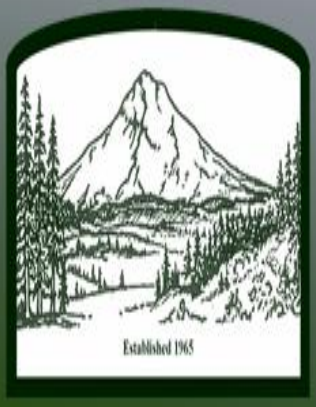


Welcome to the

City of Happy Valley

Our Mission is Our Community – Working with You to Preserve, Serve, and Enrich

City Home
Mayor and City Council
Planning Commission
Zoning Map
Municipal Code
Who to Call at City Hall
Employment
Committees
Business Alliance
City Hall Newsletter
Quick Links
Local Taxes Comparison
Calling 9-1-1

Happy Valley Transportation System Plan

On February 21, 2006, the City of Happy Valley adopted a new Transporation System Plan. The details of this comprehesive plan can be found through the following links. Please note that these links require Adobe's free Acrobat viewer in order to view them. You can download the free viewer from Adobe.

Privacy Policy | Appropriate Use Policy and Disclaimer | Webmaster

Happy Valley Transportation System Plan

Adopted February 21, 2006

Prepared for

City of Happy Valley

Prepared by

DKS Associates
TRANSPORTATION SOLUTIONS

In association with

Real Urban Geographics

Table of Contents Link

Acknowledgments

DKS Associates
TRANSPORTATION SOLUTIONS

Table of Contents

Table of Tables

Table of Figures

DKS Associates
TRANSPORTATION SOLUTIONS

1. Summary

The current Happy Valley Transportation System Plan (TSP) was adopted in December 1998. Since that time, the City has grown by more than 50% in population and 125% in incorporated land area and there have been significant changes in regional planning efforts and requirements. The primary purpose of this update is to address these changes, with a focus on:

- Ensuring that system plans can adequately serve recent citywide growth and nearby planned major growth areas, including Pleasant Valley, Springwater and Damascus/Boring.
- Confirming consistency with the latest Regional Transportation Plan and Statewide Planning Policies.

This plan update is aimed at fulfilling Transportation Planning Rule (TPR) requirements for comprehensive transportation planning in the cities of Oregon, and presents the investments and priorities for the Pedestrian, Bicycle, Transit, and Motor Vehicle systems along with new transportation programs to correct existing shortfalls and enhance critical services. For each travel mode, a Master Plan project map and list are identified to support the City's transportation goals and policies. Projects that are reasonably expected to be funded over the next 20 years were identified and are referred to as Action Plans.

The TSP update provides specific information regarding transportation needs to guide future transportation investment in the City and determine how land use and transportation decisions can be brought together beneficially for the City and is based on needs required to meet transportation demand based on 2025 future needs.

Plan Committees

The plan was developed in close coordination with Happy Valley city staff, citizen representatives and key representatives from the surrounding communities. Two formal committees were formed to guide in the plan development:

- **Technical Advisory Committee** – Agency staff from Metro, the Oregon Department of Transportation, TriMet, Clackamas County and the City of Portland participated in reviewing the technical methods and findings of the study. Four meetings were held throughout the planning process. The focus of this group was on consistency with the plans and past decisions in adjoining jurisdictions, and consensus on new recommendations.
- **Citizen Advisory Committee** – Happy Valley citizen volunteers served as the representatives for the community. Five meetings were held throughout the planning process to review interim study findings and policy issues that benefited from their direction.

The committees met regularly through the plan development process to update the goals and policies, review interim work products, assist in developing and ranking transportation solutions, and to refine master plan elements to ensure consistency with community goals. Additionally, a public open house was held in August 2005, allowing citizens to comment on the proposed modal plans, make suggestions and provide feedback.

The Happy Valley Transportation System Plan process included the following steps:

- Inventory/Data Collection to a year 2005 baseline
- Update Goals and Policies
- Evaluate Existing Conditions and Future Travel Needs Through Forecasting
- Update Needs by Mode and Consider Alternatives
- Refine Improvement Lists to Mitigate Deficiencies by Mode For 2025 Conditions
- Determine Planning and Cost Estimates of Improvements
- Identify Financing Sources
- Draft TSP

Plan Organization

This document is divided into ten chapters and a separate Technical Appendix. The title and focus of each chapter is summarized below:

- **Chapter 1: Summary** – This chapter provides a brief overview of the plan recommendations and presents the estimated funding needed to implement it.
- **Chapter 2: Goals and Policies** – This chapter presents the recommended goals and policies applied to develop implementing measures for each of the travel modes.
- **Chapter 3: Existing Conditions** – This chapter examines the current transportation system in terms of the built facilities, how well they perform and comply with existing policies, and where current deficiencies exist.
- **Chapter 4: Future Needs and Improvements** – This chapter presents the details of how the City of Happy Valley is expected to grow over the next 20 years, and how travel demands on the city and regional facilities will change from general growth in the Metro and nearby areas.
- **Chapter 5: Pedestrian Plan** – This chapter presents plan recommendations to enhance pedestrian facilities and focus new improvements in areas with the highest concentration of activity.
- **Chapter 6: Bicycle Plan** – This chapter presents plan recommendations to enhance bicycle facilities and focus new improvements in areas with the highest concentration of activity.
- **Chapter 7: Transit Plan** – This chapter makes recommendations to be considered by TriMet in their future enhancements to transit services.
- **Chapter 8: Motor Vehicle Plan** – This chapter presents plan recommendations to provide adequate mobility and access to the city, county and state facilities as travel demands grow to 2025 levels. This chapter also recommends new street design standards, access spacing standards, functional class designations and other programs to monitor and manage travel demand.

- **Chapter 9: Other Modes Plan** – This chapter discusses transportation issues related to rail, air and water transportation.
- **Chapter 10: Financing and Implementation** – This chapter presents the complete estimated revenues and costs for the transportation projects and programs developed in the plan. New funding alternatives are presented to bridge the gaps between the two.

Goals and Policies

The goals and policies established in the 1998 TSP were adopted to guide transportation system development in Happy Valley. Goals are defined as brief guiding statements that describe a desired result. Policies associated with each of the individual goals describe the actions needed to move the community in the direction of completing each goal.

In addition to retaining and refining previously adopted goals and policies that are still applicable, new goals and policies have been incorporated into the TSP update to expand the vision for the City's transportation system and meet recent changes to state and regional transportation plan policies and regulations. The goals and policies of this TSP are not prioritized and are presented in Chapter 2. These goals and policies were applied in the development of this Transportation System Plan to develop implementing measures for each of the travel modes applied in the Happy Valley TSP study area.

Transportation Plans

The Happy Valley TSP update identifies projects and programs needed to support the City's goals and policies and to serve planned growth over the next 20 years. This document presents the recommended investments and priorities for the Pedestrian, Bicycle, Transit, and Motor Vehicle systems along with new transportation programs to enhance critical transportation services. For each travel mode, a Master Plan project map and list are identified to support the city's transportation goals and policies. Projects that are reasonably expected to be funded over the next 20 years were identified and are referred to as Action Plans. The following sections summarize the plan for each mode.

Pedestrian Plan

The existing pedestrian system in Happy Valley has significant needs. Sidewalks are provided in many newer residential neighborhoods, but are limited on arterials and collectors in older areas creating poor pedestrian connectivity throughout the city. Gaps within the sidewalk and trail system discourage pedestrian travel and put pedestrians at an increased safety risk by requiring them to share the roadway with vehicles in certain locations.

Based on these needs, a Pedestrian Master Plan was developed and is shown in Figure 5-1. The updated Pedestrian Master Plan costs are estimated to be $23.2 million. The Pedestrian Master Plan will require incremental implementation. As development occurs, streets are rebuilt and other project funding opportunities (such as grant programs) arise, projects on the Master Plan should be integrated into project development.

The pedestrian goals and input from the CAC and TAC were reviewed to create a Pedestrian Action Plan, which are projects that are reasonably expected to be funded by the year 2025. The highest ranking City projects that are reasonably expected to be funded were combined with projects from other agencies identified in the RTP Financially Constrained scenario to create the project list shown in Table 1-1.

Table 1-1: Pedestrian Action Plan Projects

Project	Improvement	Potential Funding Source	Estimated Schedule	Cost ($1,000s)
Sunnyside Road Phase 2/3A Sidewalks	Construct sidewalks on both sides of the roadway from 122nd Avenue to 162nd Avenue. Provide signalized pedestrian crossings at all traffic signals.	Joint SDC Fund	2005-2007	$2,300
Sunnyside Road Phase 3B Sidewalks	Construct sidewalks on both sides of the roadway from 162nd Avenue to 172nd Avenue. Provide signalized pedestrian crossings at all traffic signals.	Joint SDC Fund	2007-2010	$600
172nd Avenue South Sidewalks	Construct sidewalks on both sides of the roadway from Sunnyside Road to Highway 212. Provide signalized pedestrian crossings at all traffic signals.	Joint SDC Fund	2010-2015	$1,220
172nd Avenue North Sidewalks	Construct sidewalks on both sides of the roadway from Sunnyside Road to Clatsop Street. Provide signalized pedestrian crossings at all traffic signals.	Joint SDC Fund	2010-2020	$2,690
Ridgecrest Road Sidewalks*	Construct sidewalks on the south side of the roadway from 132nd Avenue to Plover Drive.	Happy Valley	2010-2020	$220
132nd Avenue Sidewalks*	Construct sidewalks on the east side of the roadway from King Road to Ridgecrest Road.	Happy Valley	2010-2020	$80
145th Avenue Sidewalks*	Construct sidewalks on the west side of the roadway from King Road to Purple Finch Loop.	Happy Valley	2010-2020	$180
King Road Sidewalks*	Construct sidewalks on the north side of the roadway from 132nd Avenue to 145th Avenue.	Happy Valley	2010-2020	$280
Scott Creek Lane Path and Bridge Crossing**	Construct pedestrian path and bridge crossing from 129th to Mountain Gate Road.	Metro/Other	2004-2009	$100
		City of Happy Valley Costs		$760
		Joint SDC Fund		$6,810
		Other Agencies		$100
		Total Pedestrian Project Costs		**$7,670**

*These projects were identified in the previous TSP.

** Project identified in the 2004 Federal Regional Transportation Plan Update Financially Constrained scenario.

Bicycle Plan

The existing bike lane system on arterial and collector streets in Happy Valley does not provide adequate connections from neighborhoods to schools, parks, retail centers, or transit stops. Continuity and connectivity are key issues for bicyclists and the lack of facilities (or gaps) cause significant problems for bicyclists. Without connectivity of the bicycle system, this mode of travel is severely limited.

A Bicycle Master Plan (Figure 6-1) was developed based on these identified needs. The updated Bicycle Master Plan costs are estimated to be $12.7 million. The Bicycle Master Plan will require incremental implementation. As development occurs, streets are rebuilt and other project funding opportunities (such as grant programs) arise, projects on the Master Plan should be integrated into project development.

The bicycle goals and input from the CAC and TAC were reviewed to create a Bicycle Action Plan, which are projects that are reasonably expected to be funded by the year 2025. The highest ranking City projects that are reasonably expected to be funded were combined with projects from other agencies identified in the RTP Financially Constrained scenario to create the project list shown in Table 1-2.

Table 1-2: Bicycle Action Plan Projects

Project	Improvement	Potential Funding Source	Estimated Schedule	Cost ($1,000s)
Sunnyside Road Phase 2/3A Bike Lanes	Construct bike lanes on both sides of the roadway from 122nd Avenue to 162nd Avenue.	Joint SDC Fund	2005-2007	$1,650
Sunnyside Road Phase 3B Bike Lanes	Construct bike lanes on both sides of the roadway from 162nd Avenue to 172nd Avenue.	Joint SDC Fund	2007-2010	$420
172nd Avenue South Bike Lanes*	Construct bike lanes on both sides of the roadway from Sunnyside Road to Highway 212.	Joint SDC Fund	2010-2015	$870
172nd Avenue North Bike Lanes*	Construct bike lanes on both sides of the roadway from Sunnyside Road to Clatsop Street.	Joint SDC Fund	2010-2020	$1,920
145th/147th Avenue Bike Lanes*	Construct bike lanes on both sides of the roadway from Clatsop Street to Monner Road.	Metro/Other	2010-2015	$1,040
162nd Avenue Bike Lanes*	Construct bike lanes on both sides of the roadway from Monner Road to Sunnyside Road.	Joint SDC Fund	2016-2025	$390
		Total Bicycle Project Costs		**$6,290****

* Project identified in the 2004 Federal Regional Transportation Plan Update Financially Constrained scenario.
**These project costs are included in a motor vehicle action plan.

Transit Plan

TriMet is the regional transit provider for the Portland metro area and operates three bus routes within Happy Valley today, #155, #156, and #157 (see Figure 7-1). A need for improvements to the existing transit facilities was identified to support the future household and employment growth within the study area. Based on these needs, a Transit System Master Plan was created that is shown in Figure 7-2.

A Transit Action Plan was developed to identify projects that are reasonably expected to be funded by the year 2025. The projects that are reasonably expected to be funded were combined with projects from other agencies identified in the RTP Financially Constrained scenario to create the project list shown in Table 1-3.

Table 1-3: Transit Action Plan Projects

Project	Description	Cost ($1,000s)
Bus Stop Enhancements	Coordinate with TriMet to provide transit stop amenities including bus shelters and street lighting at all transit stops.	-
RTP Designated Major Transit Stops	To meet RTP requirements, amend development code regulations to require new retail, office, and institutional buildings on sites at major transit stops to: ▪ Locate buildings within 20 feet of or provide a pedestrian plaza at the major transit stops. ▪ Provide reasonably direct pedestrian connections between the transit stop and building entrances on the site. ▪ Provide a transit passenger landing pad accessible to disabled persons (if not already existing to transit agency standards). ▪ Provide an easement or dedication for a passenger shelter and underground utility connection from the new development to the transit amenity if requested by the public transit provider. ▪ Provide lighting at a transit stop (if not already existing to transit agency standards).	-
Transit Corridors	Direct growth to increase the density of development along transit routes in the study area in an effort to support regional transit service goals.	-
	Transit Projects to be Funded by the City	**$0**

- These projects are under the jurisdiction of, and/or will be funded by, TriMet.

Motor Vehicle Plan

The TSP Update forecasted 2025 growth to identify motor vehicle system needs in Happy Valley. Without a significant investment in Transportation System Management (TSM), Travel Demand Management (TDM), and roadway improvements, several key facilities in the City would operate with congested conditions in the future.

The following sections summarize the recommended motor vehicle system plans that meet the demands of future growth and comply with local and regional planning requirements.

Transportation System Management (TSM)

Transportation System Management (TSM) focuses on low cost strategies to enhance operational performance of the transportation system by seeking solutions to immediate transportation

problems, finding ways to better manage transportation, maximizing urban mobility, and treating all modes of travel as a coordinated system. TSM measures focus primarily on region wide improvements, however there are a number of TSM measures that are recommended for use in Happy Valley, which include:

Intelligent Transportation Systems (ITS): ITS focuses on increasing the efficiency of existing transportation infrastructure, which enhances the overall system performance and reduces the need to add capacity (e.g. travel lanes). Efficiency is achieved by providing services and information to travelers so they can (and will) make better travel decisions and to transportation system operators so they can better manage the system and improve system reliability.

Clackamas County has prepared an ITS plan for the urbanized area of the County. The Clackamas County ITS Plan[1] has identified arterial signal control ITS projects on major streets throughout the county. Sunnyside Road and 122nd/129th Avenue within the TSP study area have been identified for planned fiber optic cable and closed-circuit cameras at several major intersections. In order to support future ITS projects including traffic signal operations, the City of Happy Valley and Clackamas County should require the installation of 3 inch conduit along arterial and selected collector roadways during roadway improvement projects. ITS projects can require additional fiber optic cable to serve the new equipment along a roadway. A 3 inch conduit would ensure adequate wiring capacity to accommodate future ITS projects.

Neighborhood Traffic Management (NTM): Happy Valley has neighborhood traffic management elements in place, such as speed humps, on streets within the study area. The city should consider additional traffic calming measures as appropriate and work with the community to find the traffic calming solution that best meets their needs and maintains roadway function. Table 8-1 lists common NTM applications and suggests which devices may be supported by the Happy Valley Fire Department. Any NTM project should include coordination with emergency agency staff to assure public safety.

Access Management: Access Management is a broad set of techniques that balance the need to provide efficient, safe and timely travel with the ability to allow access to individual properties. Proper implementation of access management techniques should guarantee reduced congestion, reduced accident rates, less need for roadway widening, conservation of energy, and reduced air pollution.

Access management is the control or limiting of vehicular access on arterial and collector facilities to maintain the capacity of the facilities and preserve their functional integrity. Access management strives to strike a balance between maintaining the integrity of the facility and providing access to adjacent parcels. Numerous driveways can erode the capacity of arterial and collector roadways. Preservation of capacity is particularly important on higher volume roadways for maintaining traffic flow and mobility. Whereas local and neighborhood streets function to provide access, collector and arterial streets serve greater traffic volume. Numerous driveways or street intersections increase the number of conflicts and potential for collisions and decrease mobility and traffic flow. Happy Valley, as with every city, needs a balance of streets that provide access with streets that serve mobility.

Several access management strategies were identified to improve local access and mobility in Happy Valley:

[1] Clackamas County ITS Plan, DKS Associates, Inc. and Zenn Associates, February 2003.

- Develop specific access management plans for major and minor arterial streets in Happy Valley to maximize the capacity of the existing facilities and protect their functional integrity.
- Work with land use development applications to consolidate driveways where feasible.
- Provide left turn lanes where warranted for access onto cross streets.
- Construct raised medians to provide for right-in/right-out driveways as appropriate.

New development and roadway projects located on City street facilities should meet the recommended access spacing standards summarized in Table 1-4. The maximum spacing of roadways and driveways listed in this table is consistent with Metro[2].

Table 1-4: Access Spacing Standards for City Street Facilities

Street Facility	Maximum spacing of roadways and driveways	Minimum spacing of full access intersections	Minimum spacing of limited access* intersections	Minimum spacing of driveways
Major Arterial	-	1,000 feet	500 feet	500 feet
Minor Arterial	-	600 feet	300 feet	300 feet
Collector	530 feet	400 feet	400 feet	200 feet
Neighborhood	530 feet	-	-	-
Local	530 feet	-	-	-

* Limited Access – Vehicles are restricted to right-in/right-out turn movements. In some cases, left-in turn movements may be permitted.

Traffic Signal Spacing: Traffic signal spacing standards have been established as part of this Happy Valley TSP update. Traffic signals that are spaced too closely on a corridor can result in poor operating conditions and safety issues due to the lack of adequate storage for vehicle queues. A minimum traffic signal spacing of 1,000-feet is required for major arterial, minor arterial and collector facilities.

Local Street Connectivity: Much of the local street network in Happy Valley is built but is not well connected. Multiple access opportunities for entering or exiting neighborhoods are limited. There are a number of locations where neighborhood traffic is funneled onto one single street. This type of street network results in out-of-direction travel for motorists and an imbalance of traffic volumes that impacts residential frontage.

A Local Street Connectivity Plan is shown in Figure 8-2. 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. To protect existing neighborhoods from 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, should meet the following connectivity standards:

[2] Metro Regional Transportation Plan, 2000.

- Provide full street connections with spacing of no more than 530 feet between connections except where prevented by barriers.
- Provide bike and pedestrian access ways with spacing of no more than 330 feet except where prevented by barriers.
- Limit use of cul-de-sacs and other closed-end street systems to situations where barriers prevent full street connections
- Include no close-end street longer than 200 feet or having no more than 10 dwelling units.
- Include street cross-sections demonstrating dimensions of ROW improvements, with streets designed for posted or expected speed limits.

The arrows shown on Figure 8-2 indicate priority local and neighborhood connections only. Topography and environmental conditions limit the level of connectivity in several areas of Happy Valley. Other stub end streets in the City's road network may become cul-de-sacs, extended cul-de-sacs or provide local connections. Pedestrian connections from the end of any stub end street that results in a cul-de-sac should be considered mandatory as future development occurs. The goal would continue to be improved city connectivity for all modes of transportation.

Functional Classification: The proposed functional classification (shown in Figure 8-3) was developed following detailed review of the existing Happy Valley TSP, Clackamas County TSP and the Rock Creek Plan functional classification. With the expansion of the TSP study area, several roadways are now classified by Happy Valley.

The following proposed Happy Valley TSP functional classifications are inconsistent with the Clackamas County TSP and/or the Rock Creek Plan.

- 172nd Avenue changed from a minor arterial (County TSP) to a major arterial
- Hagen Road changed from a local street (County TSP) to a neighborhood street
- Monner Road changed from a local street (County TSP) to a neighborhood street
- 162nd Avenue (north of Sunnyside Road) changed from a local street (County TSP) to a collector street
- 152nd Avenue (north of Sunnyside Road) changed from a collector (County TSP and Rock Creek Plan) to a minor arterial
- Valley View Terrace changed from neighborhood street (Happy Valley TSP) to a collector street

Roadway Cross-Section Standards: The City of Happy Valley has current standards for street cross sections that apply citywide to residential, neighborhood, collector and minor arterial roadways. The TSP update includes several revisions and additions to the street cross-section standards. The previous residential cross-section was renamed a “local” street. Cross-sections were added for a major arterial, industrial collector, industrial local and commercial street facilities. The two-lane minor arterial cross-section was removed. The local street cross-section was revised to include the option of either parking on both sides of the street with a 32-foot curb-to-curb width or parking on one side of the street with a 28-foot curb-to-curb width. The recommended roadway cross-sections are shown in Figures 8-4 through 8-8. The proposed street system standards for each functional classification are summarized in Table 1-5.

Table 1-5: Street System Standards

Functional Classification	Desirable Maximum Volume	Right-of-way	Paved Width	Number of Lanes	Sidewalks	Bike Lanes	Parking	Landscaping	Access Limitations*
Major Arterial	-	96 feet	74 feet	5	6 feet	6 feet	none	5 foot planting strip with street trees on both sides. 10 foot planting strip (within 14 foot median area) with street trees in median.	No direct access allowed for new dwelling units fronting roadway. Consolidation of access points must be considered.
Minor Arterial	-	68 feet	48 feet	3	5 feet	6 feet	none	5 foot planting strip with street trees on both sides. 8 foot planting strip (within 12 foot median area) with street trees in median.	No direct access allowed for new dwelling units fronting roadway. Consolidation of access points must be considered.
Collector	-	56 to 68 feet	36 to 48 feet	2 or 2 plus median/ center turn lane	5 feet	6 feet	none	5 foot planting strip with street trees on both sides. 8 foot planting strip (within 12 foot median area) with street trees in median.	No direct access allowed for new dwelling units fronting roadway. Consolidation of access points must be considered.
Industrial Collector	-	72 feet	52 feet	2	5 feet next to curb	6 feet	both sides	5 foot planting strip with street trees on both sides behind sidewalk.	No direct access allowed for new dwelling units fronting roadway. Consolidation of access points must be considered.
Neighborhood	1,500 vpd	54 feet	34 feet	2	5 feet	none	both sides	5 foot planting strip with street trees on both sides next to curb.	No direct property access within 50 feet of adjacent intersection.
Commercial	-	62 feet	38 feet	2	12 feet	none	both sides	Street tree wells within the sidewalk area next to curb.	No direct property access within 50 feet of adjacent intersection.
Local	1,000 vpd	48 to 52 feet	28 to 32 feet	2	5 feet	none	one side or both sides	5 foot planting strip with street trees on both sides next to curb.	No direct property access within 25 feet of adjacent intersection.
Industrial Local	1,000 vpd	60 feet	40 feet	2	5 feet next to curb	none	both sides	5 foot planting strip with street trees on both sides behind sidewalk.	No direct property access within 25 feet of adjacent intersection.
Cul-de-sac	150 vpd	48 feet	28 feet	2	5 feet	none	both sides	5 foot planting strip with street trees on both sides next to curb.	none
Loop Turn-Around	150 vpd	48 feet	28 feet	2 with one-way loop	5 feet	none	both sides, allowed on outside of loop	5 foot planting strip with street trees on both sides next to curb.	none
Hammerhead	-	48 feet	28 feet	2	5 feet	none	both sides	5 foot planting strip with street trees on both sides next to curb.	none

Note: VPD = vehicles per day
*Access spacing standards shown in Table 1-4 and 8-2.
Traffic calming measures are appropriate on neighborhood and local streets.

Transportation Demand Management (TDM)

Transportation Demand Management (TDM) is the general term used to describe any action that removes single occupant vehicle trips from the roadway network during peak travel demand periods. Generally, TDM focuses on reducing vehicle miles traveled and promoting alternative modes of travel for large employers of an area.

The City of Happy Valley should coordinate with Clackamas County and TriMet to implement strategies to assure that the TDM assumptions in the RTP are implemented. The City of Happy Valley, Clackamas County and TriMet should coordinate to implement the pedestrian, bicycle, and transit system improvements, which offer alternative modes of travel. The recommended TDM action plan includes:

- Support continued efforts by TriMet, Metro, ODOT, and Clackamas County to develop productive TDM measures that reduce commuter vehicle miles and peak hour trips.
- Encourage the development of high speed communication in all part of the city (fiber optic, digital cable, DSL, etc). The objective is to provide employers and residents a full range of options for conducting business and activities (such as home office, telecommuting), which can contribute to a reduction in peak hour travel on the roadway system.
- Encourage developments that effectively mix land uses to reduce vehicle trip generation. Development proposals should consider linkages (particularly non-auto) to support greater use of alternative travel modes.
- Increase industrial, commercial and institutional land uses within Happy Valley to provide additional employment opportunities and reduce the average commute length.
- Continued implementation of motor vehicle minimum and maximum parking ratios for new development.
- Continued implementation of street connectivity requirements.
- Require new development to install bicycle racks.
- Implementation of bicycle, pedestrian, transit and motor vehicle system action plans.

Roadway Improvements

The extent and nature of the recommended street improvements for Happy Valley are significant. The forecasted 2025 land use indicates significant growth in both housing and employment within the TSP study area. The portion of Happy Valley bounded loosely by Clatsop Street to the north, 145th Avenue to the east, Mountain Gate and Alta Vista to the south and the west City limits is expected to experience moderate growth in the next 20 years. The majority of this growth is additional housing. The major growth areas are the Rock Creek Area located south of Sunnyside Road between 152nd Avenue and 172nd Avenue, the Scouter Mountain Area bounded by 145th Avenue, 172nd Avenue, Clatsop Street, Monner Road and Hagen Road and the Pleasant Valley Golf Course Area bounded by 162nd Avenue, 172nd Avenue, Sunnyside Road and Hagen Road.

There are a number of locations in Happy Valley where, due to the lack of alternative routes, there is an imbalance of traffic volumes that load onto one street. A well connected transportation system limits out of direction travel for motorists, bicycles and pedestrians and reduces vehicle miles traveled within the study area. Several roadway extension projects are needed to improve citywide connectivity for all modes of travel.

The 2025 Priority analysis found that significant improvements would be required at the majority of the study intersections to accommodate the forecasted growth. These improvements include traffic signal control, additional turn lanes, roadway widening, revised traffic signal phasing and traffic signal coordination. Based on these needs, a Motor Vehicle Master Plan was created that is shown in Figure 8-10. The updated Motor Vehicle Master Plan costs are estimated to be $191 million. The Motor Vehicle Master Plan will require incremental implementation. As development occurs, streets are rebuilt and other project funding opportunities (such as grant programs) arise, projects on the Master Plan should be integrated into project development.

The motor vehicle goals and input from the CAC and TAC were reviewed to create a Motor Vehicle Action Plan, which are projects that are reasonably expected to be funded by the year 2025. The highest ranking City projects that are reasonably expected to be funded were combined with projects from other agencies identified in the RTP Financially Constrained scenario to create the project list shown in Table 1-6. The construction of new collector and arterial facilities would only occur to support future development or redevelopment and would not be initiated by the City.

Table 1-6: Motor Vehicle Action Plan Projects

Project	Improvement	Potential Funding Source	Estimated Schedule	Cost ($1,000s)
Sunnyside Road Widening Phase 2/3B	Widen to 5-lane major arterial between 122nd Avenue and 162nd Avenue. Modify traffic signals at 132nd Avenue, 142nd Avenue, 147th Avenue and 152nd Avenue. Construct new traffic signals at 157th and 162nd Avenue.	Joint SDC Fund	2006-2010	$18,000
Sunnyside Road Widening Phase 3B	Widen to 5-lane major arterial between 162nd Avenue and 172nd Avenue. Construct a traffic signal at 167th and 172nd Avenue.	Joint SDC Fund	2006-2010	$5,000
172nd Avenue/Sunnyside Road	Install a traffic signal, provide a 5-lane approach to each leg.	Joint SDC Fund	2006-2010	$1,200
172nd Avenue Widening South	Widen to 5-lane major arterial between Sunnyside Road and Highway 212.	Joint SDC Fund	2011-2015	$15,000
172nd Avenue Widening North	Widen to 5-lane major arterial between Sunnyside Road and Clatsop Street.	Joint SDC Fund	2021-2025	$21,300
122nd/129th Avenue Widening*	Widen to 3-lane collector between Sunnyside Road and King Road and smooth curves.	Joint SDC Fund	2016-2025	$4,800
162nd Avenue Widening	Widen to 3-lane collector from Hagen Road to Sunnyside Road.	Joint SDC Fund	-	$5,300
162nd Avenue Extension South** (Roadway E)	Construct a new 3-lane collector south of the Taralon development to Highway 212.	Joint SDC Fund	-	$8,800
162nd Avenue Extension North** (Roadway D)	Construct a new 3-lane collector between Hagen Road and Clatsop Street.	Joint SDC Fund	-	$14,600
Clatsop Street Extension East** (Roadway C)	Construct a new 3-lane collector between 162nd Avenue and 172nd Avenue.	Joint SDC Fund	-	$2,050
Scouter Mountain South Roadway** (Roadway H)	Construct a new 3-lane east-west collector just north of Hagen Road between 147th Avenue and 172nd Avenue.	Joint SDC Fund	-	$5,000
Rock Creek Major Arterial** (Roadway M)	Construct a new 5-lane east-west major arterial from 172nd Avenue to the Sunrise Corridor Rock Creek interchange.	Joint SDC Fund	-	$15,700
	Total Motor Vehicle Project Costs			**$116,750**

*These projects were identified in the previous TSP.
**These projects would only occur with development or redevelopment and would not be initiated by the City.

Trucks

Efficient truck movement plays a vital role in the economical movement of raw materials and finished products. The establishment of through truck routes provides for this efficient movement while at the same time maintaining neighborhood livability, public safety, and minimizing maintenance costs of the roadway system. Sunnyside Road and 172nd Avenue are recommended as designated through truck routes in the TSP study area. The objective of these route designations is to allow these routes to focus on design criteria that are "truck friendly"; i.e. 12-foot travel lanes, longer access spacing, 35-foot (or larger) curb returns and pavement design that accommodates a larger share of trucks.

Other Modes

While auto, transit, bicycle and pedestrian transportation modes are the primary means of travel in Happy Valley, other modes of transportation must be considered and addressed. Future needs for alternative fuel vehicles, rail, air and water infrastructure are identified and summarized below.

Alternative Fuel Vehicles

The use of alternative fuel vehicles should be encouraged in Happy Valley. This could be achieved by providing incentives for electric car charging spaces at key activity centers and biodiesel stations within the City. Alternative fuel vehicles would use the same right-of-way as gasoline-powered vehicles.

Rail

There are no rail facilities within the City of Happy Valley. There are not expected to be any rail facilities within the City in the near future. Due to these considerations, no policies or recommendations in this area of transportation is provided for Happy Valley.

Air

There are no airports within the City of Happy Valley. Passenger service to Happy Valley residents is provided via Portland International Airport, approximately 10 miles to the north of Happy Valley.

Water

There are no navigable waterways in the Happy Valley TSP study area. No policies or recommendations in this area of transportation are provided.

Funding

Transportation funding is commonly viewed as a user fee system where the users of the system pay for infrastructure through motor vehicle fees (such as gas tax and registration fees) or transit fares. However, a great share of motor vehicle user fees goes to road maintenance, operation and preservation of the system rather than construction of new system capacity. Much of what the public views as new construction is commonly funded (partially or fully) through property tax levies, traffic impact fees and fronting improvements to land development. The City of Happy Valley utilizes a number of mechanisms to fund construction of its transportation infrastructure, including:

- State Fuel Tax and Vehicle License Fee
- Portland General Electric Privilege Tax
- System Development Charges

Under the above funding programs, Happy Valley would collect a total revenue of $129 million over the next 20 years. The majority of these funds are from estimated SDC fees which are based on the future land use forecasts and would be obtained from development. If the forecasted future growth does not occur than the amount of SDC revenue would be reduced drastically.

The cost estimates outlined in the Transportation System Plan to implement the Action Plans for Motor Vehicles, Transit, Bicycles and Pedestrians total $117.5 million, and the recommended transportation operations and maintenance programs would add $11.7 million for a total cost over 20 years of $129.2 million. Refer to Chapter 4 through 9 for details on the individual projects by travel mode. Note that some additional projects are listed in the Action Plans that are expected to be funded by other agencies (Metro, TriMet). These non-City costs have not been included in the estimates in Table 10-2, but are identified in the master plans.

Table 1-7: Happy Valley Transportation Action Plans Costs over 20 years (2004 Dollars)

Transportation Element	Approximate Cost ($1,000)
System Improvement Projects (Action Plans projects to be funded by the City)	
Pedestrian	$760
Bicycle	$0
Transit	$0
Motor Vehicle	$116,750
Total Capital Projects	**$117,510**
Operations and Maintenance Programs and Services	
Road Maintenance ($381,000/yr plus 150%)	$11,430
School Safety Program ($5,000/yr)	$100
Neighborhood Traffic Management ($10,000/yr)	$200
Total Operations and Maintenance Programs	**$11,730**
20 YEAR TOTAL	**$129,240**

The estimated $129 million for transportation capital projects and maintenance is expected to be adequately funded by the 20-year revenue estimate of $129 million (see Table 10-1). New funding sources to allow additional project on future Action Plans should be considered.

It is recommended that the City consider establishing a street utility fee in the near future to increase capital funding. Street utility fees can provide a stable source of dedicated revenue useable for transportation system operations and maintenance and/or capital construction. Rate revenues can also secure revenue bond debt if used to finance capital improvements. Street utilities can be formed by Council action, and billed through the City utility billing system.

In addition, the City should actively pursue grant and other special program funding in order to mitigate the costs to its citizens of transportation capital construction.

2. Goals and Policies

The goals and policies established by the 1998 TSP were adopted to guide transportation system development in Happy Valley. In addition to retaining and refining previously adopted policies that are still applicable, new policies have been incorporated to meet recent changes to state and regional transportation plan policies and regulations.

The following transportation-related goals and policies were developed with input from the Citizen's Advisory Committee and Technical Advisory Committee. Some policies are provided with additional background information and explanation regarding their implementation.

Goal 1: <u>Livability</u> - Transportation facilities shall be planned, designed and constructed in a manner which enhances the livability of Happy Valley.

Policy 1a: Build residential and neighborhood streets to discourage speeding.

The City will develop and maintain design standards and criteria for neighborhood traffic management for use in new development as well as existing neighborhoods for City streets. Measures to be developed may include narrower streets, speed bumps, traffic circles, curving streets, diverters, enforcement and/or other measures.

Policy 1b: Encourage pedestrian accessibility by providing safe, secure and desirable pedestrian routes.

The City will develop and maintain a pedestrian plan in Happy Valley, outlining pedestrian routes. Sidewalk standards will be developed to define various widths, as necessary, for City street types.

Policy 1c: The City shall encourage the use of alternative fuel vehicles and the use of more efficient transportation modes.

The City shall consider providing incentives to encourage development which supports the use of alternative fuel vehicles within Happy Valley (i.e. charging stations for electric cars, biodiesel stations, etc.)

Policy 1d: The City shall be open to alternative designs such as roundabouts, etc.

Goal 2: **<u>Mobility</u> - Transportation facilities shall accommodate commercial, industrial and residential growth and provides access though and around Happy Valley.**

Policy 2a: The City shall work to minimize traffic on local streets within the city by supporting improvements that limit the amount of cut-through traffic passing through Happy Valley except for on major arterials.

Policy 2b: In development of roadway projects, impacts to adjacent homes/properties should be considered, minimized, and balanced between providing a safe and efficient transportation facility.

The City shall create a balance between neighborhood impacts and traffic safety by considering varying street widths (via removal of planter strips and/or center turn lane/median or by narrowing travel lanes) as well as traffic needs when roadway improvements are made.

Policy 2c: Balance the functional classification system throughout the City.

The City shall design an appropriate balance of local, collector, and arterial streets to accommodate the mobility needs of the City. This may include designing additional arterial streets as well as maintaining the functionality of the existing classifications of streets (i.e. a collector shall function as a collector, not a local street)

Goal 3: <u>Multi-Modal Travel</u> - Happy Valley shall strive to achieve a balanced transportation system that reduces the number of trips by single occupant vehicles by meeting the needs of auto, bicycle, pedestrian, and transit and increasing the connectivity for alternate travel modes.

Policy 3a: Bicycle lanes must be constructed on all arterials and collectors within Happy Valley (with construction or reconstruction projects). All schools, parks, public facilities and retail areas shall have direct access to a bikeway.

The City will develop a bicycle plan which connects key activity centers (such as schools, parks, public facilities and retail areas) with adjacent access. Standards for bicycle facilities within Happy Valley will be developed and maintained. Where activity centers are on local streets, connections to bicycle lanes shall be designated.

Policy 3b: Sidewalks must be constructed on all streets within Happy Valley (with construction or reconstruction projects). All schools, parks, public facilities and retail areas shall have direct access to a sidewalk.

The City will develop a pedestrian plan which connects key activity centers with adjacent access. Standards for pedestrian facilities within Happy Valley will be developed and maintained.

Policy 3c: Bicycle and pedestrian plans shall be developed which link to existing and planned recreational trails.

The bicycle and pedestrian plans will need to indicate linkages between recreational and basic pedestrian networks.

Policy 3d: The City shall coordinate with Tri-Met to improve transit service in Happy Valley. Fixed route transit will use arterial and collector streets in Happy Valley. Park & Ride lots will be provided to accommodate concentrated transit demands where feasible.

The Regional Transportation Plan (RTP) and Tri-Met service plan will be the guiding documents for development of Happy Valley's transit plan. The City should provide input to Tri-Met regarding their specific needs, such as maintaining the existing dial-a-ride service provided within the Happy Valley City limits or regarding desired new routes.

Policy 3e: Local streets shall be designed to encourage a reduction in trip length by providing connectivity and limiting out-of-direction travel. Connectivity shall be provided according to published Metro street connectivity guidelines that improve local circulation by providing connections to activity centers and destinations, with a priority for pedestrian connections.

The purpose of this policy is to provide accessibility within Happy Valley, with a focus on pedestrian connectivity. Pedestrian connectivity can be provided via pedestrian/bike paths between cul-de-sacs and/or greenways where auto connectivity does not exist or is not feasible. Wherever necessary, new streets built to provide connectivity shall incorporate traffic management design elements, particularly those which inhibit speeding.

Policy 3f: Happy Valley will participate in vehicle trip reduction strategies developed regionally.

DEQ and Metro are developing regional policies regarding trip reduction. Some of these policies are aimed at provision of parking and others are aimed at ridesharing (Employee Commute Options - ECO rules).

Policy 3g: Pedestrian access to transit will be improved as transit services increases in the future.

Policy 3h: The City will persue the expansion of the regional and local trail system with new development.

The City will coordinate regional trail development with Metro. Design standards for recreational elements will need to be developed and maintained.

Goal 4: <u>Safety</u> - Happy Valley shall strive to achieve a safe transportation system by developing street standards, access management policies when constructing streets and by making street maintenance a priority.

Policy 4a: Design of streets should relate to their intended use and function.

A functional classification system shall be developed for Happy Valley which meets the City's needs and respects needs of other agencies (Clackamas County, Metro, City of Portland). Appropriate design standards for these roadways will be developed by the appropriate jurisdiction.

