane (on Highway 26) for both directions of travel. The Springwater Trail is paved and open to both bicyclists and pedestrians. Within the study area, the trail generally parallels Telford Road and provides a north-south connection between the county line and the City of Gresham. The dedicated bicycle lane runs through the study area along Highway 26 from the City of Sandy to the City of Gresham.

The combination of the multi-use bicycle and pedestrian path and dedicated bicycle lanes provides north-south access to and from the study area. However, the study area is lacking sufficient east-west connections. Two roads, Rugg Road and Stone Road, travel the length of the study area in the east-west direction. While Stone Road provides acceptable conditions for an experienced bicyclist, Rugg road is narrow with no striping, and therefore, it does not provide adequate safety for most bicyclists. Very few, if any of the roadways within the study area provide continuous sidewalks.

Transit Network

In the study area, there are few existing transit facilities. The Gresham Central transit center (located north of the study area) serves as the main transit center for the study area, at present. Only one TriMet route (Route 84) operates within the Springwater study area. It only briefly enters the northeast corner of the study area near the intersection of SE 282nd Avenue and Orient Drive. Route 84 operates between the Gresham Transit Center and the communities of Boring and Kelso.

The Gresham Central transit station has several additional fixed-route bus services and a light rail station. The bus routes that are most relevant to the study area include:

- Route 9, approximately 15-minute peak-hour headways between the Gresham Transit Center and Portland City Center
- Route 80, approximately 40-minute peak-hour headways between the Gresham Transit Center and Troutdale
- Route 81, approximately 40-minute peak-hour headways between the Gresham Transit Center and Troutdale
- Route 82, approximately 60-minute peak-hour headways between the Gresham Transit Center and the Rockwood Transit Center.

In addition, Sandy Area Metro (SAM) runs a bus with a 30-minute peak-hour headway and a 60-minute off-peak headway along Highway 26 between Sandy and the Gresham Transit Center. However, this service does not currently stop in the Springwater study area.

TRANSPORTATION SYSTEM ALTERNATIVES ANALYSIS

Transportation networks were developed for the three land use alternatives developed during the concept planning process¹. The peak hour trips generated with full development of the Springwater area were estimated to range from 9,200 for Alternative A up to 10,800 vehicle trips for Alternative C. These estimates assumed nominal transit services for this area, and could be further reduced with improved transit services or travel demand management programs.

¹ The Concept Planning process and the three Concept Plan scenarios are described in more detail in the Springwater Community Plan Report Summary (Springwater Community Plan Volume I)

The general features of the initial circulation networks for the three scenarios included:

- Alternative A: A central grade-separated interchange on US 26, with two parallel highway overcrossings roughly collinear with Orient Drive-Butler Road and Rugg Road-Stone Road. The local street patterns maintained the north-south grid layout commonly observed in built neighborhoods to the north.
- Alternative B: Two at-grade connections on US 26, with one grade-separated overcrossing near Stone Road. The local street grid rotated 45 degrees to mirror the orientation of US 26.
- Alternative C: A northern grade-separated interchange on US 26, roughly collinear with Orient Drive, with a new connection along Telford Road to Hogan Drive. Two parallel highway overcrossings to US 26 were located further southeast.

These networks formed the basis for the model networks with the year 2025 travel forecasts. The nature of traffic controls for the at-grade intersection and ramp terminals was not specifically evaluated for each of the scenarios.

Future Traffic Forecasts

Metro's regional 2025 travel demand forecast model (recently used for the RTP update) was determined to be the most appropriate model for this project. The Financially Constrained model scenario was adjusted to reflect the mid-level land use alternative for Springwater (Alternative B), and then Metro modeling staff re-ran the trip distribution model to update new travel patterns in the Springwater area. In addition, the model was refined to provide a greater level of street network detail in the Springwater area for a future base condition as well as the three conceptual street networks (with their associated land use patterns). The land use assumptions applied in the travel demand forecasts for Springwater are summarized for households (HH), retail employment (RET) and other employment (OTH), as shown in Table 5.

Exhibit D – Amendment to Volume 4 – Transportation System Plan

Table 5: Springwater Land Use Assumptions for Travel Forecasts

Transportation Analysis Zone	Households	Retail Employment	Other Employment
542	81	0	9
662	19	0	0
663	19	0	144
690	0	0	1,870
691	0	0	608
1300	70	0	0
1301	175	0	0
1302	334	0	0
1303	386	128	1,669
1304	510	109	415
1305	144	0	681
1306	0	0	2,544
1307	0	0	324
1308	0	0	1,431
1309	0	0	376
1310	0	0	751
1311	0	0	233
1312	0	89	1,602
1313	0	0	1,385
1314	0	0	1,121
1315	5	0	374
1316	61	0	8
1317	272	69	897
1318	41	0	0
Totals	2,115	395	16,443

**SPRINGWATER MASTER
URBANIZATION PLAN**

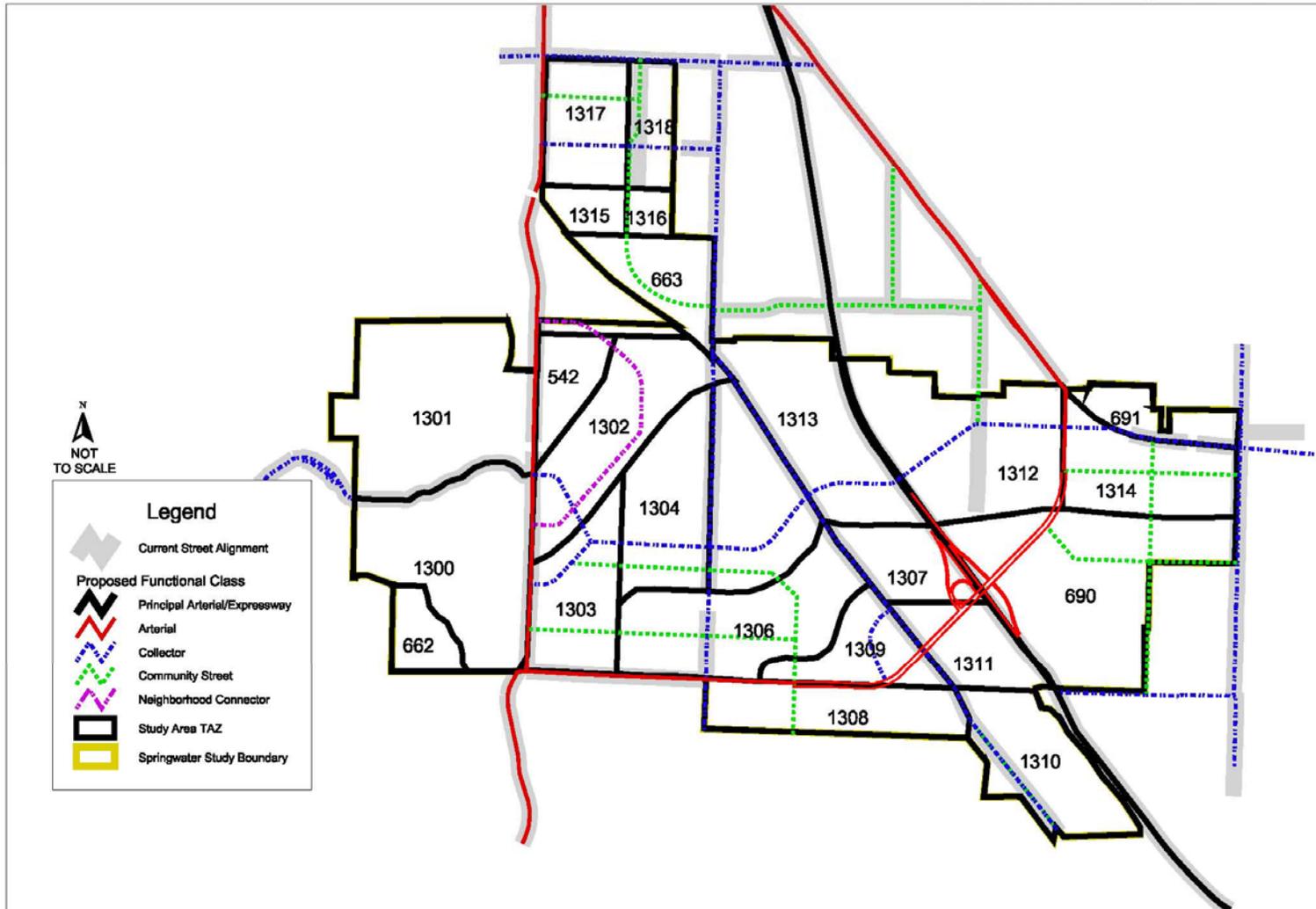


Figure 1. Springwater Transportation Analysis Zones (TAZ)

The 2025 travel forecasts showed significantly different travel patterns than is currently typical for this area of Gresham, primarily because of future employment centers in Springwater and in Damascus to the south in Clackamas County. The model analysis found a significant proportion (about two-thirds) of Springwater traffic traveling to and from areas south of the county line (including southeast and southwest) versus about one-third to and from the north. Model volumes were “post-processed” to develop intersection turn movement volumes for each of the alternatives.

Alternative Comparison

The three land use and circulation alternatives were compared based on expected vehicle trip generation, system capacity analysis, preliminary cost estimates for street improvements and general observations.

