CHAPTER

8

Motor Vehicle Master Plan

This chapter summarizes strategies to be used in evaluating the future needs of the City of West Linn's street network, and recommends improvements for motor vehicle (automobiles, trucks, buses and other vehicles) operations. The Motor Vehicle Plan is intended to develop projects to address the needs identified in Chapter 4 (Future Conditions), as well as identifying cost for those projects.

Strategies

To serve future growth and conform to the City of West Linn's future needs, a set of interrelated strategies needs to be implemented to meet city and state performance standards. Operational Projects, Capital Projects, and Policy changes are the three related strategies available to the city for managing the forecasted future travel demand. Operational Projects (such as signal timing improvements or ITS implementation) often involve the improvement of a city's existing transportation infrastructure. Capital Projects are generally larger scale improvements, and can involve physical improvements to existing infrastructure (such as widening a facility) or the planning and construction of new city infrastructure. Policy changes generally do not result in physical changes in the city's infrastructure, but rather a change in the implementation of how the city conducts business.

The impact of future growth would be severe without investment in transportation improvements. Strategies for meeting automobile facility needs include the following:

- Transportation System Management (TSM)
- Intelligent Transportation Systems (ITS)
- Functional Class
- Neighborhood Traffic Management
- Access Management
- Additional Traffic Signals on Arterial/Collector Intersections
- Local Street Connectivity
- Transportation Demand Management
- Intersection Capacity Improvements
- Regional Circulation Enhancements

The following sections outline the type of improvements that could be needed for the long-range Motor Vehicle Master Plan.

Transportation System Management (TSM)

Transportation System Management (TSM) focuses on low cost strategies within the existing transportation infrastructure to enhance operational performance. Finding ways to better manage transportation while maximizing urban mobility and treating all modes of travel as a coordinated system is a priority. TSM strategies include signal improvements, traffic signal coordination, traffic calming, access management, local street connectivity and intelligent transportation systems (ITS). Traffic signal coordination and systems typically provide the most significant tangible benefits to the traveling public. The primary focus of TSM measures are region-wide improvements, however there are a number of TSM measures that could be used in a smaller scale environment such as within the City of West Linn. The following sections discuss TSM measures that could be appropriate for the City of West Linn

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 plan identifies opportunities for regional coordination and funding and calls for Clackamas County to dedicate funding sources for projects. The Clackamas County ITS Plan[1] identifies ITS projects in West Linn located along I-205 and Highway 43. Projects located in West Linn along each of these facilities (and planned implementation schedules) are:

Highway 43

- CCTV cameras at three locations [Planned 11-20 years]
- Detector station [Planned 11-20 years]
- Incident management corridor [Planned 11-20 years]
- Transit priority corridor (and information display) [Planned 6-10 years]
- Fiber optic cable [Planned 11-20 years]

Interstate 205

- CCTV cameras at four locations [*completed*]
- Fiber optic cable [*completed*]

Projects located along Highway 43 generally do not have a high priority in the regional plan (10+ years until implementation) and for this reason specific funding sources have not been identified. Potential funding sources for these ITS projects include the Metropolitan Transportation Improvement Program (MTIP) or programming City of West Linn transportation funds.

Other ITS projects to consider in the City may include transit signal priority, signal coordination and optimization, traffic monitoring and surveillance, information availability, and incident management. In order to support future ITS projects including traffic signal operations, the City of West Linn and

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

Clackamas County should require the installation of three-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 three-inch conduit would ensure adequate wiring capacity to accommodate future ITS projects.

Functional Classification

The functional class of a road aids in defining the primary function and associated design standards for the facility. The hierarchy of the facilities within the network in regards to the type of traffic served (through or local trips), balance of function (providing access and/or capacity), and the level of use (generally measured in vehicles per day) are generally dictated by the functional class.

How Street Functional Classification is Applied

Functional classification has two components: the extent of connectivity and the frequency of the facility type. Maps can be used to determine regional, city, 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. Spacing standards can be a guide for setting functional class, but other features and potential long term uses in the area must be considered. For instance, some areas may not experience significant changes in demand, while others will. It is acceptable for the City to re-classify street functional designations to have different naming conventions, however, the general intent and purpose of the facility, whatever the name, should be consistent with regional, state and federal guidelines.

By planning an effective functional classification of streets, the City can manage public facilities pragmatically and cost-effectively. The hierarchy of these classifications does not directly affect the volumes on the roadways. However, standards that are specific to each facility type provide the characteristics that dictate relative attractiveness of a route and the mix of through and local traffic.

Identification of connectivity does not dictate the demand for a facility (which is a function of land use). Streets with the highest connectivity have the greatest potential for high traffic volumes, but do not necessarily have high volumes as an outcome, depending upon land uses in the area. Typically, a significant reason for high traffic volumes on surface streets at any point can be related to the level of land use intensity within a mile or two. Many arterials with the highest level of connectivity have only 35-65% "through traffic." Without the connectivity provided by arterials and collectors, the impact of traffic intruding into neighborhoods and local streets increases substantially.