Policy 4b: Safe and secure routes to schools shall be designated for each school and any new residential project shall identify the safe path to school for children.

Working with the school district and citizens, the City will need to undertake a process of defining school route.

Policy 4c: Safe and secure pedestrian and bikeways shall be designed between parks and other activity centers in Happy Valley.

Policy 4d: Street maintenance shall be a priority to improve safety in Happy Valley.

The City shall coordinate with Clackamas County for the maintenance of those facilities within the City maintained by the County.

Policy 4e: Access management standards shall be developed in conjunction with the functional classification system for Happy Valley to improve safety in Happy Valley.

Access control standards shall be developed for each street classification. These standards shall be applied to all new road construction and new development. For roadway reconstruction, existing driveways shall be compared with the standards and a reasonable attempt shall be made to comply.

Policy 4f: New roadways shall meet lighting standards. Existing roadways shall be systematically retrofitted with roadway lighting.

Priority locations for roadway lighting include schools, parks, town center. The City shall coordinate with the County lighting district.

Goal 5: <u>Evaluation</u> - Transportation performance measures shall be maintained in the City.

Policy 5a: A minimum intersection level of service standard shall be maintained for the City of Happy Valley. All signalized intersections shall operate at level of service D or better during the peak hour of analysis. All unsignalized intersections shall operate at level of service E or better (based on average approach delay) for all side street approaches during the peak hour of analysis. The City shall utilize these standards to evaluate land use actions and proposed mitigations. All public facilities shall be designed to meet these standards.

The intersection level of service standards shall be listed in the Land Development Code (LDC) for the City of Happy Valley.

Policy 5b: Parking ratios shall be set to provide adequate parking, while providing an incentive to limit the use of the single occupant vehicle consistent with Title 2 regional standards.

Parking standards shall be listed in the Land Development Code (LDC) for the City of Happy Valley. DEQ is encourages lower parking ratios to encourage use of alternative modes (walking, biking, transit, car pooling, etc.).

Policy 5c: For purposes of compliance with OAR 660-12-060 (Transportation Planning Rule), the City will consider only improvements listed in the Financially Constrained funding scenario of the Regional Transportation Plan, and/or in the City's Capital Improvement Plan (CIP), in determining the planned capacity, function and level of service of transportation facilities and services. This policy will apply to all plan and ordinance amendments.

Goal 6: <u>Accessibility</u> - Develop transportation facilities which are accessible to all members of the community.

Policy 6a: Design and construct transportation facilities to meet the requirements of the Americans with Disabilities Act.

Goal 7: <u>Cooperation</u> - Implement the Transportation System Plan (TSP) in a coordinated manner.

Policy 7a: Coordinate and cooperate with adjacent agencies when necessary to develop transportation projects which benefit the region as a whole in addition to the City of Happy Valley.

Policy 7b: Plan transportation projects which are consistent with the amount of funding available.

Goal 8: <u>Goods Movement</u> - Provide for efficient movement of goods and services.

Policy 8a: All collector, neighborhood route, and local streets in Happy Valley shall limit through truck traffic.

Policy 8b: Specific arterials shall be designated as freight routes for through truck movements.

Policy 8c: Develop adjacent land uses in ways that facilitate the efficient movement of goods and services.

3. Existing Conditions

This chapter presents the existing condition of the transportation network in the study area for the Happy Valley transportation system plan. The purpose of this chapter is to document existing transportation facilities in the study area. The findings will be a basis for determining the existing transportation needs and developing future transportation projects within the study area.

Overview

Existing transportation conditions were evaluated as part of the City of Happy Valley TSP Update. An analysis of current conditions provides an understanding of facility development, service and performance. This chapter summarizes existing transportation operation in the City for all travel modes including pedestrians, bicycles, transit, motor vehicles, freight, water and air, as applicable. To understand existing travel patterns and conditions, multiple aspects of the city's transportation system were considered. An inventory was conducted in the Spring of 2005 to establish base year conditions for the TSP. Much of this data provides a basis of comparison for future assessment of transportation performance in Happy Valley relative to desired policies.

The study area includes the City of Happy Valley and the surrounding area transportation system network. The study area for this TSP update is shown in Figure 3-1.

Twenty-four intersections within the study area were selected for focused operational analysis. Data was gathered at these locations to evaluate traffic conditions including vehicle delays and levels of service. The following sections review the existing transportation systems including pedestrian, bicycle, transit, motor vehicle and other modes (such as heavy vehicle, rail, marine, etc.) and their performance within the City of Happy Valley.

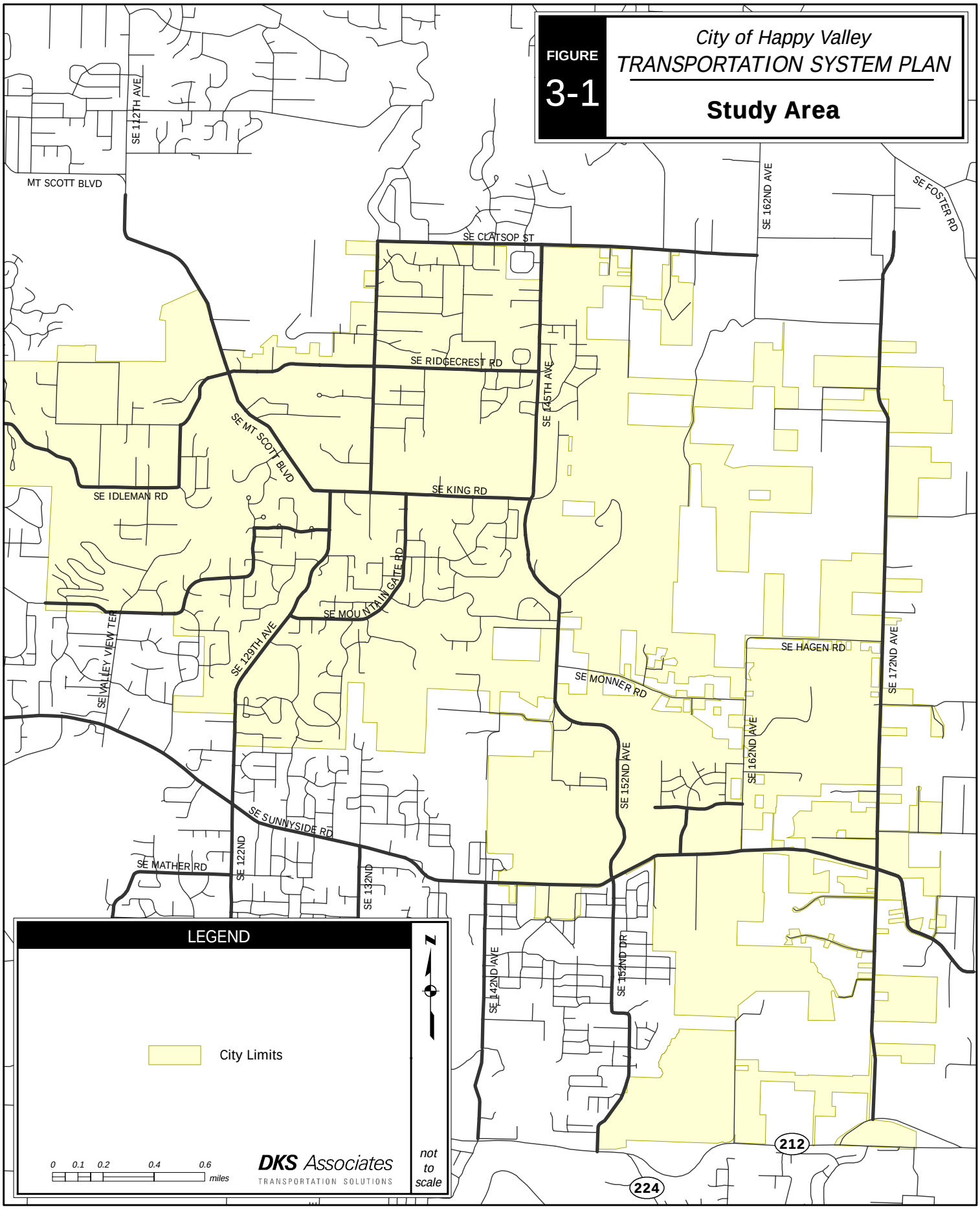


FIGURE
3-1
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Study Area
SE 112TH AVE
MT SCOTT BLVD
SE CLATSOP ST
SE 162ND AVE
SE FOSTER RD
SE RIDGECREST RD
SE 145TH AVE
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SE MOUNTAIN GATE RD
SE VALLEY VIEW TER
SE 129TH AVE
SE HAGEN RD
SE MONNER RD
SE 172ND AVE
SE 152ND AVE
SE 162ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 132ND
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
N
not to scale

PEDESTRIANS

The arterial and collector streets in Happy Valley have intermittent sidewalks. Although many of the study area intersections have sidewalks on each approach leg, often the connectivity beyond the intersection is poor and does not extend far from the intersection. Many of the new residential developments in the area have sidewalks within the development, but are lacking a connection to other nearby sidewalks, thus discouraging walking as a viable, safe mode of travel. Figure 3-2 shows the existing sidewalk inventory in Happy Valley. Sidewalks on either side of residential streets are shown in Figure 3-2. Residential developments constructed in the last 15 years have sidewalks typically on both sides of residential streets. There are very few exceptions where new residential streets have sidewalks on only one side of the street. The Sunnyside Road Phase 2/3A Improvement project will begin construction in early June of 2005 and will construct sidewalks on both sides of Sunnyside Road from 122nd Avenue to 162nd Avenue.

Pedestrian counts were conducted during the PM peak hour at 12 of the study intersections. Additional pedestrian crossing data from the other 12 intersections within the study area was obtained from other recent traffic counts conducted previously. These counts represent a sample of the existing pedestrian activity based on one evening peak period. Pedestrian activity is influenced by factors such as time of year and weather conditions; variations would be expected with data collection over time based on these factors. Generally, the proximity to adjacent land uses (i.e. schools, parks, commercial developments) are the most significant predictors of pedestrians and thus represent key areas for sidewalk placement and connectivity. Pedestrian crossing volumes are shown in Table 3-1.

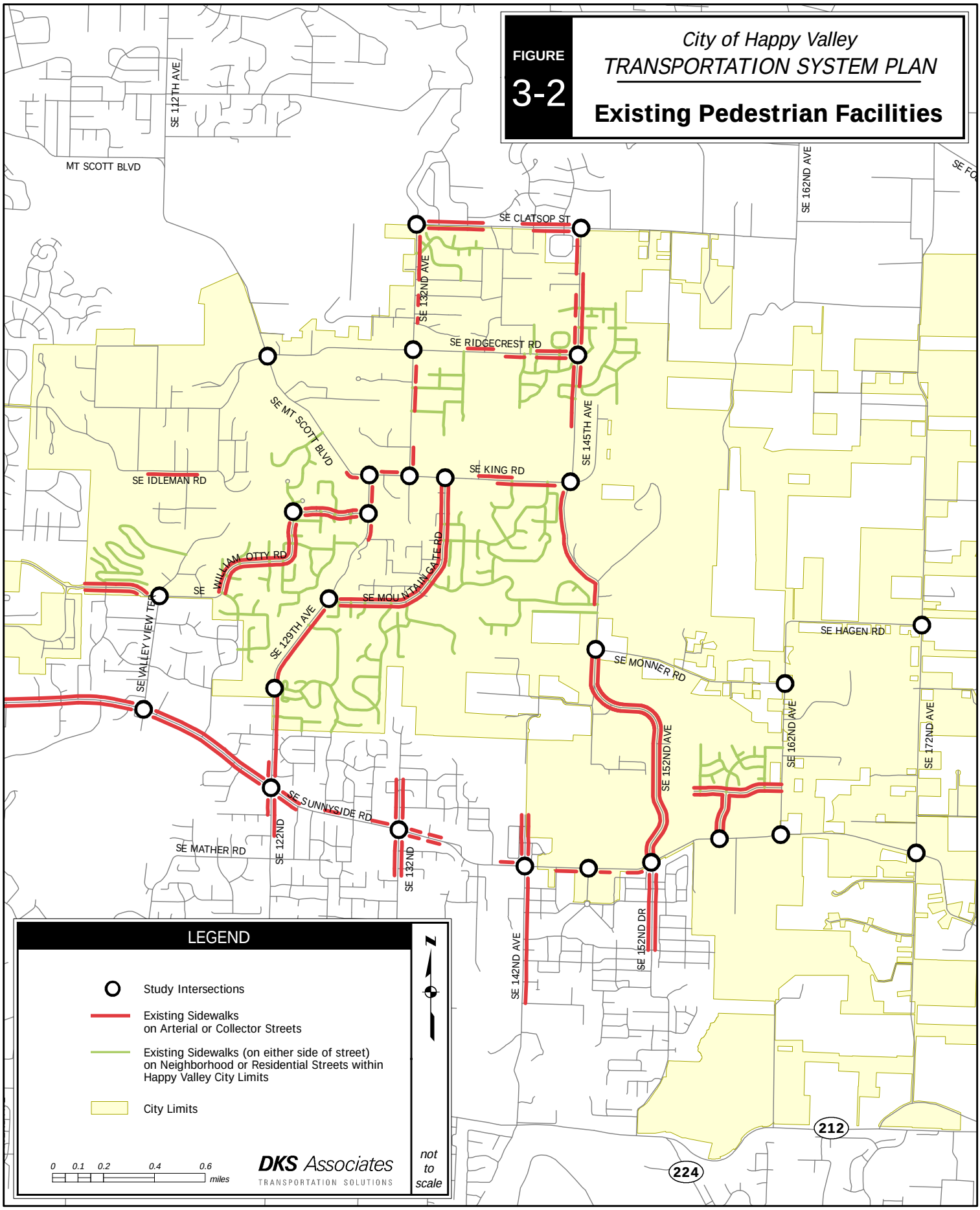


FIGURE
3-2
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Existing Pedestrian Facilities
MT SCOTT BLVD
SE 112TH AVE
SE CLATSOP ST
SE 132ND AVE
SE RIDGECREST RD
SE 162ND AVE
SE MT SCOTT BLVD
SE 145TH AVE
SE IDLEMAN RD
SE KING RD
WILLAMETTE VALLEY VIEW TER
SE WILLAMETTE FALLS DR
SE MOUNTAIN GATE RD
SE 129TH AVE
SE HAGEN RD
SE MONNER RD
SE 152ND AVE
SE 162ND AVE
SE 172ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 132ND
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
Study Intersections
Existing Sidewalks on Arterial or Collector Streets
Existing Sidewalks (on either side of street) on Neighborhood or Residential Streets within Happy Valley City Limits
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

Table 3-1: Pedestrian Crossing Volumes (Weekday PM Peak Hour)

Intersection	Pedestrian Crossing Volume
Sunnyside Road/Valley View Terrace	17
Sunnyside Road/122nd Avenue	0
Sunnyside Road/132nd Avenue	3
Sunnyside Road/142nd Avenue	14
Sunnyside Road/147th Avenue	7
Sunnyside Road/152nd Avenue	0
Sunnyside Road/162nd Avenue	0
Sunnyside Road/172nd Avenue	0
162nd Avenue/Monner Road	0
172nd Avenue/Hagen Road	0
147th Avenue/Monner Road	3
145th Avenue/King Road	-
145th Avenue/Callahan Road	-
145th Avenue/Clatsop Road	2
132nd Avenue/King Road	16
132nd Avenue/Ridgecrest Road	-
132nd Avenue/Clatsop	6
122nd Avenue/Spring Mountain Drive	-
129th Avenue/Mountain Gate Road	-
129th Avenue/William Otty Road	2
129th Avenue/King Road/Mt. Scott	1
William Otty Road/Kimberly Court	9
William Otty Road/Valley View Terrace	13
Mt. Scott Boulevard/Idleman Road/Ridgecrest Road	2

This table represents volumes collected during a peak period (4:00-6:00 p.m.) that cross all four (or three as applicable) legs of the intersection.

The highest pedestrian volumes were observed at 142nd Avenue/Sunnyside Road, Valley View Terrace/Sunnyside Road and 132nd Avenue/King Road. These pedestrian trips are likely generated by the adjacent land use. William Otty Road at Valley View Terrace and Kimberly Court also experienced moderate pedestrian volumes.

BICYCLES

The arterial and collector roadway system within the study area has intermittent bicycle facilities. Mountain Gate road has bicycle lanes in both directions and Clatsop Street has bicycle lanes between 132nd Avenue and 145th Avenue. In many roadway sections, the north-south connections end abruptly and do not extend far from Sunnyside Road.

Many collectors in the area have intermittent bike lanes, particularly around schools or other newer residential developments that do not connect and leave the bicyclist forced to share the travel lane with motor vehicles or use the shoulder. In many cases, this is not a desirable option for bicyclists due to narrow widths and uneven pavement conditions. The hilly topography also poses additional safety issues for bicycles sharing the traveled lane with motor vehicles. Figure 3-3 shows the existing inventory of bicycle lanes throughout the study area.

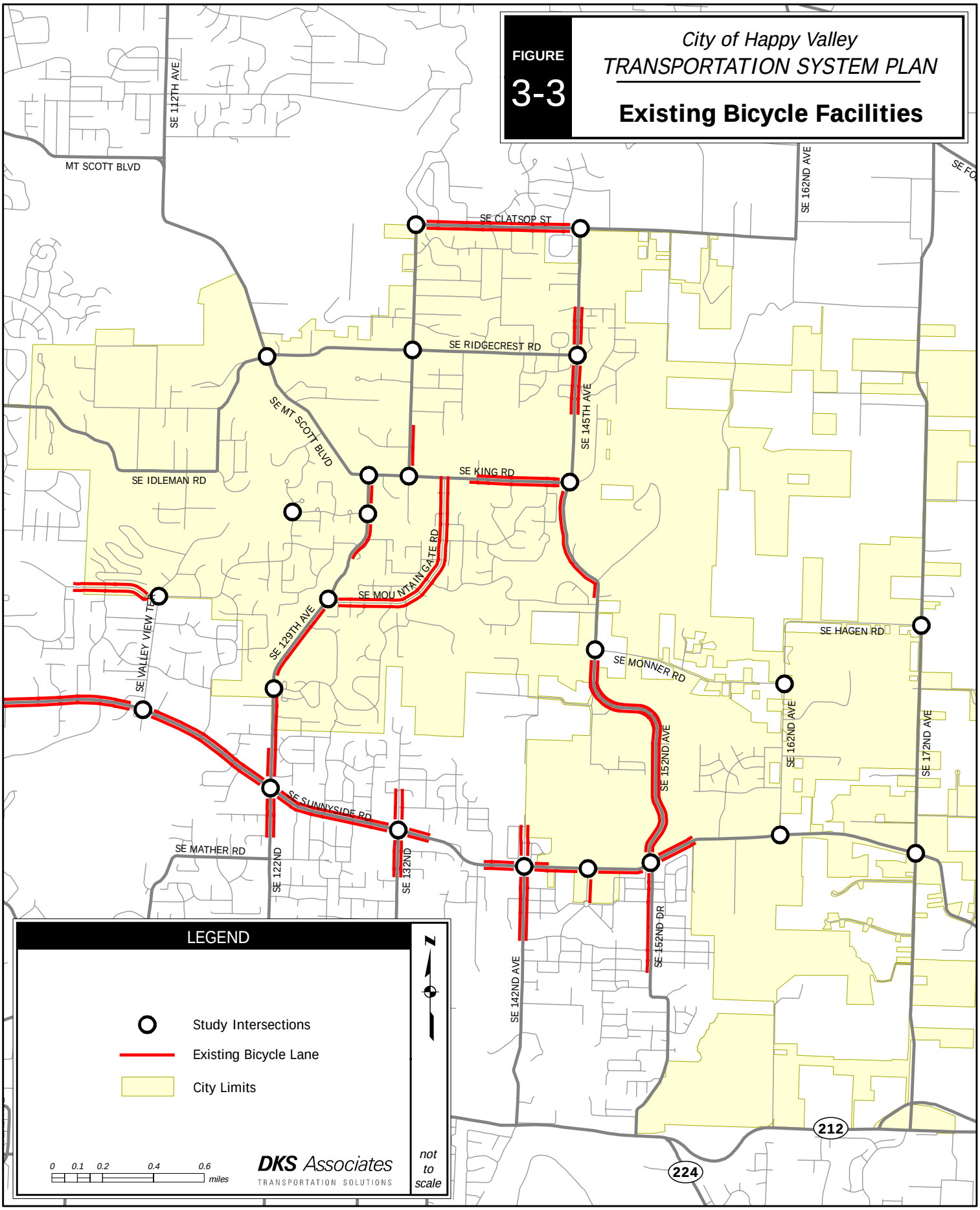


FIGURE
3-3
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Existing Bicycle Facilities
SE 112TH AVE
MT SCOTT BLVD
SE CLATSOP ST
SE 162ND AVE
SE RIDGECREST RD
SE MT SCOTT BLVD
SE 145TH AVE
SE IDLEMAN RD
SE KING RD
SE MOUNTAINGATE RD
SE VALLEY VIEW TER
SE 129TH AVE
SE HAGEN RD
SE MONNER RD
SE 152ND AVE
SE 162ND AVE
SE 172ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 132ND
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
Study Intersections
Existing Bicycle Lane
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

TRANSIT

Transit service is provided in Happy Valley by Tri-Met. Currently there are two routes serving Sunnyside Road and Happy Valley. Bus route 155 services Sunnyside Road and extends from the Clackamas Town Center to 147th Avenue. Route 157 operates north of Sunnyside Road along 129th Avenue and 132nd Avenue in the northbound direction and along 145th Avenue and Mountain Gate Road in the southbound direction as it completes its one-way loop. Most of the bus stops along these routes have minimal amenities, many only have a bench. Both of these routes offer standard service with existing headways of one hour throughout the day. Route 157 does not operate on Sunday. Route 156 serves the area south of Sunnyside Road with the northernmost stop on Oregon Trail Drive within Sunnyside Village. Figure 3-4 shows the transit routes and bus stops serving the City of Happy Valley. Also shown on the figure are routes 19 and 31 that connect to routes serving Happy Valley, but are not within the study area. There are no park and ride lots located within the study area. Annual weekday bus boardings were obtained from the 2003 Tri-Met Census. Table 3-2 shows the transit stop locations and the weekday bus boardings for stops on routes 155, 156, and 157 that are within the study area.

Table 3-2: Transit Stop Locations and Daily Weekday Boardings

Route	Stop Location	Direction	On	Off	Total
155	Sunnyside/Valley View	Westbound	5	2	7
155	Sunnyside/119th	Eastbound	3	9	12
155	Sunnyside/122nd	Westbound	1	1	2
155	Sunnyside/122nd	Eastbound	2	4	6
155	Sunnyside/128th	Eastbound	0	1	1
155	Sunnyside/128th	Westbound	0	0	0
155	Sunnyside/132nd	Eastbound	1	4	5
155	Sunnyside/132nd	Westbound	5	2	7
155	Sunnyside/139th	Eastbound	1	4	5
155	Sunnyside/140th	Westbound	2	0	2
155	Sunnyside/142nd	Eastbound	0	2	2
155	Sunnyside/142nd	Westbound	2	1	3
155	Sunnyside/145th	Eastbound	0	2	2
155	Sunnyside/145th	Westbound	0	0	0
155	14682 SE 147th	Eastbound	10	8	18
155	14718 SE 147th	Westbound	10	9	19
155	Oregon Trail/Hines	Eastbound	0	3	3
155	Oregon Trail/Hines	Westbound	4	0	4
	Total Route 155		**46**	**52**	**98**
156	Oregon Trail/Hines	Eastbound	2	1	3
156	Oregon Trail/Hines	Westbound	1	1	2
	Total Route 156		**3**	**2**	**5**
157	Sunnyside/114th	Northbound	0	1	1
157	Sunnyside/114th	Southbound	1	0	1
157	Sunnyside/119th	Northbound	1	6	7
157	Sunnyside/119th	Southbound	4	1	5

Route	Stop Location	Direction	On	Off	Total
157	Sunnyside/Valley View	Southbound	4	1	5
157	122nd/One Rosa Dr	Northbound	0	2	2
157	122nd/One Rosa Dr	Southbound	1	0	1
157	122nd /Spring Mountain	Northbound	0	1	1
157	122nd /Spring Mountain	Southbound	0	0	0
157	129th/Masa Lane	Northbound	0	0	0
157	129th/Masa Lane	Southbound	0	0	0
157	129th/Scott Creek Lane	Northbound	2	2	4
157	129th/King	Northbound	1	0	1
157	132nd/Geneva	Northbound	0	0	0
157	132nd/Parkside	Northbound	0	0	0
157	132nd/Callahan	Northbound	0	0	0
157	132nd/Lucille	Northbound	1	1	2
157	Clatsop/141st	Northbound	3	2	5
157	Clatsop/144th	Northbound	0	3	3
157	Clatsop/144th	Southbound	2	0	2
157	145th/Carmichael	Southbound	0	0	0
157	145th/Purple Finch	Southbound	0	0	0
157	10322 145th	Southbound	0	0	0
157	14352 King	Southbound	0	0	0
157	King/Happy Valley	Southbound	0	0	0
157	King/Regina	Southbound	1	0	1
157	Mountain Gate/King	Southbound	0	0	0
157	Mountain Gate/Beckett	Southbound	0	0	0
157	Mountain Gate/Blaze	Southbound	1	0	1
157	Mountain Gate/Evening Star	Southbound	0	0	0
	Total Route 157		**22**	**20**	**42**

As shown by the 2003 census data, ridership is low on the routes serving Happy Valley, specifically Route 157 with very few weekday boardings. Bus stops are located close together, requiring frequent stops and contributing to slower overall service.

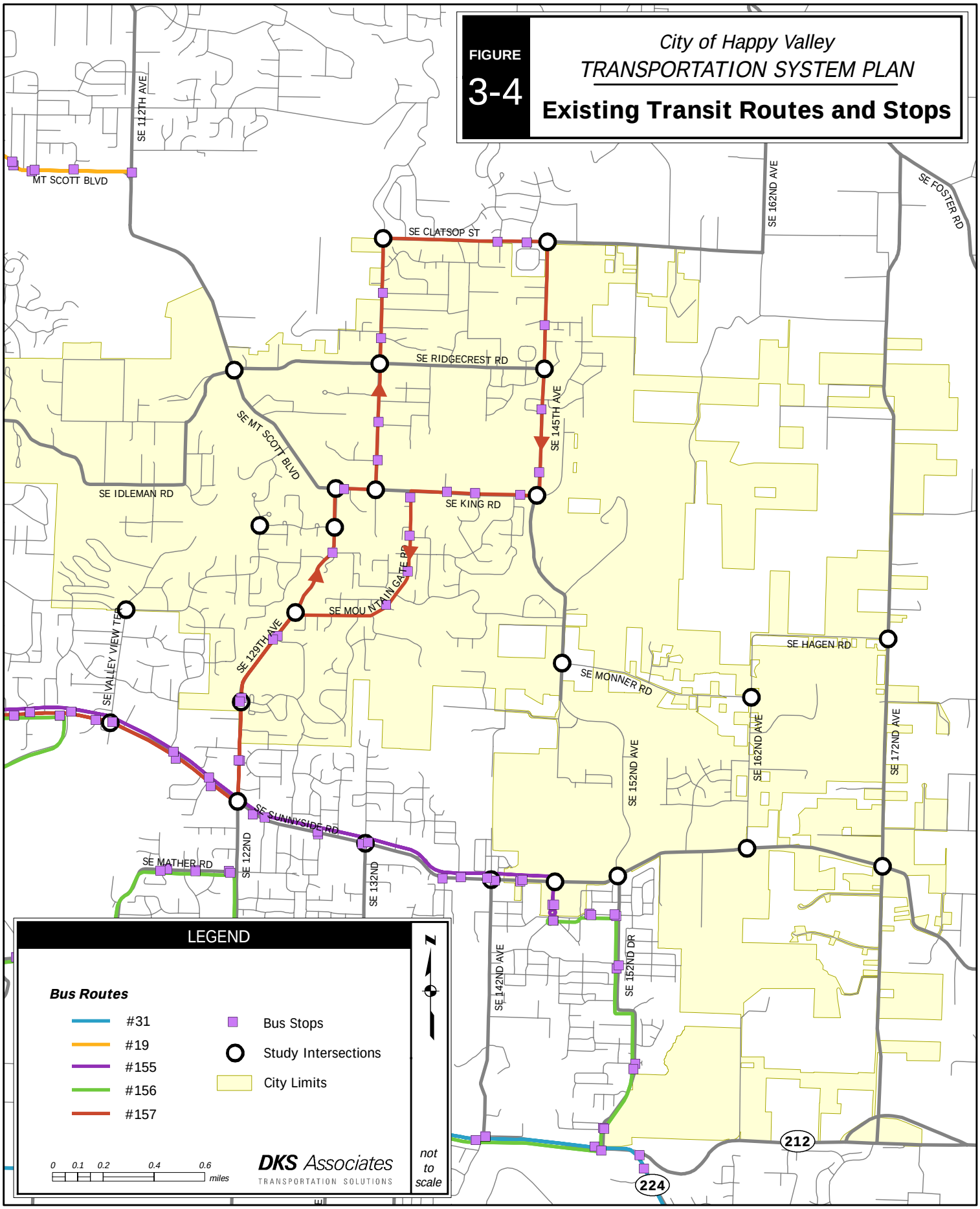


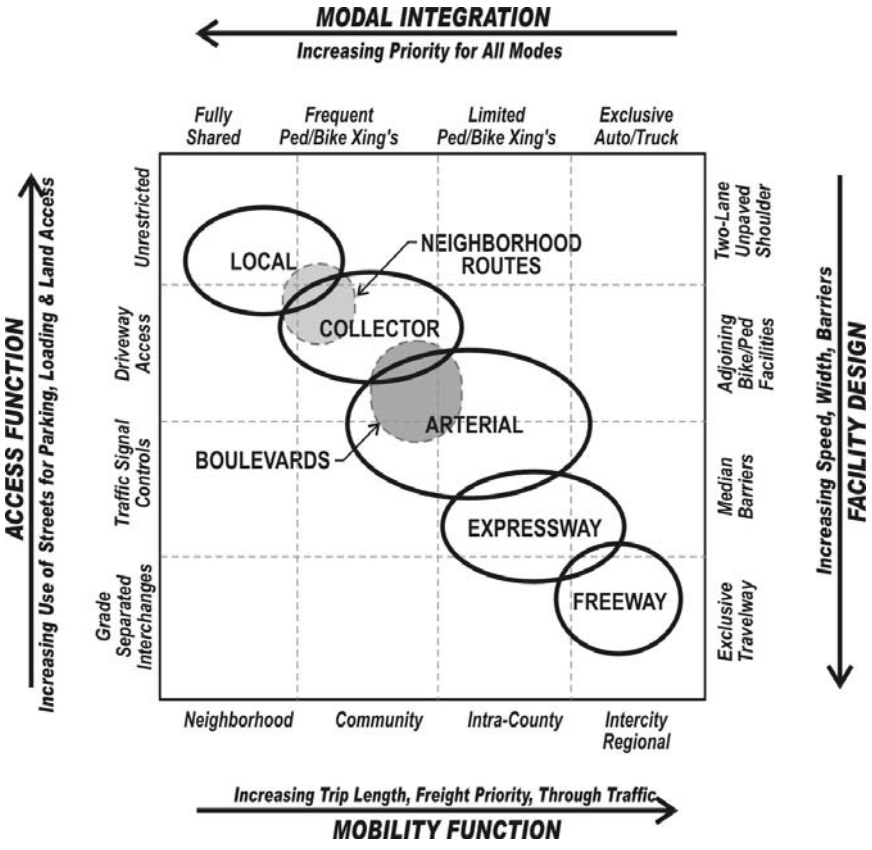
FIGURE
3-4
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Existing Transit Routes and Stops
MT SCOTT BLVD
SE 112TH AVE
SE CLATSOP ST
SE 162ND AVE
SE FOSTER RD
SE RIDGECREST RD
SE 145TH AVE
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SE MOUNTAIN GATE DR
SE VALLEY VIEW TER
SE 129TH AVE
SE HAGEN RD
SE MONNER RD
SE 152ND AVE
SE 162ND AVE
SE 172ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 132ND
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
Bus Routes
#31
#19
#155
#156
#157
Bus Stops
Study Intersections
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

MOTOR VEHICLES

Functional Classification

The functional classification system is designed to serve transportation needs within the community. The schematic diagram below shows the competing functional nature of roadway facilities as it relates to access, mobility, multi-modal transport, and facility design. The diagram is useful to understand how worthwhile objectives can have opposing effects. For example, as mobility is increased (bottom axis), the provision for non-motor vehicle modes (top axis) is decreased accordingly. Similarly, as access increases (left axis), the facility design (right axis) dictates slower speeds, narrower roadways, and non-exclusive facilities. The goal of selecting functional classes for particular roadways is to provide a suitable balance of these four competing objectives.

The diagram shows that as street classes progress from local to freeway the following occurs:



Mobility Increases – Longer trips between destinations, greater proportion of freight traffic movement, and a higher proportion of through traffic.

Integration of Pedestrian and Bicycle Decreases – Provisions for sidewalks and bike facilities are required up through the arterial class, however, the frequency of intersection or mid-block crossings for non-motorized vehicles steadily decreases with higher functional classes. The expressway and freeway facilities typically do not allow pedestrian and bike facilities adjacent to the roadway and crossings are grade-separated to enhance mobility and safety.

Access Decreases – The shared uses for parking, loading, and direct land access is reduced. This occurs through parking regulation, access control and spacing standards (see opposite axis).

Facility Design Standards Increase – Roadway design standards require increasingly wider, faster facilities leading to exclusive travel ways for autos and trucks only. The opposite end of the scale is the most basic two-lane roadway with unpaved shoulders.

Two additional areas are noted on the diagram for Neighborhood Routes and Boulevards that span two conventional street classes.

The existing functional classifications from the 1998 Happy Valley TSP, the Rock Creek Plan and the Clackamas County Functional Classification Plan are shown in Figure 3-5. Where a roadway has different classifications, the Rock Creek Classification took precedence, then the Happy Valley TSP and then the Clackamas County Plan in terms of what is shown on Figure 3-5. The figure identifies five roadway classifications: major arterial (Clackamas County), minor arterial, collector, neighborhood and local. Two state roadways are located south of the TSP study area. The Oregon Highway Plan provides the functional classification of state roadways. Highway 212 is designated as a Statewide Highway and Highway 224 is designated as a District Highway.

This TSP update should address the limitations of the existing functional class and establish a system that meets City and regional policy issues. A functional class system based primarily on connectivity would allow the design flexibility to handle each of the issues identified above.

Roadway Jurisdiction

Roadway ownership and maintenance responsibilities of arterial and collector roadways in the TSP study area are identified in Figure 3-6. Most arterial and collector roadways north and west of Sunnyside Road and 172nd Avenue are under City jurisdiction. In general, residential and neighborhood classified roadways (see Figure 3-5) within the city limits are under City jurisdiction. The remaining arterial and collector roadways in the TSP study area are under County jurisdiction. Highway 212 and 224 south of the TSP study area are under State jurisdiction.

Connectivity

The existing street network within Happy Valley is bounded by Sunnyside Road on the south. Sunnyside Road serves as the primary arterial and represents the only direct connector between the east and west boundaries of town. Currently 152nd Avenue/147th Avenue/145th Avenue provides the only direct north/south connector that connects Sunnyside Road with the northern most limits of the City. The remaining street network is made up of roadways with limited connectivity from the edge of the study area to edge of study area. Many of the collectors in the northern or "bowl" section of the city consist of older roadways and narrow travel lanes, mixed with newer facilities with bike lanes and sidewalks.

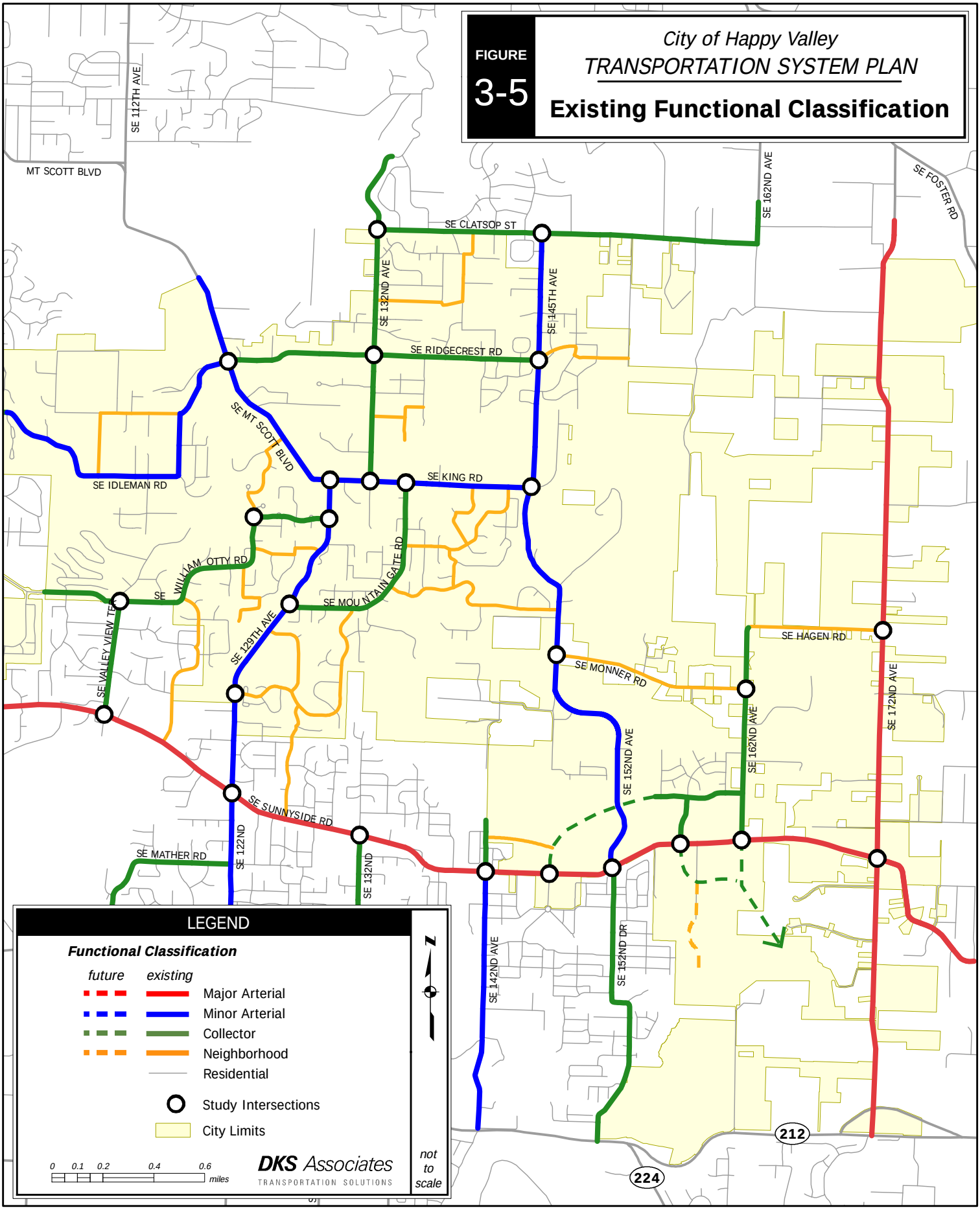


FIGURE
3-5
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Existing Functional Classification
SE 112TH AVE
MT SCOTT BLVD
SE CLATSOP ST
SE 132ND AVE
SE 145TH AVE
SE 162ND AVE
SE FOSTER RD
SE RIDGECREST RD
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SE WILLIAM OTTY RD
SE MOUNTAIN GATE RD
SE VALLEY VIEW TER
SE 129TH AVE
SE HAGEN RD
SE MONNER RD
SE 152ND AVE
SE 162ND AVE
SE 172ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 132ND
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
Functional Classification
future
existing
Major Arterial
Minor Arterial
Collector
Neighborhood
Residential
Study Intersections
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

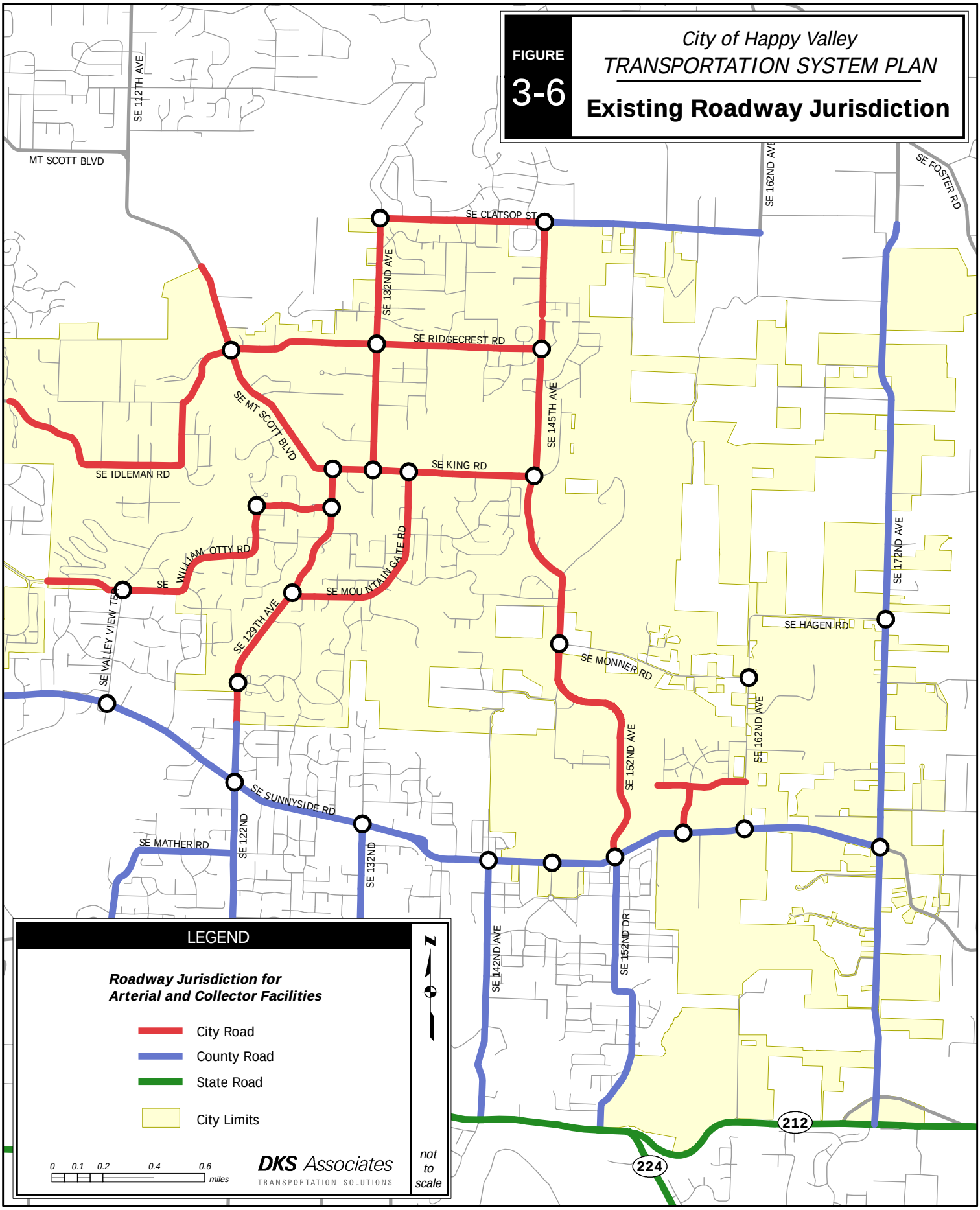


FIGURE
3-6
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Existing Roadway Jurisdiction
MT SCOTT BLVD
SE 112TH AVE
SE CLATSOP ST
SE 132ND AVE
SE RIDGECREST RD
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SE 145TH AVE
SE 162ND AVE
SE FOSTER RD
SE WILLIAM OTTY RD
SE MOUNTAIN GATE RD
SE VALLEY VIEW TER
SE 129TH AVE
SE HAGEN RD
SE 172ND AVE
SE MONNER RD
SE 152ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 132ND
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
Roadway Jurisdiction for
Arterial and Collector Facilities
City Road
County Road
State Road
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

ROADWAY CHARACTERISTICS

Field observations were conducted to determine existing characteristics of collectors and arterials within the TSP study area. Data collected included posted speed limits, roadway lanes and intersection controls. These characteristics define roadway capacity and operating speeds through the street system, which affects travel path choices for drivers in Happy Valley.