A further refinement was made in the estimation of trip generation to account for the effects of truck traffic within Springwater. Truck trips were determined using data obtained from studies conducted by Caltrans in the 1980’s. Truck trips were calculated as a percentage of total trips by ITE land use category. Truck activity ranged from a low of 1 percent for office uses up to 13 percent for warehousing and distribution centers. Table 6 summarizes the number of truck trips estimated for each scenario. While truck trips vary by up to 65 percent between scenarios, this represents a difference of less than 200 evening peak hour trips.

Table 6: Relative Peak Hour Vehicle Trip Comparison Between Scenarios

Scenario	Base Trips	Truck Trips	Length Adjusted Trips
A	9,254	466	9,496
B	9,950	399	10,180
C	10,723	279	10,954

Length adjusted trips are intended to account for the fact that trip length varies by land use type. For example, work related trips are typically longer than school and shopping trips. Trip length factors derived from the *National Personal Transportation Survey* were applied to estimated trip generation by land use category. Residential trips formed the baseline trip length, with work, shopping and other trips assigned factors relative to those trips. Length adjusted trips do not vary significantly, in relative proportion, to base trips. Therefore, this adjustment does little to clarify the differences between scenarios.

Intersection level of service was calculated at study intersections using Highway Capacity Manual methodology². In addition, the general system performance of the major arterials and highways were reviewed for each road segment within the study area. The cumulative effects of planned growth through East Multnomah and Clackamas County (including Springwater, Damascus, Boring, and Pleasant Valley) are reflected in the system impacts described below. Key highlights of the level of service analysis and system review include the following:

- The off-site intersections along Hogan Drive and Burnside Road between Division and Palmquist fail for all three alternatives. Major system improvements are needed in this area (corridor and/or intersection level) regardless of the alternative selected for Springwater.
- Several intersections fail along Hogan Drive between Division Street and the Springwater study area in each alternative. The intersection of Butler/Hogan is better (LOS E) in Alternative A than in the other alternatives.

² Highway Capacity Manual, 2000, Operations Method.

- Several intersections fail along US 26 (outside of the Springwater area) regardless of the alternative.
- Alternative B does not include an interchange with US 26 in the Springwater study area, but does include two at-grade intersections. Preliminary analysis indicates that these intersections would theoretically work acceptably, either as at-grade signalized intersections or as roundabouts, but only with three through travel lanes on US 26. Three-lane roundabouts are very rare (some can be found on the east coast and in Europe) and are not practical or feasible for this location. Additional turns lanes would also be required at both intersections, even with additional travel lanes on US 26.
- Hogan (as three lanes) operates over capacity within the study area for each of the alternatives. A five-lane section will be needed on Hogan Drive within the study area, possibly extending as far south as ORE 212. This type of improvement is already in the long-range plans adopted by the Gresham and Multnomah County. Further south, Clackamas County has programmed improvements three lanes for Hogan Drive, but, as part of the Damascus Community Plan development, is re-evaluating those needs, and they are expected to show need for a five-lane street section.
- US 26 operates the best under Alternative A within the study area. Under Alternative A US 26 does not exceed capacity for any link to the study area. Under Alternatives B and C, US 26 does exceed capacity on some links.
- All north-south routes, with the exception of 257th Avenue are approaching or exceeding their capacity between I-84 and Powell Boulevard for most or all of their southbound links.
- East-west routes generally operate within planned capacity throughout the Gresham/East County area.

Preliminary, planning level cost estimates were developed for each alternative for arterial and collector roadways within the study area. All arterials and collectors were assumed to be three-lanes wide with a 74 foot right-of-way, with the exception of Hogan Drive, which was assumed to be five-lanes wide with a 100 foot right-of-way. Subsequent to the alternatives analysis, the appropriate street cross-sections were determined to best service the plan area, and this included several arterial sections with more than three lanes. These right of way widths and associated roadway costs include Green Street swales where appropriate. Roadways within and along the periphery of the Springwater Study Area were included in the cost estimates. Table 7 summarizes the costs for each alternative.

Table 7: Preliminary Arterial/Collector Roadway Costs by Alternative (in Millions)

Functional Classification	Alternative A	Alternative B	Alternative C
Arterial	\$46.3	\$43.8	\$40.6
Collector	\$49.4	\$50.0	\$48.0
Interchange/Overcrossing/Roundabout	\$20.0	\$4.5	\$20.0
Total	\$115.7	\$98.3	\$108.6

Alternative B appeared to be the least expensive, but the cost differences were within the margin of error for typical planning-level costs. Alternative B is less expensive, primarily because no interchanges are included in that alternative and the costs of widening US 26 to three lanes are not included in these cost estimates. Also, additional considerations will need to be addressed including the need and/or desire to limit access to US 26 since Alternative B requires at-grade access.

Based on the previous analysis of the alternatives, it was determined that none of the alternatives was clearly superior in terms of the relative impacts to the regional transportation system, or the extents and

functionality of the on-site circulation system. Therefore, it was recommended that a hybrid circulation system be developed to support the preferred land use plan that incorporates the best parts of the circulation alternatives. Some general observations that were considered in formulating the preferred alternative circulation system include:

- Alternative A provides only one east-west arterial, while Alternatives B and C each provide two. Typically arterials are spaced at approximately one-mile intervals. The core portion of the Springwater study area is about one-mile in the north-south direction and about 2 ½ miles in the east-west direction. Either one or two east-west arterials could function adequately, given the density and location of development within Springwater.
- Alternative C locates the interchange with US 26 toward to the north end of Springwater, providing highway access closer to the urban area where demand is anticipated. Alternative A provides US 26 interchange access centrally located to Springwater, but does not functionally serve urban development further north.
- Alternative B does not include interchange access with US 26, thereby slowing traffic (e.g., roundabouts) or stopping traffic (e.g., traffic signals) on US 26 as it heads south out of the study area.
- Regardless of the alternative, additional capacity is needed for north-south travel through Gresham and East County, either in the form of widening existing facilities (i.e., US 26) or by providing additional capacity through access control and/or new routes.
- Since so much traffic is traveling to and from the south, additional inter-regional capacity is needed between Springwater and areas south (i.e. Damascus-Boring).

RECOMMENDED TRANSPORTATION SYSTEM PLAN

Motor Vehicle Plan

The motor vehicle plan for Springwater connects employment and residential neighborhoods to the regional arterial and highway facilities to provide safe and convenient access for future residents and workers. The existing arterial facilities such as Palmquist Road, Orient Drive, and 242nd Avenue form the framework for travel around and through this area. A new arterial is recommended to provide east-west circulation within the community, and to provide access to US 26.

The new arterial route begins along existing Orient Drive, then bends south to form a new four-way intersection within Springwater. This functional change will help to reduce travel speeds on Orient Drive to be more compatible with existing residential uses. A new arterial would continue south then southwesterly across US 26 to connect to Rugg Road and 242nd Avenue. This new arterial route is expected to be the primary link for employment circulation within Springwater, and it is also expected to serve regional traffic for connections to and from US 26. The other new arterial crosses US 26 to the north, and connects to Telford Road and the middle of the Village Center area west of 252nd Avenue.

The new residential neighborhoods east of 242nd Avenue include the Village Center area opposite to Butler Road. This area will be served by a series of collector streets and one neighborhood connector, as shown in Figure 1. The looping neighborhood connector alignment reduces the number of stream crossings, and still provides convenient connections from the residential neighborhoods to 242nd Avenue and the Village Center. The proposed functional classifications are consistent with the adopted Gresham Transportation System Plan. The exception is the designated Neighborhood Connector route, which has the same design profile as a Community Street, but allows for future traffic calming measures to be deployed, as the need arises.