Classification Types

Freeways are state or interstate facilities that provide regional travel connections. These routes have the highest capacity and the most restrictive access requirements. Two local freeway interchanges at 10th Street and at Highway 43 serve the entire city of West Linn. Interchanges are grade-separated facilities with arterial or principal arterial streets. No intermediate vehicular or pedestrian access is allowed.

Principal Arterials are typically state highways that provide the high level roadway capacity to local land uses. These routes connect over the longest distance (sometimes miles long) and are less frequent than other arterial or collectors. These highways generally span several jurisdictions and often have

statewide importance (as defined in the ODOT State Highway Classification). These facilities should provide for a high level of transit service and include transit priority measures to expedite bus travel. **Arterial streets** serve to interconnect the City. These streets link major commercial, residential, industrial and institutional areas. Arterial streets are typically spaced about one mile apart to assure accessibility and reduce the incidence of traffic using collectors or local streets for through traffic in lieu of a well placed arterial street. Access control is the key feature of an arterial route. Arterials are typically multiple miles in length.

Collector streets provide both access and circulation within and between residential and commercial/industrial areas. Collectors differ from arterials in that they provide more of a citywide circulation function, do not require as extensive control of access (compared to arterials) and penetrate residential neighborhoods, distributing trips from the neighborhood and local street system. Collectors are typically greater than 0.5 to 1.0 miles in length.

Neighborhood Routes are usually long relative to local streets and provide connectivity to collectors or arterials. Since neighborhood routes have greater connectivity, they generally have more traffic than local streets and are used by residents in the area to access the neighborhood, but do not serve citywide/large area circulation. They are typically about a quarter to a half-mile in total length. Traffic from cul-de-sacs and other local streets may drain onto neighborhood routes to gain access to collectors or arterials. Because traffic needs are greater than a local street, certain measures should be considered to retain the neighborhood character and livability of these streets. Neighborhood traffic management measures are often appropriate (including devices such as speed humps, traffic circles and other devices - refer to later section in this chapter). However, it should **not** be construed that neighborhood routes automatically get speed humps or any other measures. While these streets have special needs, neighborhood traffic management is only one means of retaining neighborhood character and vitality.

Local Streets have the sole function of providing access to immediate adjacent land. Service to "through traffic movement" on local streets is deliberately discouraged by design.

The proposed functional classification of roadways was developed following detailed review of the existing West Linn TSP, Clackamas County TSP, and the Metro RTP functional classification. No changes are proposed to the existing functional classification. The functional classification for the roadways in the City of West Linn is shown in Figure 8-1.

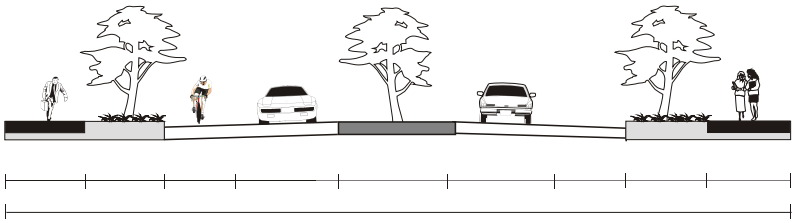
Roadway Cross-Section Standards

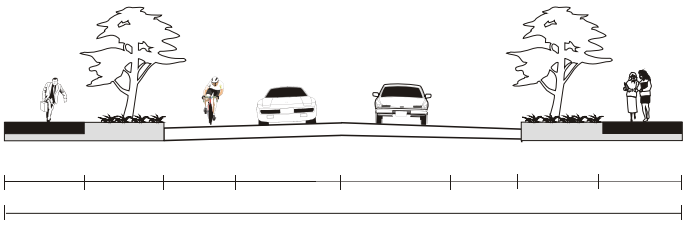
The design characteristics of streets in the City of West Linn need to meet the function and demand for each facility type. The actual design of a roadway can vary from segment to segment due to adjacent land uses and demands. The objective was to define a system that allows standardization of key characteristics to provide consistency, but also to provide criteria for application that provides some flexibility, while meeting the design standards. Table 8-1 outlines the width requirements for different street elements for streets in the City of West Linn. The cross-section standards for each functional classification are further detailed in Figures 8-2 through 8-5.

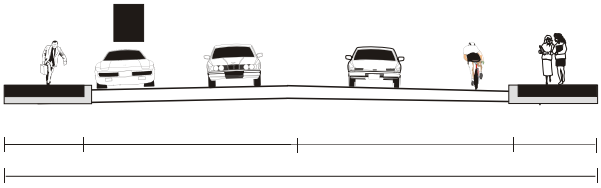
Unless prohibited by extreme topographic conditions, newly constructed streets shall meet the maximum standards indicated in the cross-sections. When widening an existing street, lesser standards than the maximum may be used to accommodate physical and existing development constraints. Examples of constrained street cross-sections are shown for arterial and collector streets. These constrained cases should be applied where future daily volumes do not require center left-turn pockets or raised medians. In some locations, "green streets" (those that utilize vegetation to manage drainage) may be appropriate due to design limitations or adjacent land use. Green street elements (shown in the cross section figures) may be included at the discretion of the city engineer and planning director.