Vehicle Speeds

Figure 3-7 shows an inventory of the posted speeds in Happy Valley. Sunnyside Road is posted at 40 mph through the entire length of the study area. In general, local and collector roadways are posted at 25 or 35 mph with a few sections posted higher at 40 or 45 mph. The highest posted speed limit within the study area is 45 mph. There are also school zones on King Road, 132nd Avenue and 122nd Avenues that have lower posted speed limits of 20 mph during school periods.

Roadway speed surveys were conducted at four locations over a 24 hour period to determine existing vehicle speed conditions. The 85th percentile vehicle speed represents a condition when 15 percent of the vehicles surveyed were traveling faster than the 85th percentile speed and 85 percent of the vehicles were traveling slower than the 85th percentile speed. Table 3-3 summarizes the speed survey findings.

Table 3-3 Speed Survey Data

Speed Survey Location	NB	SB	EB	WB	85th Percentile Average	50th Percentile Average
147th south of Monner	39	39	-	-	39	34
129th south of Mountain Gate	42	40	-	-	41	36
Mt. Scott Blvd north of Ridgecrest	46	46	-	-	46	41
King Avenue east of 129th Avenue	-	-	37	36	37	32

Intersection Control

The only signalized intersections within the City of Happy Valley are located along Sunnyside Road. The remaining intersections are controlled by stop signs. The 24 study intersection locations and the existing intersection controls are shown in Figure 3-7. The study intersections include six signalized intersections, 14 intersections with stop sign control and four all-way stop controlled intersection.

Roadway Cross-section

The existing number of travel lanes on key roadways in Happy Valley are shown in Figure 3-8. The widest roadway is Sunnyside Road, which ranges from 7-lanes at west of 122nd Avenue to two lanes at 172nd Avenue. The remaining roads in Happy Valley are generally two lane roadways.

The key roadways in Happy Valley were measured in various locations to determine typical cross-section widths. Many of the streets within the study area have new sections intermixed with older sections, resulting in ranges of roadway widths depending on location. Figure 3-8 also shows the existing roadway widths.

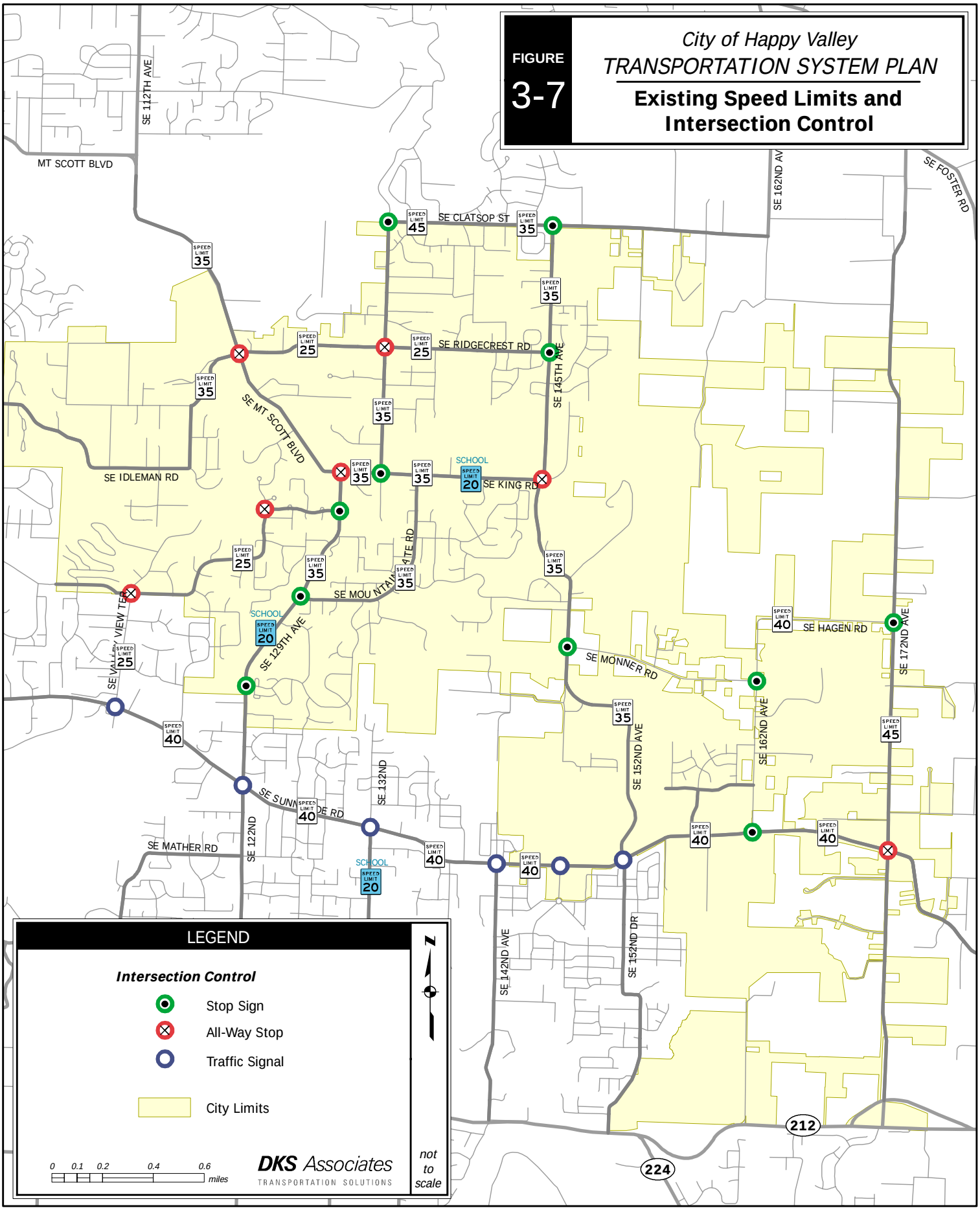


FIGURE
3-7
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Existing Speed Limits and Intersection Control
SE 112TH AVE
MT SCOTT BLVD
SE CLATSOP ST
SE RIDGECREST RD
SE 145TH AVE
SE 162ND AVE
SE FOSTER RD
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SCHOOL
SE MOUNTAIN TE RD
SE VALLEY VIEW TER
SE 129TH AVE
SE MONNER RD
SE HAGEN RD
SE 172ND AVE
SE 152ND AVE
SE 132ND
SE SUNNYSIDE RD
SE 122ND
SE MATHER RD
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
Intersection Control
Stop Sign
All-Way Stop
Traffic Signal
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

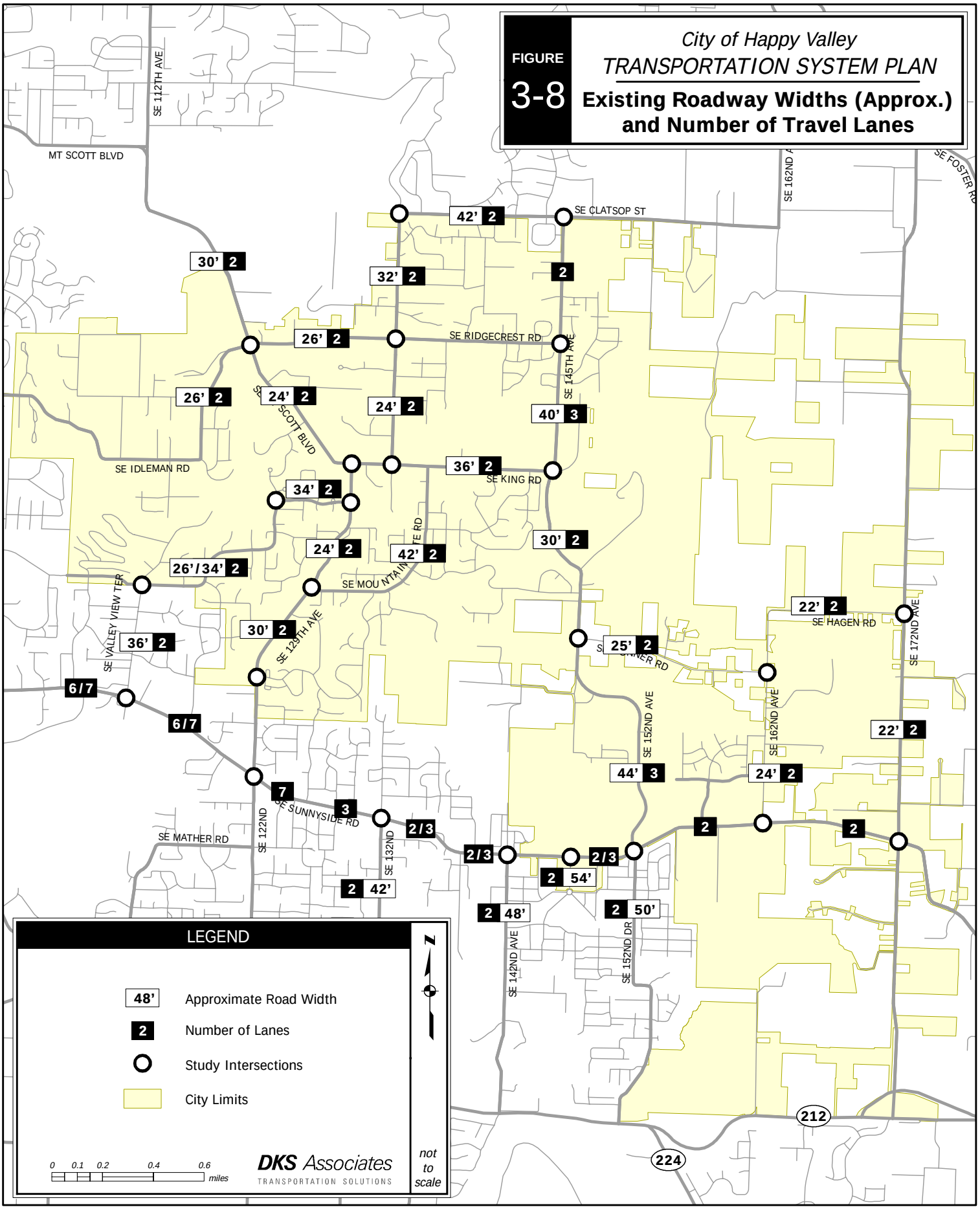


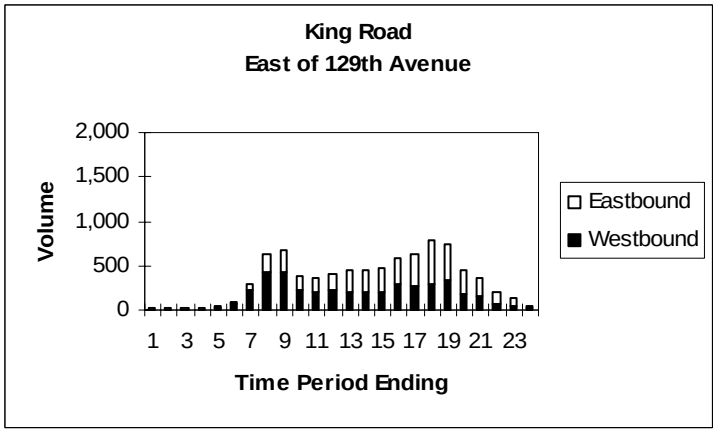
FIGURE
3-8
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Existing Roadway Widths (Approx.) and Number of Travel Lanes
MT SCOTT BLVD
SE 112TH AVE
SE CLATSOP ST
SE 162ND AVE
SE FOSTER RD
42' 2
30' 2
32' 2
2
26' 2
SE RIDGECREST RD
SE 145TH AVE
26' 2
24' 2
24' 2
40' 3
SE IDLEMAN RD
36' 2
SE KING RD
34' 2
30' 2
24' 2
42' 2
26'/34' 2
SE MOUNTAIN TOP RD
SE VALLEY VIEW TER
30' 2
SE 129TH AVE
22' 2
SE HAGEN RD
SE 172ND AVE
36' 2
25' 2
6/7
6/7
SE 152ND AVE
SE 162ND AVE
22' 2
44' 3
24' 2
7
3
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 132ND
2/3
2/3
2/3
2
2
2
2 54'
2 42'
2 48'
2 50'
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
48' Approximate Road Width
2 Number of Lanes
Study Intersections
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

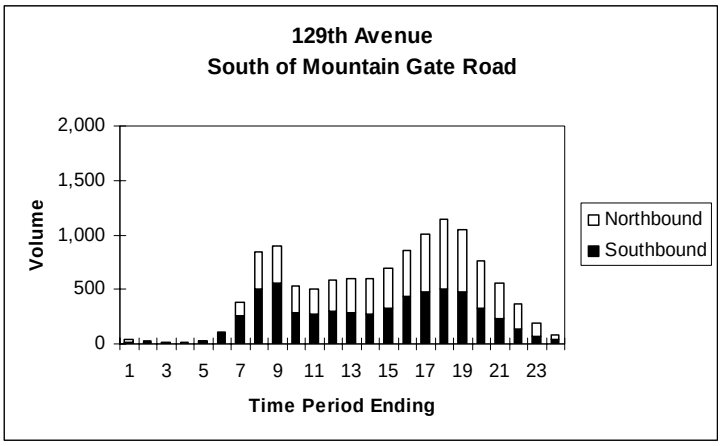
Emergency Response Routes

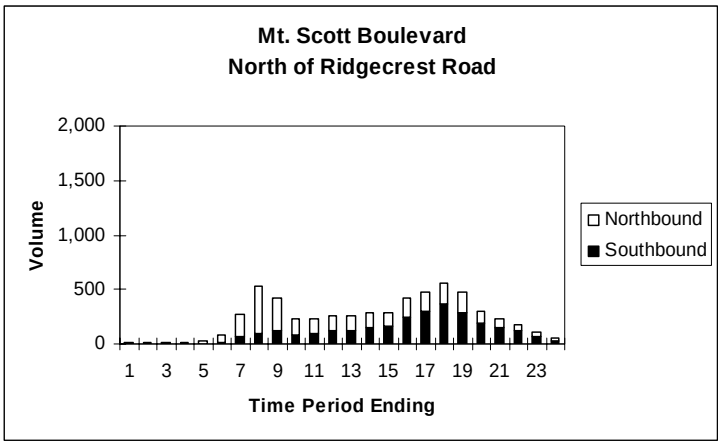
Emergency fire services are provided in Happy Valley by Clackamas County Fire District #1. The Happy Valley fire station is located on the north leg of the KingRoad/129th Avenue intersection. Response times are a high priority for emergency services, as patient care is time-sensitive. Roadway connectivity can play a key role in reducing emergency response times. Generally, restrictive or deflective traffic calming devices (e.g. speed humps, raised intersections, and diverters) should not be located on primary emergency response routes.

Motor Vehicle Volume

The average daily traffic volumes on key roadways in the study area are shown in Figure 3-9. Roadway volume surveys were conducted in the spring of 2005 on 129th Avenue, 147th Avenue, King Road and Mt. Scott Boulevard over a 24-hour period to determine existing daily traffic volumes by direction. These counts were conducted after the 152nd Avenue north of Sunnyside was opened. The remaining average daily traffic volumes (ADT) were obtained from Clackamas County's 2002 ADT counts. The traffic volume profiles shown below illustrate the trends of travel for three of the four locations that were surveyed.







PM peak hour traffic turn movement counts were also obtained to provide the basis for analyzing existing problem areas as well as establishing a base condition for future comparisons. The City of Happy Valley staff contributed to the selection of the study intersections based on specific areas of concern on major roadways and other issues affecting the residents of the city.

Turn movement counts were conducted at 24 intersections during the weekday evening peak period to determine existing operating conditions. Most of the study intersections experience peak hour volumes between 5:00 and 6:00 PM, with a few intersections exhibiting some variations including: 4:45 to 5:45 PM and 4:35 to 5:35 P.M.

TRAFFIC LEVELS OF SERVICE

Level of Service (LOS) is used as a measure of effectiveness for intersection operation. It is similar to a "report card" rating based upon average vehicle delay. Level of Service A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. Level of Service D and E are progressively worse peak hour operating conditions. Level of Service F represents conditions where demand has exceeded capacity. This condition is typically evident in long queues and delays.

The unsignalized intersection level of service calculation evaluates each movement separately to identify problems (typically left turns from side streets). The calculation is based on the average total delay per vehicle for stop-controlled movements (typically on the minor side street or left turn movements). Level of service (LOS) F indicates that there are insufficient gaps of suitable size to allow minor street traffic to safely enter or cross the major street. This is generally evident by long delays and queuing on the minor street. Level of service F may also result in more aggressive driving, with side street vehicles accepting shorter gaps. It should be noted that the major street traffic moves without delay and the LOS F is for side street or left turns, which may be only a small percentage of the total intersection volume. It is for these reasons that level of service results must be interpreted differently for signalized and unsignalized locations. A summary of the descriptions for level of service will be provided in the TSP technical appendix.

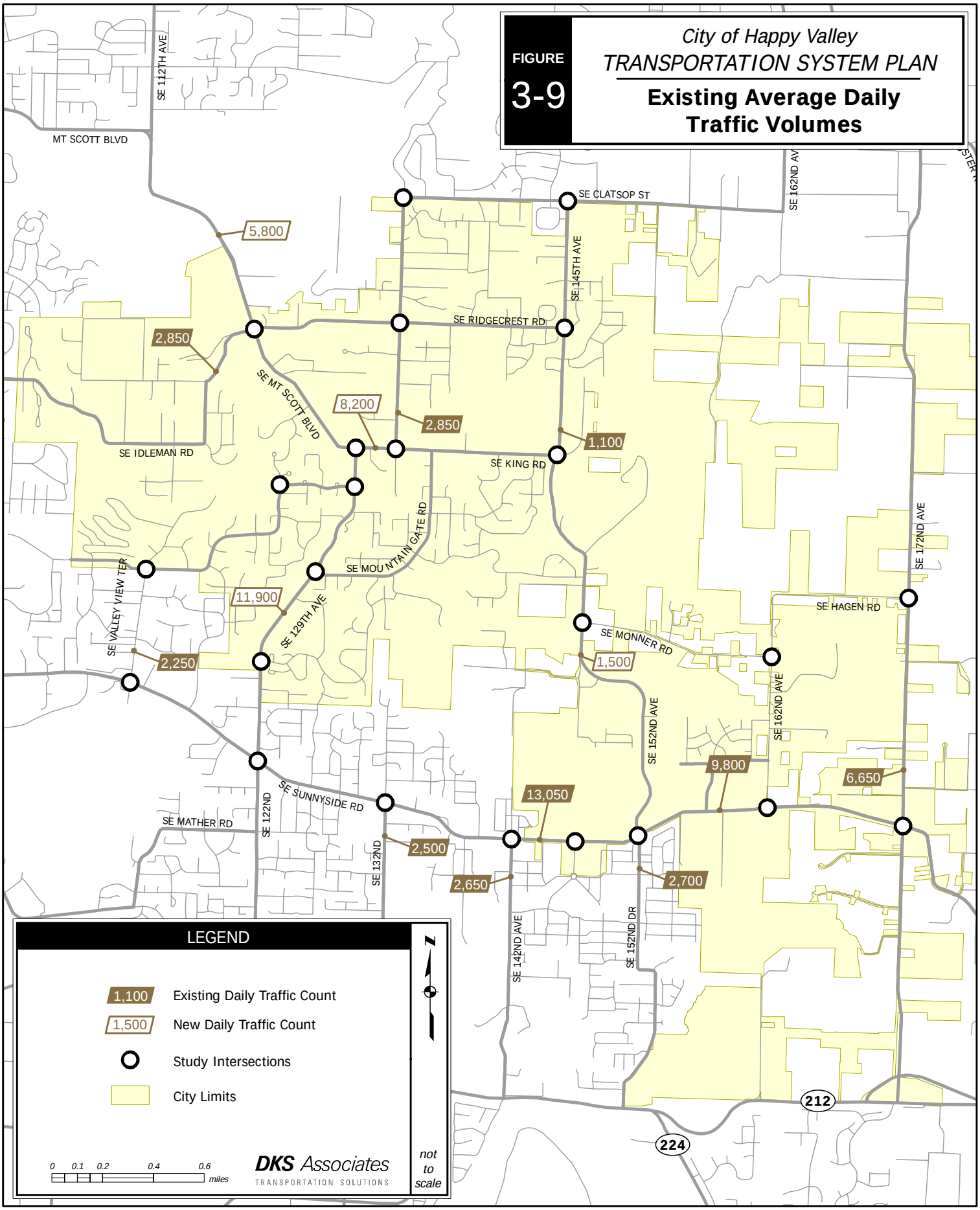


FIGURE
3-9
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Existing Average Daily Traffic Volumes
SE 112TH AVE
MT SCOTT BLVD
SE CLATSOP ST
SE 162ND AVE
SE 145TH AVE
SE RIDGECREST RD
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SE MOUNTAIN GATE RD
SE VALLEY VIEW TER
SE 129TH AVE
SE 172ND AVE
SE HAGEN RD
SE MONNER RD
SE 152ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 132ND
SE 142ND AVE
SE 152ND DR
5,800
2,850
8,200
2,850
1,100
11,900
2,250
1,500
9,800
6,650
13,050
2,500
2,650
2,700
LEGEND
1,100 Existing Daily Traffic Count
1,500 New Daily Traffic Count
Study Intersections
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale
212
224

The volume to capacity ratio (V/C) is used as a measure of effectiveness for signalized and unsignalized intersection operation. The V/C is calculated by dividing the volume entering the intersection by the total capacity (maximum volume the intersection could serve). The V/C describes the amount of intersection capacity that is utilized by the volume. A V/C of 1.0 suggests there is no available capacity at that intersection and not one more vehicle could be accommodated.

The PM peak hour intersection counts were used to determine the existing level of service based on the *2000 Highway Capacity Manual* methodology. Traffic counts and level of service calculation sheets will be provided in the TSP appendix. Table 3-4 and Figure 3-10 summarizes the existing weekday PM peak hour study intersection operation conditions.

Table 3-4: Existing Weekday Intersection Level of Service (PM Peak Hour)

Intersection	Level of Service	Delay	Volume/ Capacity
Unsignalized Intersections			
Sunnyside Road/162nd Avenue	A/B	14.6	-
Sunnyside Road/172nd Avenue	D	30	0.94
172nd Avenue/Hagen Road	A/C	18.1	-
147th Avenue/Monner Road	A/A	9.7	-
162nd Avenue/Monner Road	A/A	8.9	-
145th Avenue/King Road	A	8.4	0.27
145th Avenue/Callahan	A/B	11.2	-
145th Avenue/Clatsop Road	A/A	9.2	-
132nd Avenue /King Road	A/D	29.0	-
132nd Avenue/Ridgecrest Road	A	9.6	0.33
132nd Avenue/Clatsop Road	A/B	10.7	-
122nd Avenue/Spring Mountain Drive	A/D	26.9	-
129th Avenue/Mountain Gate Road	A/E	43.0	-
129th Avenue/William Otty Road	A/C	16.9	-
129th Avenue/King Road/Mt.Scott Boulevard	C	18.4	0.77
William Otty Road/Kimberly Court	A	7.1	0.04
Mt. Scott Boulevard/Idleman Road/Ridgecrest Road	B	12.2	0.59
Valley View/William Otty Road	A	7.2	0.10
Signalized Intersections			
Sunnyside Road/Valley View Terrace	B	11.8	0.60
Sunnyside Road/122nd Avenue	C	28.8	0.80
Sunnyside Road/132nd Avenue	D	39.8	0.90
Sunnyside Road/142nd Avenue	B	12.2	0.73
Sunnyside Road/147th Avenue	B	13.1	0.62
Sunnyside Road/152nd Avenue	B	13.3	0.68

Notes: A/A=major street LOS/minor street LOS
Signalized and all-way stop delay = average vehicle delay in seconds for entire intersection
Unsignalized delay = highest minor street approach delay
*All-way stop control intersection

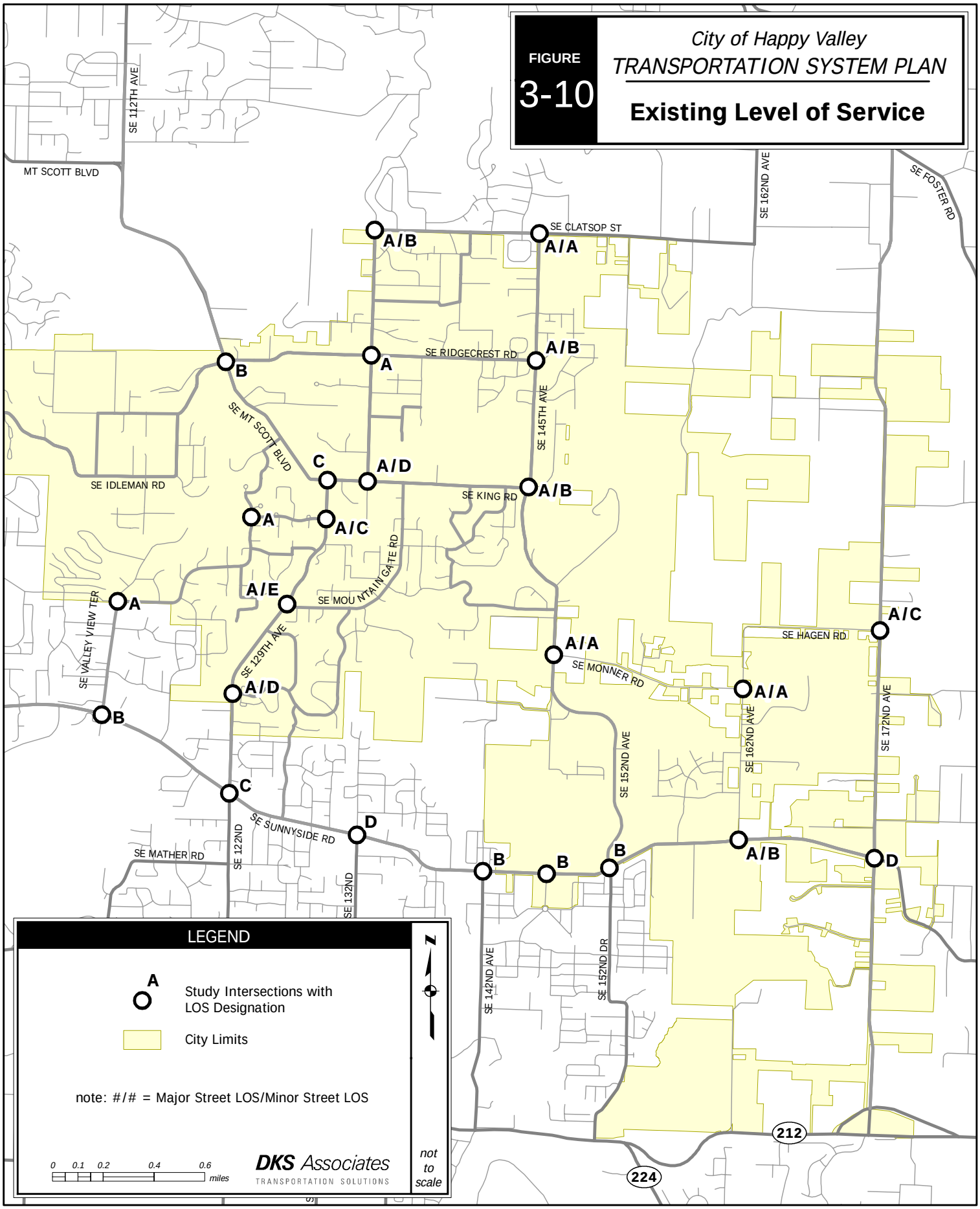


FIGURE
3-10
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Existing Level of Service
SE 112TH AVE
MT SCOTT BLVD
SE 162ND AVE
SE FOSTER RD
SE CLATSOP ST
A/B
A/A
SE RIDGECREST RD
A/B
A
B
SE MT SCOTT BLVD
SE 145TH AVE
C
A/D
SE IDLEMAN RD
SE KING RD
A/B
A
A/C
SE MOUNTAIN GATE RD
A/E
A
SE VALLEY VIEW TER
SE 129TH AVE
A/C
SE HAGEN RD
A/A
SE MONNER RD
A/A
A/D
B
SE 152ND AVE
SE 162ND AVE
SE 172ND AVE
C
SE SUNNYSIDE RD
D
SE MATHER RD
SE 122ND
SE 132ND
B
B
B
A/B
D
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
A
Study Intersections with LOS Designation
City Limits
note: #/# = Major Street LOS/Minor Street LOS
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

TRAFFIC SAFETY

Collision data was also obtained from the Oregon Department of Transportation for the period from 2001 through 2003 for each of the 24 study area intersections in Happy Valley. The most significant number of collisions occurred at the intersection of Sunnyside Road and 122nd Avenue. Over the most recent three year period, 31 collisions occurred at this intersection. Over half (58%) of these crashes were classified as rear end collisions. Sunnyside Road intersections at 142nd Avenue, Valley View Terrace, and 172nd Avenue had the next highest number of crashes, with 6, 6 and 10, respectively. Sunnyside Road and 172nd Avenue is controlled by a four way stop, while the other intersections are signalized. Table 3-5 includes collision data for each of the study intersections that had incidents, classified by fatal, non-fatal, and property damage only incidents. The accident rate was also calculated to standardize the existing data. The equivalent accident rates per million entering vehicles (MEV) are shown in Table 3-5. A collision rate greater than 1.0 generally indicates a safety-related problem that should be evaluated further. As shown below, all of the calculated accident rates are below 1.0. The collision data is summarized by location in Figure 3-11.

Table 3-5: Intersection Collision Classification

Intersection	Fatal	Non-Fatal	Property Damage Only	Total	Accident Rate*
162nd Avenue/Monner Road	0	0	1	1	0.77
147th Avenue/Monner Road	0	0	1	1	0.50
145th Avenue/Callahan Road	0	1	0	1	0.30
Sunnyside Road/142nd Avenue	0	3	3	6	0.29
Sunnyside Road/132nd Avenue	0	2	2	4	0.25
Sunnyside Road/122nd Avenue	0	16	15	31	0.82
172nd Avenue/Hagen Road	0	1	0	1	0.11
Sunnyside Road/Valley View	0	4	2	6	0.16
Sunnyside Road/172nd Avenue	0	6	4	10	0.72
Sunnyside Road/162nd Avenue	0	1	0	1	0.09
Sunnyside Road/147th Avenue	0	1	2	3	0.17
129th Avenue/King Road/Mt.Scott	0	0	1	1	0.08
129th Avenue/Mountain Gate Road	0	1	1	2	0.15
132nd Avenue/Ridgecrest Road	0	1	1	2	0.29

*Average annual accidents per million entering vehicles

Note: Based on ODOT collision data from 2001 through 2003.

Happy Valley is characterized by significant changes in elevations throughout the City. This may have additional safety implications related to sight distance at some of the intersections within the study area.

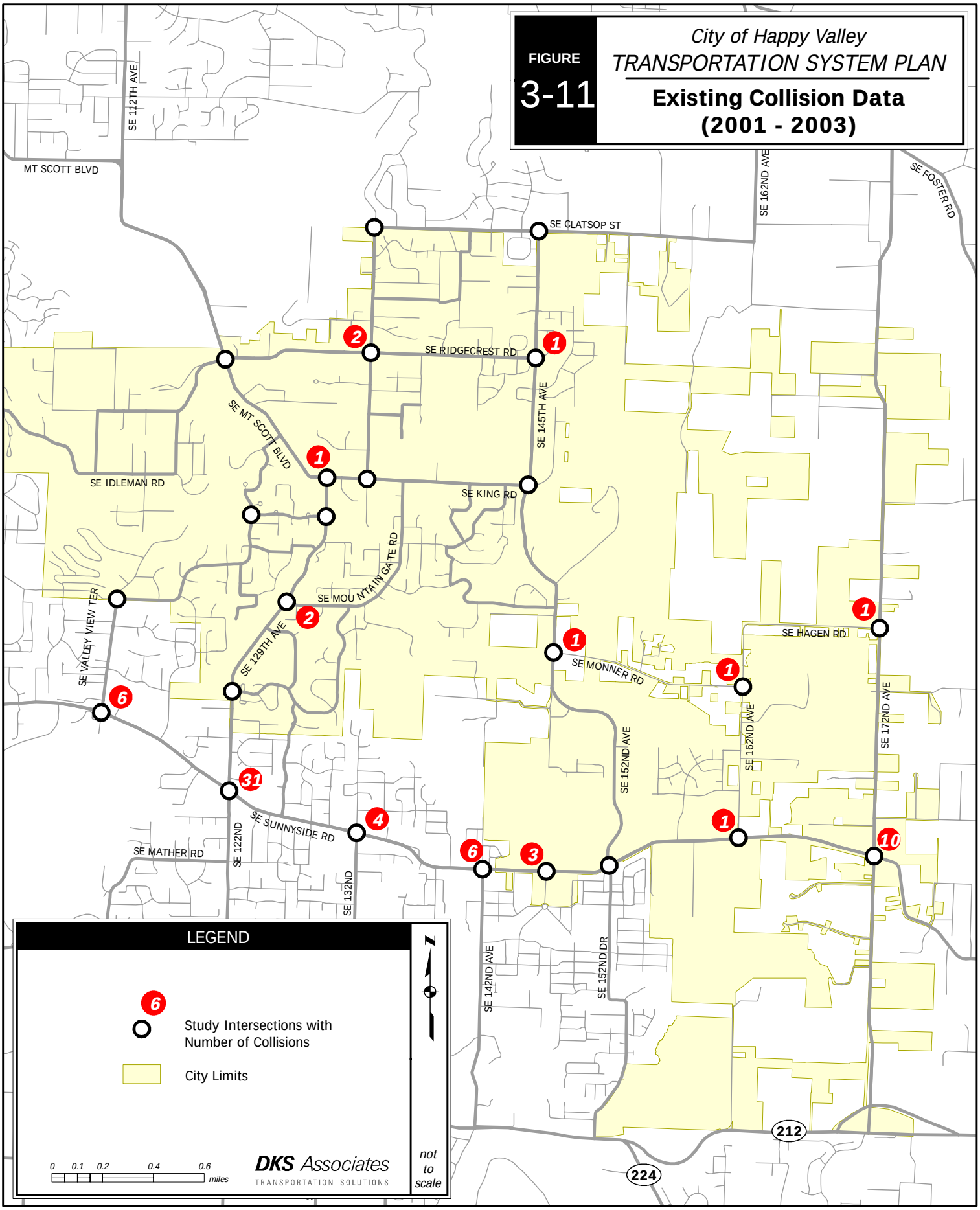


FIGURE
3-11
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Existing Collision Data
(2001 - 2003)
MT SCOTT BLVD
SE 112TH AVE
SE CLATSOP ST
SE 162ND AVE
SE FOSTER RD
SE RIDGECREST RD
SE MT SCOTT BLVD
SE 145TH AVE
SE IDLEMAN RD
SE KING RD
SE MOUNTAIN GATE RD
SE VALLEY VIEW TER
SE 129TH AVE
SE HAGEN RD
SE MONNER RD
SE 172ND AVE
SE 152ND AVE
SE 162ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 132ND
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
Study Intersections with Number of Collisions
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

TRUCKS

Heavy vehicle percentages for each intersection were also determined from the traffic counts during the PM peak hour. This count only provides a sampling of truck volumes. Currently, there is a significant amount of heavy vehicle traffic, specifically related to the construction activities taking place in many areas of the City such as Sunnyside Road and the Happy Valley Town Center. Typically, heavy vehicle traffic is focused on Sunnyside Road with trips traveling through Happy Valley to regional destinations or to adjacent commercial land uses which require freight deliveries. Many streets throughout the city restrict thru truck traffic. Currently, there are no designated freight routes through the City of Happy Valley.

OTHER MODES

No transportation facilities related to other modes of travel, including rail, air and water are located within the TSP study area.