SPRINGWATER MASTER URBANIZATION PLAN

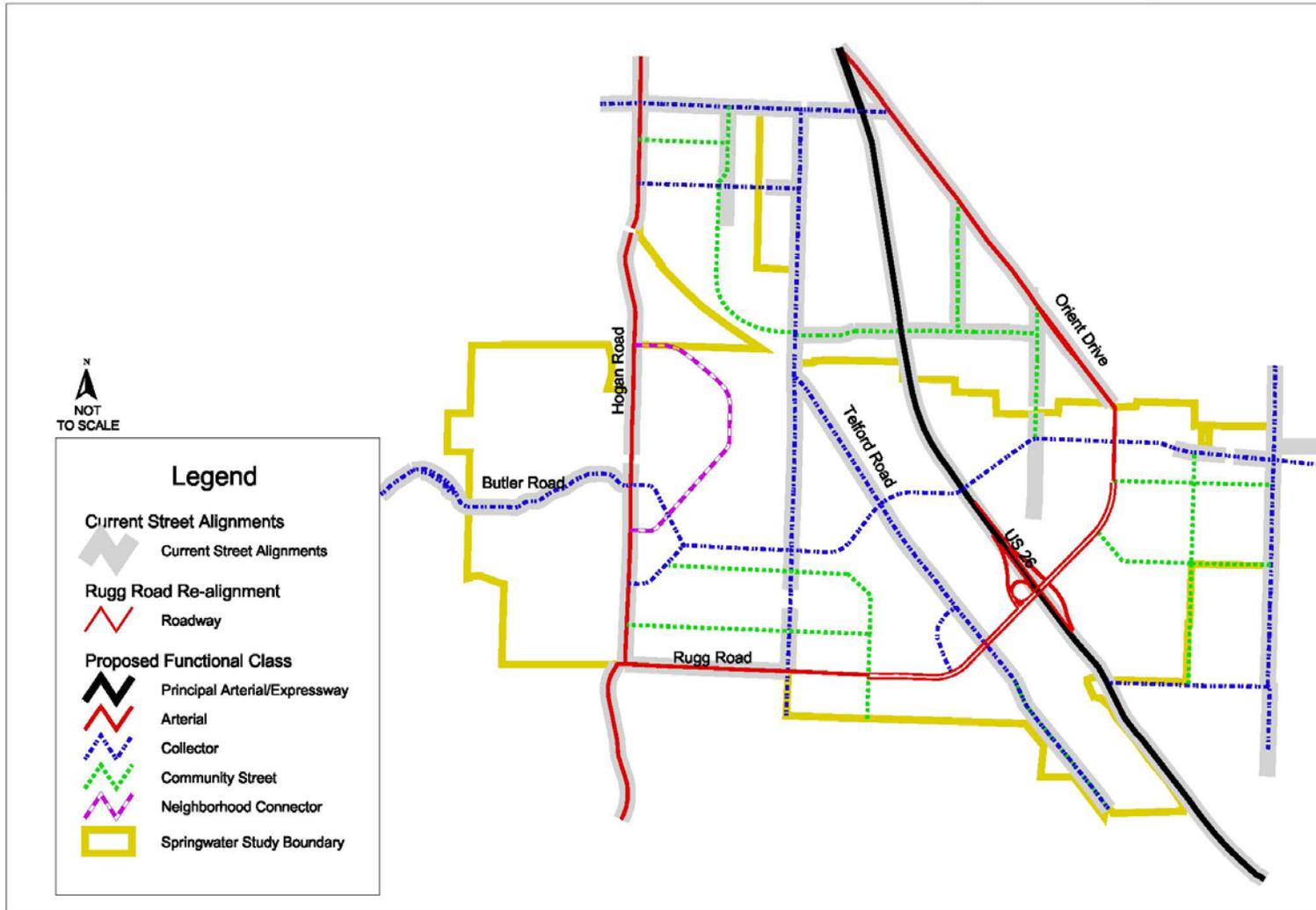


Figure 2 – Proposed Functional Classifications

Transit Plan

Current transit plans do not extend to the Springwater community, and any new service will require an amendment to the existing TriMet and Metro transit plans for this area. In order to provide convenient access to most of the employment and residential areas internal and external to the Springwater expansion area, three transit routes have been identified. Each of these routes will offer a different level of service to transit riders based on the City of Gresham's transit typology.

Primary routes serve as regional trunk lines and provide high quality transit service between community and employment centers and the rest of the region. A priority within this corridor is to ensure adequate and convenient pedestrian and bicycle access to stops and transit preferential treatments such as signal preemption, bus shelters and curb extensions. This route should provide 10-15 minute service between transit vehicles during peak traffic hours and no less than 30 minutes between transit vehicles during non-peak times. The primary route proposed with the Springwater plan travels north/south via Hogan Road/242nd Avenue and will connect the Springwater study area with the MAX light rail line, Mt. Hood Community College and other transit opportunities in Gresham to the north, and the Damascus-Boring area to the south. Depending on ridership levels and transit funding in the region, this corridor is a likely candidate for future high capacity transit services.

Higher capacity transit services could increase the attractiveness of using public transit for Springwater residents and employees. This type of service would be provided by combinations of larger vehicles, less time between vehicles, and higher travel speeds that could make the transit trip more competitive with the conventional automobile trip. The higher capacity transit services could include bus rapid transit, a separated bus way, or street car facilities. Each of these types of services would have specific needs for expanded stations and platforms compared to fixed-route bus service. They also have higher priority for right-of-way at arterial intersections to reduce travel delays and maintain schedule reliability.

Secondary routes connect higher-density neighborhoods to light rail, primary transit routes, and centers. These routes are typically shorter in length than primary routes and are designed to serve mainly Gresham and the rest of east Multnomah County. Peak hour traffic service should be 10-15 minutes between transit vehicles and off-peak service should be between 30-60 minutes between transit vehicles. The proposed Springwater secondary route will provide a loop pattern around the study area, traveling on Kane Road, Orient Drive, Rugg Road and terminating in the Village Center.

The third layer of service, neighborhood circulation, provides local service connections between lower-density neighborhoods, employment centers and higher-frequency transit routes. These routes may be serviced by shuttle buses or vans and may include paratransit. Paratransit service enhances access to the regular fixed bus routes by serving residences and businesses within 3/4 – mile from the existing designated route. Peak hour traffic service should be 15-30 minutes between transit vehicles and off-peak 30-60 minutes between transit vehicles. The neighborhood circulation route proposed for Springwater will bisect the study area by traveling along Butler Road to Pleasant Valley and other points west of the study area including Foster Road. Extending this service across US 26 into the rural eastern section of the study area will provide more coverage within Springwater with a minimum service investment. Existing fixed route bus service in this area is provided by Route 84, which also provides services in the rural lands east of 282nd Avenue. TriMet may modify the services provided by this existing route as new routes are provided within the Springwater area. Any route modifications will be subject to further study by TriMet.

Proposed transit routes are shown in Figure 3. In addition to the proposed routes described above, Sandy Transit currently offers an express bus service along US 26 with 30-60 minute frequency during the weekday. This service does not currently have any local stops, but could possibly be amended to allow for local stops and circulation in Springwater in the future.

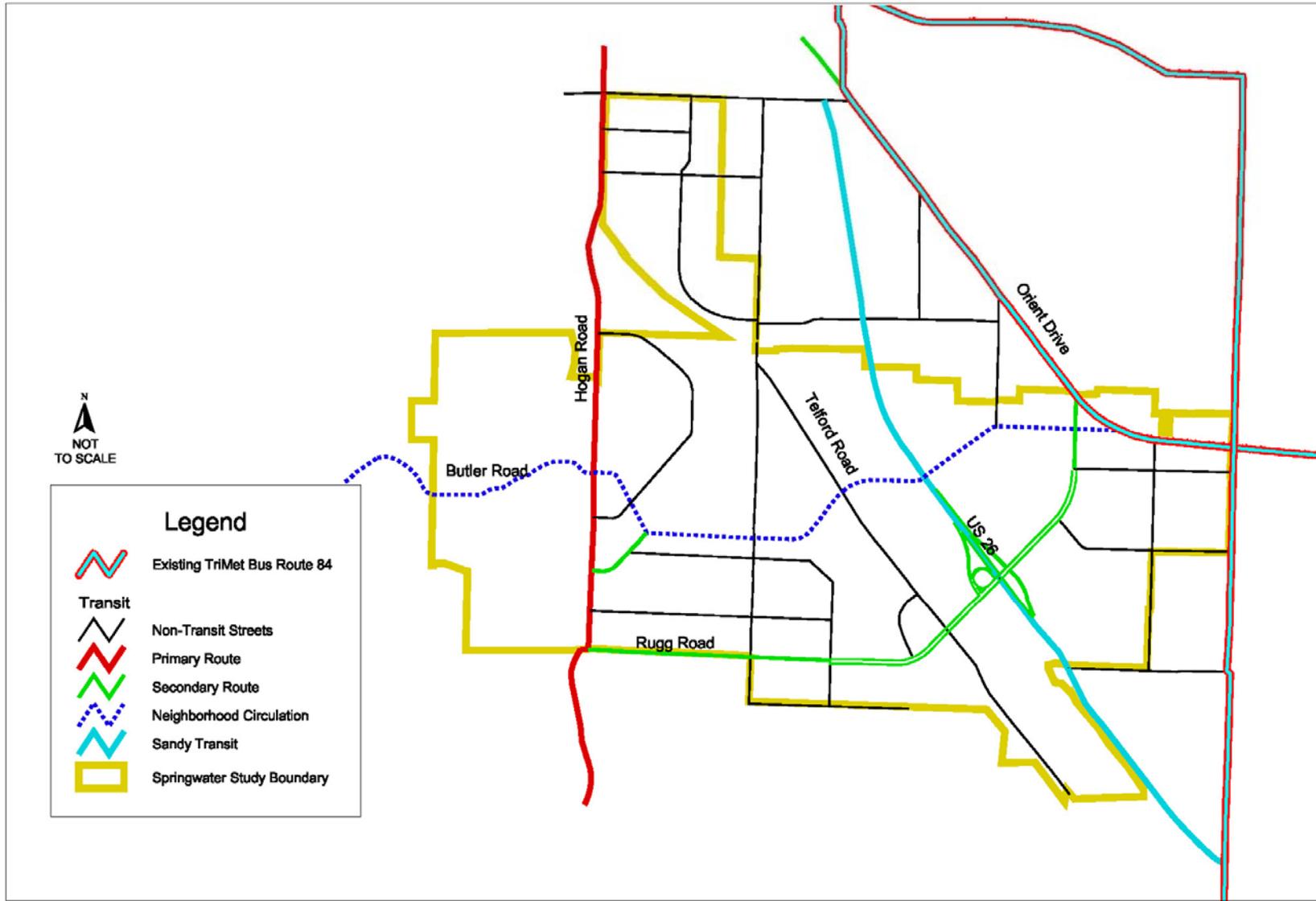


Figure 3 – Proposed Transit Routes

Bicycle and Pedestrian Plan

The design for non-motor vehicle travel shares all the Springwater roadways, and uses specific off-street facilities for exclusive connections to the many greenways, open spaces and a regional trail system. The proposed Bicycle and Pedestrian Plan, illustrated in Figure 4, shows the arterial and collector system within Springwater, and one alternative for the trail system. The final trail alignment east of US 26 has not been selected. Two trail options – one adjacent to streets and one adjacent to streams – are shown in more detail in the Public Facilities Plan and will undergo further evaluation by the City. The costs for off-street trails adjacent to streets have been included within the Parks Master Plan for Springwater, and they are not specifically identified within this TSP. If the recommended trail alignment includes trails along multiple stream corridors east of US 26, the cost of the trail improvements may change from the costs identified in the Public Facilities Plan.

Figures 5a and 5b show typical cross sections for different street types in Springwater. All of the community streets, collector streets and arterials within the plan have provisions for either on-street bicycle lane facilities, or parallel off-street trails that provide bicycle riders a convenient route to various destinations. As in Pleasant Valley, all streets also have provisions for Green Street swales, with the exception of the streets that are anticipated for use in commercial office areas with high turnover of on-street parking. Figure 5b shows swale medians on regional facilities, however swales could also be located adjacent to sidewalks depending on the specific needs of the adjacent properties. Additional details regarding the bicycle and pedestrian trail system are provided in the Public Facility Plan and Master Plan for Parks, Trails, and Open Space. Similarly, all of the streets within Springwater include sidewalks, either curb tight (for local streets) or separated from the roadway by planter strips. The design of street spacing within the residential areas corresponds with the regional spacing requirements in the RTP under Title 6.

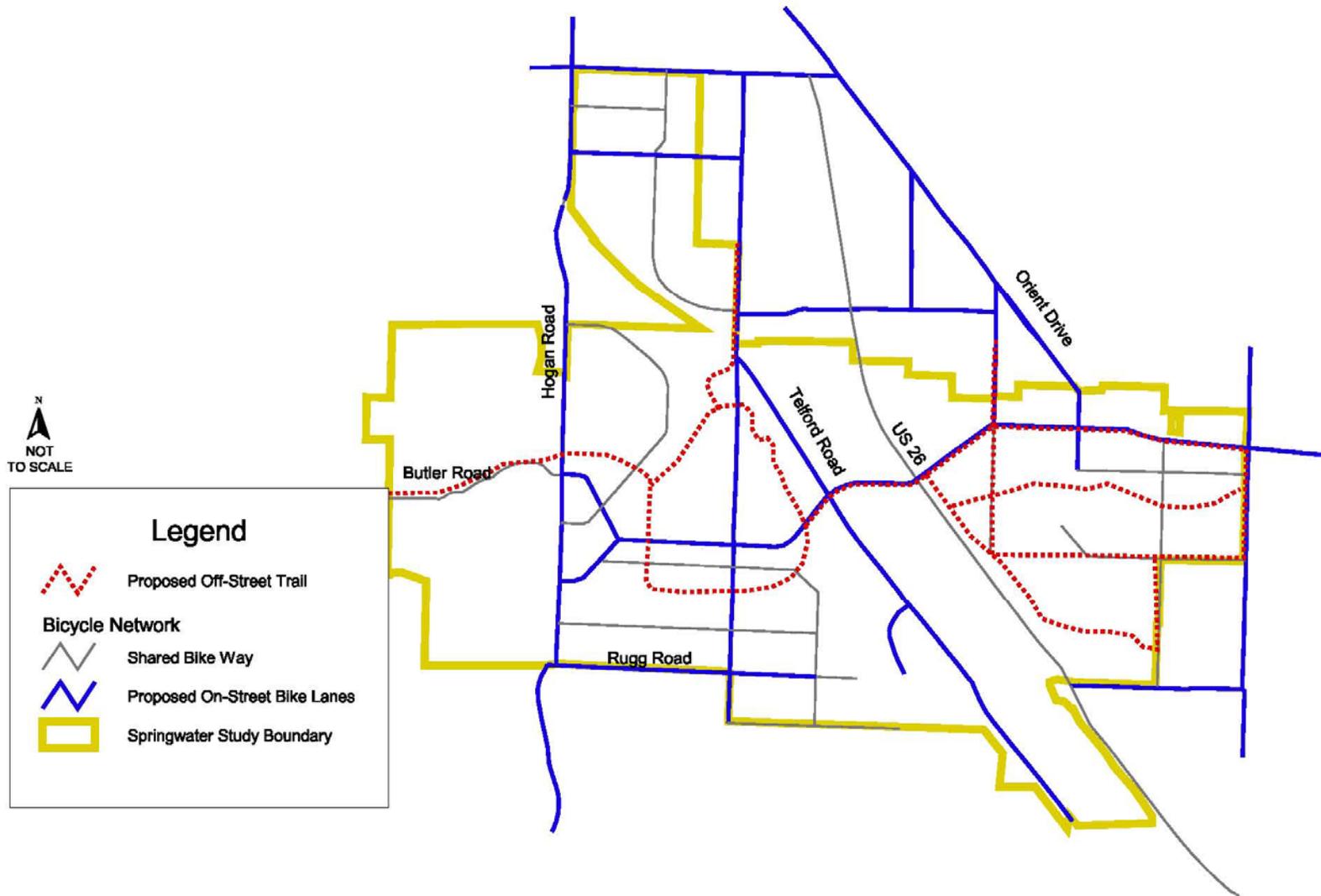


Figure 4 – Proposed Bicycle and Pedestrian Plan

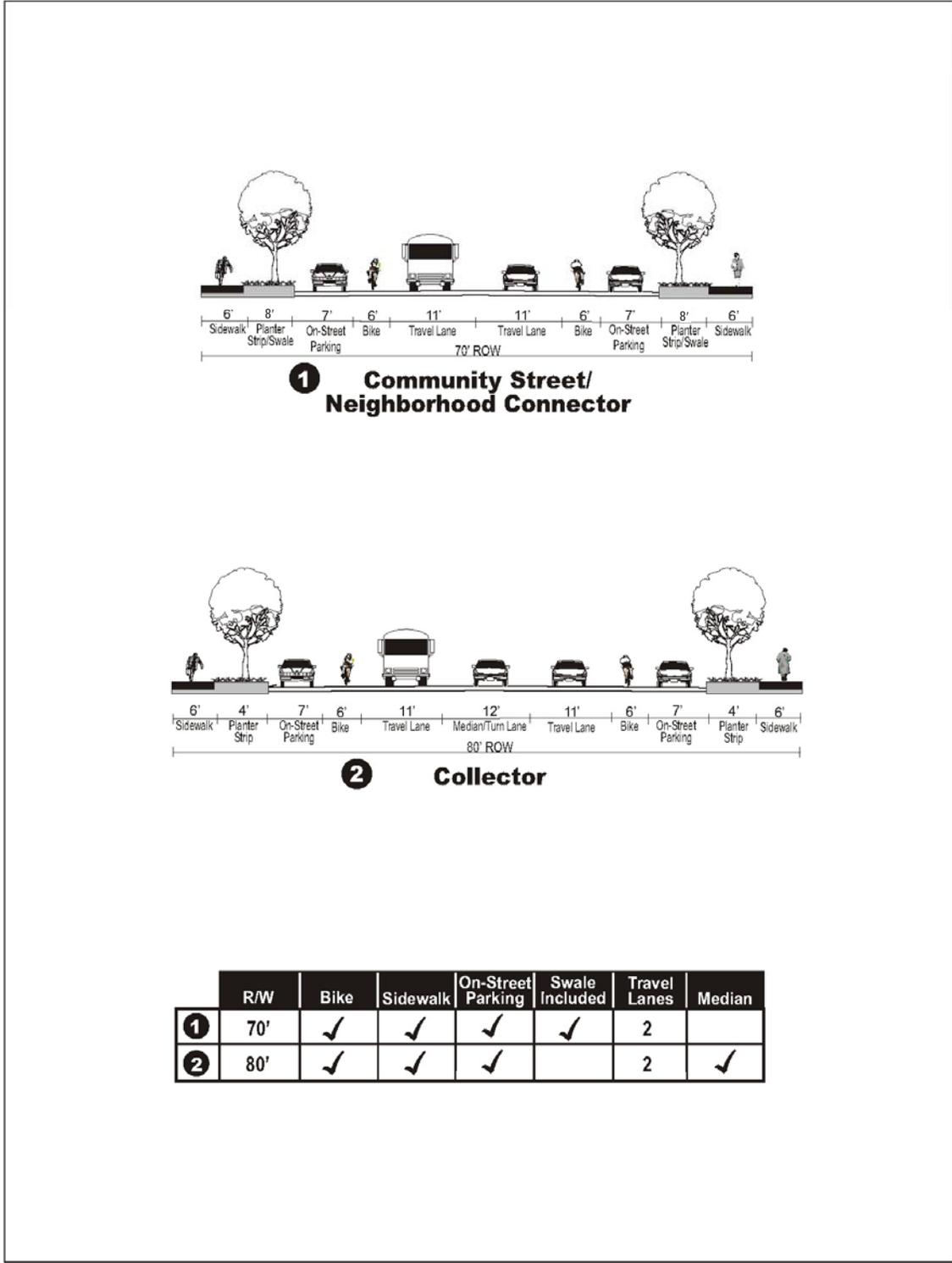
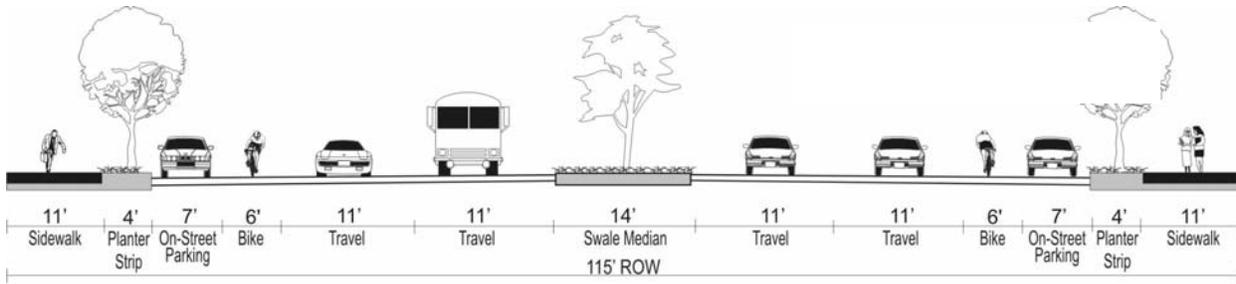
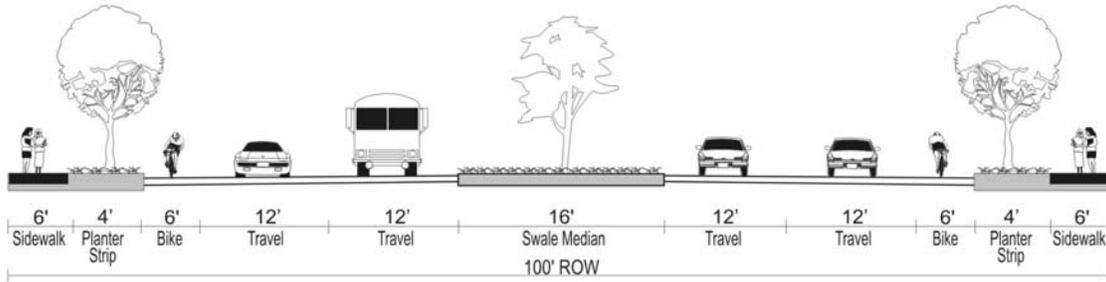