4. Future Needs and Improvements

Travel Demand and Land Use

The Happy Valley Transportation System Plan (TSP) Update addresses existing system needs and additional facilities that are required to serve future growth beyond the 2015 forecast year of the existing TSP. Metro's urban area transportation forecast model was used to determine future traffic volumes in Happy Valley. This forecast model translates assumed land uses into person travel, selects travel modes and assigns motor vehicles to the roadway network. These traffic volume projections form the basis for identifying potential roadway deficiencies and for evaluating alternative circulation improvements. This section describes the forecasting process including key assumptions and the land use scenario developed from the existing Comprehensive Plan designations and allowed densities.

Projected Land Use Growth

Land use is a key factor in developing a functional transportation system. The amount of land that is planned to be developed, the type of land uses and how the land uses are mixed together have a direct relationship to expected demands on the transportation system. Understanding the amount and type of land use is critical to taking actions to maintain or enhance transportation system operation.

Projected land uses were developed for the study area and reflect the Comprehensive Plan and Metro's land use assumptions for the year 2025. Complete land use data sets were developed for the following conditions.

- Existing 2005 Conditions (base travel forecast for the region)
- Future 2025 Conditions

The following sections summarize the forecasted growth that will influence travel within Happy Valley.

Growth within Happy Valley

The base year travel model is updated periodically and for this study effort, the available base model provided by Metro was for year 2005. This land use database includes the number of dwelling units, retail employees and other employees. Table 4-1 summarizes the land uses for the 2005 base and future 2025 scenarios within the Happy Valley TSP study area. The land use summarized in Table 4-1 is roughly bounded by 172nd Avenue to the east, Clatsop Street to the north, I-205 to the west, Sunnyside Road to the south west of 152nd Avenue and Highway 212 to the south east of 152nd Avenue.

These land use projections are significantly higher than the previous 2015 forecasts due to the additional 10 years of growth and the expanded TSP study area. A detailed summary of the land uses for each Transportation Analysis Zone (TAZ) within the Happy Valley study area is provided in the technical appendix.

Table 4-1: Happy Valley TSP Study Area Land Use Summary

Land Use	2005	2025	Increase	Percent Increase
Households	5,610	21,150	15,540	277%
Retail Employees	1,088	1,970	882	81%
Other Employees	3,171	8,384	5,213	164%

At the existing level of land development, the transportation system generally operates without significant motor vehicle deficiencies in the study area. As land uses are changed in proportion to each other (i.e. there is a significant increase in employment relative to household growth), there will be a shift in the overall operation of the transportation system. Retail land uses generate higher amounts of trips per acre of land than households do and other land uses. The location and design of retail land uses in a community can greatly affect transportation system operation. Additionally, if a community is homogeneous in land use character (i.e. all employment or residential), the transportation system must support significant trips coming to or from the community rather than within the community. Typically, there should be a mix of residential, commercial, and employment type land uses so that some residents may work and shop locally, reducing the need for residents to travel long distances.

As shown in Table 4-1, the future 2025 land use indicates significant growth in both housing and employment within the TSP study area. The portion of Happy Valley bounded loosely by Clatsop Street to the north, 145th Avenue to the east, Mountain Gate Road and Alta Vista Drive to the south and the west City limits is expected to experience moderate growth in the next 20 years. The majority of this growth is additional housing with minimal employment growth. The major growth areas are the Rock Creek Area located south of Sunnyside Road between 152nd Avenue and 172nd Avenue and the Scouter Mountain Area bounded by 145th Avenue, 172nd Avenue, Clatsop Street, Monner Road and Hagen Road. The transportation system should be monitored to make sure that land uses in the plan are balanced with transportation system capacity. This TSP balances needs with the forecasted 2025 land uses.

For transportation forecasting, the land use data is stratified into geographical areas called transportation analysis zones (TAZs), which represent the sources of vehicle trip generation. There are approximately 18 Metro TAZs within the Happy Valley TSP Update study area. These 18 TAZs were subdivided, as part of this plan, into approximately 105 TAZs to more specifically represent land use and access to the transportation system in Happy Valley. The disaggregated model zone boundaries are shown in Figure 4-1.

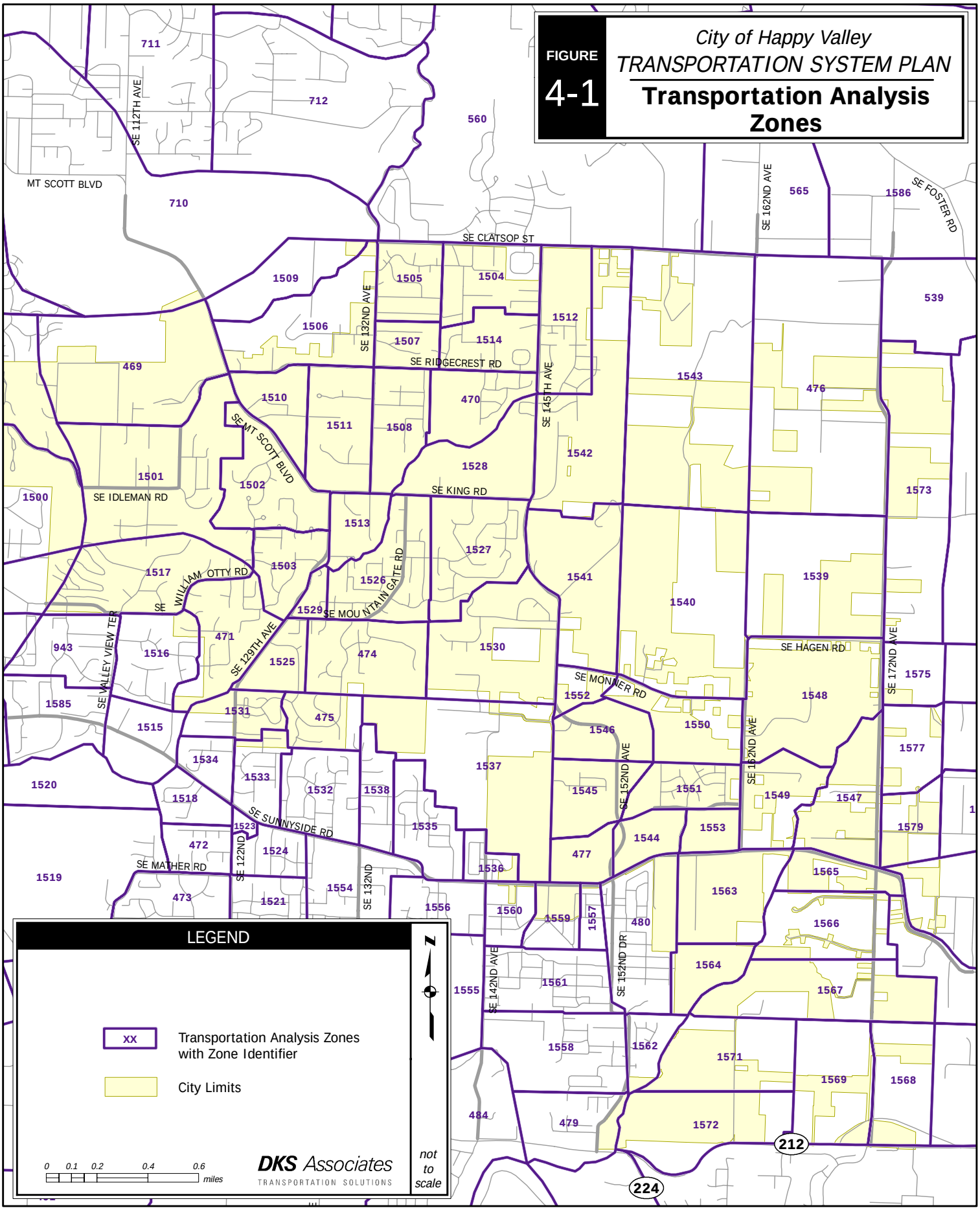


FIGURE
4-1
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Transportation Analysis Zones
LEGEND
XX
Transportation Analysis Zones with Zone Identifier
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale
711
712
560
710
565
1586
539
1509
1505
1504
1512
1506
1507
1514
469
1510
1511
1508
470
1543
476
1542
1528
1501
1500
1502
1513
1527
1573
1517
1503
1526
1541
1539
1529
1540
943
1516
471
1525
474
1530
1575
1585
1531
475
1552
1548
1515
1546
1550
1577
1534
1537
1520
1533
1532
1538
1545
1551
1549
1547
1518
1535
1553
1579
1523
472
1524
1544
1519
1536
477
1565
473
1521
1554
1556
1560
1559
1557
480
1563
1566
1564
1555
1561
1567
1558
1562
1571
1569
1568
484
479
1572
212
224
MT SCOTT BLVD
SE 112TH AVE
SE CLATSOP ST
SE 162ND AVE
SE FOSTER RD
SE 132ND AVE
SE RIDGECREST RD
SE 145TH AVE
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SE WILLIAM OTTY RD
SE MOUNTAIN GATE RD
SE VALLEY VIEW TER
SE 129TH AVE
SE HAGEN RD
SE 172ND AVE
SE MONNER RD
SE 152ND AVE
SE SUNNYSIDE RD
SE 122ND
SE MATHER RD
SE 142ND AVE
SE 152ND DR

Growth East of Happy Valley

An important aspect of growth is the recent expansions to the Urban Growth Boundary east of Happy Valley that are now being planned for urban growth. The most significant planned areas are Pleasant Valley, Springwater, and Damascus/Boring. The Pleasant Valley Master Plan was recently approved by the City of Gresham as well as the City of Happy Valley, which is particularly focused on "Area C" located south of the Multnomah/Clackamas County boundary. The total development planned for Pleasant Valley is 5,000 housing units and about 5,000 jobs. The master plan development for Springwater is expected to conclude in late 2005, and the land use mix currently expects about 18,000 new jobs with about 2,000 residential households. In addition, Clackamas County is currently developing urban plans for the East Happy Valley, Damascus and Boring areas, which include over 25,000 new residential households and 1,600 acres of employment within the planning horizon of this TSP. Taken together, the combination of recent UGB expansions east of Happy Valley will have a significant influence on travel demands within Happy Valley, in terms of through traffic on the arterial facilities and the development of more local employment centers closer to the city.

Metro Area Transportation Model

A determination of future traffic system needs in Happy Valley requires the ability to accurately forecast travel demand resulting from estimates of future population and employment for the City. The objective of the transportation planning process is to provide the information necessary for making decisions on when and where improvements should be made to the transportation system to meet travel demand as developed in an urban area travel demand model as part of the Regional Transportation Plan update process. Metro uses EMME/2, a computer based program for transportation planning, to process the large amounts of data for the Portland Metropolitan area. For the Happy Valley TSP Update, the regional 2025 model used for the 2004 RTP update was used to develop future forecasts.

Traffic forecasting can be divided into several distinct but integrated components that represent the logical sequence of travel behavior (see Figure 4-2). These components and their general order in the traffic forecasting process are as follows:

- Trip Generation
- Trip Distribution
- Mode Choice
- Traffic Assignment

The initial roadway network used in the traffic model was the existing streets and roadways. Future 2025 land use scenarios were tested and roadway improvements were added to mitigate the impacts of motor vehicle traffic growth, using the RTP Priority System and the 2015 Happy Valley TSP improvements as a starting basis. Improvements in each of these plans (the RTP and TSP) were validated in the study process. Forecasts of PM peak period traffic flows were produced for every major roadway segment within Happy Valley. Traffic volumes were projected on all arterials and most collector streets. Some local streets were included in the model, but many are represented by centroid connectors in the model process.

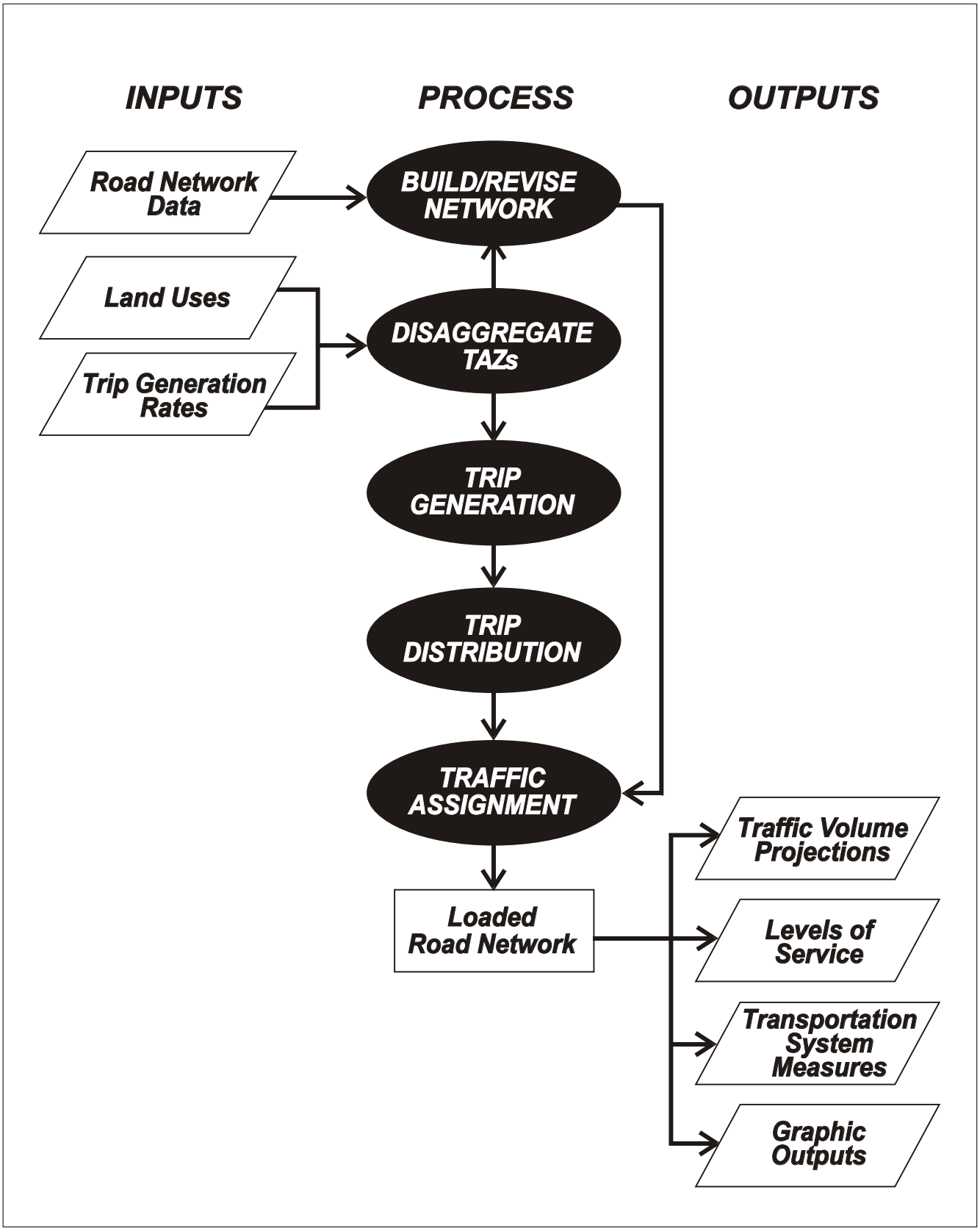


Figure 4-2
MODEL PROCESS

Trip Generation

The trip generation process translates land use quantities (number of dwelling units, retail, and other employment) into vehicle trip ends (number of vehicles entering or leaving a TAZ or sub-TAZ) using trip generation rates established during the model verification process. The Metro trip generation process is elaborate, entailing detailed trip characteristics for various types of housing, retail employment, non-retail employment, and special activities. Typically, most traffic impact studies rely on the Institute of Transportation Engineers (ITE) research for analysis[1]. The model process is tailored to variations in travel characteristics and activities in the region.

Table 4-2 illustrates the estimated growth in vehicle trips generated within the Happy Valley TSP study area during the PM peak period between 2005 and 2025. It indicates that vehicle trips in Happy Valley would grow by approximately 147 percent between 2000 and 2025 if the land develops according to Metro's 2025 land use assumptions. Assuming a 20-year horizon to the 2025 scenario, this represents annualized growth rate of about 4.5 percent per year.

Table 4-2: Happy Valley Vehicle Trip Generation (1-Hour PM Period)

	2005 Trips	2025 Trips	Percent Increase
Happy Valley TSP Update Study Area	12,100	29,000	140%

Trip Distribution

This step estimates how many trips travel from one zone in the model to any other zone. Distribution is based on the number of trip ends generated in each zone pair and on factors that relate the likelihood of travel between any two zones to the travel time between zones. In projecting long-range future traffic volumes, it is important to consider potential changes in regional travel patterns. Although the locations and amounts of traffic generation in Happy Valley are essentially a function of future land use in the city, the distribution of trips is influenced by regional growth. External trips (trips that have either an origin and not a destination in Happy Valley or have a destination but not an origin in Happy Valley) and through trips (trips that pass through Happy Valley and have neither an origin nor a destination in Happy Valley) were projected using trip distribution patterns based upon census data and traffic counts performed at gateways into the Metro area Urban Growth Boundary (UGB) calibration.

Mode Choice

This step determined how many trips will be by various modes (single-occupant vehicle, transit, carpool, pedestrian, bicycle, etc.). The 2005 mode splits are incorporated into the base model and adjustments to that mode split may be made for the future scenario, depending on any expected changes in transit or carpool use. These considerations are built into the forecasts used for 2025.

[1] *Trip Generation Manual*, 7th Edition, Institute of Transportation Engineers, 2003.

Traffic Assignment

In this process, trips from one zone to another are assigned to specific travel routes in the network, and resulting trip volumes are accumulated on links of the network until all trips are assigned.

Network travel times are updated to reflect the congestion effects of the traffic assigned through an equilibrium process. Congested travel times are estimated using what are called "volume-delay functions" in EMME/2. There are different forms of volume/delay functions, all of which attempt to simulate the impact of congestion on travel times (greater delay) as traffic volume increases. The volume-delay functions take into account the specific characteristics of each roadway link, such as capacity, speed and facility type. This allows the model to reflect conditions somewhat similar to driver behavior.

Model Verification

The base 2005 modeled traffic volumes were compared against actual traffic volume counts across screenlines, on key arterials and at key intersections. Most arterial traffic volumes meet screenline tolerances for forecast adequacy. Based on this performance, the model was used for future forecasting and assessment of circulation change.

Model Application to Happy Valley

Intersection turn movements were extracted from the model at key intersections for both the base year 2005 and forecast year 2025 scenarios. These intersection turn movements were not used directly, but a portion of the increment of the year 2025 turn movements over the 2005 turn movements was applied (added) to existing (actual 2005) turn movement counts in Happy Valley. A post processing technique is utilized to refine model travel forecasts to the volume forecasts utilized for 2025 intersection analysis. The turn movement volumes used for future year intersection analysis can be found in the technical appendix.

5. Pedestrian Plan

This chapter summarizes existing and future pedestrian needs in the City of Happy Valley. The following sections identify the policies for implementing a pedestrian plan, evaluate needs and recommend a pedestrian plan for the City of Happy Valley. The policies used in evaluating pedestrian needs were identified through work with the City's Citizen Advisory Committee.

Policies

Several policies were developed for future pedestrian facilities in Happy Valley. These policies are aimed at providing the City with priorities to direct its funds towards pedestrian projects that meet the goals of the City.

The policies for pedestrian facilities are:

- Policy 1b: Encourage pedestrian accessibility by providing safe, secure and desirable pedestrian routes.
- Policy 3b: Sidewalks must be constructed on all streets within Happy Valley (with construction or reconstruction projects). All schools, parks, public facilities and retail areas shall have direct access to a sidewalk.
- Policy 3c: Bicycle and pedestrian plans shall be developed which link to existing and planned recreational trails.
- Policy 3g: Pedestrian access to transit will be improved as transit services increases in the future.
- Policy 3h: The City will persue the expansion of the regional and local trail system with new development.
- Policy 4b: Safe and secure routes to schools shall be designated for each school and any new residential project shall identify the safe path to school for children.
- Policy 4c: Safe and secure pedestrian and bikeways shall be designed between parks and other activity centers in Happy Valley.
- Policy 6a: Design and construct transportation facilities to meet the requirements of the Americans with Disabilities Act.

Needs

Arterial and collector streets in Happy Valley provide a limited sidewalk inventory (see Figure 3-2). Sidewalks are provided in many newer residential neighborhoods, but are limited in older neighborhoods creating poor connectivity throughout the city. Gaps within the sidewalk and trail network discourage pedestrians and put them at an increased safety risk by requiring them to share the roadway with vehicles in certain locations. Hilly topography throughout the City also contributes to poor sight distances and further justification for providing safe pedestrian facilities separate from the roadway. These conditions result in a poor existing pedestrian network.

An important existing pedestrian need in Happy Valley is providing sidewalks on all arterial and collector roadways and providing a connection from residential areas to bus stops, schools, parks and shopping centers. This includes the need for safe, well lighted arterials and collector streets with suitable pedestrian amenities and crossing facilities to reduce the barriers for pedestrian travel. Pedestrian facility needs in Happy Valley must consider the three most prevalent trip types:

- Residential based trips – home to school, home to home, home to retail, home to park, home to transit, home to entertainment
- Service based trips – multi-stop retail trips, work to restaurant, work to services, work/shop to transit
- Recreational based trips – home to park, exercise trips, casual walking trips

Residential trips need a set of interconnected sidewalks radiating out from homes to destinations within one-half to one mile. Beyond these distances, walking trips of this type become substantially less common (over 20 minutes). Service based trips require direct, conflict-free connectivity between uses (for example, a shopping mall with its central spine walkway that connects multiple destinations). Service based trips need a clear definition of connectivity. This requires mixed use developments to locate front doors which relate directly to the public right-of-way and provide walking links between uses within one-half mile. Recreational walking trips have different needs. Off-street trails, well landscaped sidewalks and relationships to unique environment (creeks, trees, farmland) are important.

The most common need is to provide a safe and interconnected system that affords the opportunity to consider the walking mode of travel, especially for trips less than one mile in length.

Facilities

Sidewalks should be built to current design standards of the City of Happy Valley and in compliance with the Americans with Disabilities Act (at least four feet of unobstructed sidewalk).[1] Wider sidewalks are desireable to promote pedestrian travel on all roadways. Additional pedestrian facilities may include accessways, pedestrian districts and pedestrian plazas.

- Accessway – A walkway that provides pedestrian and/or bicycle passage either between streets or from a street to a building or other destinations such as a school, park or transit stop.
- Pedestrian District – A plan designation or zoning classification that establishes a safe and convenient pedestrian environment in an area planned for a mix of uses likely to support a relatively high level of pedestrian activity.

[1] *Americans with Disabilities Act*, Uniform Building Code.

- Pedestrian Plaza – A small, semi-enclosed area usually adjoining a sidewalk or a transit stop which provides a place for pedestrians to sit, stand or rest.

Metro 2004 Regional Transportation Plan (RTP) identifies Sunnyside Road, 122nd/129th and 172nd Avenue with a pedestrian designation as transit/mixed use corridors. The RTP defines transit/ mixed-use corridors as priority areas for pedestrian travel that are served by good quality transit service and that will generate substantial pedestrian traffic near neighborhood-oriented retail development, schools, parks, and bus stops. These corridors should include such design features as wide sidewalks with buffering from traffic, pedestrian-scale lighting, benches, bus shelters, and street trees.

Metro has also proposed the Mt. Scott Trail and the Scouter Mountain Trail projects as a conceptual part of the regional trails and greenways system. The Mt. Scott Trail is planned to extend north from Mt. Talbert to join the Springwater Corridor near Powell Butte. It will cross over Mt. Scott and follow Johnson Creek before intersecting with the Springwater Corridor. The Scouter Mountain Trail will connect Powell Butte at the Springwater Corridor to Scouter Mountain to the south and back again to the Springwater further to the east. Before decisions are made about specific trail alignment and appropriate use, there will be a master planning process and many opportunities for public involvement.

Recommended Pedestrian Master Plan

To meet transportation performance standards and serve future growth, the future transportation system needs multi-modal improvements to manage the forecasted travel demand. The extent of the recommended multi-modal improvements for Happy Valley is significant. Future growth can be accommodated with significant investment in transportation improvements.

A list of potential pedestrian projects to meet the identified needs and achieve these policies was developed into a Pedestrian Master Plan. The Master Plan shown in Figure 5-1 and summarized in Table 5-1 is an overall plan and summarizes the 'wish list' of pedestrian related projects in Happy Valley. Projects that were identified in the previous TSP are identified with an asterisk (*). These projects will be used to create a Pedestrian Action Plan. The Action Plan consists of projects that the City should give priority to in funding. As development occurs, streets are rebuilt and other opportunities (grant programs) arise, projects on the Master Plan should be pursued as well.

The planning level cost estimates provided are based on general unit costs for transportation improvements, but do not reflect the unique project elements that can significantly add to project costs. Each of these project costs will need further refinement to detail right-of-way requirements and costs associated with special design details as projects are pursued.

Table 5-1: Pedestrian Master Plan Projects

Priority	Project	Location/Side	From	To	Cost ($1,000s)
Sidewalks on Existing Arterials and Collectors					
High	Sunnyside Road Phase 2/3A	North/South	122nd Avenue	162nd Avenue	$2,310
High	Sunnyside Road Phase 3B	North/South	162nd Avenue	172nd Avenue	$590
High	William Otty Road	North/South	Valley View Terrace	SE 119th Drive	$260
High	William Otty Road	South	Valley View Terrace	200 feet west	$20
High	Ridgecrest Road*	South	132nd Avenue	Plover Drive	$220

Priority	Project	Location/Side	From	To	Cost ($1,000s)
High	King Road*	North	132nd Avenue	145th Avenue	$280
High	King Road	South	132nd Avenue	Happy Valley Drive	$220
High	King Road	South	129th Avenue	132nd Avenue	$90
High	145th Avenue*	West	King Road	Purple Finch Loop	$180
High	132nd Avenue*	East	King Road	Ridgecrest Road	$80
High	122nd /129th Avenue*	East	Mountain Gate	Scott Creek Lane	$160
High	147th Avenue	West	Alta Vista Drive	Monner Road	$100
Medium	172nd Avenue South	East/West	Sunnyside Road	Highway 212	$1,220
Medium	172nd Avenue North	East/West	Sunnyside Road	Clatsop Street	$2,690
Medium	Mt. Scott Boulevard	East/West	Ridgecrest Road	129th Avenue	$730
Medium	Ridgecrest Road*	North/South	Mt. Scott Boulevard	132nd Avenue	$650
Medium	132nd Avenue*	East/West	Ridgecrest Road	Clatsop Street	$370
Medium	132nd Avenue	West	King Road	Ridgecrest Road	$270
Medium	Clatsop Street	North/South	138th Place	141st Court	$240
Medium	145th Avenue	West	Ridgecrest Road	Clatsop Street	$40
Medium	145th Avenue	East	Wallowa Way	Clatsop Street	$170
Medium	Valley View Terrace*	East/West	Sunnyside Road	William Otty Road	$500
Low	145th Avenue	East	King Road	Denali Drive	$210
Low	Ridgecrest Road	North	132nd Avenue	145th Avenue	$190
Low	Mt. Scott Boulevard	East/West	Northern city limits	Ridgecrest Road	$400
Low	122nd/129th Avenue*	West	Sunnyside Road	King Road	$740
Low	Idleman Road	North	Western City limits	Mt. Scott Boulevard	$790
Low	Idleman Road	South	Western City limits	Walnut Drive	$330
Low	Idleman Road	South	Hillside Drive	Mt. Scott Blvd	$370
Low	147th Avenue	East	King Road	Monner Road	$400
Low	Clatsop Street	North/South	145th Avenue	162nd Avenue	$950
Low	162nd Avenue	East/West	Sunnyside Road	Hagen Road	$920
Local/Neighborhood Street Sidewalk Infill					
Low	Kanne Road*	North/South	132nd Avenue	139th Avenue	$280
Low	139th Avenue*	East/West	Kanne Road	Portland View Place	$210
Low	139th Avenue Extension"	East/West	Kanne Road	Ridgecrest Road	$110
Low	City View Drive*	East/West	Tyler Road	Ridgeway Drive	$260
Low	Ridgeway Drive*	East/West	City View Drive	Eastview Drive	$260
Low	Eastview Drive*	East/West	Ridgeway Drive	Tyler Road	$260
Low	Parkside Estates N/S Roadway*	East/West	King Road	Ridgecrest Road	$590
Low	Peggy Way*	East/West	Valley View Terrace	William Otty Road	$180
Low	Lucille Street*	North/South	132nd Avenue	137th Avenue	$280
Low	137th Avenue*	East/West	Kanne Road	Portland view Place	$210
Low	Valemont Lane*	North/South	132nd Avenue	East end of Street	$210
Low	Portland View Place*	North/South	137th Avenue	145th Place	$440
Low	140th Place*	East/West	Portland View Place	Clatsop Street	$110

Priority	Project	Location/Side	From	To	Cost ($1,000s)
Low	Lucille Street*	North/South	139th Avenue	145th Avenue	$340
Low	Clover Lane*	North/South	Idleman Road	End of Street	$270
Low	Lenore Street*	North/South	Valley View Terrace	West end of Street	$330
Low	Hillside Drive*	North/South	Idleman Road	South end of Street	$250
Low	Aldridge Road*	North/South	147th Avenue	West end of Street	$500
Low	Eastbourne Lane*	East/West	Aldridge Road	Existing Sidewalk	$160
Low	Hilltop Court*	East/West	Hillside Drive	East end of Street	$130
Low	Walnut Drive*	East/West	Idleman Road	Tyler Road	$270
Low	Tyler Road*	North/South	Walnut Drive	Idleman Road	$550
Low	Dorset Lane*	North/South	Idleman Road	Cresthill Road	$70
Low	Cresthill Road*	East/West	Dorset Lane	Sichel Way	$150
Local Multi-Use Trail					
High	Scott Creek Lane path and bridge crossing*		129th Avenue	Mt. Gate Road	$100
Sidewalks on New Arterials/Collectors					
Clatsop Extension West		North/South	Mt. Scott Boulevard	132nd Avenue	**
Clatsop Extension East		North/South	162nd Avenue	172nd Avenue	**
Johnson Creek Extension		East/West	Idleman Road	North City Limits	**
162nd Avenue Extension North		North/South	Hagen Road	Clatsop Street	**
162nd Avenue Extension South		North/South	Sunnyside Road	Highway 212	**
Monner Road Extension		North/South	162nd Avenue	172nd Avenue	**
Barbara Welch Extension		East West	Clatsop Street	Scouter Mountain South Roadway	**
Scouter Mountain South Roadway		East/West	147th Avenue	172nd Avenue	**
Scouter Mountain East Roadway #1		North/South	Barbara Welch Extension	172nd Avenue	**
Scouter Mountain East Roadway #2		North/South	162nd Avenue	172nd Avenue	**
Pleasant Valley Golf Course Roadway #1		North/South	162nd Avenue	172nd Avenue	**
Pleasant Valley Golf Course Roadway #2		East/West	Scouter Mountain Roadway	Sunnyside Road	**
Rock Creek Major Arterial		North/South	172nd Avenue	Sunrise Corridor	**
Rock Creek Roadway #1		North/South	162nd Avenue	172nd Avenue	**
Rock Creek Roadway #2		East/West	162nd Avenue	Rock Creek Collector #1	**
			Sidewalks on Existing Arterials and Collectors		$16,690
			Local/Neighborhood Street Sidewalk Infill		$6,420
			Local Multi-Use Trail		$100
			Sidewalks on New Arterials/Collectors		$**
			Total Pedestrian Master Plan Projects		**$23,210**

*These projects were identified in the previous TSP.
**These project costs are included in a motor vehicle plans.

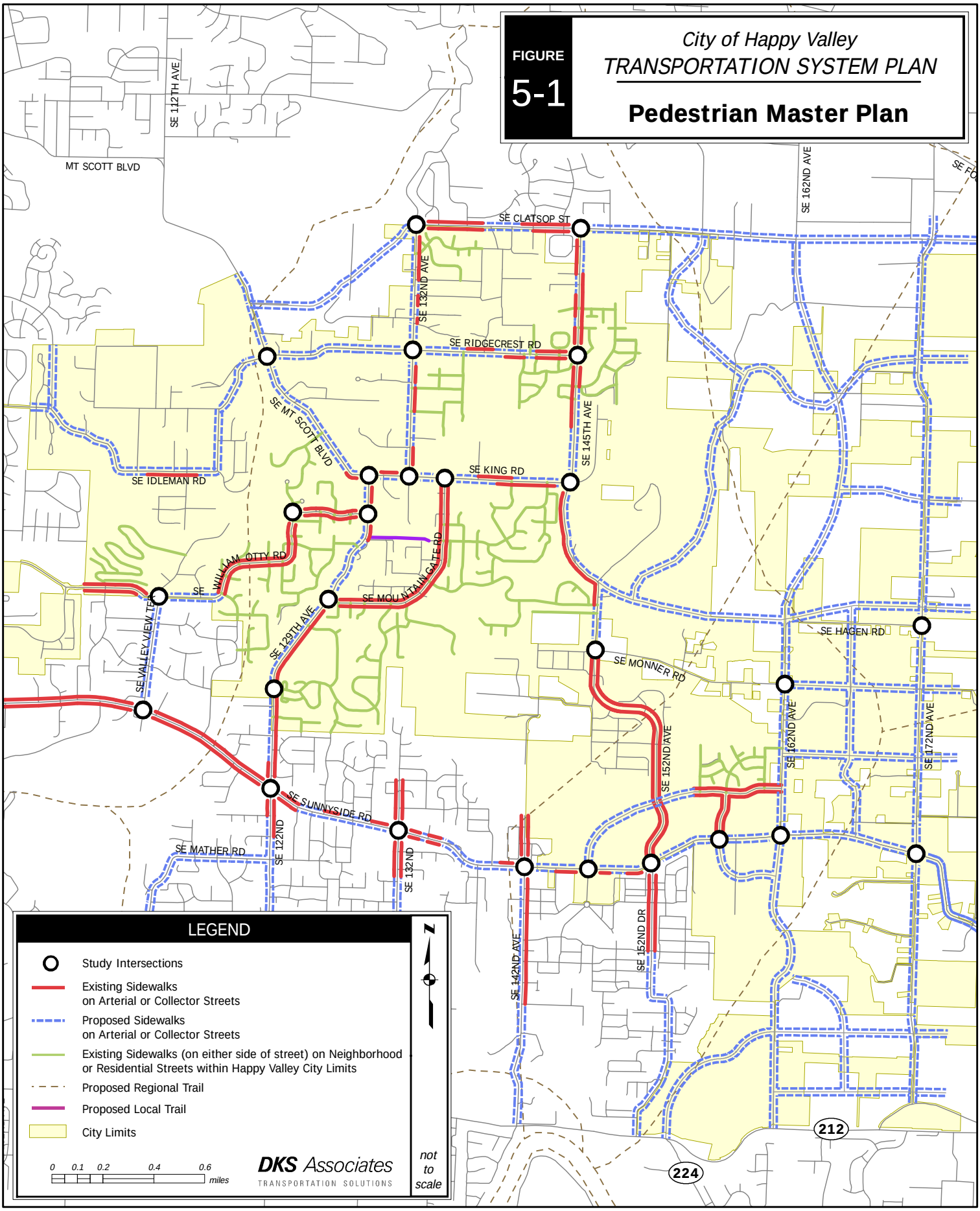


FIGURE
5-1
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Pedestrian Master Plan
MT SCOTT BLVD
SE 112TH AVE
SE CLATSOP ST
SE 132ND AVE
SE RIDGECREST RD
SE 145TH AVE
SE 162ND AVE
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SE WILLAMETTE VIEW TER
SE WILLAMETTE FALLS DR
SE MOUNTAIN GATE RD
SE 129TH AVE
SE HAGEN RD
SE MONNER RD
SE 152ND AVE
SE 162ND AVE
SE 172ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 132ND
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
Study Intersections
Existing Sidewalks on Arterial or Collector Streets
Proposed Sidewalks on Arterial or Collector Streets
Existing Sidewalks (on either side of street) on Neighborhood or Residential Streets within Happy Valley City Limits
Proposed Regional Trail
Proposed Local Trail
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
N
not to scale

Pedestrian Action Plan

The pedestrian action plan identifies projects that are reasonably expected to be funded by 2025, which meets the requirements of the updated TPR[2]. The TSP goals and policies were used to rank the projects. The highest ranking City projects that are reasonably expected to be funded (see Chapter 10) were combined with projects identified in the RTP Financially Constrained scenario and projects with anticipated funding from other agencies to create the list shown in Table 5-2.

Table 5-2: Pedestrian Action Plan Projects

Project	Improvement	Potential Funding Source	Estimated Schedule	Cost ($1,000s)
Sunnyside Road Phase 2/3A Sidewalks	Construct sidewalks on both sides of the roadway from 122nd Avenue to 162nd Avenue. Provide signalized pedestrian crossings at all traffic signals.	Joint SDC Fund	2006-2010	$2,300
Sunnyside Road Phase 3B Sidewalks	Construct sidewalks on both sides of the roadway from 162nd Avenue to 172nd Avenue. Provide signalized pedestrian crossings at all traffic signals.	Joint SDC Fund	2006-2010	$600
172nd Avenue South Sidewalks	Construct sidewalks on both sides of the roadway from Sunnyside Road to Highway 212. Provide signalized pedestrian crossings at all traffic signals.	Joint SDC Fund	2011-2015	$1,220
172nd Avenue North Sidewalks	Construct sidewalks on both sides of the roadway from Sunnyside Road to Clatsop Street. Provide signalized pedestrian crossings at all traffic signals.	Joint SDC Fund	2021-2025	$2,690
162nd Avenue Sidewalks	Construct sidewalks on both sides of the roadway from Clatsop Street to Hwy 212.	Joint SDC Fund	-	$2,810
Clatsop Street Sidewalks	Construct sidewalks on both sides of the roadway from 162nd Ave to 172nd Ave.	Joint SDC Fund	-	$420
Ridgecrest Road Sidewalks*	Construct sidewalks on the south side from 132nd Ave to Plover Dr.	Happy Valley	2010-2020	$220
132nd Avenue Sidewalks*	Construct sidewalks on the east side of the roadway from King Road to Ridgecrest Road.	Happy Valley	2010-2020	$80
145th Avenue Sidewalks*	Construct sidewalks on the west side of the roadway from King Road to Purple Finch Loop.	Happy Valley	2010-2020	$180
King Road Sidewalks*	Construct sidewalks on the north side of the roadway from 132nd Avenue to 145th Avenue.	Happy Valley	2010-2020	$280
Scott Creek Lane Path and Bridge Crossing**	Construct pedestrian path and bridge crossing from 129th to Mountain Gate Road.	Metro/Other	2004-2009	$100
		City of Happy Valley Costs		$760
		Joint SDC Fund		$10,040
		Other Agencies		$100
		Total Pedestrian Project Costs		**$7,670**

*These projects were identified in the previous TSP.

** Project identified in the 2004 Federal Regional Transportation Plan Update Financially Constrained scenario.

[2] *OAR Chapter 660*, Department of Land Conservation and Development, Division 012, Transportation Planning, adopted on March 15, 2005, effective April 2005.