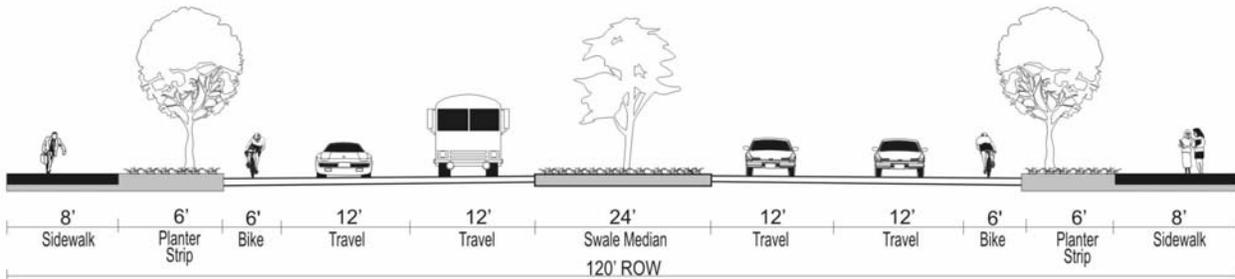
Figure 5a. Springwater Street Cross Sections



3 Boulevard



4 Arterial



5 Principal Arterial/Expressway*

	R/W	Bike	Sidewalk	On-Street Parking	Swale Included	Travel Lanes	Median
3	115'	✓	✓	✓	✓	4	✓
4	100'	✓	✓		✓	4	✓
5	120'	✓	✓		✓	4	✓

* Expressway cross section will be based on the Oregon Department of Transportation's Highway Design Manual.

Figure 5b. Springwater Street Cross Sections

Freight Master Plan

To accommodate planned vehicle movement through Springwater, the Gresham’s TSP and the Regional Transportation Plan should be amended to delete the planned connection between Hogan Drive and US 26 that was originally envisioned as part of the Mt. Hood Parkway project. In addition, the planned designation of this route as a freight route should be amended to terminate at Powell Boulevard. This segment represented the most southern portion of the planned 242nd Avenue freight route from US 26 and I-84 in conjunction with the County’s 242nd Avenue extension project to I-84 to provide an alternative freight route between US 26 and I-84. That project has been suspended, and the roadway connection within this study area is not included in the Springwater Concept Plan. The remaining segments of the 242nd freight route, from Burnside Road to Glisan Street, will continue to provide service to the I-84 interchange at 207th Avenue. On-going studies in Clackamas County may recommend amending the freight route designation for 242nd Avenue south of the city limits to Highway 212.

In addition to the regional freight route services, the street system within Springwater has been developed to provide convenient freight vehicle movements to local destinations. Local freight travel is best facilitated by adhering to appropriate functional class street cross-sections, appropriate curb radii at intersections and driveways, public street and access spacing standards, efficient traffic control plans, and by maintaining adequate service levels during peak travel hours of the day. The primary freight routes for local service will be provided to and from US 26 at the planned interchange near 252nd Avenue, then distributed to local destinations via arterials and collector streets. These elements have been incorporated into the Springwater Community plan.

Other Travel Modes

Airport

There is no airport or airfield within the study area. The closest airport activity is the Troutdale Airport, which provides general aviation services, but no commercial airline carrier services.

Rail

There is no freight or passenger rail facilities within the planning area. The Springwater Trail is located on a former freight line right-of-way, but there is no active freight services within this corridor.

Pipeline

There is one high-pressure gas line within the study area along Hogan Drive – 242nd Avenue corridor. Appropriate setbacks from the gas line and construction activity around it should be maintained. Refer to the Gresham TSP for details on the high-pressure gas line, and the planned water service line from the Bull Run reservoir.

IMPLEMENTATION PLAN

The Springwater area has several key implementation issues associated with incorporating the Springwater Plan into the City of Gresham plans and ordinances, staging infrastructure improvements to US 26, and linking to existing County and State roadway facilities. To resolve these issues, as part of the adoption phase of the Springwater Community Plan efforts, the City’s transportation system plan will need to be amended to include:

- Recommended changes to the street functional class map
- Recommended street cross-sections for the Springwater area
- Recommended amendments to the transportation plans for each travel mode (motor vehicle, transit, bicycle, pedestrian)

- Funding program needs for the City of Gresham and the addition of transportation improvements to the project list..

These elements are described in more detail later in this TSP.

New or modified street connections to County facilities (e.g., 242nd Avenue, 282nd Avenue) will require compliance with appropriate spacing and design standards. One specific consideration for streets on the Urban Growth Boundary edge, especially 282nd Avenue, is that urban improvements will be built on the Springwater site only. The rural edge of these street facilities will be left intact on the side fronting the rural protect lands.

US26 Improvements

This section summarizes findings from the Springwater US 26 Concept Design and Access Study prepared under a separate planning document (included in the Reference Documents). The study focused on alternative access concepts to US 26 to support Springwater as it develops over the next twenty years. The development assumptions and travel forecasting process was coordinated with the Master Plan development process so that the same assumptions and methods were applied for both studies. The 2025 travel forecasts were made using the same Metro model that was applied for Springwater. More detail was provided to describe the various network alternatives used in this study, but, overall, the same base model was applied. A wide range of alternative highway connections were investigated for Springwater, including at-grade intersections controlled by traffic signals, and several variations of grade separated interchanges. The alternatives were developed with consideration of applicable mobility, safety and design standards that are adopted by ODOT and the City of Gresham. One of the critical elements of this concept design process considered the minimum spacing between adjacent traffic signals or interchanges and the proximity to major environmental constraints, so that the proposed alternatives were consistent with standards, and generally considered feasible to construct. The concept design alternatives were evaluated using 2025 traffic conditions to assess how successful they performed relative to the applicable automobile and freight mobility standards. A comparative matrix evaluation showed the relative merits and impacts for each alternative, in terms of compliance with standards, performance and potential impacts to the environment.

The recommended plan alternative for Springwater was a new US 26 interchange at the southern arterial, which connects to Rugg Road on the west and Orient Drive on the east. Prior to the construction of the interchange, the necessary environmental reviews, facilities design and approval and project funding need to be completed. The initial concept design will be further refined to address any identified impacts or issues identified through these further studies. Interim steps for access and circulation to and from US 26 in the Springwater area were identified in the following phases. Where appropriate, potential thresholds for development triggers in Springwater have been identified, however, a specific evaluation will be required at the time of development application to confirm the need and timing of interim improvements.

POTENTIAL US 26 CORRIDOR CONSTRUCTION PHASING

The potential construction phasing of improvements to the US 26 corridor and Springwater roadway network must support the transportation demand as the Springwater community develops. In general the US 26 corridor will be developed from north to south and will tentatively utilize Proposed Collector A as a temporary connection to US 26 until the transportation demand supports building the Proposed Arterial B interchange as the permanent connection to US 26. Figure 5-6 illustrates the following potential construction phasing for the recommended US 26 corridor concept that is described in more detail in this section:

- Phase 1A: Stop Control at Proposed Collector A

- Phase 1B: Traffic Signal at Proposed Collector A
- Phase 2A: Build Proposed Arterial B Interchange
- Phase 2B: Build Proposed Collector A Overcrossing

The phasing of access improvements to US 26 will need to be addressed at a higher level of detail in the NEPA process and preliminary engineering. This additional analysis may lead to changes in the phasing shown in this report.

Phase 1A: Stop Control at Proposed Collector A

Phase 1A includes the following potential construction elements:

- Construct Proposed Collector A, including a bridge over Johnson Creek, as an at-grade intersection with US 26 just south of the wide median on US 26. This also includes an at grade intersection with Telford Road and the Springwater Trail.
- Install stop signs on the Proposed Collector A approaches to the US 26/Proposed Collector A intersection. Use the lane configuration illustrated in Figure 5-6, which includes one dedicated left and right turn lane and two through lanes on both US 26 approaches as well as one dedicated left turn lane and one shared through/right lane on both Proposed Collector A approaches. An additional dedicated left turn lane and through lane should be added to both Proposed Collector A approaches for the installation of a traffic signal (see Phase 1B) since this geometry will maximize the life span of the intersection.
- Install underground electrical conduit to accommodate the installation of a traffic signal at the US 26/Proposed Collector A intersection (see Phase 1B).
- Close the US 26/267th Avenue intersection upon the completion of the US 26/Proposed Collector A intersection.
- Keep the US 26/Hillyard Road and US 26/Stone Road intersections open.

Phase 1B: Traffic Signal at Proposed Collector A

Phase 1B includes the following potential construction elements:

- Construct a traffic signal at the US 26/Proposed Collector A intersection. Maintain the lane geometry constructed during Phase 1A and open the additional dedicated left turn lane and through lane on both Proposed Collector A approaches.
- Construct visual indicators on US 26 to cue motorists to the presence of a traffic signal. Specific design elements will be determined by ODOT during the design of the traffic signal and may include vertical elements such as raised curbs and roadway illumination that provide a more urban feel.
- Keep the US 26/Hillyard Road and US 26/Stone Road intersections open.

Phase 2A: Build Proposed Arterial B Interchange

Phase 2A includes the following potential construction elements:

- Construct Proposed Arterial B and the interchange at US 26. This also includes grade-separation at Telford Road and the Springwater Trail and a bridge at Johnson Creek. Install traffic signals at the ramp terminals if they are warranted within three years of the interchange completion. Install stop signs at the ramp terminals if traffic signals are not warranted.
- Keep the US 26/Stone Road intersection open during construction of the interchange for as long as feasible.
- Keep the US 26/Hillyard Road intersection open during this phase.
- Maintain the traffic signal at the US 26/Proposed Collector A intersection.

Phase 2B: Build Proposed Collector A Overpass

Phase 2B includes the following potential construction elements:

- Close the US 26/Proposed Collector A, US 26/Hillyard Road, and US 26/Stone Road intersections at the completion of Phase 2A. These intersections will no longer meet access spacing standards once the interchange is operational.
- Remove the traffic signal at US 26/Proposed Collector A.
- Realign southbound US 26 at the north end of Springwater to reduce the median separation between southbound and northbound US 26 to 16 feet, which is the current ODOT standard for US 26. By saving this realignment until the last phase it provides more flexibility for detours, lane closures, or construction staging during the earlier phases.
- Construct the Proposed Collector A overcrossing at US 26.

It will be important for development to recognize the shift in access over time within Springwater. During the early years, primary access will be to and from the northern Collector; however, eventually, this connection to US 26 will be close (Phase 3), and these circulation replaced by the new interchange located at the southern Arterial.

Amendment to Street Functional Class Map and Plan Designations

The city street designations in the Gresham Transportation System Plan were applied to the Springwater Master Plan area. The street design type designations and cross-section elements were taken from the Pleasant Valley Plan area, since it is the most recent new development that incorporates Green Street components into new street designs. The proposed Street Functional Class Plan for the Springwater Master Plan area was illustrated in Figure 1.

The key arterial connections for Springwater include US 26, 242nd Avenue, Orient Drive, Kane Road and Rugg Road. The existing alignment of Orient Drive changes to create a new four-way intersection just east of 267th Avenue. This change is intended to separate urban travel to and from the US 26 connections versus rural travel between destinations in rural East County areas. Other aspects of the proposed functional class plan include:

- Orient Drive changes designations from arterial to collector at the new four-way junction.
- Two crossings to US 26 are shown; one is a collector facility and the other is an arterial facility. The north collector changes to a collector after crossing Telford Road, and then continues westerly through the proposed Village Center to its terminus at 242nd Avenue. The southerly crossing to US 26 connects Rugg Road to new Orient Drive junction.
- A neighborhood connector route is shown as a loop road east of 242nd Avenue north of Butler Road through the residential neighborhood.
- Hillyard Road is upgraded to a Community Street between 262nd Avenue and Anderson Road (267th Avenue). This change is recommended because SE 262nd Street is not extended as a full street into the Springwater Master Plan area, because it is too close to the northerly US 26 crossing for a standard intersection. Therefore, the designation of 262nd Street south of Hillyard Road would be changed to local street within the city limits.

Street Cross-sections

Figures 5a and 5b illustrated the street cross-sections for these facilities. The illustration shows the right-of-way requirements, and the composition of street elements included within each profile. The cross-sections essentially are the same as shown in the city Transportation System Plan with two amendments. The section have been modified to explicitly allow drainage swales in addition to conventional storm water drainage. Also, a new designation has been added for Neighborhood Connector, which is the same size as a standard Community Street, but it allows for traffic calming measures, as appropriate. All of the streets are expected to provide on-street bicycle facilities and adjoining sidewalks, however, others may also include on-street parking, center medians, or green street swale areas. Outside of the Village Center area, where on-street parking activity is high, it is appropriate and possible to have swales alongside the street curbs. For cases where off-street trails are indicated on the Local Street Connectivity Plan (see Figure 7), the need for on-street bicycle facilities is optional.

Amendment to Street Project List

The Gresham TSP identifies long-range improvement projects that are expected to be built and operational within the plan year period to serve planned growth. New or modified streets within the Springwater area are identified for additions to this list. The street projects are labeled by segment number on Figure 6, and summarized in Table 8 below. The functional class identifies the type of street cross-section that is to be constructed for each of the roadways. The street cross-sections are adapted from the Pleasant Valley plan area, since they incorporate Green Street elements that help to reduce the stormwater runoff.

The total estimated cost for all arterial, collector, and community street improvements is \$165.5 million. A portion of this total cost would be built as development occurs through exactions of property and frontage road improvement requirements. The community streets needs represent approximately \$50 million of the above total. New or upgraded bridges represent approximately \$29 million of the total. All of these projects would be funded and constructed by either the City of Gresham or local development as growth occurs.

Table 8: Springwater Street Projects

New Roads									
Num	Street	From	To	Functional Class	Lanes	Length	Cost	Bridge	Bridge Cost
1	Rugg Road Ext.	Orient Drive	US 26	Arterial	4	3,100'	\$9,116,000	1	\$3,040,000
2	Rugg Road Ext.	US 26	252nd Avenue	Arterial	4	4,500'	\$20,385,000	3	\$10,080,000
3	Rugg Road	252nd Avenue	242nd Avenue	Arterial	4	2,700'	\$6,183,000		\$0
4	4	242nd Avenue	252nd Avenue	Collector	2	2,600'	\$4,108,000		\$0
5	252nd Avenue	Palmquist Road	10	Collector	2	7,200'	\$11,376,000		\$0
6	252nd Avenue	10	Rugg Road	Collector	2	1,900'	\$3,002,000		\$0
7	7	242nd Avenue	9	Collector	2	1,400'	\$4,532,000	1	\$2,320,000
8	8	242nd Avenue	9	Collector	2	1,100'	\$1,892,000		\$0
9	9	7	252nd Avenue	Collector	2	1,800'	\$3,096,000		\$0
10	10	252nd Avenue	Telford Road	Collector	2	1,600'	\$4,848,000	1	\$2,320,000
11	11	Telford Road	Orient Drive	Collector	4	4,300'	\$6,794,000		\$0
12	12	Palmquist Road	4	Community Street	2	1,300'	\$1,794,000		\$0
13	13	4	252nd Avenue	Community Street	2	3,200'	\$4,416,000		\$0
14	14	242nd Avenue	242nd Avenue	Neighborhood Connector	2	4,400'	\$7,992,000	1	\$1,920,000
15	267th Avenue	Springwater boundary	16	Community Street	2	1,700'	\$2,346,000		\$0
16	16	15	Rugg Road	Community Street	2	1,300'	\$3,714,000	1	\$1,920,000
17	17	Rugg Road	282nd Avenue	Community Street	2	2,500'	\$3,450,000		\$0
18	18	Orient Drive	17	Community Street	2	1,200'	\$3,576,000	1	\$1,920,000
19	19	20	Stone Road	Community Street	2	2,600'	\$5,508,000	1	\$1,920,000
20	20	Rugg Road	9	Community Street	2	1,900'	\$2,622,000		\$0
21	21	8	252nd Avenue	Community Street	2	1,500'	\$2,070,000		\$0
22	22	252nd Avenue	26	Community Street	2	2,000'	\$4,680,000	1	\$1,920,000
23	23	26	Rugg Road	Community Street	2	650'	\$2,817,000	1	\$1,920,000
25	25	20	252nd Avenue	Community Street	2	1,400'	\$1,932,000		\$0
26	26	252nd Avenue	20	Community Street	2	2,600'	\$3,588,000		\$0
Community Street Subtotal (May be built by development)						28,250'	\$50,505,000		
Other Road Subtotal							\$75,332,000		
New Roads Total						60,450'	\$125,837,000	12	\$29,280,000
Existing Roads									
27	242nd Avenue	Palmquist Road	Rugg Road	Arterial	4	9,300'	\$18,228,000		
28	Telford Road	Springwater boundary	252nd Avenue	Collector	2	8,800'	\$13,904,000		
29	Palmquist Road	242nd Avenue	252nd Avenue	Collector	2	2,600'	\$4,108,000		
30	282nd Avenue	Springwater boundary	20	Collector	2	2,200'	\$3,476,000		
31	US Hwy. 26	267th Avenue	--	Interchange			\$24,500,000		
Existing Roads Total						22,900'	\$64,216,000		
TOTAL						83,350'	\$190,053,000		
All bridges assumed 200' long @ \$200 per s.f.									