Plan Implementation

Address Gaps in Pedestrian System

In an effort to provide adequate pedestrian infrastructure, developers in the City of Happy Valley are required to build sidewalks on project frontages. However, developers often have little means or incentive to extend sidewalks beyond their property. Additionally, property owners without sidewalks are unlikely to independently build sidewalks that do not connect to anything. In fact, some property owners are resistant to sidewalk improvements due to cost (they do not want to pay) or changes to their frontage (they may have landscaping in the public right-of-way). As an incentive to fill some of these gaps concurrent with development activities, the City could consider an annual walkway fund that would supplement capital improvement-type projects. A fund of about $20,000 per year could build over 600-feet of sidewalk annually to help fill gaps. If matching funds were provided, over double this amount may be possible. The fund could be used several ways:

- Matching other governmental transportation funds to build connecting sidewalks identified in the master plan.
- Matching funds with land use development projects to extend a developer's sidewalks off-site to connect to non-contiguous sidewalks.
- Supplemental funds to roadway projects which build new arterial/collector sidewalks to create better linkages into neighborhoods.
- Matching funds with adjacent land owners that front the proposed sidewalk.
- Reimbursement agreements with developers

Complementing Land Use Actions

Land use actions enable significant improvements to the pedestrian system to occur. A change in land use from vacant or under utilized land creates two key impacts to the pedestrian system:

- Added vehicle trips that conflict with pedestrian flows
- Added pedestrian volume that requires safe facilities

The above mentioned impacts require mitigation to maintain a safe pedestrian system. Pedestrians walking in the traveled way of motor vehicles are exposed to potential conflicts that can be minimized or removed entirely with sidewalk installation. The cost of a fronting sidewalk to an individual single family home would be roughly $1,000 to $2,000 (representing less than one percent of the cost of a house). Over a typical 50-year life of a house, this would represent less than $50 per year assuming that cost of money is 4% annually. This cost is substantially less than the potential risk associated with the cost of an injury accident or fatality without safe pedestrian facilities (injury accidents are likely to be $10,000 to $50,000 per occurrence and fatalities are $500,000 to $1,000,000). Sidewalks are essential for the safety of elderly persons, the disabled, transit patrons and children walking to school, a park or a neighbor's house. No area of the city can be isolated from the needs of these users (not residential, employment areas or shopping districts). Therefore, fronting improvements including sidewalks are required on every change in land use or roadway project.

For any developing or redeveloping property in Happy Valley, the cost savings to the private developer is the only benefit of not providing sidewalks – at the potential risk and future expense to

the public. Therefore, sidewalks are required in Happy Valley with all new development and roadway projects.

Developments should be responsible for providing a pedestrian connection from the site main entrance to the public right-of-way. Also, buildings should be sited to be supportive and convenient to pedestrians, bicyclists and transit riders. This is most critical for residential, commercial and public service (library, community center) developments where higher pedestrian volumes would be expected. Pedestrian circulation through large parking lots should generally be provided in the form of accessways. Conflict free paths and traffic calming elements should be identified, as appropriate.

It is important that, as new development occurs, connections or accessways are provided to link the development to the existing pedestrian facilities in as direct manner as possible. As a guideline, the sidewalk distance from the building entrance to the public right-of-way should not exceed 1.25 times the straight line distance.

It is also very important that residential developments consider the routes that children will use to walk to school. Safe and accessible sidewalks should be provided to accommodate these routes, particularly within one mile of a school site.

6. Bicycle Plan

This chapter summarizes existing and future facility needs for bicycles in the City of Happy Valley. The following sections identify the policies for implementing a bikeway plan, evaluate needs and recommend a bikeway plan for the City of Happy Valley. The policies used in evaluating bicycle needs were identified through work with the City's Citizen Advisory Committee.

Policies

Several policies were considered for construction of future bikeway facilities in Happy Valley. These policies are aimed at providing the City with priorities since it is likely that the available funding will be insufficient to address all of the projects identified in the Bikeway Master Plan.

The policies for bicycle facilities are:

- Policy 3a: Bicycle lanes must be constructed on all arterials and collectors within Happy Valley (with construction or reconstruction projects). All schools, parks, public facilities and retail areas shall have direct access to a bikeway.
- Policy 3c: Bicycle and pedestrian plans shall be developed which link to existing and planned recreational trails.
- Policy 3h: The City will persue the expansion of the regional and local trail system with new development.
- Policy 4c: Safe and secure pedestrian and bikeways shall be designed between parks and other activity centers in Happy Valley.

Needs

The existing bike lane system on arterial and collector streets does not provide adequate connections from neighborhoods to schools, parks, retail centers, or transit stops (see Figure 3-3). Continuity and connectivity are key issues for bicyclists and the lack of facilities (or gaps) cause significant problems for bicyclists in Happy Valley. Without connectivity of the bicycle system, this mode of travel is severely limited. Local streets do not require dedicated bike facilities since the lower motor vehicle volumes and speeds typically allow for both autos and bikes to share the roadway. Cyclists desiring to travel through the City generally either share the roadway with motor vehicles on major streets or find alternate routes on lower volume local streets. There are designated on-street bike facilities (striped bike lane or wide shoulder) along Sunnyside Road from Valley View Terrace to 152nd Avenue. Additional bike lanes are provided intermittently along 122nd/129th Avenue, King Road, 145th Avenue, Mountain Gate Road and Clatsop Street within the Happy Valley City limits.

Bicycle trips are different from pedestrian and motor vehicle trips. Common bicycle trips are

longer than walking trips and generally shorter than motor vehicle trips. Where walking trips are attractive at lengths of a quarter mile (generally not more than a mile), bicycle trips are attractive up to three miles. Bicycle trips can generally fall into three groups: commuting, activity-based and recreational. Commuter trips are typically home/work/home (sometimes linking to transit) and are made on direct, major connecting roadways and/or local streets. Bicycle lanes provide good accommodations for these trips. Activity based trips can be home-to-school, home-to-park, home-to-neighborhood commercial or home-to-home. Many of these trips are made on local streets with some connections to arterials and collectors. Their needs are for lower volume/speed traffic streets, safety and connectivity.

Recreational trips share many of the needs of both the commuter and activity-based trips, but create greater needs for off-street routes, connections to rural routes and safety. Typically, recreational bike trips will exceed the normal bike trip length.

Facilities

Bicycle ways can generally be categorized as bike lanes, bicycle accommodation, or off-street bike paths/multi-use trails. Bike lanes are areas within the street right-of-way designated specifically for bicycle use. Federal research has indicated that bike lanes are the most cost effective and safe facilities for bicyclists when considering all factors of design. Bicycle accommodations are where bicyclists and autos share the same travel lanes, including a wider outside lane and/or bicycle boulevard treatment (priority to through bikes on local streets). Multi-use paths are generally off-street routes (typically recreationally focused) that can be used by several transportation modes, including bicycles, pedestrians and other non-motorized modes (i.e. skateboards, roller blades, etc.). Wide sidewalks (greater than eight feet wide) can also be considered as multi-use paths. The term bikeway is used in this plan to represent any of the bicycle accommodations described above. The bicycle plan designates where bike lanes and multi-use paths are anticipated and any other bicycleways are expected to be bike accommodations (i.e. shared with motor vehicles).

Bicycle lanes adjacent to the curb are preferred to bicycle lanes adjacent to parked cars or bicycle lanes combined with sidewalks. Five or six-foot bicycle lanes are recommended. Provision of a bicycle lane not only benefits bicyclist but also motor vehicles which gain greater shy distance/emergency shoulder area and pedestrians which gain buffer between walking areas and moving vehicles. Off-street trails and sidewalks that are constructed under a curb tight basis should be planned for 12 feet in width, which is desirable for mixed-use activity (pedestrian and bike). Signing and marking of bicycle lanes should follow the *Manual on Uniform Traffic Control Devices*. Design features in the roadway can improve bicycle safety. For example, using curb storm drain inlets rather than catch basins significantly improves bicycle facilities.

The Metro 2004 Regional Transportation System Plan (RTP) identifies the following corridors within the regional bicycle system:

- Sunnyside Road Regional on-street bikeway
- 122nd/129th Avenue Regional on-street bikeway
- Mt. Scott Boulevard Regional on-street bikeway
- Idleman Road Community connector bikeway
- Mt. Scott Trail Proposed regional corridor off-street bikeway
- East Buttes Power Line Corridor Trail Proposed regional corridor off-street bikeway
- Scouter Mountain Trail Proposed regional corridor off-street bikeway

A regional corridor bikeway provides point-to-point connections between the central city, regional centers, and larger town centers. They generally carry higher automobile speeds and volumes than community connector bikeways. By complying with the RTP designation, the Happy Valley Bicycle Master Plan is consistent with plans developed by Metro and Clackamas County.

The proposed Metro regional trails within the study area are shown on the Bicycle Master Plan (Figure 6-1) and described below.

Mt. Scott Trail – Proposed as a trail that would extend north from Mt. Talbert to join the Springwater Corridor near Powell Butte. It would cross over Mt. Scott and follow Johnson Creek before intersecting with the Springwater Corridor.

East Buttes Power Line Corridor Trail – Proposed as part of the Pleasant Valley Concept Plan, this trail would connect from the Springwater Corridor south to the Clackamas River Greenway following an existing powerline right of way. It also would connect to the southern end of the Gresham to Fairview Trail.

Scouter Mountain Trail – Proposed to connect Powell Butte at the Springwater Corridor to Scouter Mountain to the south and back again to the Springwater Corridor further to the east.

Recommended Bicycle Master Plan

To meet transportation performance standards and serve future growth, the future transportation system needs multi-modal improvements to manage the forecasted travel demand. The extent of the recommended multi-modal improvements for Happy Valley is significant. Future growth can be accommodated with significant investment in transportation improvements.

A list of potential bicycle projects to meet the identified needs and achieve these strategies was developed into a Bicycle Master Plan. The Master Plan shown in Figure 6-1 and summarized in Table 6-1 is an overall plan and summarizes the 'wish list' of bicycle related projects in Happy Valley, providing a long-term map for planning bicycle facilities. Projects that were identified in the previous TSP are identified with an asterisk (*). These projects will be used to create an updated Bicycle Action Plan. The Action Plan consists of projects that the City should give priority to in funding. As development occurs, streets are rebuilt and other opportunities (such as grant programs) arise, projects on the Master Plan should be pursued as well. Additional local facilities such as bike lanes, bike routes, off-street trails and crossing enhancements recommended in this plan extend beyond the regional scope of the RTP.

The planning level cost estimates provided are based on general unit costs for transportation improvements, but do not reflect the unique project elements that can significantly add to project costs. Each of these project costs will need further refinement to detail right-of-way requirements and costs associated with special design details as projects are pursued.

Table 6-1: Bicycle Master Plan Projects

Priority	Project	Location	From	To	Cost ($1,000s)
Bike Lanes on Existing Arterials & Collectors					
High	Sunnyside Road Phase 2/3A	North/South	122nd Avenue	162nd Avenue	$1,650
High	Sunnyside Road Phase 3B	North/South	162nd Avenue	172nd Avenue	$420
High	145th Avenue*	East/West	Wallowa Way	Clatsop Street	$250
High	145th Avenue	East/West	King Road	Purple Finch Loop	$260
High	147th Avenue	East	King Road	Monner Road	$290
High	147th Avenue	West	Alta Vista Drive	Monner Road	$70
High	King Road*	North/South	129th Avenue	Regina Court	$350
Medium	Mt. Scott Boulevard*	East/West	Northern City limits	129th Avenue	$800
Medium	132nd Avenue*	West	King Road	Clatsop Street	$400
Medium	132nd Avenue*	East	Clatsop Street	Geneva Way	$350
Medium	172nd Avenue South	East/West	Sunnyside Road	Highway 212	$870
Medium	172nd Avenue North	East/West	Sunnyside Road	Clatsop Street	$1,920
Medium	162nd Avenue	East/West	Sunnyside Road	Hagen Road	$660
Medium	122nd /129th Avenue*	West	Sunnyside Road	King Road	$530
Medium	122nd /129th Avenue	East	Mountain Gate Road	Scott Creek Lane	$110
Low	Valley View Terrace	East/West	Sunnyside Road	William Otty Road	$360
Low	Ridgecrest Road*	North/South	Mt. Scott Boulevard	132nd Avenue	$470
Low	Ridgecrest Road*	North/South	132nd Avenue	145th Avenue	$510
Low	Idleman Road*	North/South	Western City Limit	Mt.Scott Boulevard	$1,130
Low	William Otty Road*	North/South	Valley View	129th Avenue	$870
Low	Monner Road	North/South	147th Avenue	162nd Avenue	$390
Bike Lanes on New Arterials & Collectors					
132nd Avenue Extension		East/West	Sunnyside Road	Mountain Gate Road	**
Clatsop Extension West		North/South	Mt. Scott Boulevard	132nd Avenue	**
Clatsop Extension East		North/South	162nd Avenue	Foster Road	**
Johnson Creek Extension		East/West	Idleman Road	North	**
162nd Avenue Extension North		North/South	Hagen Road	Clatsop Street	**
162nd Avenue Extension South		North/South	Sunnyside Road	Sunrise Corridor	**
Monner Road Extension		North/South	162nd Avenue	172nd Avenue	**
Barbara Welch Extension		East West	Clatsop Street	Scouter Mountain South Roadway	**
Scouter Mountain South Roadway		East/West	147th Avenue	172nd Avenue	**
Scouter Mountain East Roadway #1		North/South	Barbara Welch Extension	172nd Avenue	**
Scouter Mountain East Roadway #2		North/South	162nd Avenue	172nd Avenue	**
Pleasant Valley Golf Course Roadway #1		North/South	162nd Avenue	172nd Avenue	**

Priority Project	Location	From	To	Cost ($1,000s)
Pleasant Valley Golf Course Roadway #2	East/West	Scouter Mountain Roadway	Sunnyside Road	**
Rock Creek Major Arterial	North/South	172nd Avenue	Sunrise Corridor	**
Rock Creek Roadway #1	North/South	162nd Avenue	172nd Avenue	**
Rock Creek Roadway #2	East/West	162nd Avenue	Rock Creek Collector #1	**
Regional Multi-Use Trail				
Mt. Scott Trail		Powell Butte	Mt. Talbert	-
East Buttes Power Line Corridor Trail		Springwater Corridor	Clackamas River Greenway	-
Scouter Mountain Trail		Powell Butte	Springwater Corridor	-
		Bike Lanes on Existing Arterials & Collectors		$12,660
		Bike Lanes on New Arterials & Collectors		$**
		Regional Multi-Use Trail		-
		Total Bicycle Master Plan Projects		**$12,660**

*These projects were identified in the previous TSP.
**These project costs are included in a motor vehicle plan.
- These projects are under the jurisdiction of, and will be funded by, other agencies.

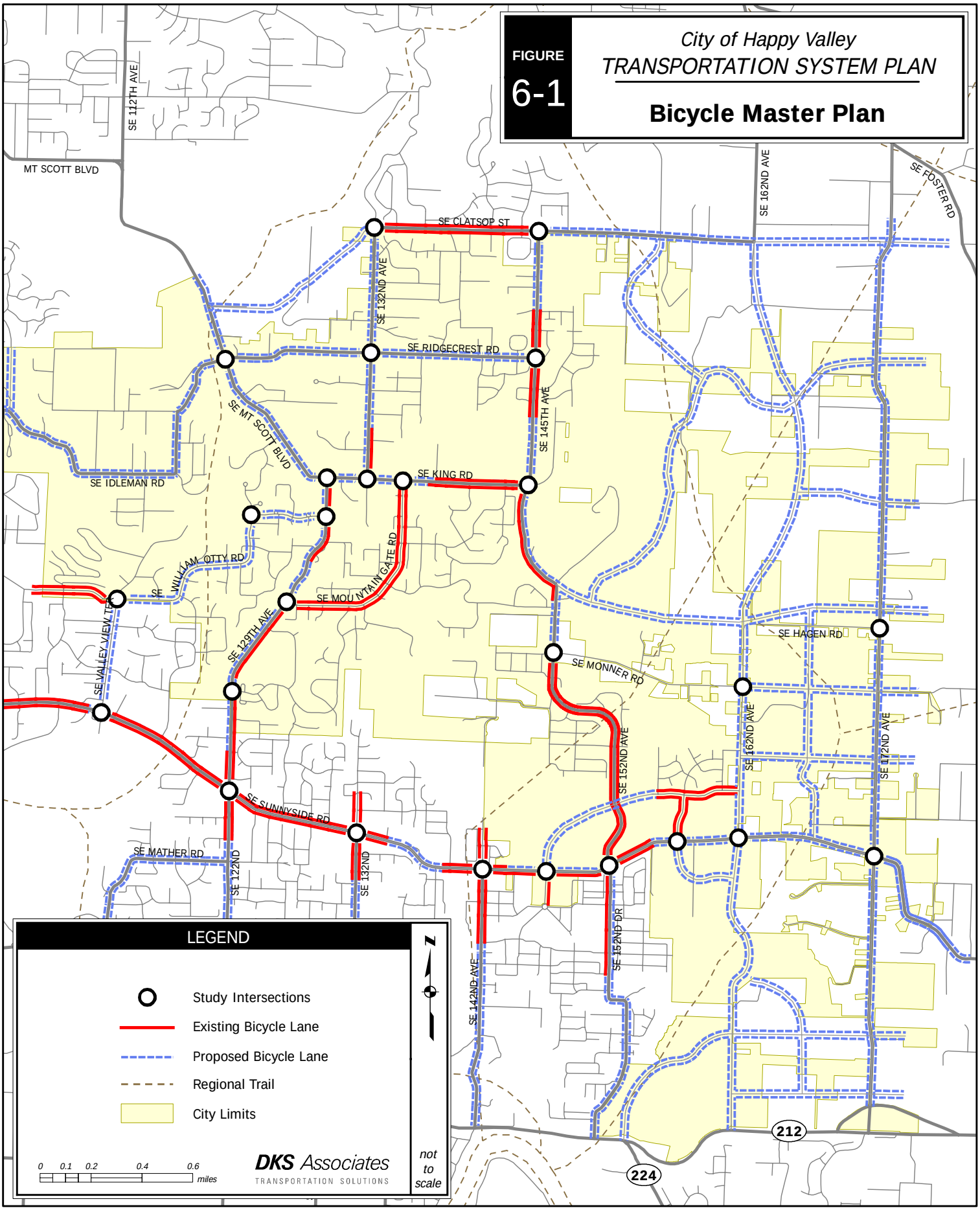


FIGURE
6-1
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Bicycle Master Plan
MT SCOTT BLVD
SE 112TH AVE
SE CLATSOP ST
SE 132ND AVE
SE RIDGECREST RD
SE MT SCOTT BLVD
SE 145TH AVE
SE IDLEMAN RD
SE KING RD
SE WILLIAM OTTY RD
SE MOUNTAIN GATE RD
SE VALLEY VIEW TER
SE 129TH AVE
SE 162ND AVE
SE FOSTER RD
SE HAGEN RD
SE MONNER RD
SE 152ND AVE
SE 172ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 132ND
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
Study Intersections
Existing Bicycle Lane
Proposed Bicycle Lane
Regional Trail
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

Bicycle Action Plan

A bicycle system action plan project list was created to identify bicycle projects that are reasonably expected to be funded by the year 2025, which meets the requirements of the updated Transportation Planning Rule[1]. The TSP goals and policies were used to rank the bicycle projects. The highest ranking City projects that are reasonably expected to be funded (see Chapter 10) were combined with projects identified in the RTP Financially Constrained scenario and projects with anticipated funding from other agencies to create the project list shown in Table 6-2.

Table 6-2: Bicycle Action Plan Projects

Project	Improvement	Potential Funding Source	Estimated Schedule	Cost ($1,000s)
Sunnyside Road Phase 2/3A Bike Lanes	Construct bike lanes on both sides of the roadway from 122nd Avenue to 162nd Avenue.	Joint SDC Fund	2006-2010	$1,650
Sunnyside Road Phase 3B Bike Lanes	Construct bike lanes on both sides of the roadway from 162nd Avenue to 172nd Avenue.	Joint SDC Fund	2006-2010	$420
172nd Avenue South Bike Lanes*	Construct bike lanes on both sides of the roadway from Sunnyside Road to Highway 212.	Joint SDC Fund	2011-2015	$870
172nd Avenue North Bike Lanes*	Construct bike lanes on both sides of the roadway from Sunnyside Road to Clatsop Street.	Joint SDC Fund	2021-2025	$1,920
162nd Avenue Bike Lanes	Construct bike lanes on both sides of the roadway from Monner Road to Clatsop Street and Sunnyside Road to Highway 212.	Joint SDC Fund	-	$2,430
Clatsop Street Bike Lanes	Construct bike lanes on both sides of the roadway from 162nd Avenue to 172nd Avenue.	Joint SDC Fund	-	$300
145th/147th Avenue Bike Lanes*	Construct bike lanes on both sides of the roadway from Clatsop Street to Monner Road.	Metro/Other	2010-2015	$1,040
162nd Avenue Bike Lanes*	Construct bike lanes on both sides of the roadway from Monner Road to Sunnyside Road.	Metro/Other	2016-2025	$390
		City of Happy Valley Costs		$0
		Joint SDC Fund		$7,590
		Other Agencies		$1,430
		Total Bicycle Project Costs		**$9,020****

* Project identified in the 2004 Federal Regional Transportation Plan Update Financially Constrained scenario.
**These project costs are included in a motor vehicle action plan.

[1] *OAR Chapter 660*, Department of Land Conservation and Development, Division 012, Transportation Planning, adopted on March 15, 2005, effective April, 2005.

Plan Implemention

It is important that, as new development occurs, connections or accessways are provided to link the development to the existing bicycle and pedestrian facilities in as direct manner as is reasonable. If a development fronts a bikeway or sidewalk (as shown in the Bicycle or Pedestrian Master Plans), the developer shall be responsible for providing the bikeway or walkway facility as part of any half-street improvement required for project mitigation.

DKS Associates
TRANSPORTATION SOLUTIONS

7. Transit Plan

This chapter summarizes existing and future transit needs in the City of Happy Valley. The following sections outline the policies used to evaluate needs and the recommended transit plan for the City of Happy Valley. The method used to develop the transit plan combined TriMet, city staff and other agencies input.

Policies

Several policies were developed for future transit facilities in Happy Valley. These policies are aimed at providing the City with priorities to direct its funds towards transit projects that meet the goals of the City.

The policies for transit facilities are:

- Policy 3d: The City shall coordinate with Tri-Met to improve transit service in Happy Valley. Fixed route transit will use arterial and collector streets in Happy Valley. Park & Ride lots will be provided to accommodate concentrated transit demands where feasible.
- Policy 3g: Pedestrian access to transit will be improved as transit services increases in the future.
- Policy 6a: Design and construct transportation facilities to meet the requirements of the Americans with Disabilities Act.

Needs

TriMet is the regional transit provider for the Portland metro area and operates three bus routes within Happy Valley today, #155, #156, and #157 (see Figure 7-1). Bus route #157 serves Happy Valley north of Sunnyside Road. Bus route #155 serves Sunnyside Road with connections to Clackamas Town Center. Bus route #156 serves areas south of Sunnyside Road. Within the City of Happy Valley there are currently no park and ride lots.

TriMet's Transit Investment Plan[1] (TIP) identifies strategies for meeting regional public transit needs, focusing on improvements to the total transit system, such as improvements on existing lines. Therefore the TIP focuses on targeted, strategic improvements to the system, including:

- Maintain the quality of the existing system
- Expand the high capacity transit system (commuter rail or bus rapid transit)
- Expand the Frequent Service system
- Improve local service

[1] *Transit Investment Plan* TriMet, 2003.

The quality of transit service within Happy Valley can be characterized by the following indicators:

- Transit route coverage,
- Frequency,
- Reliability, and
- User amenities

The following sections present the analysis and findings for each of these service characteristics, and identify potential needs for future transit service improvements in Happy Valley.

Transit Coverage

The minimum land use density[2] required to support a fixed route transit bus service with 1-hour scheduled between arrivals is about four housing units per acre or three employees per acre. Figure 7-1 shows those areas in Happy Valley that meet this transit supportive density threshold with the 2025 development forecasts, as well as the transit coverage area represented by a 0.25 mile radius from transit stops. This future 2025 transit coverage assessment serves as a general indication of transit demand corridors. The location and density of actual future development will ultimately determine transit service needs.

In general, about half of the future 2025 transit supportive areas are covered with transit service. The residential areas roughly bordered by Sunnyside Road, 147th Avenue, Monner Road and 172nd Avenue show a potential need for future transit coverage. The Pleasant Valley area located northeast of the 162nd Avenue/Clatsop Street intersection also shows a demand for future transit coverage. The remaining portions of the City either are supported by transit service today or have forecasted land use not expected to meet the density thresholds in 2025. It is important to continue TriMet's LIFT Program and Ride Connection operated by the American Red Cross to areas within the City not supported by transit service. By law, TriMet must offer ADA complementary service such as LIFT within three-quarters of a mile from a fixed transit route.

Transit coverage can also be improved by providing adequate access to transit service. Typically, the recommended transit stop spacing in urban areas is approximately 500 feet minimum. Today, the bus stops on Sunnyside Road are located approximately 1,000-feet to 1,800-feet apart. As development occurs and ridership demand increases, the bus stop spacing on Sunnyside Road should be reduced.

The recently annexed Rock Creek Area located south of Sunnyside Road between 152nd Avenue and 172nd Avenue is expected to develop as a major employment center with a need for future transit coverage. Bus route #10 currently provides service from downtown Portland to Foster Road at 122nd Avenue. An extension of this bus route should be considered further east on Foster Road, south on 172nd Avenue, west on Highway 212 with a returning loop to 172nd Avenue through the major employment center.

Bus route #155 currently provides service on Sunnyside Road west of 147th Avenue. An extension of this bus route should be considered to the east in increments as new development occurs along Sunnyside Road. In the near-term, the #155 bus route should be extended to 162nd Avenue based on anticipated transit demand from recently approved developments on Sunnyside Road.

[2] Thresholds for minimum land use density to support fixed-route transit service are based on definitions in the 2000 *Highway Capacity Manual*, Chapter 27 for transit service analysis methodologies.

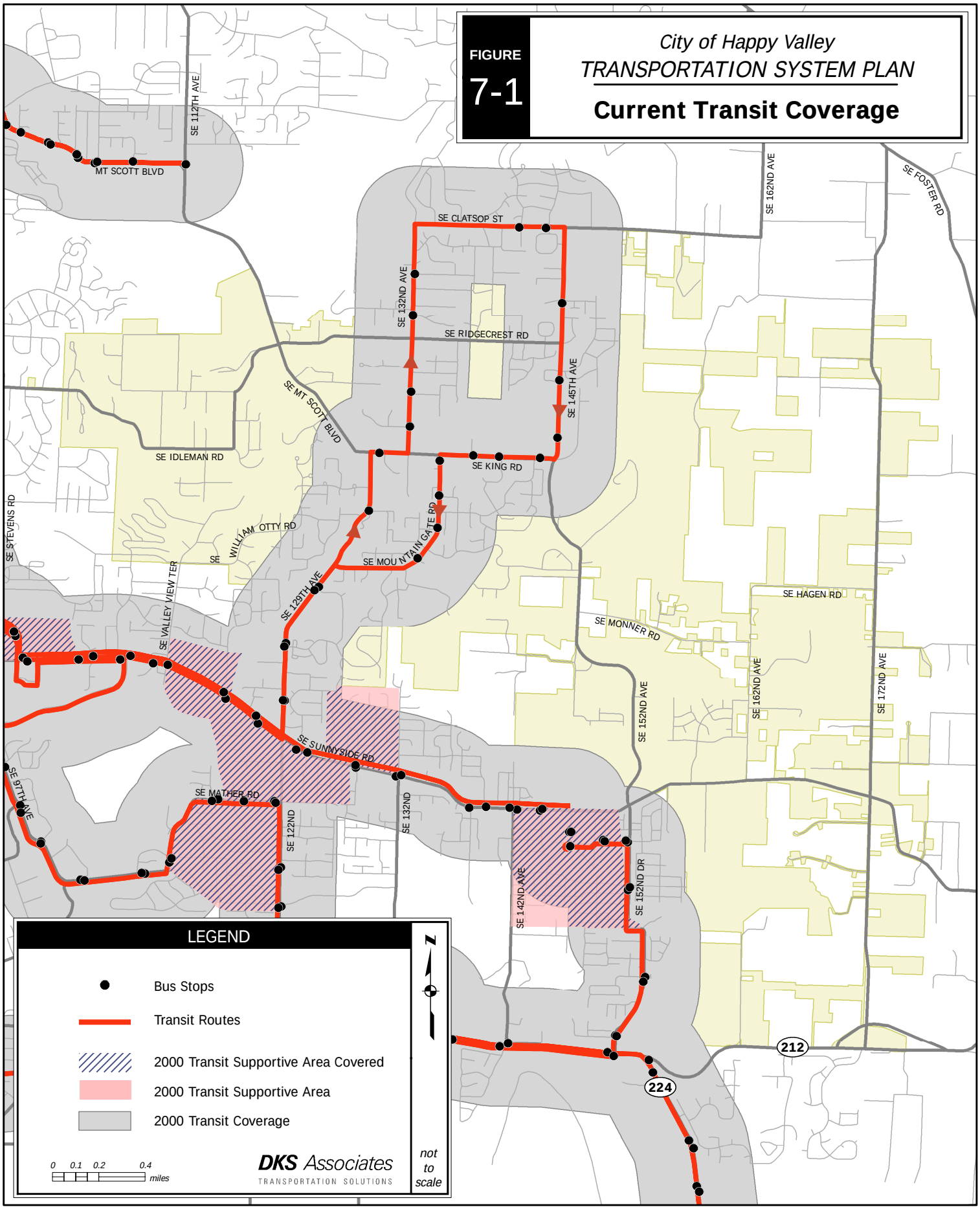


FIGURE
7-1
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Current Transit Coverage
MT SCOTT BLVD
SE 112TH AVE
SE CLATSOP ST
SE 132ND AVE
SE RIDGECREST RD
SE 145TH AVE
SE 162ND AVE
SE FOSTER RD
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SE STEVENS RD
SE WILLIAM OTTY RD
SE MOUNTAIN GATE RD
SE VALLEY VIEW TER
SE 129TH AVE
SE HAGEN RD
SE MONNER RD
SE 152ND AVE
SE 162ND AVE
SE 172ND AVE
SE SUNNYSIDE RD
SE 97TH AVE
SE MATHER RD
SE 122ND
SE 132ND
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
Bus Stops
Transit Routes
2000 Transit Supportive Area Covered
2000 Transit Supportive Area
2000 Transit Coverage
0 0.1 0.2 0.4
miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

Bus route #157 has relatively low ridership today with less than 50 boardings per day. The future demand for transit service in the area is not expected to increase enough to continue service on the same route. However, the residential areas near 147th Avenue and 152nd Avenue north of Sunnyside Road to King Road show a transit supportive density that would warrant future transit service. Bus route #157 should be reconfigured to remove service from Mountain Gate Road, 132nd Avenue, 145th Avenue (north of King Road) and Clatsop Street and provide service on 122nd Avenue/129th Avenue, King Road and 145th Avenue (south of King Road), Misty Drive and 152nd Avenue.

Transit Frequency

In addition to providing service to a geographic area, transit route frequency is a measure of transit quality of service and mode attractiveness. As development occurs within the study area and transit demand increases, bus service frequency should be reduced to every 15 to 30 minutes.

Transit Reliability

Transit service reliability is a key performance characteristic for retaining riders. Congested roadways, bottlenecks and traffic signals can delay transit vehicles and cause transit vehicles to arrive off schedule and close together. In the future, the Sunnyside Road and 172nd Avenue transit corridors will be faced with numerous traffic signal control delays and forecasted congestion.

A bus rapid transit system (BRT) can significantly improve bus operations, reliability and travel times for a modest capital investment. A BRT utilizes buses in service that are integrated with key components of the existing automobile transportation infrastructure, such as roads and rights-of-way, intersections and traffic signals. It allows for incremental construction and implementation and can be easily tailored to meet the specific transportation needs and opportunities within individual neighborhoods and transportation corridors.

Specific elements of a Bus Rapid Transit system include:

- Bus lanes – A lane on an urban arterial or city street is reserved for the exclusive or near-exclusive use of buses. Allows buses to avoid traffic congestion.

- Bus signal priority– Preferential treatment of buses at intersections can involve the extension of green time or actuation of the green light at signalized intersections upon detection of an approaching bus. Intersection priority can be particularly helpful when implemented in conjunction with bus lanes or streets, because general-purpose traffic does not intervene between buses and traffic signals.

- Traffic management improvements – Low-cost infrastructure elements that can increase the speed and reliability of bus service include bus boarding islands and curb realignments.

Bus stop relocation can also improve transit reliability. Transit stops should be spaced appropriately to provide adequate accessibility to riders while limiting bus delays from frequent stops. Typically, the recommended transit stop spacing in urban areas is approximately 500 feet minimum. Transit stop relocations should be coordinated with pedestrian improvements, such as curb extensions, as they are constructed.

User Amenities

The purpose of transit stop amenities is to improve the convenience and attractiveness of using the transit system. Good public transportation is important to the livability of a community. Accessible transit stops are essential to a useable system. TriMet prioritizes the need for bus stop amenities by ridership and special circumstances (senior center, etc.). Potential improvements to the overall system include:

- Transit Tracker – Transit riders can utilize Transit Tracker by phone to access next bus arrival times using the bus stop ID number provided at the bus stop.
- Bus shelters – Improve the convenience of using the transit system by providing a comfortable place to wait for the bus.
- Curb extensions – The extension of the sidewalk area into the parking lane provides a more convenient pedestrian connection to a stopped bus.
- Street lighting – Bus stops should be highly visible locations so pedestrians can easily identify the locations and good security can be provided.
- Park and Ride Lots – Improves access to transit service by providing free designated parking lots near concentrated transit demand.

One of the most significant user amenities for bus services is a shelter at the transit stop. Most of the bus stops within the study area today have minimal amenities. These user amenity improvements are particularly important along the transit route #155 serving Sunnyside Road due to the higher volumes of passengers expected along this corridor.

Metro RTP

In addition to the performance based needs discussed above, the Happy Valley TSP needs to consider Metro RTP designations for consistency. The RTP identifies regional bus transit designation[3] for the following facilities:

- Sunnyside Road
- 172nd Avenue
- 122nd/129th Avenue

Regional bus service operates with minimum frequencies of 15 minutes with conventional stop spacing along the route. Covered bus shelters, special lighting, signal preemption and curb extensions are appropriate at high ridership locations along these routes.

Also, the RTP identifies several major transit stops on Sunnyside Road. Major bus stops are intended to provide a high degree of transit passenger comfort and access. Major transit stops shall provide schedule information, lighting, benches, shelters and trash cans.

Recommended Transit Plan

To meet transportation performance standards and serve future growth, the future transportation system needs multi-modal improvements to manage the forecasted travel demand. Future growth can be accommodated with significant investment in transportation improvements. TriMet is responsible for any changes in transit routes through their annual TIP report. In order for the City

[3] Based on the *2000 Regional Transportation Plan*, Metro, August 12, 2000.

to have its transit needs assessed, the City can provide input to TriMet's TIP through the Clackamas County Coordinating Committee or through the TIP Open House held every January.

Transit projects were determined based on the identified needs, policies and project feasibility. Proposed transit master plan projects are summarized in Table 7-1 and shown in Figure 7-2. Transit enhancements within the Tri-Met service area are ultimately decided based on regional transit goals. Happy Valley should coordinate with TriMet to incorporate changes to bus service within the City.

Table 7-1: Transit Master Plan Projects

Project	Description	Cost ($1,000s)
Bus Stop Enhancements	Coordinate with TriMet to provide transit stop amenities including bus shelters and street lighting at all transit stops.	-
RTP Designated Major Transit Stops	To meet RTP requirements, amend development code regulations to require new retail, office, and institutional buildings on sites at major transit stops to: ▪ Locate buildings within 20 feet of or provide a pedestrian plaza at the major transit stops. ▪ Provide reasonably direct pedestrian connections between the transit stop and building entrances on the site. ▪ Provide a transit passenger landing pad accessible to disabled persons (if not already existing to transit agency standards). ▪ Provide an easement or dedication for a passenger shelter and underground utility connection from the new development to the transit amenity if requested by the public transit provider. ▪ Provide lighting at a transit stop (if not already existing to transit agency standards).	$0
Park & Ride Lots	Coordinate with TriMet to provide future park and ride lots.	-
Sunnyside Road Transit Signal Priority	Coordinate with TriMet to construct and implement transit signal priority on Sunnyside Road as congested conditions occur and ridership volumes increase.	-
172nd Avenue Transit Signal Priority	Coordinate with TriMet to construct and implement transit signal priority on 172nd Avenue as congested conditions occur and ridership volumes increase.	-
Expand Bus Route #10	Bus route #10 should be extended to serve future transit demand in Pleasant Valley, on 172nd Avenue and at the planned major employment center north of Highway 212.	-
Reconfigure Bus Route #157	Bus route #157 should be reconfigures to serve future transit demand on 147th Avenue, Misty Drive and 152nd Avenue between Sunnyside Road and King Road.	-
Expand Bus Route #155	Bus route #155 should be extended further east on Sunnyside Road to serve future transit demand.	-
Transit Corridors	Direct growth to increase the density of development along transit routes in the study area in an effort to support regional transit service goals.	-
	Transit Project Total	**$0**

- These projects are under the jurisdiction of, and/or will be funded by, other agencies.

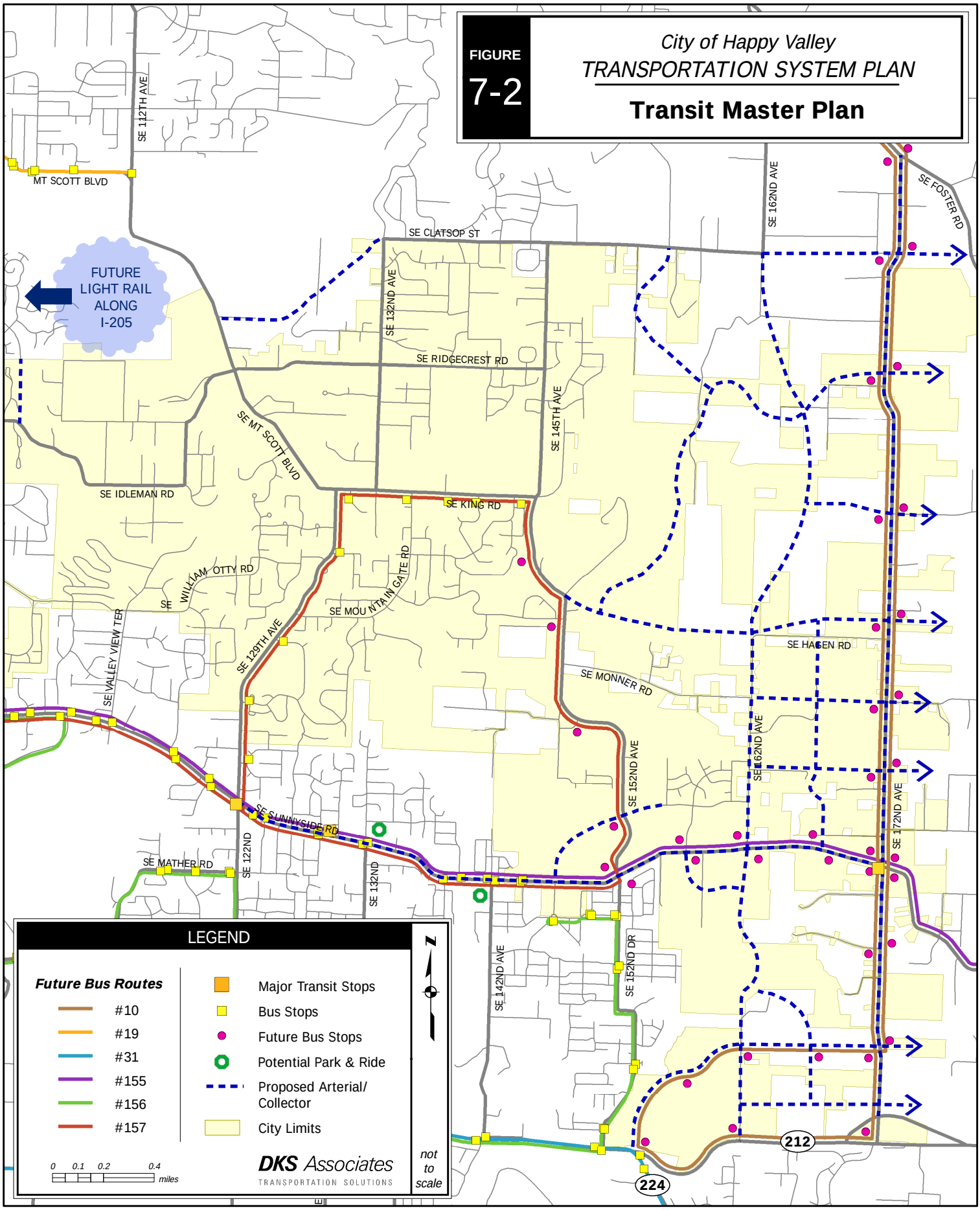


FIGURE
7-2
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Transit Master Plan
FUTURE LIGHT RAIL ALONG I-205
MT SCOTT BLVD
SE 112TH AVE
SE CLATSOP ST
SE 132ND AVE
SE RIDGECREST RD
SE 145TH AVE
SE 162ND AVE
SE FOSTER RD
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SE WILLIAM OTTY RD
SE MOUNTAIN GATE RD
SE VALLEY VIEW TER
SE 129TH AVE
SE HAGEN RD
SE MONNER RD
SE 152ND AVE
SE 162ND AVE
SE 172ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 132ND
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
Future Bus Routes
#10
#19
#31
#155
#156
#157
Major Transit Stops
Bus Stops
Future Bus Stops
Potential Park & Ride
Proposed Arterial/ Collector
City Limits
0 0.1 0.2 0.4 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

Transit Action Plan

A transit system action plan project list was created to identify transit projects that are reasonably expected to be funded or implemented by the year 2025, which meets the requirements of the updated TPR[4]. Projects that are reasonably expected to be funded or implemented (see Chapter 10) were combined with projects identified in the RTP Financially Constrained scenario to create the project list shown in Table 7-2.

Table 7-2: Transit Action Plan Projects

Project	Description	Cost ($1,000s)
Bus Stop Enhancements	Coordinate with TriMet to provide transit stop amenities including bus shelters and street lighting at all transit stops.	-
RTP Designated Major Transit Stops	To meet RTP requirements, amend development code regulations to require new retail, office, and institutional buildings on sites at major transit stops to: ▪ Locate buildings within 20 feet of or provide a pedestrian plaza at the major transit stops. ▪ Provide reasonably direct pedestrian connections between the transit stop and building entrances on the site. ▪ Provide a transit passenger landing pad accessible to disabled persons (if not already existing to transit agency standards). ▪ Provide an easement or dedication for a passenger shelter and underground utility connection from the new development to the transit amenity if requested by the public transit provider. ▪ Provide lighting at a transit stop (if not already existing to transit agency standards).	$0
Transit Corridors	Direct growth to increase the density of development along transit routes in the study area in an effort to support regional transit service goals.	-
	Transit Projects to be Funded by the City	**$0**

- These projects are under the jurisdiction of, and/or will be funded by, TriMet.

[4] *OAR Chapter 660*, Department of Land Conservation and Development, Division 012, Transportation Planning, adopted on March 15, 2005, effective April, 2005.

DKS Associates
TRANSPORTATION SOLUTIONS

8. Motor Vehicle Plan

This chapter summarizes needs for the motor vehicle system for future conditions in the City of Happy Valley. It also outlines the strategies to be used in evaluating needs and recommends plans for motor vehicles (automobiles, trucks, buses and other vehicles). The Motor Vehicle modal plan is intended to be consistent with other jurisdictional plans including Metro's Regional Transportation System Plan (RTP), Clackamas County's Transportation System Plan (TSP) and the Rock Creek Plan.

Policies

Several policies were developed for future motor vehicle facilities in Happy Valley. These policies are aimed at providing the City with priorities to direct its funds towards motor vehicle projects that meet the goals of the City.

The policies for motor vehicle facilities are:

- Policy 1a: Build residential and neighborhood streets to discourage speeding.
- Policy 1d: The City shall be open to alternative designs such as roundabouts, etc.
- Policy 2a: The City shall work to minimize traffic on local streets within the city by supporting improvements that limit the amount of cut-through traffic passing through Happy Valley except for on major arterials.
- Policy 2b: In development of roadway projects, impacts to adjacent homes/properties should be considered, minimized, and balanced between providing a safe and efficient transportation facility.
- Policy 2c: Balance the functional classification system throughout the City.
- Policy 3e: Local streets shall be designed to encourage a reduction in trip length by providing connectivity and limiting out-of-direction travel. Connectivity shall be provided according to published Metro street connectivity guidelines that improve local circulation by providing connections to activity centers and destinations, with a priority for pedestrian connections.
- Policy 4a: Design of streets should relate to their intended use and function.
- Policy 4e: Access management standards shall be developed in conjunction with the functional classification system for Happy Valley to improve safety in Happy Valley.
- Policy 4f: New roadways shall meet lighting standards. Existing roadways shall be systematically retrofitted with roadway lighting.

- Policy 5a: A minimum intersection level of service standard shall be maintained for the City of Happy Valley. All signalized intersections shall operate at level of service D or better during the peak hour of analysis. All unsignalized intersections shall operate at level of service E or better (based on average approach delay) for all side street approaches during the peak hour of analysis. The City shall utilize these standards to evaluate land use actions and proposed mitigations. All public facilities shall be designed to meet these standards.
- Policy 8a: All collector, neighborhood route, and local streets in Happy Valley shall limit through truck traffic.
- Policy 8b: Specific arterials shall be designated as freight routes for through truck movements.

Future Capacity Deficiencies

The base case analysis for the forecasted 2025 growth was essentially a no-build scenario based on the RTP Financially Constrained funding scenario. This scenario only includes transportation system improvements outside of the TSP study area that are expected to be constructed and implemented with the current funding levels. Figure 8-1 shows the forecasted demand to capacity ratio on roadways within the TSP study area for the no-build scenario. As shown in the figure, the no-build scenario transportation system does not have adequate roadway capacity to serve the expected future travel needs. Red roadway segments in Figure 8-1 indicate roadway segments that are over-capacity and do not meet either City of County traffic operating standards. The demand to capacity ratios exceed 1.0 on multiple key corridors in the study area including Sunnyside Road, 129th Avenue, 132nd Avenue, 145th/147th/152nd Avenue, Mt. Scott Boulevard, Idleman Road, Ridgecrest Road and Clatsop Street.

Strategies

To meet performance standards and serve future growth, the future transportation system needs multi-modal improvements and strategies to manage the forecasted travel demand. The extent and nature of the multi-modal improvements for Happy Valley are significant. The impact of future growth would be severe without investment in transportation improvements. Strategies for meeting automobile facility needs include the following:

- Local Circulation Enhancements
- Neighborhood Traffic Management
- Transportation Demand Management Programs to Reduce Peak Traffic for Employers in Happy Valley
- Additional Traffic Signals on Arterial/Collector Intersections
- Intelligent Transportation Systems (ITS)
- Intersection Modifications
- Transportation System Management (TSM)
- Regional Circulation Enhancements
- Mitigate all Intersections to Level of Service D and V/C of 0.99 in the PM Peak Hour

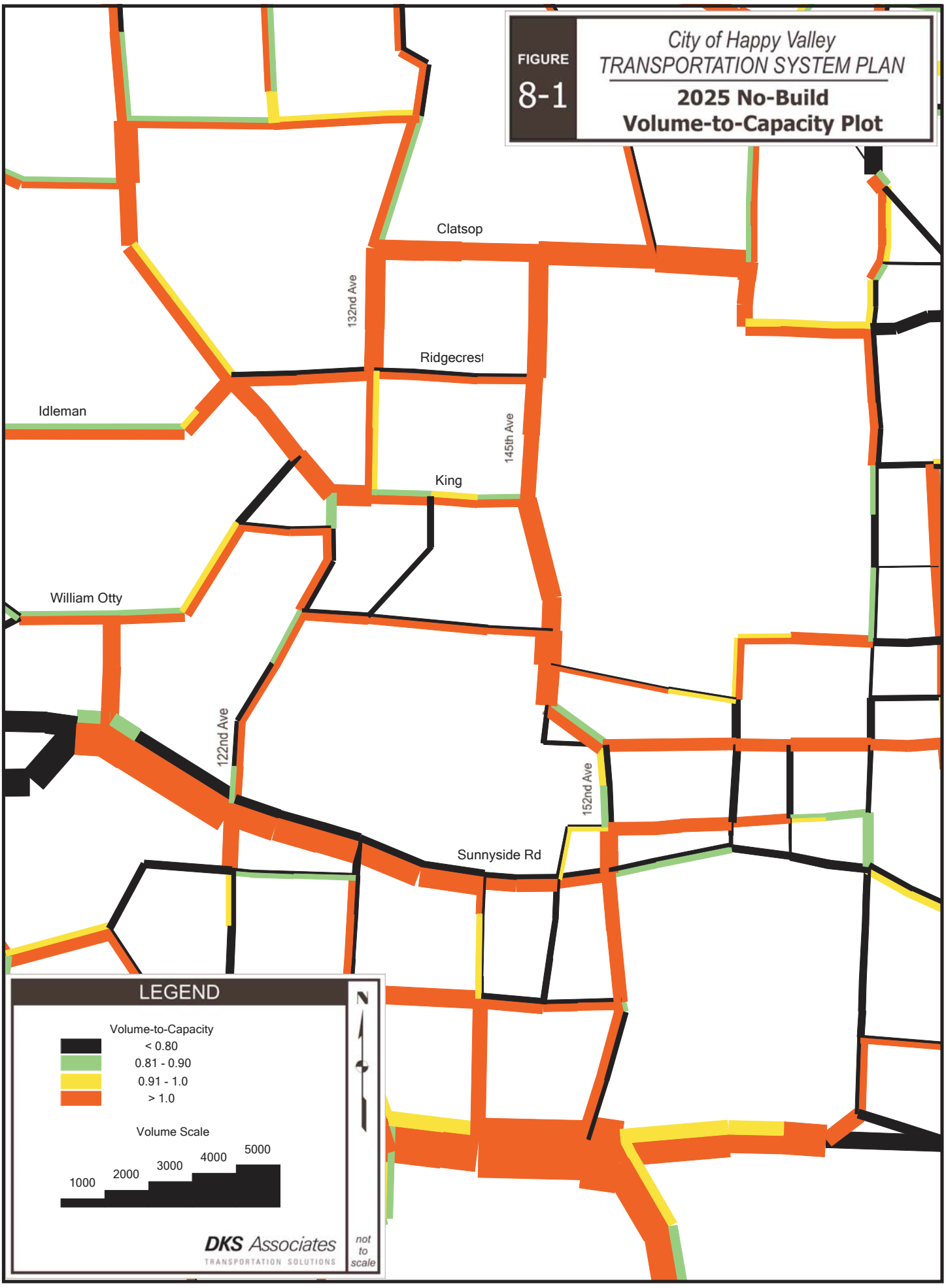


FIGURE
8-1
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
2025 No-Build
Volume-to-Capacity Plot
Clatsop
132nd Ave
Ridgecrest
Idleman
145th Ave
King
William Otty
122nd Ave
152nd Ave
Sunnyside Rd
LEGEND
Volume-to-Capacity
< 0.80
0.81 - 0.90
0.91 - 1.0
> 1.0
Volume Scale
1000
2000
3000
4000
5000
N
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

The following sections outline the type of improvements that would be necessary as part of a long-range Motor Vehicle Master Plan. Phasing of implementation will be necessary since all of the improvements cannot be done at once. This will require prioritization of projects and periodic updating to reflect current needs. Most importantly, it should be understood that the improvements outlined in the following sections are a guide to managing growth in Happy Valley as it occurs over the next 20 years.

Transportation System Management (TSM)

Transportation System Management (TSM) focuses on low cost strategies to enhance operational performance of the transportation system by seeking solutions to immediate transportation problems, finding ways to better manage transportation, maximizing urban mobility, and treating all modes of travel as a coordinated system. These types of measures include such things as signal improvements, traffic signal coordination, traffic calming, access management, local street connectivity and intelligent transportation systems (ITS). Typically, the most significant measures that can provide tangible benefits to the traveling public are traffic signal coordination and systems.

TSM measures focus primarily on region wide improvements, however there are a number of TSM measures that could be used in a smaller scale environment such as the Happy Valley area. The following sections discuss TSM measures that could be appropriate for the Happy Valley 2025 TSP study area.

Intelligent Transportation Systems (ITS)

ITS involves the application of advanced technologies and proven management techniques to relieve congestion, enhance safety, provide services to travelers and assist transportation system operators in implementing suitable traffic management strategies. ITS focuses on increasing the efficiency of existing transportation infrastructure, which enhances the overall system performance and reduces the need to add capacity (e.g. travel lanes). Efficiency is achieved by providing services and information to travelers so they can (and will) make better travel decisions and to transportation system operators so they can better manage the system and improve system reliability.

Clackamas County has prepared an ITS plan for the urbanized area of the County. The Clackamas County ITS Plan[1] has identified arterial signal control ITS projects on major streets throughout the county. Sunnyside Road and 122nd/129th Avenue within the TSP study area have been identified for planned fiber optic cable and closed-circuit cameras at several major intersections.

Other ITS projects to consider in the future may include:

- Transit signal priority
- Signal coordination and optimization
- Traffic monitoring and surveillance
- Information availability
- Incident management

[1] Clackamas County ITS Plan, DKS Associates, Inc. and Zenn Associates, February 2003.

In order to support future ITS projects including traffic signal operations, the City of Happy Valley and Clackamas County should require the installation of 3 inch conduit along arterial and selected collector roadways during roadway improvement projects. ITS projects can require additional fiber optic cable to serve the new equipment along a roadway. A 3 inch conduit would ensure adequate wiring capacity to accommodate future ITS projects.

Neighborhood Traffic Management (NTM)

Happy Valley has neighborhood traffic management elements in place, such as speed humps, on streets within the study area. The city should consider additional traffic calming measures and work with the community to find the traffic calming solution that best meets their needs and maintains roadway function. Table 8-1 lists common NTM applications and suggests which devices may be supported by the Clackamas County Fire District. Any NTM project should include coordination with emergency agency staff to assure public safety.

Table 8-1: Traffic Calming Measures by Roadway Functional Classification

Traffic Calming Measure	Roadway Classification		
	Arterial	**Collector**	**Neighborhood/ Local Street**
Curb Extensions	Not Supported	Supported*	Traffic calming measures are acceptable on lesser emergency response routes that have connectivity (more than two accesses) and are accepted by the City of Happy Valley.
Medians	Supported	Supported	
Pavement Texture	Not Supported	Supported	
Speed Hump	Not Supported	Not Supported	
Roundabout	Supported**	Supported	
Raised Crosswalk	Not Supported	Not Supported	
Speed Cushion (provides emergency pass-through with no vertical deflection)	Not Supported	Not Supported	
Choker[2]	Not Supported	Not Supported	
On-Street Parking	Not Supported	Not Supported	
Traffic Circle	Not Supported	Not Supported	
Diverter (with emergency vehicle pass through)	Not Supported	Not Supported	

* Only supported on roadways with on-street parking.

** In special cases to be determined by City staff.

Note: It is desirable to have all traffic calming measures meet Clackamas County Fire District guidelines including minimum street width, emergency vehicle turning radius, and accessibility/connectivity.

Access Management

Access Management is a broad set of techniques that balance the need to provide efficient, safe and timely travel with the ability to allow access to individual properties. Proper implementation of access management techniques should guarantee reduced congestion, reduced accident rates, less need for roadway widening, conservation of energy, and reduced air pollution.

Access management is the control or limiting of vehicular access on arterial and collector facilities to maintain the capacity of the facilities and preserve their functional integrity. Access management strives to strike a balance between maintaining the integrity of the facility and

[2] Chokers are not supported when they do not shadow parking. If parking is shadowed, see curb extensions.

providing access to adjacent parcels. Numerous driveways can erode the capacity of arterial and collector roadways. Preservation of capacity is particularly important on higher volume roadways for maintaining traffic flow and mobility. Whereas local and neighborhood streets function to provide access, collector and arterial streets serve greater traffic volume. Numerous driveways or street intersections increase the number of conflicts and potential for collisions and decrease mobility and traffic flow. Happy Valley, as with every city, needs a balance of streets that provide access with streets that serve mobility.

Several access management strategies were identified to improve local access and mobility in Happy Valley:

- Develop specific access management plans for major and minor arterial streets in Happy Valley to maximize the capacity of the existing facilities and protect their functional integrity.
- Work with land use development applications to consolidate driveways where feasible.
- Provide left turn lanes where warranted for access onto cross streets.
- Construct raised medians to provide for right-in/right-out driveways as appropriate.

New development and roadway projects located on City street facilities should meet the recommended access spacing standards summarized in Table 8-2. The maximum spacing of roadways and driveways listed in this table is consistent with Metro[3].

Table 8-2: Access Spacing Standards for City Street Facilities

Street Facility	Maximum spacing of roadways and driveways	Minimum spacing of full access intersections	Minimum spacing of limited access* intersections	Minimum spacing of driveways
Major Arterial	-	1,000 feet	500 feet	500 feet
Minor Arterial	-	600 feet	300 feet	300 feet
Collector	530 feet	400 feet	400 feet	200 feet
Neighborhood	530 feet	-	-	-
Local	530 feet	-	-	-

Note: Intersection and driveway spacing measured from centerline to centerline.
* Limited Access – Vehicles are restricted to right-in/right-out turn movements. In some cases, left-in turn movements may be permitted.

Access management is not easy to implement and often requires long institutional memory of the impacts of short access spacing – increased collisions, reduced capacity, poor sight distance and greater pedestrian exposure to vehicle conflicts. The most common opposition response to access control is that "there are driveways all over the place at closer spacing than mine – just look out there". These statements are commonly made without historical reference. Many of the pre-existing driveways that do not meet access spacing requirements were put in when traffic volumes were substantially lower and no access spacing criteria were mandated. With higher and higher traffic volume in the future, the need for access control on all arterial and collector roadways is

[3] Metro Regional Transportation Plan, 2000.

critical – the outcome of not managing access properly is additional wider roadways which have much greater impact than access control.

Traffic Signal Spacing

Traffic signal spacing standards have been established as part of this Happy Valley TSP update. Traffic signals that are spaced too closely on a corridor can result in poor operating conditions and safety issues due to the lack of adequate storage for vehicle queues. A minimum traffic signal spacing of 1,000-feet is required for major arterial, minor arterial and collector facilities.

Local Street Connectivity

Much of the local street network in Happy Valley is built but is not well connected. Multiple access opportunities for entering or exiting neighborhoods are limited. There are a number of locations where neighborhood traffic is funneled onto one single street. This type of street network results in out-of-direction travel for motorists and an imbalance of traffic volumes that impacts residential frontage. The outcome can result in the need for wider roads, traffic signals and turn lanes (which can negatively impact traffic flow). By providing connectivity between neighborhoods, out-of-direction travel and vehicle miles traveled (VMT) can be reduced, accessibility between various travel modes can be enhanced and traffic levels can be balanced out between various streets. Additionally, public safety response time is reduced.

Some of these local connections can contribute with other street improvements to mitigate capacity deficiencies by better dispersing traffic. Several roadway connections will be needed within neighborhood areas to reduce out of direction travel for vehicles, pedestrians and bicyclists. This is most important in the areas where a significant amount of new development is possible.

Figure 8-2 shows the proposed Street Connectivity Plan for Happy Valley. 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 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 local connections are based on the Metro RTP requirements for new residential or mixed-use developments.

- Every 330 feet, a grid for pedestrians and bicycles
- Every 530 feet, a grid for automobiles

To protect existing neighborhoods from 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 bike 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 no more than 10 dwelling units
- Includes street cross-sections demonstrating dimensions of ROW improvements, with streets designed for posted or expected speed limits

The arrows shown on Figure 8-2 indicate priority local and neighborhood connections only. Topography and environmental conditions limit the level of connectivity in several areas of Happy Valley. Other stub end streets in the City's road network may become cul-de-sacs, extended cul-de-sacs or provide local connections. Pedestrian connections from the end of any stub end street that results in a cul-de-sac should be considered mandatory as future development occurs. The goal would continue to be improved city connectivity for all modes of transportation.

Functional Classification

The proposed functional classification of roadways (shown in Figure 8-3) was developed following detailed review of the existing Happy Valley TSP, Clackamas County TSP and the Rock Creek Plan functional classification. With the expansion of the TSP study area, several roadways are now classified by Happy Valley. Also, a proposed roadway system has been developed within the planned growth areas of the TSP study area. The proposed functional classification of these roadways is shown in Figure 8-3.

The following proposed Happy Valley TSP functional classifications are inconsistent with the Clackamas County TSP and/or the Rock Creek Plan.

- 172nd Avenue changed from a minor arterial (County TSP) to a major arterial
- Hagen Road changed from a local street (County TSP) to a neighborhood street
- Monner Road changed from a local street (County TSP) to a neighborhood street
- 162nd Avenue (north of Sunnyside Road) changed from a local street (County TSP) to a collector street
- 152nd Avenue (north of Sunnyside Road) changed from a collector (County TSP and Rock Creek Plan) to a minor arterial
- Valley View Terrace changed from neighborhood street (Happy Valley TSP) to a collector street

The criteria used to assess functional classification have two components: the extent of connectivity and the frequency of the facility type. Maps can be used to determine regional, city/district and neighborhood connections. The frequency or need for facilities of certain classifications is not routine or easy to package into a single criterion. While planning textbooks call for arterial spacing of a mile, collector spacing of a quarter to a half-mile, and neighborhood connections at an eighth to a sixteenth of a mile, this does not form the only basis for defining functional classification.

Changes in land use, environmental issues or barriers, topographic constraints, and demand for facilities can change the frequency for routes of certain functional classifications. While spacing standards can be a guide, they must consider other features and potential long term uses in the area (some areas would not experience significant changes in demand, where others will). It is acceptable for the city to re-classify street functional designations to have different naming conventions than the RTP street functional classifications, however, the general intent and purpose of the facility, whatever the name, should be consistent with regional, state and federal guidelines.

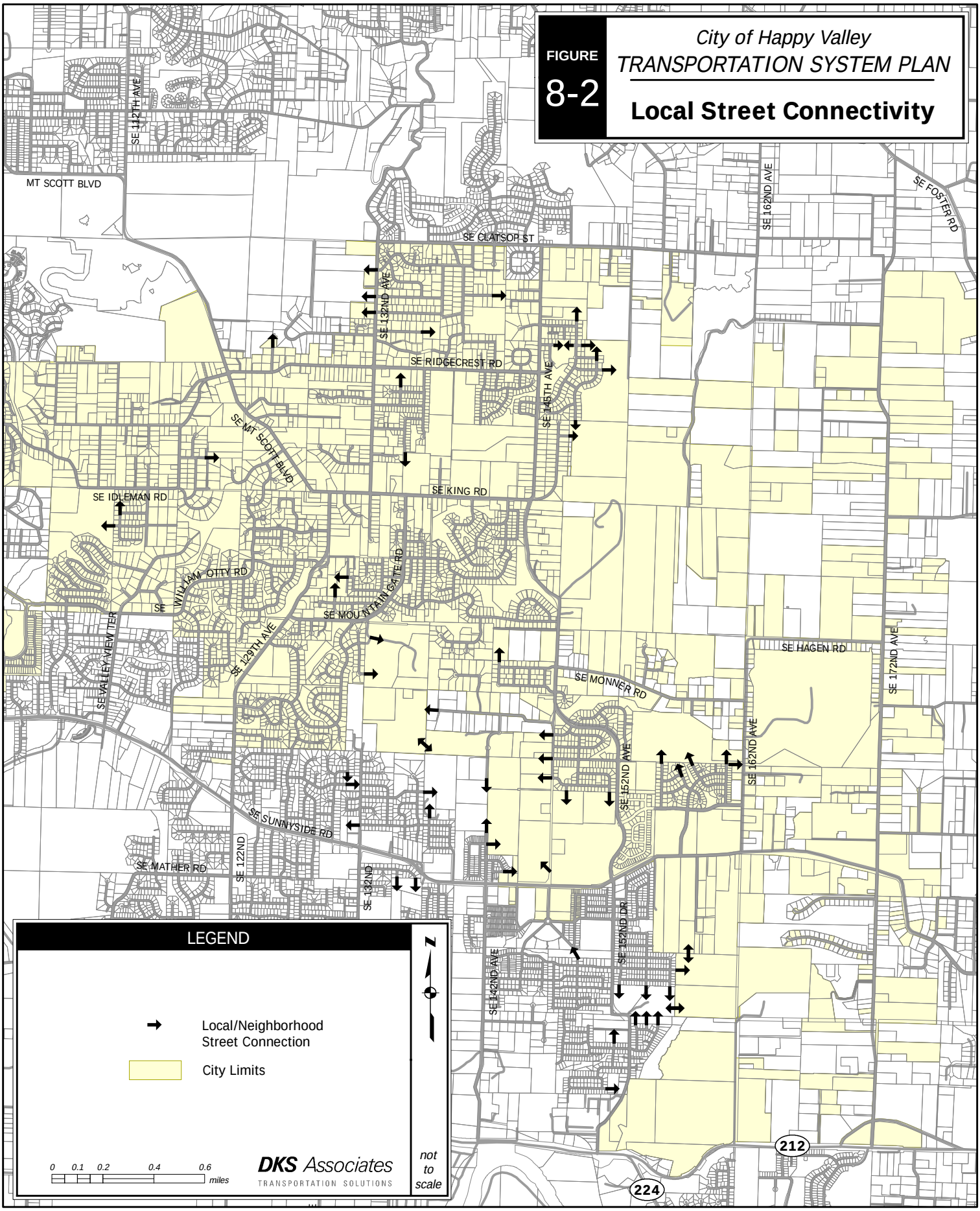


FIGURE
8-2
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Local Street Connectivity
MT SCOTT BLVD
SE 112TH AVE
SE CLATSOP ST
SE 132ND AVE
SE RIDGECREST RD
SE 145TH AVE
SE 162ND AVE
SE FOSTER RD
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SE WILLAMETTE VIEW TER
SE WILLAMETTE FALLS DR
SE MOUNTAIN GATE RD
SE 129TH AVE
SE HAGEN RD
SE MONNER RD
SE 172ND AVE
SE 152ND AVE
SE SUNNYSIDE RD
SE 122ND
SE MATHER RD
SE 142ND AVE
212
224
LEGEND
Local/Neighborhood Street Connection
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

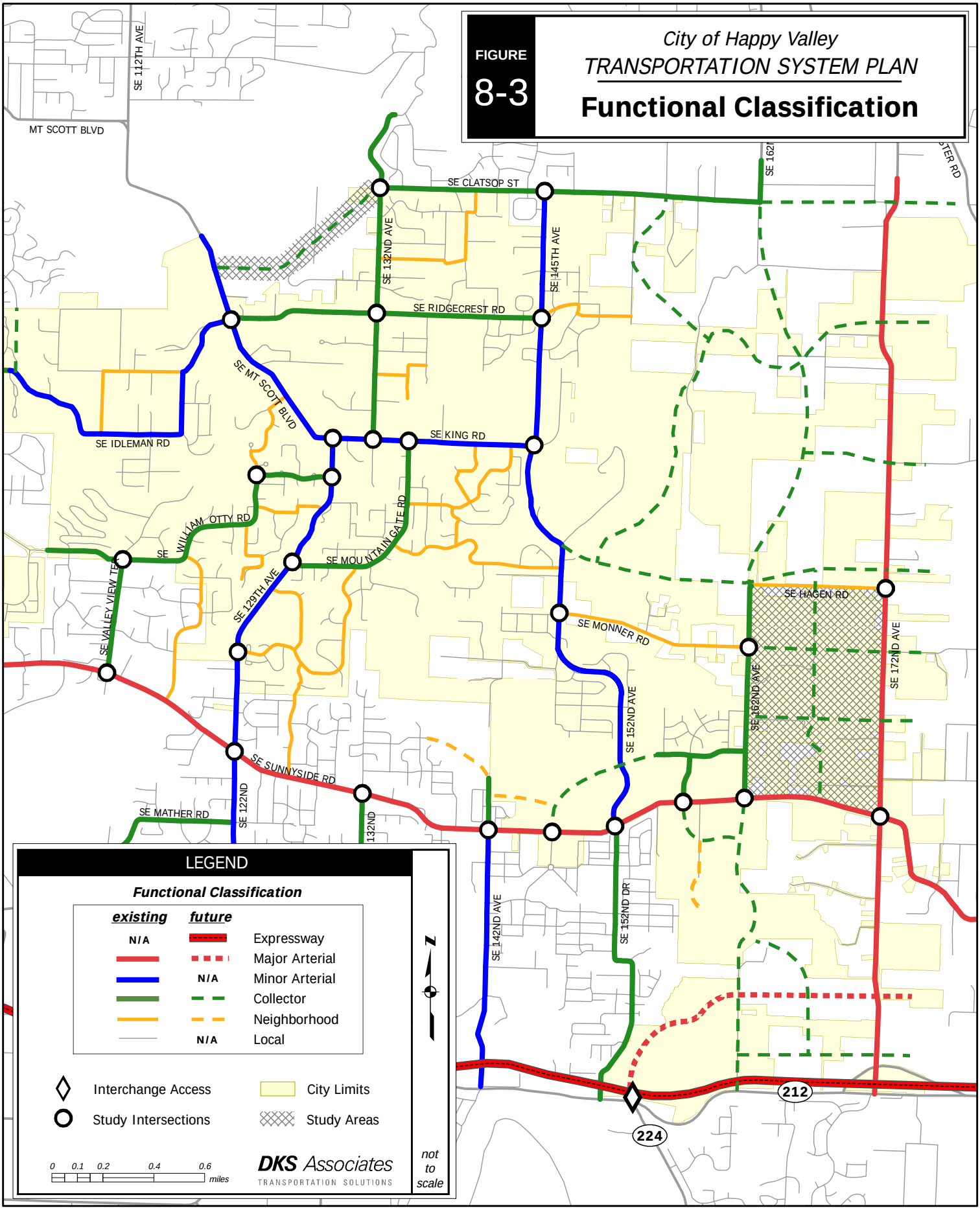


FIGURE
8-3
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Functional Classification
SE 112TH AVE
MT SCOTT BLVD
SE CLATSOP ST
SE 132ND AVE
SE 145TH AVE
SE RIDGECREST RD
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SE WILLIAM OTTY RD
SE MOUNTAIN GATE RD
SE VALLEY VIEW TER
SE 129TH AVE
SE HAGEN RD
SE MONNER RD
SE 162ND AVE
SE 172ND AVE
SE 152ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
132ND
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
Functional Classification
existing
future
N/A
Expressway
Major Arterial
N/A
Minor Arterial
Collector
Neighborhood
N/A
Local
Interchange Access
Study Intersections
City Limits
Study Areas
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

Roadway Cross-Section Standards

The design characteristics of streets in Happy Valley were developed to meet the function and demand for each facility type. Because the actual design of a roadway can vary from segment to segment due to adjacent land uses and demands, the objective was to define a system that allows standardization of key characteristics to provide consistency, but also to provide criteria for application that provides some flexibility, while meeting the design standards.

Table 8-3 summarizes the proposed street characteristics for Happy Valley. Figures 8-4 through 8-8 show the proposed cross-sections for arterials, collectors, neighborhood routes and local streets in Happy Valley. Where center left turn lanes are identified (3 lane section), the actual design of the street may include sections without center turn lanes (2 lane section) adjacent to environmentally sensitive or physically constrained areas or with median treatments, where feasible. The actual treatment will be determined within the design for implementation of each project.

The local roadway cross-sections shown in Figure 8-7 provide for a 28-foot pavement section with parking on one side of the street and a 32-foot pavement section with parking on both sides of the street. This cross-section standard is based on the recommendations of the Fire Code Applications Guide from the Oregon Fire Code[4] and comments received from the Clackamas County Fire District #1 representatives. The intent of the local roadway cross-sections is to provide sufficient roadway width to adequately accommodate emergency vehicles.

Table 8-3: Proposed Street Characteristics

Street Element	Characteristic	Width/Options
Vehicle Lane Widths: (Minimum widths)	Truck Route	12 feet
	Bus Route	11 feet
	Arterial	12 feet
	Collector	12 feet
	Neighborhood	10 feet
	Local	10 feet
	Turn Lane	12 feet[5]
On-Street Parking:		8 feet
Bicycle Lanes: (minimum widths)	New Construction	5 to 6 feet
	Reconstruction	5 to 6 feet
Sidewalks: (Minimum width)	Neighborhood/Local	5 feet
	Collector	5 feet
	Arterial	6 feet
Landscape Strips:	Required on all streets	5 feet
Medians:	5-Lane	Required
	3-Lane	Required
	2-Lane	Optional
Neighborhood Traffic Management:	Local	Should not be necessary
	Neighborhood	Should consider if appropriate
	Collectors	Under special conditions
	Arterials	Prohibited
Transit:	Arterial/Collectors	Appropriate
	Neighborhood/Local	Only in special circumstances
	Local	Not appropriate

[4] Fire Code Applications Guide, Oregon Fire Code, Metro Code Committee, revised January 2005.

[5] In constrained conditions on collector and neighborhood facilities, a minimum width of 11 feet may be considered.

Under some conditions a variation to the adopted street cross-sections may be requested from the City Engineer. Typical conditions that may warrant consideration of a variation include (but are not limited to) the following:

- Infill sites
- Innovative designs (roundabouts)
- Severe topographic or environmental constraints
- Existing developments and/or buildings that make it extremely difficult or impossible to meet the design standards.

Street Right-of-Way Needs

Figure 8-9 summarizes the anticipated right-of-way needs for existing and proposed roadways within the TSP planning horizon. Planning level right-of-way needs can be determined utilizing street cross-sections and the lane geometry outlined later in this chapter. Special consideration was given to the proposed roadway network with environmental constraints such as creeks and steep grades. Several proposed roadways with the Scouter Mountain Area have been identified as two-lane roadways to reduce environmental impacts.

Wherever arterial or collectors cross each other, planning for additional right-of-way to accommodate turn lanes should be considered within 500 feet of the intersection. Specific right-of-way needs will need to be monitored continuously through the development review process to reflect current needs and conditions. This will be necessary since more specific detail may become evident in development review which requires improvements other than those outlined in this 20 year general planning assessment of street needs.

Parking Requirements

The City of Happy Valley currently has off-street parking ratios (minimum and maximum) standards consistent with the TPR and RTP parking ratio requirements. In addition, there are several parking policies[6] that should be considered including:

- Allow the designation of residential parking districts to protect residential areas from spillover parking generated by adjacent commercial, employment, or mixed-use areas, or other uses that generate a high demand for parking.
- Provide Metro annual parking data when requested that demonstrates compliance with the minimum and maximum parking ratios, including the application of any variances to the regional standards.
- Require parking lots more than three acres in size to provide street-like features along major driveways; including curbs, sidewalks, and street trees or planter strips. Major driveways in new residential and mixed-use areas shall meet connectivity standards for full street connections.

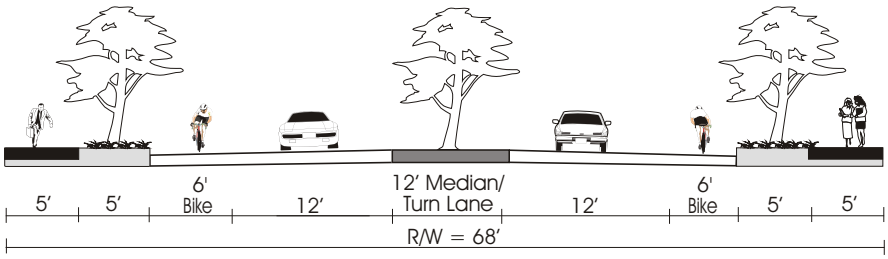
[6] *Urban Growth Management Functional Plan*, Title 2: Regional Parking Policy, Metro, September 22, 2004.