SPRINGWATER MASTER URBANIZATION PLAN

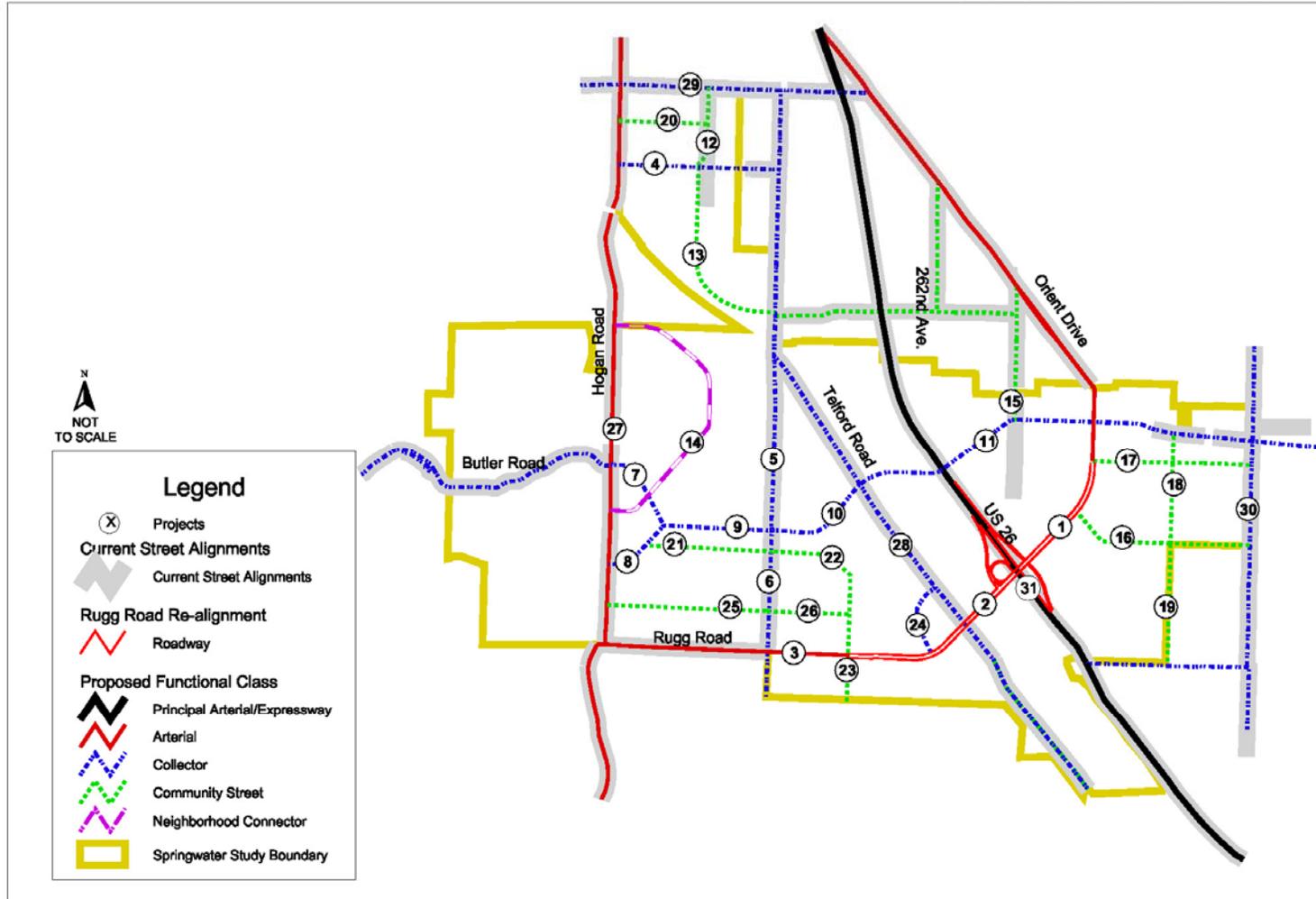


Figure 6. Proposed Functional Classes and Road Projects

For all phases, estimated construction cost for the ultimate US 26 connection improvements totals \$24.5 million. Once the preferred US 26 improvement project has been adopted, the specific nature and expected construction costs should be incorporated into the, Gresham TSP, and the Metro RTP as appropriate.

Several existing streets bordering Springwater require improvements in the long-term to support planned growth. These include the projects numbered 27 through 30 shown in Table 8. Of these, Telford Road is the only street that traverses the planning area; the other streets border the site. The total estimated cost for improvements on these facilities is \$38 million. Most of these projects will be constructed in a 6-20 year timeframe; however some would be required to support likely initial development in the northern part of the study area adjacent to US 26 and Telford Road. These are shown as occurring in a 1-5 year timeframe. All of the recommended improvements for Springwater are eligible for funding using system development charges (SDCs), however the City should investigate opportunities to obtain federal, state, or private funding to augment local funding of transportation improvements.

Outstanding Issues

The improvements identified above do not address the off-site system improvements required to service long-term travel demands, particularly in the north-south arterial corridors. The North/South Transportation Study (also known as the East Metro Area Telecommunications and Transportation Assessment) is evaluating the need for enhanced services or new facilities, and subsequent regional studies are to address recommended capacity improvements through Gresham (including additional needs associated with Springwater and Damascus development). Preliminary findings from that study show the need for substantially more north-south carrying capacity, which could include upgrade existing arterials to higher quality of service, and implementing a high capacity transit solution between Damascus and Interstate 84. The implications for Springwater potentially include a much higher level of traffic for the connector between 242nd Avenue and US 26 (Projects 2 and 3), and potentially a wider right-of-way requirement on 242nd Avenue (or other parallel north-south route) for a high capacity transit service. Based on this study, the City's Transportation System Plan update and Metro's Regional Transportation Plan update provide forums to continue to address off-site improvements beyond the Springwater Plan.

Local Street Connectivity Map

Overall, local street planning for Springwater incorporates the on-site circulation requirements to support the intended land use development schemes, and is designed to provide key connections for low volume circulation between neighborhoods for automobiles, bicycles and pedestrians alike. A better connected street and trail system helps to reduce out-of-direction travel for all modes of transportation, and it also complies with requirements as described in Title 6 of the Regional Transportation Plan.

The local street network in Gresham bordering the Springwater area is developed along the northern face, on either side of US 26, and portions of the western face along 242nd Avenue, north of Butler Road. The southern and eastern faces of the Springwater planning area border the Urban Growth Boundary and local street extensions are not expected with the current designations. Development of local streets within Springwater will be consistent with standards adopted by the City of Gresham for spacing, sight distance and other design elements. The specific alignments of local streets within Springwater have not been defined explicitly to allow for greater flexibility in land use development.

By providing connectivity between neighborhoods, out-of-direction travel and vehicle miles traveled (VMT) can be reduced, accessibility between various modes can be enhanced and traffic levels can be balanced out between various streets. Additionally, public safety response time is reduced. In south

Gresham, some of these local connections can contribute with other street improvements to mitigate capacity deficiencies by better dispersing local traffic, rather than relying solely on the arterials street system. Several roadway connections are recommended between the residential neighborhood areas to reduce out of direction travel for vehicles, pedestrians and bicyclists.

Figure 7 shows the proposed Local Street and Trail Connectivity Plan for Springwater. The primary purpose of this map is to illustrate how the new Springwater roads and trails will connect to neighborhoods bordering it. In most cases, the connector alignments are not specific and are aimed at reducing potential neighborhood traffic impacts by better balancing traffic flows on neighborhood routes. The double-headed arrows shown in the figures represent potential connections and the general direction for the placement of the connection. In each case, the specific alignments and design will be better determined upon development review. The criteria used for providing connections are as follows:

- Every 300 feet, a grid for pedestrians and bicycles (shown as dotted lines)
- Every 530 feet, a grid for automobiles (shown as solid lines)

Most of the street or multi-use (trail) extensions are shown along the northern edge of Springwater into existing residential neighborhoods. Most of these connections are shown restricted to pedestrian and bicycle travel only (trail), which allows more direct connections to the trails and proposed community parks within Springwater. The full street connections are limited since the land use in this part of Springwater is designated as industrial use, and mixing travel between the two should be discouraged.

To protect neighborhoods from the potential traffic impacts of extending stub end streets, connector roadways should incorporate neighborhood traffic management into their design and construction. All stub streets should have signs indicating the potential for future connectivity. Additionally, new development that constructs new streets, or street extensions, must provide a proposed street map that:

- Provides full street connections with spacing of no more than 530 feet between connections except where prevented by barriers.
- Provides bicycle and pedestrian access ways in lieu of streets with spacing of no more than 330 feet except where prevented by barriers.
- Limits use of cul-de-sacs and other closed-end street systems to situations where barriers prevent full street connections.
- Includes no close-end street longer than 200 feet or having more than 25 dwelling units.
- Includes street cross-sections demonstrating dimensions of right-of-way (ROW) improvements, with streets designed for posted or expected speed limits.