FIGURE 8-4

City of Happy Valley
TRANSPORTATION SYSTEM PLAN

Arterial Facility Cross-Section

MINOR ARTERIAL
3 Lane Section



MAJOR ARTERIAL
5 Lane Section

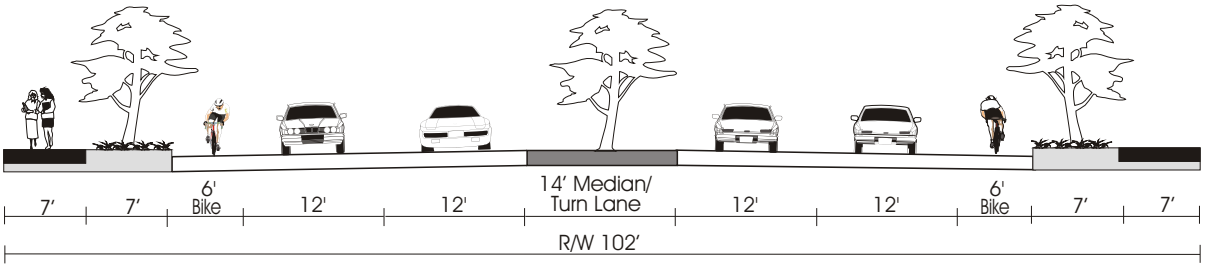
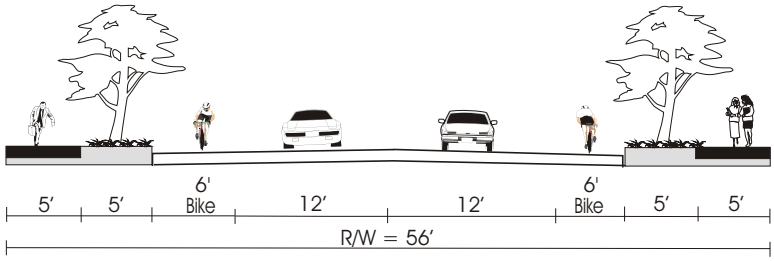


FIGURE 8-5

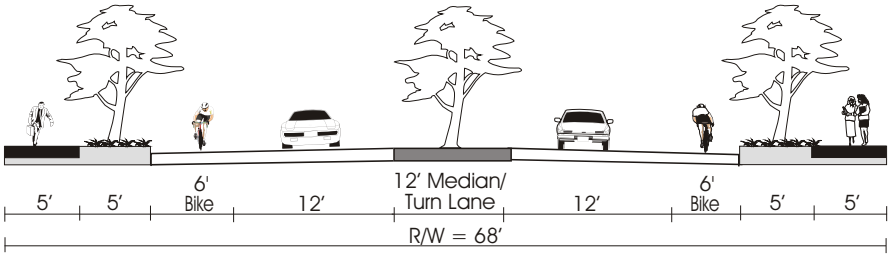
City of Happy Valley
TRANSPORTATION SYSTEM PLAN

Collector Facility Cross-Section

2 Lane Section



3 Lane Section



Industrial
2 Lane Section

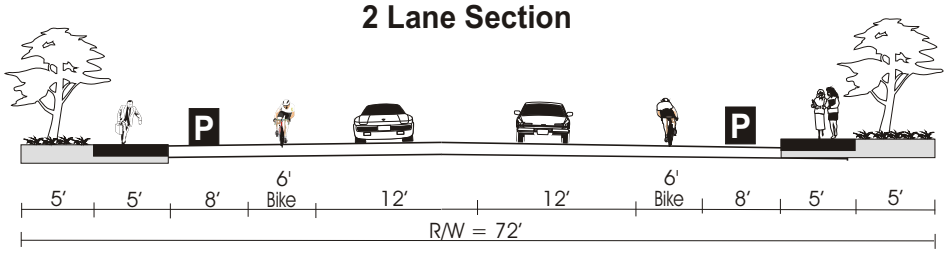
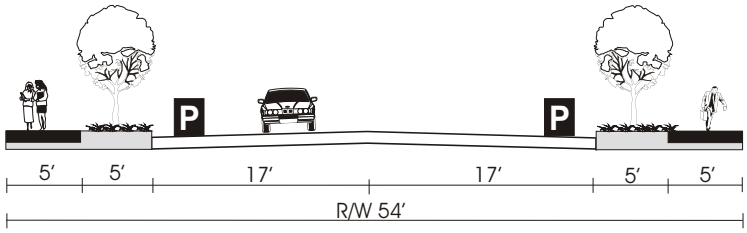


FIGURE 8-6

City of Happy Valley
TRANSPORTATION SYSTEM PLAN

Neighborhood & Commercial Facility Cross-Section

Neighborhood Street



Commercial Street

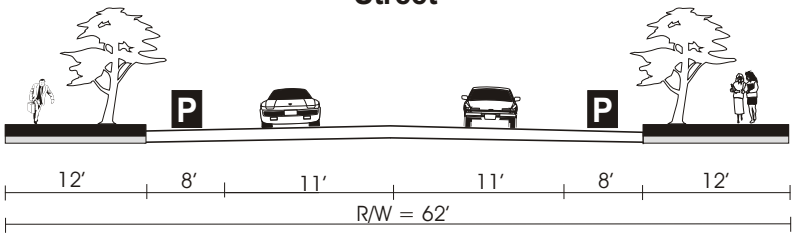
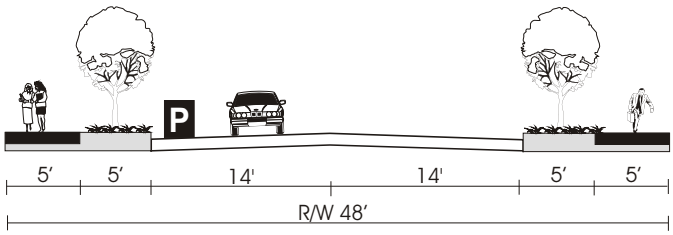


FIGURE 8-7

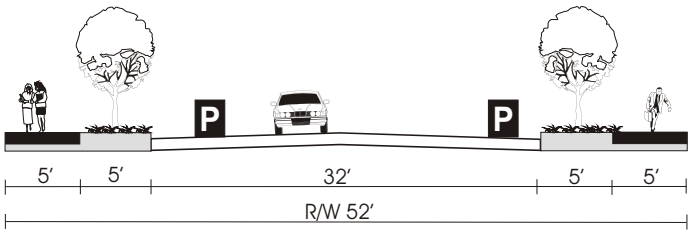
City of Happy Valley
TRANSPORTATION SYSTEM PLAN

Local Facility Cross-Section

Local Street
Parking on One Side



Local Street
Parking on Both Sides



Local Industrial

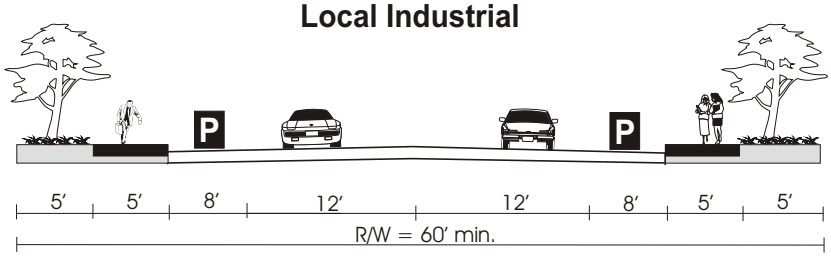
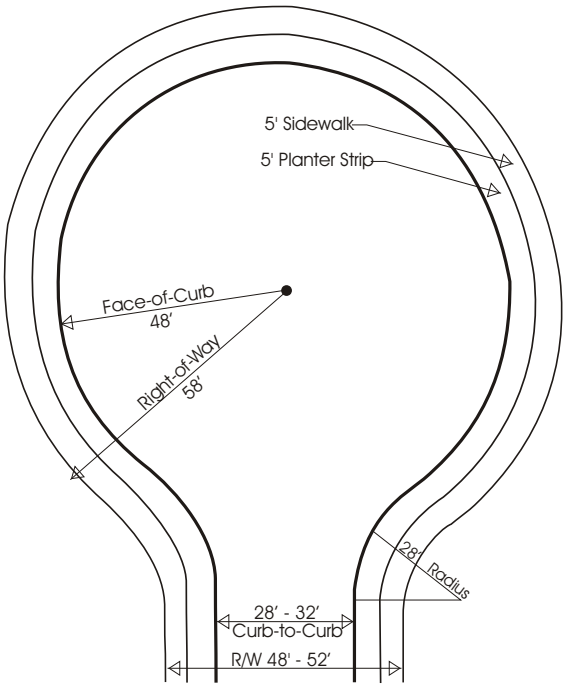


FIGURE 8-8

City of Happy Valley
TRANSPORTATION SYSTEM PLAN

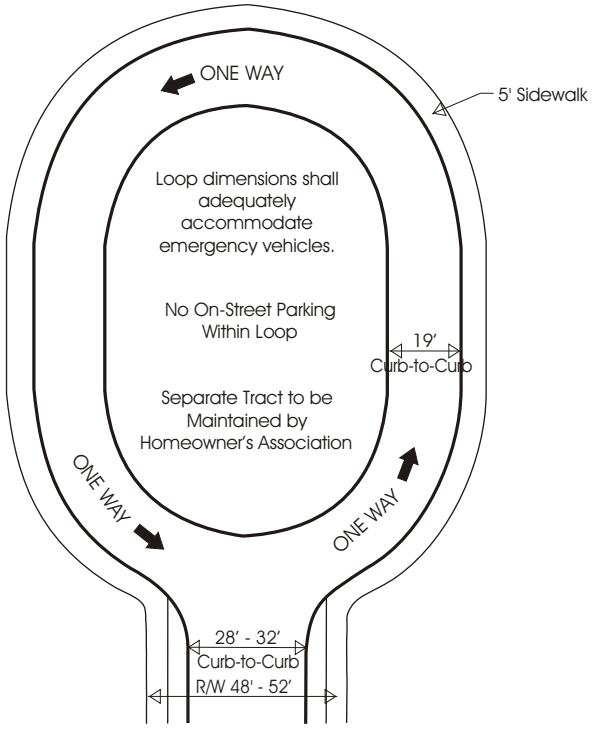
Cul de Sac, Loop Turn-Around & Hammerhead Cross-Sections

CUL DE SAC



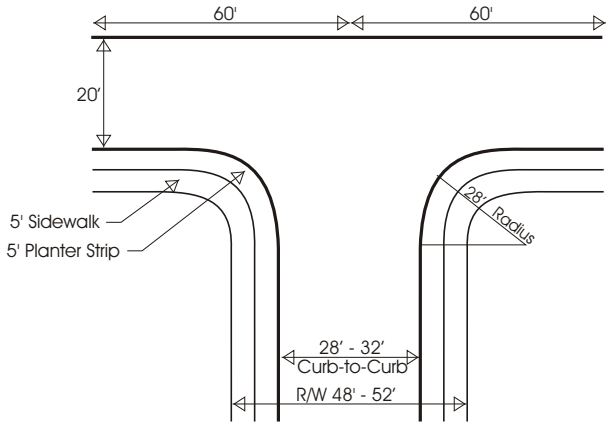
Sketch Not to Scale

LOOP TURN-AROUND



Sketch Not to Scale

HAMMERHEAD



Sketch Not to Scale

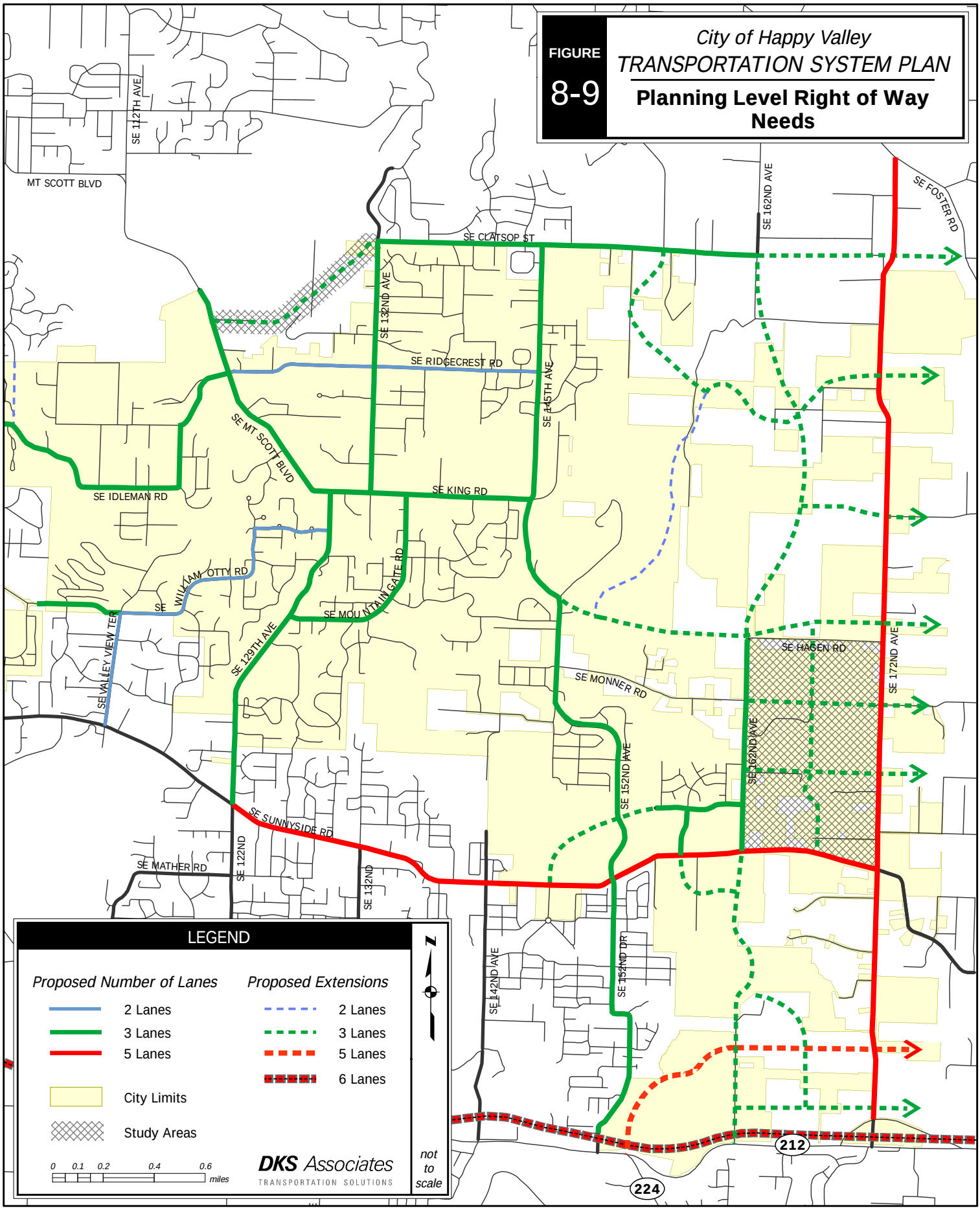


FIGURE
8-9
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Planning Level Right of Way Needs
MT SCOTT BLVD
SE 112TH AVE
SE CLATSOP ST
SE 132ND AVE
SE RIDGECREST RD
SE 145TH AVE
SE 162ND AVE
SE FOSTER RD
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SE WILLIAM OTTY RD
SE MOUNTAIN GATE RD
SE VALLEY VIEW TER
SE 129TH AVE
SE HAGEN RD
SE MONNER RD
SE 172ND AVE
SE 162ND AVE
SE 152ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 132ND
SE 142ND AVE
SE 152ND DR
212
224
LEGEND
Proposed Number of Lanes
2 Lanes
3 Lanes
5 Lanes
City Limits
Study Areas
Proposed Extensions
2 Lanes
3 Lanes
5 Lanes
6 Lanes
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
N
not to scale

Transportation Demand Management (TDM)

Transportation Demand Management (TDM) is the general term used to describe any action that removes single occupant vehicle trips from the roadway network during peak travel demand periods. As growth in the Happy Valley area occurs, the number of vehicle trips and travel demand in the area will also increase. The ability to change a user's travel behavior and provide alternative mode choices will help accommodate this growth.

Generally, TDM focuses on reducing vehicle miles traveled and promoting alternative modes of travel for large employers of an area. This is due in part to the Employee Commute Options (ECO) rules that were passed by the Oregon Legislature in 1993 to help protect the health of Portland area residents from air pollution and to ensure that the area complied with the Federal Clean Air Act.[7]

Research has shown that a comprehensive set of complementary policies implemented over a large geographic area can have an effect on the number of vehicle miles traveled to/from that area.[8] However, the same research indicates that in order for TDM measures to be effective, they should go beyond the low-cost, uncontroversial measures commonly used such as carpooling, transportation coordinators/associations, priority parking spaces, etc. Setting TDM goals and policies for new development will be necessary to help implement TDM measures in the future.

The more effective TDM measures include elements related to parking and congestion pricing, improved services for alternative modes of travel, and other market-based measures. However, TDM includes a wide variety of actions that are specifically tailored to the individual needs of an area. Table 8-4 provides a list of several strategies outlined in the ECO program that could be applicable to the Happy Valley area.

[7] Oregon Administrative Rules, Chapter 340, Division 30.

[8] *The Potential for Land Use Demand Management Policies to Reduce Automobile Trips*, ODOT, by ECO Northwest, June 1992.

Table 8-4: Transportation Demand Management Strategies

Strategy	Description	Potential Trip Reduction
Telecommuting	Employees work at home or at a work center closer to home, rather than commuting from home to work. This can be full time or on selected workdays. This can require computer equipment to be most effective.	82-91% (Full Time) 14-36% (1-2 day/wk)
Compressed Work Week	Schedule where employees work their regular scheduled number of hours in fewer days per week.	7-9% (9 day/80 hr) 16-18% (4 day/40 hr) 32-36% (3 day/36 hr)
Transit Pass Subsidy	For employees who take transit to work on a regular basis, the employer pays for all or part of the cost of a monthly transit pass.	19-32% (full subsidy, high transit service) 2-3% (half subsidy, medium transit service)
Cash Out Employee Parking	An employer that has been subsidizing parking (free parking) discontinues the subsidy and charges all employees for parking. An amount equivalent to the previous subsidy is then provided to each employee, who then can decide which mode of travel to use.	Reduction / Transit 8-20% High 5-9% Medium 2-4% Low
Reduced Parking Cost for HOVs	Parking costs charged to employees are reduced for high occupancy vehicles (HOV) such as carpools and vanpools.	1-3%
Alternative Mode Subsidy	For employees that commute to work by modes other than driving alone, the employer provides a monetary bonus to the employee.	21-34% (full subsidy of cost, high alternative modes) 2-4% (half subsidy of cost, medium alternative modes)
Bicycle Program	Provides support services to those employees that bicycle to work. Examples include: safe/secure bicycle storage, shower facilities and subsidy of commute bicycle purchase.	0-10%
On-site Rideshare Matching for HOVs	Employees who are interested in carpooling or vanpooling provide information to a transportation coordinator regarding their work hours, availability of a vehicle and place of residence. The coordinator then matches employees who can reasonably rideshare together.	1-2%
Provide Vanpools	Employees that live near each other are organized into a vanpool for their trip to work. The employer may subsidize the cost of operation and maintaining the van.	15-25% (company provided van with fee) 30-40% (subsidized van)
Gift/Awards for Alternative Mode Use	Employees are offered the opportunity to receive a gift or an award for using modes other than driving alone.	0-3%
Walking Program	Provide support services for those who walk to work. This could include buying walking shoes or providing lockers and showers.	0-3%
Company Cars for Business Travel	Employees are allowed to use company cars for business-related travel during the day	0-1%
Guaranteed Ride Home Program	A company owned or leased vehicle or taxi fare is provided in the case of an emergency for employees that use alternative modes.	1-3%
Time off with Pay for Alternative Mode Use	Employees are offered time off with pay as an incentive to use alternative modes.	1-2%

Source: *Guidance for Estimating Trip Reductions from Commute Options*, Oregon Department of Environmental Quality, August 1996.

With many regional trips destined to, or traveling through, the Happy Valley area, region wide TDM measures should help to reduce congestion. Metro has established non-SOV (Single Occupancy Vehicle) mode share targets to be achieved by 2040. The 2040 non-SOV model target for corridors (Sunnyside Road) is 45-55%.[9]

The Metro 2025 Regional Demand Model provides an analysis tool for monitoring non-SOV trip percentages between the various RTP funding scenarios. The forecasted non-SOV trip percentages take into account all RTP improvement projects (including transit, pedestrian, and bicycle system improvements), as well as the TAZ performance factors (which includes an increase in parking pricing and a decrease in transit pass fees paid by individual riders). Parking factors are based on a ratio of parking costs in comparison to a South/North Draft Environmental Impact Study (DEIS) parking survey. Transit Pass factors represent the amount of full transit fare that a transit rider is expected to pay (considering ECO rule and discount downtown fares). The RTP projects included in the 2025 financially constrained and priority models for the study area are shown in Table 8-5 and Table 8-6, respectively.

Table 8-5: TDM Improvements included in the RTP Financially Constrained System*

RTP #	Location	Improvement	Jurisdiction	Time-Line	Cost ($1,000s)
5103	County-wide	Advanced transportation system management and ITS program	Clackamas County	2004-2009	$6,514
5211	SE 129th to Mountain Gate Rd	Scott Creek Lane Pedestrian Improvements (construct pedestrian path and bridge crossing)	Happy Valley	2004-2009	$104
5207	Sunnyside Rd to Mt. Talbert	Mt. Scott Trail	Clackamas County/ Happy Valley	2016-2025	$767
5064	Clackamas TC to Oregon City	I-205 Rapid Bus	TriMet	2004-2009	-
7009	145th/147th Avenue	Widen to provide bike lanes from Clatsop Street to Monner Road.	Clackamas County/ Happy Valley	2010-2015	$1,040
7010	162nd Avenue	Widen to provide bike lanes from Monner Road to Sunnyside Road	Clackamas County/ Happy Valley	2016-2025	$393
7011	Monner Road	Widen to provide bike lanes from 147th Avenue to 162nd Avenue	Clackamas County/ Happy Valley	2016-2025	$393
7022	Sunnyside Road Frequent Bus	Provide improvements that enhance new frequent bus service from Clackamas regional center to Damascus	TriMet	2010-2015	$913
			TOTAL		**$10,124**

*This project list is based on the *2004 Federal Regional Transportation Plan Update*.

[9] Based on the *2000 Metro Regional Transportation Plan*, Ordinance No. 00-869A (August 10, 2000), page 1-62.

Table 8-6: Additional TDM Improvements included in the RTP Priority System*

RTP #	Location	Improvement	Jurisdiction	Time-Line	Cost ($1,000s)
8030	Region-wide	Vehicle purchases to provide for expanded service – 3.8% per year	TriMet	2004-2025	$546,000
8033	Region-wide	Bus operating facilities	Tri-Met	2004-2025	$152,062
8045	Region-wide	Bus stop improvements	Tri-Met	2004-2025	$13,212
8048	Region-wide	Transit Signal Priority	Tri-Met	2004-2025	$83,746
8051	Region-wide	Regional Travel Options TDM Program	Tri-Met	2004-2025	$47,124
			TOTAL		**$843,584**

*This project list is based on the *2004 Federal Regional Transportation Plan Update*.

An analysis was performed to determine the level of non-single occupant vehicle (SOV) mode share forecasted in 2025. The travel model provides estimates of the various modes of travel that can be generally assessed at the transportation analysis zone level. Generally, the areas served by bus service have the highest levels of non-SOV mode use. The overall Happy Valley TSP study area forecasted non-SOV percentage with the RTP financially constrained improvements is 40%. Additional improvements in the RTP priority scenario increase the overall non-SOV percentage to 42%, which corresponds to an increase of approximately 2%.

These forecasted non-SOV percentages can only be achieved with significant improvements to the transportation system and implementation of trip reduction strategies. The City of Happy Valley should coordinate with Clackamas County and Tri-Met to implement strategies to assure that the TDM assumptions in the RTP are implemented. The City of Happy Valley, Clackamas County and Tri-Met should coordinate to implement the pedestrian, bicycle and transit system improvements, which offer alternative modes of travel. The recommended TDM action plan includes:

- Support continued efforts by Happy Valley, TriMet, Metro, and Clackamas County to develop productive TDM measures that reduce commuter vehicle miles and peak hour trips.
- Encourage the development of high speed communication in all part of the city (fiber optic, digital cable, DSL, etc). The objective would be to allow employers and residents the maximum opportunity to rely upon other systems for conducting business and activities than the transportation system during peak periods.
- Encourage developments that effectively mix land uses to reduce vehicle trip generation. These plans may include development linkages (particularly non-auto) that support greater use of alternative modes.
- Implement motor vehicle minimum and maximum parking ratios for new development.
- Continued implementation of street connectivity requirements.
- Work with employers to install bicycle racks.
- Implementation of bicycle, pedestrian, motor vehicle and transit system action plan.

Future Intersection Capacity Analysis

The motor vehicle capacity needs within the TSP study area were determined for future conditions. This section presents the capacity analysis conducted to determine the street improvements that would be necessary as part of a long-range master plan. Phasing of implementation will be necessary since not all the improvements can be done at once. This will require prioritization of projects and periodic updating to reflect current needs. It should be understood that the improvements outlined in the following section are a guide to defining the types of right-of-way and street needs that will be required as development occurs.

Year 2025 traffic volume forecasts were analyzed to identify locations where evening peak hour performance will drop below minimum desirable levels. This analysis focuses on the 25 study intersections. Traffic volumes were developed as described previously (Chapter 4) and applied to existing intersection geometries. The value in reviewing the motor vehicle system performance is that it highlights where the planned system fails to meet performance standards. These locations will be reviewed to consider street improvements alternatives that could better serve planned growth.

2025 No-Build

A 2025 no-build alternative was created by removing all future capacity projects within the study area and regional facilities in the surrounding area from the 2025 financially constrained model. This scenario evaluated the impact of allowing the development of the 2025 land use forecast without constructing the supporting transportation infrastructure. The 2025 no-build traffic forecasts found that the existing roadway system in the TSP study area is insufficient to handle future capacity needs. As previously shown in Figure 8-1, the majority of roadways operate with over capacity conditions which translate to significant congestion. As expected, all 25 study intersections operate below standard under the 2025 no-build scenario.

2025 Financially Constrained

The 2025 financially constrained scenario includes transportation improvements that are reasonably funded and likely to be constructed by the year 2025. This scenario comprises TDM improvements identified in Table 8-5 plus capacity projects identified in the RTP financially constrained system, shown in Table 8-7.

The most significant project included in the financially constrained system within the study area is the Sunnyside Road widening project. This improvement widens Sunnyside Road to a five-lane facility from 122nd Avenue to 172nd Avenue. The portion of the project from 122nd Avenue to 162nd Avenue is currently under construction.

The Highway 224 Extension project, also known as the first phase of the Sunrise Corridor, provides a major new east-west roadway near the study area. In the financially constrained scenario, the project would construct a new four-lane facility from I-205 to 122nd Avenue. Preliminary plans provided by Clackamas County indicate that access to the facility would be limited to ramps at I-205 and a new diamond interchange near 122nd Avenue just north of Highway 212/224. This project does not include the extension of 122nd Avenue south of Hubbard Road.

Table 8-7: RTP Financially Constrained Motor Vehicle Capacity Improvements*

RTP #	Location	Improvement	Jurisdiction	Time-Line	Cost ($1,000s)
5021	Highway 224 Extension (Sunrise Corridor)	Construct a new four-lane highway from I-205 to 122nd Avenue	ODOT	2010-15	$84,315
5066	122nd Avenue to 172nd Avenue	East Sunnyside Road Improvements (widen to five lanes to improve safety and accessibility to Damascus)	Clackamas County	2010-15	$45,045
5209	122nd/129th Avenue	Sunnyside Road to King Road (widen to three lanes, smooth curves)	Clackamas County	2016-25	$3,465
7000	172nd Avenue	Widen to 5 lanes from Foster Road to Highway 212	Clackamas County	2016-25	$8,085
			TOTAL		**$132,825**

* Based on *2004 Federal Regional Transportation Plan Update*, and includes Financially Constrained Motor Vehicle System projects.

Table 8-8 summarizes the study intersection performance for the 2025 financially constrained scenario. Based on the analysis, the majority of the study intersections would not meet demands with the capacity improvements identified in the RTP financially constrained system. The majority of signalized and four-way stop controlled study intersections operate at LOS F with a demand to capacity ratio greater than 1.0. Most unsignalized intersections operate LOS F for the minor street approach and LOS B or worse for the major street approach.

Forecasted volumes on Sunnyside Road from Valley View Terrace to 152nd Avenue in the eastbound and westbound directions are significantly higher than existing volumes. Without a new parallel east-west route to provide additional capacity for the forecasted land use, the planned five-lane section for Sunnyside Road cannot perform adequately. Forecasted volumes within the center of Happy Valley are also considerably higher than today. The significant congestion on Sunnyside Road results in diverted trips on 122nd/129th Avenue and 152nd Avenue to the north, continuing through the City primarily on King Road, Mt. Scott Boulevard and Idleman Road.

Table 8-8: 2025 Financially Constrained Intersection Level of Service (PM Peak Hour)

Intersection	Level of Service	Delay	Volume/ Capacity
Unsignalized Intersections			
172nd Avenue/Hagen Road	C/F	>50	-
147th Avenue/Monner Road	B/F	>50	-
162nd Avenue/Monner Road	A/D	59.9	-
145th Avenue/King Road	F	>50	>1.0
145th Avenue/Ridgecrest	B/F	>50	-
145th Avenue/Clatsop Road	B/F	>50	-
132nd Avenue /King Road	B/F	>50	-
132nd Avenue/Ridgecrest Road	F	>50	>1.0
132nd Avenue/Clatsop Road	A/F	>50	-
122nd Avenue/Spring Mountain Drive	D/F	>50	-
129th Avenue/Mountain Gate Road	B/F	>50	-
129th Avenue/William Otty Road	B/F	>50	-
129th Avenue/King Road/Mt.Scott Boulevard	F	>50	>1.0
William Otty Road/Kimberly Court	C	22.0	0.85
Mt. Scott Boulevard/Idleman Road/Ridgecrest Road	F	>50	>1.0
Valley View/William Otty Road	F	>50	>1.0
Signalized Intersections			
Sunnyside Road/Valley View Terrace	F	>80	>1.0
Sunnyside Road/122nd Avenue	F	>80	>1.0
Sunnyside Road/132nd Avenue	F	>80	>1.0
Sunnyside Road/142nd Avenue	C	26.8	1.0
Sunnyside Road/147th Avenue	F	>80	>1.0
Sunnyside Road/152nd Avenue	F	>80	>1.0
Sunnyside Road/157th Avenue	E	80.0	>1.0
Sunnyside Road/162nd Avenue	F	>80	>1.0
Sunnyside Road/172nd Avenue	F	>80	>1.0

Notes: A/A=major street LOS/minor street LOS
Signalized and all-way stop delay = average vehicle delay in seconds for entire intersection
Unsignalized delay = highest minor street approach delay
*All-way stop control intersection

2025 Priority

The 2025 Priority scenario includes additional transportation improvement projects that do not have an identified funding source and may not be constructed by the year 2025. This scenario builds on the planned TDM improvements (summarized in Tables 8-5 and 8-6) and capacity improvements previously identified for the 2025 financially constrained system (Table 8-7). Table 8-9 identifies the additional capacity improvements that are included in the priority scenario.

Table 8-9: RTP Priority Motor Vehicle Capacity Improvements*

RTP #	Location	Improvement	Jurisdiction	Time-Line	Cost ($1,000s)
5003	Sunrise Highway Unit 1, Phase 2	Construct new 4-lane facility from 122nd Avenue and Rock Creek Junction	ODOT	2004-09	$104,550
5005	Sunrise Highway Unit 2, Phase 1	Construct new 4-lane facility from Rock Creek Junction to 242nd Avenue	ODOT	2004-09	$184,800
5006	Sunrise Highway Unit 2, Phase 2	Construct new 4-lane facility from 242nd Avenue to US 26	ODOT	2004-09	$177,000
			TOTAL		**$466,350**

* Based on *2004 Federal Regional Transportation Plan Update*, and includes Priority Motor Vehicle System projects.

The Sunrise Corridor project identified in the priority system would provide a significant extension to the east. The project would construct a new four-lane facility from the 122nd Avenue interchange to US 26 in Gresham. Preliminary plans provided by Clackamas County indicate that access to the facility near the study area would be limited to an interchange at the Rock Creek Junction near the Highway 212/224 split. No direct access to the Sunrise Corridor would be provided from 152nd Avenue, 162nd Avenue or 172nd Avenue.

With the addition of the priority projects, several study intersection improve to acceptable operating standards. The majority of the signalized study intersections on Sunnyside Road east of 142nd Avenue meet the level of service standard. This improvement is due in part to the reduction in east-west volume that is now traveling on the Sunrise Corridor. Although volumes are lower in the center of Happy Valley, operating conditions continue at LOS F for the minor street approach at most unsignalized study intersections. Table 8-10 summarizes the study intersection performance for the 2025 priority scenario.

Based on the 2025 priority analysis, the majority of the study intersections would not meet the City's level of service standard with the capacity improvements identified in the RTP priority system. Additional capacity improvements will be needed to provide an adequate transportation system for the forecasted land use.

Table 8-10: 2025 Priority Intersection Level of Service (PM Peak Hour)

Intersection	Level of Service	Delay	Volume/ Capacity
Unsignalized Intersections			
172nd Avenue/Hagen Road	B/F	>50	-
147th Avenue/Monner Road	A/F	>50	-
162nd Avenue/Monner Road	A/D	26.7	-
145th Avenue/King Road	F	>50	>1.0
145th Avenue/Ridgecrest	B/F	>50	-
145th Avenue/Clatsop Road	B/F	>50	-
132nd Avenue /King Road	A/F	>50	-
132nd Avenue/Ridgecrest Road	F	>50	>1.0
132nd Avenue/Clatsop Road	A/F	>50	-
122nd Avenue/Spring Mountain Drive	B/F	>50	-
129th Avenue/Mountain Gate Road	B/F	>50	-
129th Avenue/William Otty Road	A/F	>50	-
129th Avenue/King Road/Mt.Scott Boulevard	F	>50	>1.0
William Otty Road/Kimberly Court	A	9.2	0.43
Mt. Scott Boulevard/Idleman Road/Ridgecrest Road	F	>50	>1.0
Valley View/William Otty Road	F	>50	>1.0
Signalized Intersections			
Sunnyside Road/Valley View Terrace	F	>80	>1.0
Sunnyside Road/122nd Avenue	F	>80	>1.0
Sunnyside Road/132nd Avenue	F	>80	>1.0
Sunnyside Road/142nd Avenue	C	25.1	0.89
Sunnyside Road/147th Avenue	C	30.5	0.78
Sunnyside Road/152nd Avenue	C	32.0	0.77
Sunnyside Road/157th Avenue	C	32.3	0.75
Sunnyside Road/162nd Avenue	D	36.0	0.67
Sunnyside Road/172nd Avenue	C	30.6	0.66

Notes: A/A=major street LOS/minor street LOS
Signalized and all-way stop delay = average vehicle delay in seconds for entire intersection
Unsignalized delay = highest minor street approach delay
*All-way stop control intersection

Priority Plus TSP Recommended Projects

Based on the priority system analysis, additional capacity improvements are recommended to accommodate the forecasted land use within the TSP study area. The following sections summarize the evaluation of proposed planning level roadway network, roadway extensions and intersection improvements to meet future capacity needs.

Proposed Roadway Network

The forecasted 2025 land use indicates significant growth in both housing and employment within the TSP study area. The portion of Happy Valley bounded loosely by Clatsop Street to the north, 145th Avenue to the east, Mountain Gate and Alta Vista to the south and the west City limits is expected to experience moderate growth in the next 20 years. The majority of this growth is additional housing. The major growth areas are the Rock Creek Area located south of Sunnyside Road between 152nd Avenue and 172nd Avenue, the Scouter Mountain Area bounded by 145th Avenue, 172nd Avenue, Clatsop Street, Monner Road and Hagen Road and the Pleasant Valley Golf Course Area bounded by 162nd Avenue, 172nd Avenue, Sunnyside Road and Hagen Road. The recommended planning level roadway system is shown in Figure 8-10.

Rock Creek Area – (bounded by Sunnyside, Highway 212, 152nd and 172nd)

The Rock Creek Area includes moderate housing growth south of Sunnyside Road and a major employment center north of Highway 224 expected to generate more than 3,000 jobs in the next 20 years. An arterial and collector roadway system was developed within the Rock Creek Area to accommodate the future motor vehicle demands. The RTP identified Sunrise Corridor project would provide a direct regional connection to this area with the planned Rock Creek interchange to alleviate some of the future demand on Sunnyside Road. The proposed Rock Creek Area roadway system is consistent with the conceptual roadway system developed by Clackamas County for the Damascus/Boring Concept Plan.[10]

172nd Avenue would serve as the major north-south arterial in the area. A new major east-west arterial roadway is recommended through the employment center to connect 172nd Avenue to the Sunrise Corridor Rock Creek interchange. This would serve local demand from the employment center and provide access to the regional roadway system for trips outside the study area.

The extension of 162nd Avenue would provide area-wide connectivity between the residential neighborhoods planned north of Sunnyside Road and the future residential and employment center planned south of Sunnyside Road. This new north-south roadway extension is needed to alleviate future demands on 172nd Avenue. The 162nd Avenue extension has several geographical challenges including a creek crossing and steep grades.

A supporting north-south and east-west collector roadway system was defined within the employment center area to provide local circulation. The collector facilities were planned approximately one-quarter mile apart to establish desirable traffic signal spacing.

Scouter Mountain Area – (bounded by 145th, 172nd, Clatsop, Monner and Hagen)

A large portion of the Scouter Mountain Area has recently been annexed into the City with potential for future residential land use. The forecasted land use includes approximately 5,000 dwelling units within the area. Several geographical constraints were considered with the development of the proposed roadway system in this area. The peak elevation of Scouter

[10] Damascus/Boring Concept Plan, Draft Transportation System Recommendations, Clackamas County, June 17, 2005.

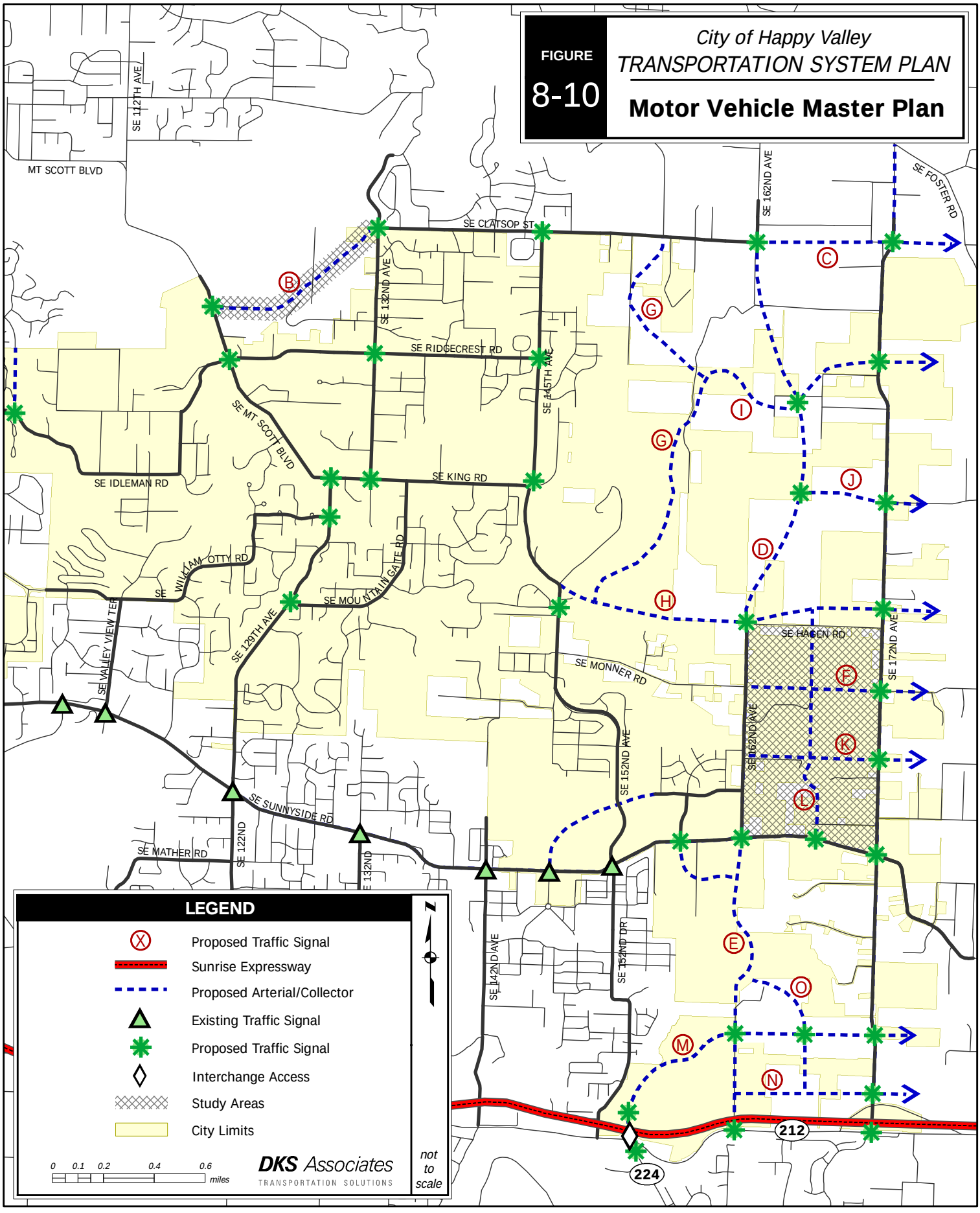


FIGURE
8-10
City of Happy Valley
TRANSPORTATION SYSTEM PLAN
Motor Vehicle Master Plan
MT SCOTT BLVD
SE 112TH AVE
SE CLATSOP ST
SE 132ND AVE
SE RIDGECREST RD
SE 145TH AVE
SE 162ND AVE
SE FOSTER RD
SE MT SCOTT BLVD
SE IDLEMAN RD
SE KING RD
SE WILLAMETTE VALLEY VIEW TER
SE WILLIAM OTTY RD
SE MOUNTAIN GATE RD
SE 129TH AVE
SE HAGEN RD
SE MONNER RD
SE 172ND AVE
SE 152ND AVE
SE SUNNYSIDE RD
SE MATHER RD
SE 122ND
SE 142ND AVE
SE 152ND DR
212
224
B
C
G
I
J
D
H
F
K
L
E
O
M
N
LEGEND
Proposed Traffic Signal
Sunrise Expressway
Proposed Arterial/Collector
Existing Traffic Signal
Proposed Traffic Signal
Interchange Access
Study Areas
City Limits
0 0.1 0.2 0.4 0.6 miles
DKS Associates
TRANSPORTATION SOLUTIONS
not to scale

Mountain is 940-feet while the elevation of the surrounding roadways (145th Avenue, Monner Road and Clatsop Street) are as low as 420-feet. As a result, finding a feasible alignment for several desired roadways was difficult. It was assumed that roadways with estimated grades of 12% or lower would be reasonable.

A need for an east-west roadway from 145th Avenue near Ridgecrest Road to 172nd Avenue was identified, however the existing contours in the area result in roadways with grades in excess of 15%. It was determined that a neighborhood route connection through the Jackson Hills subdivision to the east would be the most appropriate improvement to support the traffic demands in the area.

The extension of 162nd Avenue between Hagen Road and Clatsop Street would provide area-wide north-south connectivity and alleviate future traffic demands on 145th Avenue and 172nd Avenue. The proposed 162nd Avenue alignment is intended to follow the contours of the hillside to keep grades and environmental impacts at a minimum.

A supporting north-south and east-west collector roadway system was defined within the area to provide local circulation. The collector facilities were planned approximately one-quarter mile apart to establish desirable traffic signal spacing.

Pleasant Valley Golf Course Area – (bounded by 162nd, 172nd, Sunnyside and Hagen)

The Pleasant Valley Golf Course and the adjacent property to the south have a potential for future residential redevelopment. The forecasted land use includes approximately 1,000 dwelling units within the area.

As part of this TSP update, Hagen Road from 162nd Avenue to 172nd Avenue was reclassified from a collector to a neighborhood street. The roadway currently has single family homes along the frontage resulting in significant impacts if the roadway were improved to the collector cross-section and extended further to the east and west. To reduce impacts, a new collector roadway is recommended just north of Hagen Road. It is anticipated that this roadway would be separated from the properties on the north side of Hagen Road with a dedicated green space. The new east-west collector roadway would extend to the west connecting to 145th Avenue south of Alta Vista Drive and to the east to 172nd Avenue.

A supporting north-south and east-west collector roadway system was defined within the area to provide local circulation. The collector facilities were planned approximately one-quarter mile apart to establish desirable traffic signal spacing.

The identified roadway network within the Pleasant Valley Golf Course area does not propose specific alignments but rather serve as a guideline for potential roadway connections. A detailed transportation subarea analysis should be conducted which considers all reasonable roadway network alternatives combined with future land use proposals to produce a balance between circulation/capacity needs and land use/environmental sensitivities in the study area.