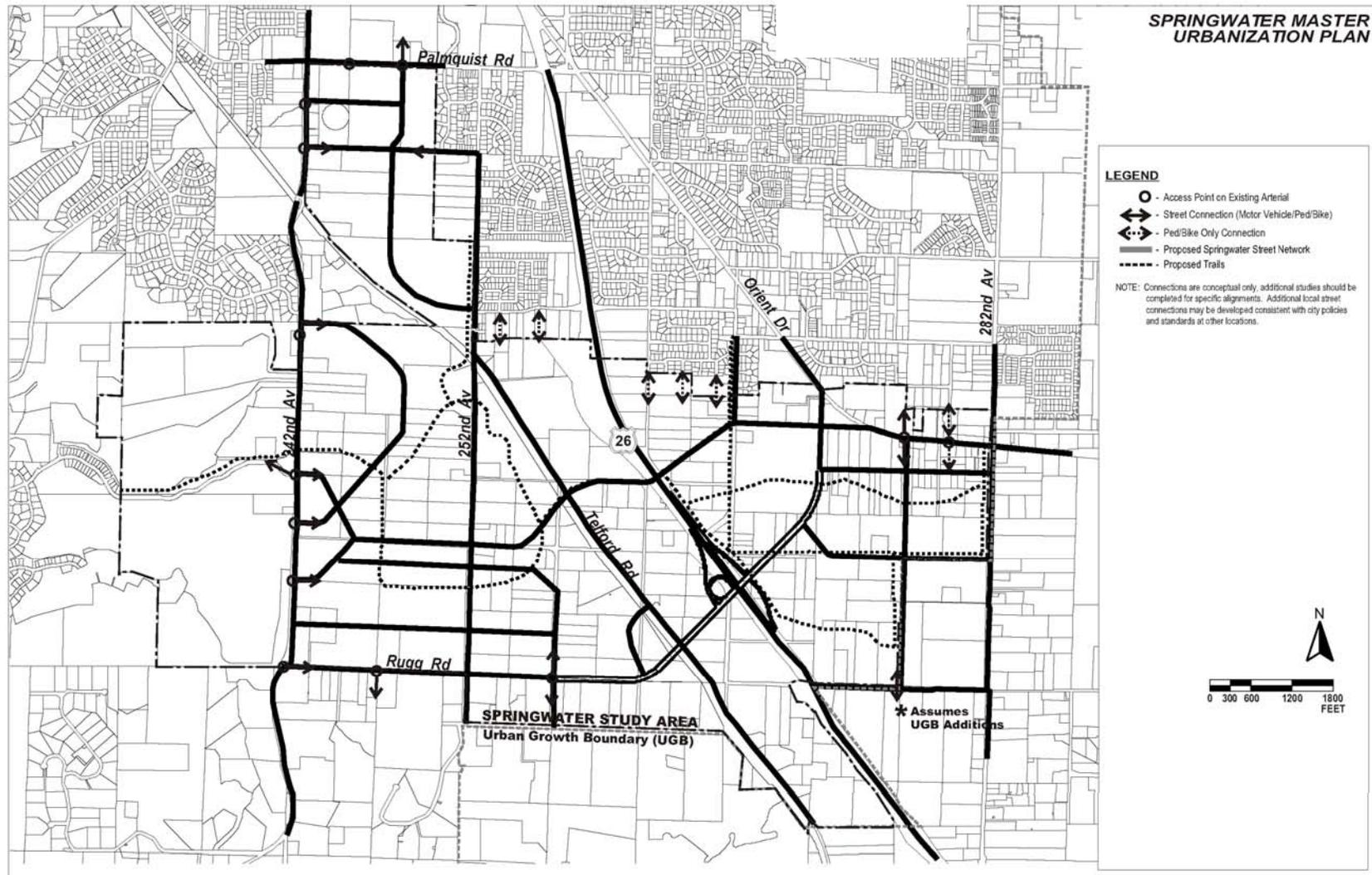


Figure 7. Local Street and Trail Connectivity Map

The other element of the Local Street Connectivity map is the locations on existing arterials that are expected to have new or modified intersections with Springwater streets. This is most significant along 242nd Avenue where seven locations are identified as new or modified intersections for connections to Springwater. The number of connections and distance between adjoining intersections is regulated by access spacing standards, and adopted by the responsible agency, either the City of Gresham or Multnomah County.

PREFERRED PLAN COST ESTIMATE AND FUNDING OPTIONS

The primary funding sources for the development of the transportation system in Springwater will include regional, state, and federal grants for large regionally-significant improvements and existing deficiencies; development exactions for frontage improvements and local street improvements; and transportation improvement fees (TIFs) for development-related system improvements.

The Springwater Plan District will include special Green Street designs for local, collector, and arterial streets. The Pleasant Valley Stormwater Master Plan³ suggests a possible design for local street drainage, but additional effort may be required to prepare a model Green Street standard. This could be connected with an early development proposal or as a separate staff-level effort. Given the importance of Green Streets to the overall plan for Springwater, the preparation and adoption of model Green Street designs is identified as an early-action item in the list of projects for implementing the TSP.

The tables below outline costs associated with the street improvements in Tables 10, as well as additional studies required to implement the Springwater TSP.

³ CH2M Hill, July 2004.

Exhibit D – Amendment to Volume 4 – Transportation System Plan

Table 9: Springwater TSP Projects

Project	Street	Cost	Timing (Years)	Responsible Jurisdiction	Funding Source
Projects Within Springwater					
1	Rugg Road Ext.	\$9,116,000	6-20	Gresham	SDC/Local
2	Rugg Road Ext.	\$20,385,000	6-20	Gresham	SDC/Local
3	Rugg Road	\$6,183,000	6-20	Gresham	SDC/Local
4	4	\$4,108,000	6-20	Gresham	SDC/Local
5	252nd Avenue	\$11,376,000	6-20	Gresham	SDC/Local
6	252nd Avenue	\$3,002,000	6-20	Gresham	SDC/Local
7	7	\$4,532,000	1-5	Gresham	SDC/Local
8	8	\$1,892,000	6-20	Gresham	SDC/Local
9	9	\$3,096,000	1-5	Gresham	SDC/Local
10	10	\$4,848,000	1-5	Gresham	SDC/Local
		\$6,794,000	1-5	Gresham	SDC/Local
11	11				
12	12	\$1,794,000	6-20	Gresham	SDC/Local
13	13	\$4,416,000	6-20	Gresham	SDC/Local
14	14	\$7,992,000	1-5	Gresham	SDC/Local
15	267th Avenue	\$2,346,000	1-5	Gresham	SDC/Local
16	16	\$3,714,000	1-5	Gresham	SDC/Local
17	17	\$3,450,000	6-20	Gresham	SDC/Local
18	18	\$3,576,000	6-20	Gresham	SDC/Local
19	19	\$5,508,000	6-20	Gresham	SDC/Local
20	20	\$2,622,000	6-20	Gresham	SDC/Local
21	21	\$2,070,000	6-20	Gresham	SDC/Local
22	22	\$4,680,000	6-20	Gresham	SDC/Local
23	23	\$2,817,000	6-20	Gresham	SDC/Local
24	24	\$1,824,000	6-20	Gresham	SDC/Local
25	25	\$1,932,000	6-20	Gresham	SDC/Local
26	26	\$3,588,000	6-20	Gresham	SDC/Local
		\$125,837,000			
Subtotal					
Projects Bordering or Near Springwater					
27	242nd Avenue	\$18,228,000	6-20	Gresham	SDC/Local
28	Telford Road	\$13,904,000	6-20	Gresham	SDC/Local
29	Palmquist Road	\$4,108,000	6-20	Gresham	SDC/Local
30	282nd Avenue	\$3,476,000	6-20	Gresham	SDC/Local
31	US 26 Interchange	\$24,500,000	6-20	State	State/Fed./Local
Subtotal		\$64,216,000			

Table 9 (Continued): Springwater TSP Projects

Project	Street	Cost	Timing (Years)	Responsible Jurisdiction	Funding Source
Additional Projects					
32	Refine Green Street Design Standards	\$50,000	1-5	Gresham	Local
33	TIF Update Study	\$100,000	1-5	Gresham	SDC
34	282 nd Access Study	\$100,000	1-5	Gresham/Multnomah County	SDC/Local
Subtotal		\$250,000			
		<i>\$190,303,000</i>			
Total Transportation Projects					

Grant Funding

Grant funding could be used to offset the cost of transportation improvements. Over the past 10 years, the City of Gresham has averaged approximately \$1 million per year in transportation capital grants from various sources. A specific estimate has not been made as to how much grant funding will be available to offset the cost of transportation improvements.

Developer Exactions

Developer exactions are applied to transportation improvements (usually frontage improvements) that developers are required to construct in order to develop their land. These most often apply to internal local streets.

TSP IMPLEMENTATION ACTIONS

The following actions are required to implement the Springwater TSP:

1. Continue to participate with other regional service providers to advance concepts from the North/South Transportation Plan to fully develop alternatives, develop a recommended plan, and identify and execute implementation measures to improve access between Springwater and major transportation routes such as I-205 and I-84.
2. Refine the Green Street concepts from this TSP and the Stormwater Master Plan as required to fully implement Green Street development in Springwater.
3. Implement a Transportation Impact Fee to adequately fund growth-related improvements in Springwater.
4. Continue to work with the Oregon Department of Transportation to develop plans for improved access to US 26 through Springwater.
5. Consider including conduit with future roadway improvements in Springwater to serve telecommunication needs in the area.