Sunrise Corridor

The forecasted 2025 Priority scenario volumes on Sunnyside Road between I-205 and 172nd Avenue indicate a need for additional east-west capacity in the study area. Clackamas County staff[11] indicated their continuing planning work for the Sunrise Corridor has shown a 6-lane cross-section may be necessary from I-205 to the 242nd Avenue interchange. The 2025 Priority Plus

[11] Discussion with Technical Advisory Committee member Ron Weinman, Clackamas County, August 25, 2005.

scenario assumed the construction of the Sunrise Corridor as a six-lane facility from I-205 to the 242nd Avenue interchange to help alleviate congestion on Sunnyside Road.

Roadway Extension Projects

There are a number of locations in Happy Valley where, due to the lack of alternative routes, there is an imbalance of traffic volumes that load onto one street. A well connected transportation system limits out of direction travel for motorists, bicycles and pedestrians and reduces vehicle miles traveled within the study area. Several roadway extension projects are recommended to:

- Allow local traffic to make in-town trips using well connected streets without traveling on arterials.
- Reduce congestion on Ridgecrest Road and 132nd Avenue.
- Reduce vehicle miles traveled (VMT) within the study area by limiting out of way travel patterns for all modes.
- Provide an adequate roadway system for future local development.

An extension of Clatsop Street west of 132nd Avenue connecting to Mt. Scott Boulevard would fill in a large gap in the street system. This roadway would provide additional east-west capacity in the northern part of the City and improve connectivity for all modes of travel. The proposed connections would alleviate traffic demand on Ridgecrest Road and 132nd Avenue. This improvement was identified in the previous TSP. The identified Clatsop Street extension does not propose a specific roadway alignment but rather serves as a guideline for a potential roadway connection. A detailed transportation subarea analysis should be conducted which considers all reasonable roadway network alternatives combined with future land use proposals to produce a balance between circulation/capacity needs and land use/environmental sensitivities in the study area.

The Johnson Creek extension continues the existing roadway up the hill to Idleman Road. The proposed connections would provide an alternative route into Happy Valley from I-205 and improve connectivity for all modes of travel. The majority of this facility was constructed as part of the Altamont PUD. This improvement was identified in the previous TSP.

Study Intersection Improvements

With the addition of the proposed roadway network and extensions described in the previous sections, the 2025 priority system plus TSP recommended project scenario was developed to forecast study intersections volumes. The operational analysis found that significant improvements would be required at the majority of the study intersections to accommodate the forecasted growth. These improvements include traffic signal control, additional turn lanes, roadway widening, and traffic signal coordination.

Preliminary Traffic Signal Warrants

Preliminary traffic signal warrants[12] were evaluated at all unsignalized study intersections under year 2025 priority traffic volume conditions. The Peak Hour Warrant analysis was based on PM peak hour traffic volumes . The results of this analysis are shown in Table 8-11.

[12] Preliminary Signal Warrants, MUTCD Warrant 3 (Peak Hour Vehicular Volume).

Table 8-11: 2025 Priority System PM Peak Hour Signal Warrant Analysis

Intersection	PM Peak Hour Signal Warrant Met?
172nd Avenue/Hagen Road	No
147th Avenue/Monner Road	No
162nd Avenue/Monner Road	No
145th Avenue/King Road	Yes
145th Avenue/Ridgecrest Road	Yes
145th Avenue/Clatsop Road	Yes
132nd Avenue /King Road	Yes
132nd Avenue/Ridgecrest Road	Yes
132nd Avenue/Clatsop Road	Yes
122nd Avenue/Spring Mountain Dr	No
129th Avenue/Mountain Gate Road	Yes
129th Avenue/William Otty Road	Yes
129th Ave/King Road/Mt.Scott Blvd	Yes
William Otty Road/Kimberly Court	No
Mt. Scott Boulevard/Idleman Road/Ridgecrest Road	Yes
Valley View/William Otty Road	No

Preliminary traffic signal warrants were met at several study intersections under year 2025 priority plus traffic volume conditions. Intersections meeting PM peak hour traffic signal warrants should be analyzed at a future date based on Eight Hour Warrants before construction of a traffic signal occurs. Meeting traffic signal warrants does not guarantee that a signal will be installed, but provides criteria that should be utilized along with engineering judgment.

Traffic signal control is recommended in the Motor Vehicle Master Plan at several study intersections based on the preliminary traffic signal warrant analysis to improve traffic operations and safety for both vehicles and pedestrians.

Motor Vehicle Master Plan

The Motor Vehicle Master Plan combines both improvement projects identified in prior plans (Happy Valley TSP, Clackamas County TSP, Rock Creek Plan, Metro RTP, etc.) and those determined as the outcome of the Happy Valley TSP update analysis. These improvements are shown in Figure 8-10 and listed below in Table 8-12. The proposed new roadways/extension projects listed in Table 8-12 have been identified (i.e. Roadway A) to correspond with the labels shown in Figure 8-10.

The planning level cost estimates provided are based on general unit costs for transportation improvements, but do not necessarily reflect the unique project elements that can significantly add to project costs. Each of these project costs will need further refinement to detail right-of-way requirements and costs associated with special design details as projects are pursued. The estimated cost to obtain required right-of-way was included in all of the roadway widening projects. Right-of-way costs were also included in the cost estimates for the162nd Avenue extensions (north and south) and the Rock Creek major arterial. The construction of these roadways would be required prior to construction of the adjacent properties to support the future

development. It was assumed that the new roadway/extension projects (except the 162nd Avenue extensions and the Rock Creek major arterial) would be constructed on land dedicated by the associated development, therefore, right-of-way costs are not included in their cost estimates.

Table 8-12: Motor Vehicle Master Plan Projects

Project	Improvement	Cost ($1,000s)
Roadway Widening		
Sunnyside Road Improvements Phase 2/3A	Widen to 5-lane major arterial between 122nd Avenue and 162nd Avenue. Modify traffic signals at 132nd Avenue, 142nd Avenue, 147th Avenue and 152nd Avenue. Construct new traffic signals at 157th Avenue and 162nd Avenue.	$18,000
Sunnyside Road Improvements Phase 3B	Widen to 5-lane major arterial between 162nd Avenue and 172nd Avenue. Construct new traffic signals at 167th Avenue and 172nd Avenue.	$5,000
Clatsop Street Widening West *	Widen to 3-lane collector between 132nd Avenue and 145th Avenue	$3,350
Clatsop Street Widening East	Widen to 3-lane collector between 145th Avenue and 162nd Avenue	$4,450
172nd Avenue Widening South	Widen to 5-lane major arterial between Sunnyside Road and Highway 212	$15,000
172nd Avenue Widening North	Widen to 5-lane major arterial between Sunnyside Road and Clatsop Street	$21,300
122nd/129th Avenue Widening*	Widen to 3-lane collector between Sunnyside Road and King Road and smooth curves	$4,800
King Road Widening*	Widen to a 3-lane collector cross-section between 129th Avenue and 145th Avenue	$3,500
132nd Avenue Widening	Widen to 3-lane collector from Clatsop Street to King Road	$4,550
145th Avenue Widening*	Widen to 3-lane collector from Clatsop Street to Monner Road	$7,700
Mt. Scott Boulevard*	Widen to 3-lane collector from 129th Avenue to north City limits	$4,450
162nd Avenue Widening	Widen to 3-lane collector from Hagen Road to Sunnyside Road	$5,300
Idleman Road Widening	Widen to 3-lane collector from Mt. Scott Boulevard to west city limits, correct roadway alignment.	$9,250
Valley View Terrace Widening	Widen to 3-lane collector from Sunnyside Road to William Otty Road	$1,400
New Roadways/Extensions		
Johnson Creek Road Extension* (Roadway A)	Extend Johnson Creek Road to connect to Idleman Road.	$1,000
Clatsop Street Extension West*/** (Roadway B)	Construct a new 3-lane collector between 132nd Avenue and Mt. Scott Boulevard.	$4,150
Clatsop Street Extension East** (Roadway C)	Construct a new 3-lane collector between 162nd Avenue and 172nd Avenue.	$2,050
162nd Avenue Extension North** (Roadway D)	Construct a new 3-lane collector between Hagen Road and Clatsop Street.	$14,600
162nd Avenue Extension South** (Roadway E)	Construct a new 3-lane collector south of the Taralon development to Highway 212.	$8,800
Monner Road Extension** (Roadway F)	Construct a new 3-lane collector between 162nd Avenue and 172nd Avenue.	$2,050

Project	Improvement	Cost ($1,000s)
Barbara Welch Extension** (Roadway G)	Construct a new 2/3 lane north-south collector between Clatsop Street and a new east-west collector just north of Hagen Road.	$6,350
Scouter Mountain South Roadway** (Roadway H)	Construct a new 3-lane east-west collector just north of Hagen Road between 147th Avenue and 172nd Avenue.	$5,000
Scouter Mountain East Roadway #1** (Roadway I)	Construct a new 3-lane east-west collector between the Barbara Welch Extension and 172nd Avenue.	$3,250
Scouter Mountain East Roadway #2** (Roadway J)	Construct a new 3-lane east-west collector from 162nd Avenue to 172nd Avenue.	$1,350
Pleasant Valley Golf Course Roadway #1** (Roadway K)	Construct a new 3-lane east-west collector from 162nd Avenue to 172nd Avenue between Sunnyside Road and Monner Road	$2,050
Pleasant Valley Golf Course Roadway #2** (Roadway L)	Construct a new 3-lane north-south collector from the Scouter Mountain South Roadway to Sunnyside Road between 162nd Avenue and 172nd Avenue.	$3,700
Rock Creek Major Arterial** (Roadway M)	Construct a new 5-lane east-west major arterial from 172nd Avenue to the Sunrise Corridor Rock Creek interchange.	$15,700
Rock Creek Roadway #1** (Roadway N)	Construct a new 3-lane east-west collector from 162nd Avenue to 172nd Avenue.	$2,150
Rock Creek Roadway #2** (Roadway O)	Construct a new 3-lane north-south collector from 162nd Avenue to Rock Creek Collector #1	$2,200
Intersection Improvements		
172nd Avenue/Sunnyside Road	Install a traffic signal, provide a 5-lane approach to each leg	$1,200
129th Avenue/Mt. Scott Boulevard/King Road*	Install a traffic signal, add eastbound right turn lane	$500
129th Avenue/Mountain Gate Road*	Install a traffic signal	$250
Mt. Scott Boulevard/Idleman Road/Ridgecrest Road*	Install a traffic signal, improve vertical curve, align eastbound and westbound approaches	$500
Mt. Scott Boulevard/Clatsop Street Extension*	Install a traffic signal	$250
145th Avenue/Ridgecrest Road	Install a traffic signal	$250
145th Avenue/King Road*	Install a traffic signal	$250
129th Avenue/William Otty Road*	Install a traffic signal	$250
145th Avenue/Clatsop Road*	Install a traffic signal	$250
132nd Avenue/King Road*	Install a traffic signal	$250
132nd Avenue/Ridgecrest Road	Install a traffic signal	$250
132nd Avenue/Clatsop Road*	Install a traffic signal	$250
Johnson Creek Road/Idleman Road*	Install a traffic signal	$250
162nd Avenue/Clatsop Street	Install a traffic signal	$250
172nd Avenue/Clatsop Street	Install a traffic signal	$250
172nd Avenue/Monner Road	Install a traffic signal	$250
147th Avenue/Scouter Mountain South Roadway**	Install a traffic signal	$250
162nd Avenue/Scouter Mountain South Roadway**	Install a traffic signal	$250
172nd Avenue/Scouter Mountain South Roadway**	Install a traffic signal	$250
162nd Avenue Extension/Scouter Mountain East Road #1**	Install a traffic signal	$250

Project	Improvement	Cost ($1,000s)
172nd Avenue Extension/Scouter Mountain East Road #1**	Install a traffic signal	$250
162nd Avenue Extension/Scouter Mountain East Road #2**	Install a traffic signal	$250
172nd Avenue Extension/Scouter Mountain East Road #2**	Install a traffic signal	$250
172nd Avenue/Pleasant Valley Golf Course Roadway #1**	Install a traffic signal	$250
Sunnyside Road/Pleasant Valley Golf Course Roadway #2**	Install a traffic signal	$250
162nd Avenue/Rock Creek Major Arterial**	Install a traffic signal	$250
172nd Avenue/Rock Creek Major Arterial**	Install a traffic signal	$250
172nd Avenue/Rock Creek Roadway #1**	Install a traffic signal	$250
Rock Creek Major Arterial/Rock Creek Roadway #2**	Install a traffic signal	$250
	Total Motor Vehicle Master Plan Cost	**$191,150**

*These projects were identified in the previous TSP.
**These projects would only occur with future development or redevelopment and would not be initiated by the City.
Note: Right-of-way is included in the cost estimates for the widening projects, the 162nd Avenue extensions (north and south) and the new Rock Creek major arterial roadway.

Table 8-13 summarizes study intersection capacity operations for the 2025 Priority Plus scenario with includes the recommended Motor Vehicle Master Plan projects. The recommended improvements for each study intersection are summarized in Table 8-12 above. The majority of study intersections meet City operating standards.

The 122nd Avenue/Spring Mountain Drive intersection continues to operate with LOS F for the minor street approach under the 2025 Priority Plus scenario. Based on the 2025 forecast, this intersection does not meet warrants for a traffic signal or additional turn lanes. The local street connectivity within the Spring Mountain Drive neighborhood is adequate to provide alternative routes to signalized intersection at both 122nd Avenue and Sunnyside Road. Therefore, no improvements at the 122nd Avenue/Spring Mountain Drive intersection are recommended.

The signalized study intersections on Sunnyside Road from Valley View Terrace to 152nd Avenue continue to operate below minimum performance standards under the 2025 Priority Plus scenario. Major roadway improvements to this portion of Sunnyside Road have recently been constructed. Additional roadway improvements to this just completed construction project is not feasible within the next 20 years. Therefore, no additional roadway projects are recommended at these intersections in the Motor Vehicle Master Plan.

The Sunnyside Road corridor within the TSP study area is forecasted to carry significant east-west volumes in the 2025 Priority Plus scenario with includes a six-lane Sunrise Corridor facility from I-205 to 242nd Avenue. A large portion of the volume increase is attributed to nearby planned major growth areas, including Pleasant Valley and Damascus/Boring. Although local transportation plans (some preliminary) have been developed for these planned growth areas, their expected impacts to adjacent areas (including Happy Valley) and regional facilities will need to be addressed.

Table 8-13: 2025 Priority Plus Intersection Level of Service (PM Peak Hour)

Intersection	Level of Service	Delay	Volume/ Capacity
Unsignalized Intersections			
172nd Avenue/Hagen Road	-/C	16.7	-
147th Avenue/Monner Road	A/D	32.9	-
162nd Avenue/Monner Road	A/D	30.4	-
122nd Avenue/Spring Mountain Drive	B/F	>50.0	-
William Otty Road/Kimberly Court	A/A	8.8	0.42
Valley View/William Otty Road	C	17.9	0.80
Signalized Intersections			
Sunnyside Road/Valley View Terrace	F	>80	>1.0
Sunnyside Road/122nd Avenue	F	>80	>1.0
Sunnyside Road/132nd Avenue	F	>80	>1.0
Sunnyside Road/142nd Avenue	E	74.0	>1.0
Sunnyside Road/147th Avenue	F	>80	>1.0
Sunnyside Road/152nd Avenue	E	>80	>1.0
Sunnyside Road/157th Avenue	C	32.0	0.65
Sunnyside Road/162nd Avenue	C	35.0	0.66
Sunnyside Road/172nd Avenue	D	38.8	0.75
129th Avenue/King Road/Mt.Scott Boulevard	D	38.6	0.85
129th Avenue/William Otty Road	B	17.0	0.66
129th Avenue/Mountain Gate Road	B	13.0	0.79
132nd Avenue/Ridgecrest Road	B	16.1	0.65
132nd Avenue/Clatsop Road	B	17.5	0.59
132nd Avenue /King Road	B	17.1	0.85
145th Avenue/Clatsop Road	B	13.4	0.49
145th Avenue/Ridgecrest	B	16.2	0.53
145th Avenue/King Road	B	17.6	0.65
Mt. Scott Boulevard/Idleman Road/Ridgecrest Road	C	20.7	0.64

Notes: A/A=major street LOS/minor street LOS
Signalized and all-way stop delay = average vehicle delay in seconds for entire intersection
Unsignalized delay = highest minor street approach delay
*All-way stop control intersection

Motor Vehicle Action Plan

A motor vehicle system action plan project list was created to identify motor vehicle projects that are reasonably expected to be funded by the year 2025, which meets the requirements of the updated Transportation Planning Rule[13]. Table 8-14 shows the action plan which combines projects identified in the RTP Priority scenario with additional projects that have been identified in the TSP update analysis. The construction of new collector and arterial facilities would only occur to support future development or redevelopment and would not be initiated by the City. The potential funding source serves as a guide for financing options the City should pursue. The estimated schedule is based on the RTP time line unless more current information is available.

Table 8-14: Motor Vehicle Action Plan Projects

Project	Improvement	Potential Funding Source	Estimated Schedule	Cost ($1,000s)
Sunnyside Road Widening Phase 2/3B	Widen to 5-lane major arterial between 122nd Avenue and 162nd Avenue. Modify traffic signals at 132nd Avenue, 142nd Avenue, 147th Avenue and 152nd Avenue. Construct new traffic signals at 157th Avenue and 162nd Avenue.	Joint SDC Fund	2006-2010	$18,000
Sunnyside Road Widening Phase 3B	Widen to 5-lane major arterial between 162nd Avenue and 172nd Avenue. Construct a traffic signal at 167th and 172nd Avenue.	Joint SDC Fund	2006-2010	$5,000
172nd Avenue/Sunnyside Road	Install a traffic signal, provide a 5-lane approach to each leg.	Joint SDC Fund	2006-2010	$1,200
172nd Avenue Widening South	Widen to 5-lane major arterial between Sunnyside Road and Highway 212.	Joint SDC Fund	2011-2015	$15,000
172nd Avenue Widening North	Widen to 5-lane major arterial between Sunnyside Road and Clatsop Street.	Joint SDC Fund	2021-2025	$21,300
122nd/129th Avenue Widening*	Widen to 3-lane collector between Sunnyside Road and King Road and smooth curves.	Joint SDC Fund	2016-2025	$4,800
162nd Avenue Widening	Widen to 3-lane collector from Hagen Road to Sunnyside Road.	Joint SDC Fund	-	$5,300
162nd Avenue Extension South** (Roadway E)	Construct a new 3-lane collector south of the Taralon development to Highway 212.	Joint SDC Fund	-	$8,800
162nd Avenue Extension North** (Roadway D)	Construct a new 3-lane collector between Hagen Road and Clatsop Street.	Joint SDC Fund	-	$14,600
Clatsop Street Extension East** (Roadway C)	Construct a new 3-lane collector between 162nd Avenue and 172nd Avenue.	Joint SDC Fund	-	$2,050
Scouter Mountain South Roadway** (Roadway H)	Construct a new 3-lane east-west collector just north of Hagen Road between 147th Avenue and 172nd Avenue.	Joint SDC Fund	-	$5,000
Rock Creek Major Arterial** (Roadway M)	Construct a new 5-lane east-west major arterial from 172nd Avenue to the Sunrise Corridor Rock Creek interchange.	Joint SDC Fund	-	$15,700
	Total Motor Vehicle Project Costs			**$116,750**

*These projects were identified in the previous TSP.
**These projects would only occur with development or redevelopment and would not be initiated by the City.

[13] *OAR Chapter 660*, Department of Land Conservation and Development, Division 012, Transportation Planning, adopted on March 15, 2005, effective April 2005.

Trucks

Efficient truck movement plays a vital role in the economical movement of raw materials and finished products. The establishment of through truck routes provides for this efficient movement while at the same time maintaining neighborhood livability, public safety, and minimizing maintenance costs of the roadway system. Sunnyside Road and 172nd Avenue are recommended as designated through truck routes in the TSP study area. The objective of these route designations is to allow these routes to focus on design criteria that are "truck friendly"; i.e. 12-foot travel lanes, longer access spacing, 35-foot (or larger) curb returns and pavement design that accommodates a larger share of trucks.

9. Other Modes Plan

This chapter summarizes existing and future rail, air and water transportation needs in the City of Happy Valley. While auto, transit, bicycle and pedestrian transportation modes have a more significant effect on the quality of life in Happy Valley, other modes of transportation must be considered and addressed.

Policies

No goals or policies were developed related to rail, air, water or pipeline transportation systems. However, one policy was developed which relates to the future use of alternative fuel vehicles in Happy Valley:

- Policy 1c: The City shall encourage the use of alternative fuel vehicles and the use of more efficient transportation modes.

Recommended Facilities

Alternative Fuel Vehicles

The use of alternative fuel vehicles should be encouraged in Happy Valley. This could be achieved by providing incentives for electric car charging spaces at key activity centers and biodiesel stations within the City. Alternative fuel vehicles would use the same right-of-way as gasoline-powered vehicles.

Rail

There are no rail facilities within the City of Happy Valley. There are not expected to be any rail facilities within the City in the near future. Due to these considerations, no policies or recommendations in this area of transportation is provided for Happy Valley.

Air

There are no airports within the City of Happy Valley. Passenger service to Happy Valley residents is provided via Portland International Airport, approximately 10 miles to the north of Happy Valley.

Water

There are no navigable waterways in the Happy Valley TSP study area. No policies or recommendations in this area of transportation are provided.

10. Financing & Implementation

This chapter outlines the funding sources that can be used to meet the needs of the transportation system. The costs for the elements of the transportation system plan are outlined and compared to the potential revenue sources. Options are discussed regarding how the costs of the plan and revenues can be balanced.

Current Funding Strategies

Transportation funding is commonly viewed as a user fee system where the users of the system pay for infrastructure through motor vehicle fees (such as gas tax and registration fees) or transit fares. However, a great share of motor vehicle user fees goes to road maintenance, operation and preservation of the system rather than construction of new system capacity. Much of what the public views as new construction is commonly funded (partially or fully) through local improvement districts (LIDs) and frontage or off-site improvements required as mitigation for land development.

The City of Happy Valley currently utilizes three sources to fund construction of its transportation infrastructure as described below. These sources collect revenue each year that is used to maintain street facilities or construct new roadway improvements, with some restrictions on the type and location of projects.

State Fuel Tax and Vehicle License Fee

The State of Oregon Highway Trust Fund collects various taxes and fees on fuel, vehicle licenses, and permits. A portion is paid to cities annually on a per capita basis. By statute, the money may be used for any road-related purpose. Happy Valley uses it for street operating needs.

Oregon gas taxes are collected as a fixed amount per gallon of gasoline served. Gas tax in Oregon has not increased since 1992 (currently 24 cents per gallon), and this tax does not vary with changes in gasoline prices. There is no adjustment for inflation tied to the gas tax, so the lack of change since 1992 means that the net revenue collected has gradually eroded over time as the cost to construct and repair transport systems increase. Fuel efficiency in new vehicles has further reduced the total dollars collected through this system. Oregon vehicle registration fees are collected as a fixed amount at the time a vehicle is registered with the Department of Motor Vehicles. Vehicle registration fees in Oregon have recently increased from $15 per vehicle per year to $27 per vehicle per year for passenger cars, with similar increases for other vehicle types. There is no adjustment for inflation tied to vehicle registration fees.

Last year Happy Valley received about $313,000 in State gas tax and vehicle license fee revenue. Essentially all of these funds are spent on roadway surface maintenance of local streets. Because there is no index for cost inflation, this revenue level will increase only proportionate with the

city's population growth, which is expected to be significant. Happy Valley is expected to receive approximately $14.9 million over the next 20 years based on population forecasts.

Portland General Electric Privilege Tax

The privilege tax represents the fee PGE pays a city for the use of the public right-of-way for utilities. Privilege taxes are typically calculated at 3.5 to 5 percent of annual gross revenues within the city limits. For the fiscal year 2004/2005, Happy Valley set aside approximately $39,000 of the privilege tax received into a sidewalk fund. Assuming that the current tax received remains relatively consistent and the same portion is set aside, Happy Valley can expect to receive $780,000 for the sidewalk fund over the next 20 years.

System Development Charge

The System Development Charge (SDC) for streets is used as a funding source for all capacity adding projects for the transportation system. The Happy Valley/Clackamas County Joint Transportation SDC District was adopted in 2001. This district is bordered by I-205 to the west, Multnomah County to the north, 172nd Avenue to the east and Highway 212 to the south. The funds collected can be used to construct or improve portions of streets with the district.

The SDC fee is collected from new development based on the proposed land use and size. The SDC fees are determined based on each land use's potential to generate vehicle trips. The current SDC rate for a single family home is $5,006 per dwelling unit and it is among the highest transportation SDC rates in the State of Oregon. Other current SDC rates range from $6,104 per 1,000 square feet for a general office building to $31,355 per 1,000 square feet for a supermarket.

For fiscal year 2004/2005, the income from the SDC for development within Happy Valley was $1,309,320. The SDC income potential over the next 20 years was estimated based on the forecasted household and employment growth within the future City limits. The SDC single family home rate was applied to household growth. However, assumptions were made to correlate the forecasted retail and other employment growth to the available SDC rates. Happy Valley is expected to collect approximately $113 million from SDC fees over the next 20 years based on land use forecasts.

Summary

Table 10-1 summarizes the current funding sources and the estimated revenue over the next 20 years. Total revenues collected over 20 years would be $129 million with the current sources. The majority of these funds are from estimated SDC fees which are based on the future land use forecasts and would be obtained from potential development. If the forecasted future growth does not occur then the amount of SDC revenue would be reduced drastically.

Table 10-1: Current Transportation Revenues for Happy Valley

Funding Category	2004/2005 Annual Amount	Estimated 20 Year Revenues
State Fuel Apportionment & Vehicle License Fee	$313,000	$14,930,000
PGE Privilege Tax	$39,000	$780,000
System Development Charge (Street)	$5,670,000	$113,270,000
Total Revenues	**$6,022,000**	**$128,980,000**

Source: City of Happy Valley

Projects and Programs

This section presents the recommended projects and programs developed for the City of Happy Valley to serve local travel for the coming 20 years. The Pedestrian, Bicycle Transit, and Motor Vehicle projects were identified in the Action Plan for each mode, and represent those projects that have the highest short-term need for implementation to satisfy performance standards, or other policies established for the Happy Valley Transportation System Plan. The costs for the remaining motor vehicle projects noted in the Motor Vehicle Master Plan are identified, but these have not been included in the funding needs analysis for the city because the Action Plan is limited to projects most likely to be funded within the planning horizon. Other projects on the Master Plan list require additional funding, and they are expected to be built beyond the 20 year horizon.

Project Cost Estimates

Cost estimates (general, order of magnitude) were developed for the projects identified in the motor vehicle, bicycle, transit, and pedestrian elements. Cost estimates from the existing RTP, County and/or City projects in Happy Valley were used in this study, if available. Other projects were estimated using general unit costs for transportation improvements, but do not reflect the unique project elements that can significantly add to project costs[1]. Development of more detailed project costs can be prepared in the future with more refined financial analysis. Since many of the projects overlap elements of various modes, the costs were developed at a project level incorporating all modes, as appropriate. It may be desirable to break project mode elements out separately, however, in most cases, there are greater cost efficiencies of undertaking a combined, overall project. Each of these project costs will need further refinement to detail right-of-way requirements and costs associated with special design details as projects are pursued.

All cost estimates are based on 2005 dollars. The historical construction costs price index has increased by 2.5 to 2.75 percent per year according to Engineering News Record research[2] . Construction costs have increased 100 percent in the 20 years from 1979 to 1999.

[1] General plan level cost estimates do not reflect specific project construction costs, but represent an average estimate. Further preliminary engineering evaluation is required to determine impacts to right-of-way, environmental mitigation and/or utilities. Experience has shown that individual projects costs can increase by 25 to 75 percent as a result of the above factors.

[2] Engineering News Record Construction Cost Index as reported for the past ten years for 20 cities around the United States. Reference: http://www.enr.com/features/conEco/costIndexes/constIndexHist.asp

Other Transportation Programs and Services

In addition to the physical system improvements identified in the previous section, the transportation facilities will require on-going operation and maintenance improvements across a variety of areas. These other transportation programs are recommended to respond to the specific policies and needs in maintaining roadway pavement quality, supporting safe routes to schools programs, allocations for implementing neighborhood traffic management, and on-going update and support of related planning documents.

Roadway Maintenance

The current annual cost of maintaining roadways under the jurisdiction of Happy Valley was estimated at $381,000, a portion of which is paid for by gas tax revenues from the state. Future annual maintenance costs for Happy Valley roadways will likely increase as the City takes jurisdiction over existing roadways from Clackamas County and new roadways within the City limits. It was assumed that over the next 20 years, the number of roadway miles the City would be responsible for maintaining would double. To estimate the City's road maintenance responsibility over the next 20 years, the annual maintenance costs (in 2005 dollars) for Happy Valley was increased by 50% resulting in an estimated cost of $11.4 million to maintain roadways.

School Safety Program

Each school within the city should be evaluated to review the convenience and safety of connections for pedestrians and bicycle travel from the neighborhoods that they serve. A "Safe Route to School" plan identifies key routes for pedestrian and bike circulation around the schools, and suggests needed improvements to traffic controls, crossing management, and on-site circulation that would improve safety for school-aged children. An annual allocation of $5,000 is set aside for this purpose.

Neighborhood Traffic Management (NTM)

Specific NTM projects are not defined. These projects will be subject to neighborhood consensus based upon City placement and design criteria. A City-wide NTM program, if desired, should be developed with criteria and policies adopted by the City Council. Speed humps can cost $2,000 to $4,000 each and traffic circles can cost $3,000 to $8,000 each. A speed trailer can cost about $10,000. It is important, where appropriate, that any new development incorporate elements of NTM as part of its on-site mitigation of traffic impacts. Annual allocation of $10,000 is identified for the program development and implementation of NTM projects.

Happy Valley Costs for TSP Action Plans

The cost estimates outlined in the Transportation System Plan to implement the Action Plans for Motor Vehicles, Transit, Bicycles and Pedestrians total $117.5 million, and the recommended transportation operations and maintenance programs would add $11.7 million for a total cost over 20 years of $129.2 million. Refer to Chapter 4 through 9 for details on the individual projects by travel mode. Note that some additional projects are listed in the Action Plans that are expected to be funded by other agencies (Metro, TriMet). These non-City costs have not been included in the estimates in Table 10-2, but are identified in the master plans.

Table 10-2: Happy Valley Transportation Action Plan Costs over 20 years (2005 Dollars)

Transportation Element	Approximate Cost ($1,000)
System Improvement Projects (Action Plans projects to be funded by the City)	
Pedestrian	$760
Bicycle	$0
Transit	$0
Motor Vehicle	$116,750
Total Capital Projects	**$117,510**
Operations and Maintenance Programs and Services	
Road Maintenance ($381,000/yr plus 150%)	$11,430
School Safety Program ($5,000/yr)	$100
Neighborhood Traffic Management ($10,000/yr)	$200
Total Operations and Maintenance Programs	**$11,730**
20 YEAR TOTAL	**$129,240**

The estimated $129 million for transportation capital projects and maintenance is expected to be adequately funded by the 20-year revenue estimate of $129 million (see Table 10-1). New funding sources to allow additional project on future Action Plans are discussed in the next section.

New Funding Sources and Opportunities

The new transportation improvement projects and recommended programs will require funding beyond the levels currently collected by the City. There are several potential funding sources for transportation improvements. This section summarizes several funding options available for transportation improvements. These are sources that have been used in the past by agencies in Oregon. In most cases, these funding sources, when used collectively, are sufficient to fund transportation improvements for local communities. Due to the complexity of today's transportation projects, it is necessary to seek several avenues of funding projects. Unique or hybrid funding of projects generally will include these funding sources combined in a new package.

Within the Portland region, funding for major transportation projects often is brought to a vote of the public for approval. This is usually for a large project or list of projects. Examples of this public funding include the Westside Light Rail Project. Because of the need to gain public approval for transportation funding, it is important to develop a consensus in the community that supports needed transportation improvements. That is the value of the Transportation System Plan. In most communities where time is taken to build a consensus regarding a transportation plan, funding sources can be developed to meet the needs of the community.

Transportation program funding options range from local taxes, assessments, and charges to state and federal appropriations, grants, and loans. All of these resources can be constrained based on a variety of factors, including the willingness of local leadership and the electorate to burden citizens and businesses; the availability of local funds to be dedicated or diverted to transportation issues from other competing City programs; and the availability and competitiveness of state and federal funds. Nonetheless, it is important for the City to consider all of its options and understand where its power may exist to provide and enhance funding for its Transportation programs.

The following funding sources have been used by cities to fund the capital and maintenance aspects of their transportation programs. There may be means to begin to or further utilize these sources, as described below, to address new needs identified in the Transportation System Plan.

General Fund Revenues

At the discretion of the City Council, the City can allocate General Fund revenues to pay for its Transportation program (General Fund revenues primarily include property taxes, use taxes, and any other miscellaneous taxes and fees imposed by the City). This allocation is completed as a part of the City's annual budget process, but the funding potential of this approach is constrained by competing community priorities set by the City Council. General Fund resources can fund any aspect of the program, from capital improvements to operations, maintenance, and administration. Additional revenues available from this source to fund new aspects of the Transportation program are only available to the extent that either General Fund revenues are increased or City Council directs and diverts funding from other City programs.

Voter-Approved Local Gas Tax

Several communities in Oregon have adopted local gas taxes by public vote. The taxes are paid to the city monthly by distributors of fuel. The process for presenting such a tax to voters will need to be consistent with Oregon State law as well as the laws of the City of Happy Valley. Table 10-3 summarizes the cities in Oregon that collect a local gas tax.

Table 10-3: Local Gas Taxes in Oregon

City	2004 Population	Vote Passage Date	Tax Rate
Cottage Grove	9,010	2003	3 cents/gallon
Dundee	2,900	2004	2 cents/gallon
Eugene	144,640	2003	3 cents/gallon
Sandy	6,360	2003	1 cent/gallon
Springfield	55,350	2003	3 cents/gallon
Stanfield	1,980	1999	1 cent/gallon
The Dalles	12,410	1986	3 cents/gallon
Tillamook	4,350	1982	1.5 cents/gallon
Woodburn	21,790	1989	1 cent/gallon

Source: League of Oregon Cities, Local Gas Tax Information, May 2005.

Currently, Happy Valley does not have any gas stations within the City. However, as forecasted growth occurs, especially along Sunnyside Road and 172nd Avenue, there is a potential for several gas stations to be constructed within the City and additional transportation revenue to be generated.

Street Utility Fee Revenue

A number of Oregon cities supplement their street funds with street utility fees. Local cities with adopted street utility fees include Lake Oswego, Wilsonville and Tualatin. Establishing user fees to fund applicable transportation activities and/or capital construction ensures that those who create the demand for service pay for it proportionate to their use. The street utility fees are recurring monthly or bi-monthly charges that are paid by all residential, commercial, industrial, and institutional users. The fees are charged proportionate with the amount of traffic generated, so a retail commercial user pays a higher rate than a residential user. Typically, there are provisions for reduced fees for those that can demonstrate they use less than the average rate implies, for example, a resident that does not own an automobile or truck.

From a system health perspective, forming a utility also helps to support the ongoing viability of the program by establishing a source of reliable, dedicated funding for that specific function. Fee revenues can be used to secure revenue bond debt used to finance capital construction. A street utility can be formed by Council action and does not require a public vote.

It is recommended that the City consider establishing a street utility fee in the near future to increase capital funding. Street utility fees can provide a stable source of dedicated revenue useable for transportation system operations and maintenance and/or capital construction. Rate revenues can also secure revenue bond debt if used to finance capital improvements. Street utilities can be formed by Council action, and billed through the City utility billing system.

Other Funding Sources

Urban Renewal District

An Urban Renewal District (URD) would be a tax-funded district within the City. The URD would be funded with the incremental increases in property taxes that result from construction of applicable improvements. This type of tax increment financing has been used in Oregon since 1960. Uses of the funding include, but are not limited to, transportation. It is tax-increment funded rather than fee funded and the URD could provide for renewal that includes, but is not limited to, transportation projects.

Local Improvement District Assessment Revenue

The City may set up Local Improvement Districts (LIDs) to fund specific capital improvement projects within defined geographic areas, or zones of benefit. LIDs impose assessments on properties within its boundaries. LIDs may not fund ongoing maintenance costs. They require separate accounting, and the assessments collected may only be spent on capital projects within the geographic area. Citizens representing 33% of the assessment can terminate a LID and overturn the planned projects so projects and costs of a LID must meet with broad approval of those within the boundaries of the LID.

Direct Appropriations

The City can seek direct appropriations from the State Legislature and/or U.S. Congress for transportation capital improvements. There may be projects identified in the Plan for which the City may want to pursue these special, one-time appropriations.

Special Assessments

A variety of special assessments are available in Oregon to defray costs of sidewalks, curbs, gutters, street lighting, parking and CBD or commercial zone transportation improvements. These assessments would likely fall within the Measure 50 limitations. A regional example would be the Westside LRT where the local share of funding was voter approved as an addition to property tax.

Employment Taxes

TriMet collects a tax for transit operations in the Portland region through payroll and self employment taxes. Approximately $145 million are collected annually in the Portland region for transit.

Debt Financing

While not a direct funding source, debt financing can be used to mitigate the immediate impacts of significant capital improvement projects and spread costs over the useful life of a project. Though interest costs are incurred, the use of debt financing can serve not only as a practical means of funding major improvements, but is also viewed as an equitable funding strategy, spreading the burden of repayment over existing and future customers who will benefit from the projects. The obvious caution in relying on debt service is that a funding source must still be identified to fulfill annual repayment obligations.

Voter-Approved General Obligation Bond Proceeds: Subject to voter approval, the City can issue General Obligation (G.O.) bonds to debt finance capital improvement projects. G.O. bonds are backed by the increased taxing authority of the City, and the annual principal and interest repayment is funded through a new, voter-approved assessment on property City-wide (a property tax increase). Depending on the critical nature of any projects identified in the Transportation Plan, and the willingness of the electorate to accept increased taxation for transportation improvements, voter-approved G.O. bonds may be a feasible funding option for specific projects. Proceeds may not be used for ongoing maintenance.

Revenue Bonds*:* Revenue bonds are debt instruments secured by rate revenue. In order for the City to issue revenue bonds for transportation projects, it would need to identify a stable source of ongoing rate funding. Interest costs for revenue bonds are slightly higher than for general obligation bonds, due to the perceived stability offered by the "full faith and credit" of a jurisdiction.

Oregon Transportation Infrastructure Bank Loans: A statewide revolving loan fund designed to promote innovative transportation funding solutions. State support for the program is provided by the Financial Services Branch of ODOT. In general, eligible projects include highway, transit, bikeway and pedestrian access projects. Projects are rated on established criteria and recommended based on the rankings. Repayment of loans must begin within five years of project completion and must be complete within 30 years or at the end of the useful life of the project.

DKS Associates
TRANSPORTATION SOLUTIONS

ACKNOWLEGEMENTS

Production of this report has been the collective effort of the following people:

City of Happy Valley

Michael Walter
Planning Services Manager

DKS Associates

Peter Coffey, PE
Project Manager

Reah Beach, PE
Project Engineer

Brandy Sularz, EIT
Transportation Engineering Staff

Technical Advisory Committee

Andrew Johnson, ODOT
John Mermin, Metro
Rick Nys, Clackamas County
Ron Weinman, Clackamas County
Gabe Onyeador, City of Portland
Tom Mills, TriMet

Citizen's Advisory Committee

Richard Wehby
Ron Petersen
Chuck Dalich
Monty Hurley
Kristen Mitchell
Paul Steigleder
Robin Wheeler
Traci Callan

This project is partially funded by a grant from the Transportation and Growth Management (TGM) Program, a joint program of the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development. This TGM grant is financed, in part, by federal Transportation Equity Act for the 21st Century (TEA-21), local government, and the State of Oregon funds. The contents of this document do not necessarily reflect views or policies of the State of Oregon.