West Linn

Transportation System Plan

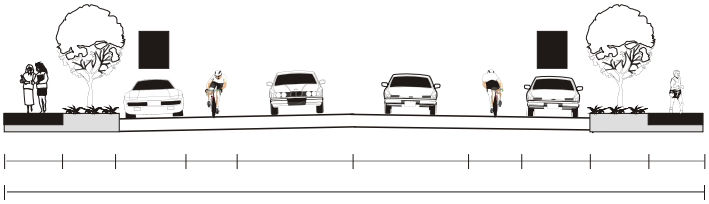


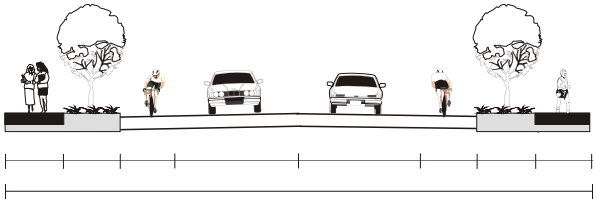


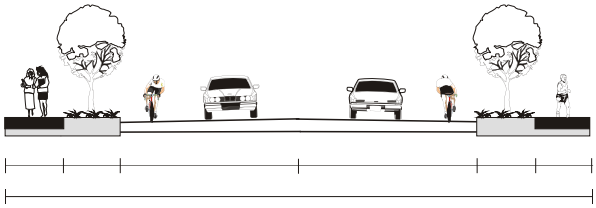


West Linn

Transportation System Plan

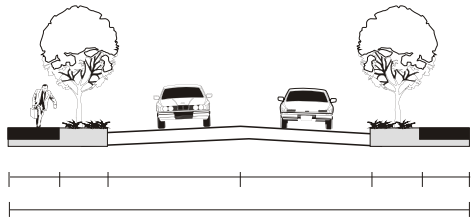






West Linn

Transportation System Plan



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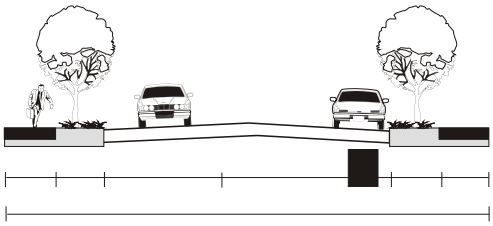

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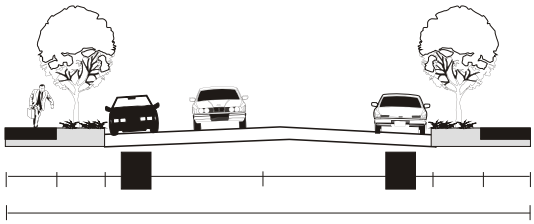

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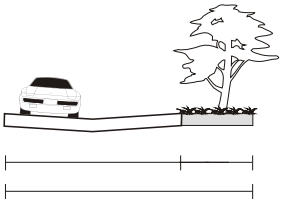

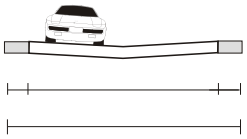

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Table 8-1: City of West Linn Roadway Cross-Section Standards

Street Element	Characteristic	Width/Options
Vehicle Lane Widths: (Minimum widths)	Arterial	11 feet
	Collector	10 feet
	Neighborhood	10 feet
	Local	12 feet
	Turn Lane	10-14 feet
On-Street Parking:	Arterials	Limited (in designated opportunity areas)
	Collectors	Some (unstriped)
	Neighborhood	Some (8 feet)
	Local	Some (unstriped)
Bicycle Lanes: (minimum widths)	New Construction	5 to 6 feet
	Reconstruction	5 to 6 feet
Sidewalks: (Minimum width)	Arterial	6 feet
	Collector	6 feet
	Neighborhood/Local	6 feet
Landscape Strips:	Can be included on all streets	6 feet
Medians:	5-Lane	Optional
	3-Lane	Optional
	2-Lane	Consider if appropriate
Neighborhood Traffic Management:	Arterials	Not recommended
	Collectors	Under special conditions
	Neighborhood	Should consider if appropriate
	Local	Should consider if appropriate
Transit:	Arterial/Collectors	Appropriate
	Neighborhood/Local	Only in special circumstances
	Local	Not recommended

Note: These standards apply to City of West Linn facilities only. ODOT width standards apply for ODOT facilities.

Neighborhood Traffic Management (NTM)

Neighborhood Traffic Management (NTM) is a term that has been used to describe traffic control devices typically used in residential neighborhoods to slow traffic or possibly reduce the volume of traffic. NTM is descriptively called traffic calming due to its ability to improve neighborhood livability. The City of West Linn currently utilizes a variety of NTM elements such as speed humps, raised pavement markings, median, bulb-outs, etc.

The City has an established traffic safety committee which meets on a monthly basis that oversees NTM issues among their other responsibilities. The committee has a set procedure for NTM implementation that starts with the identification of a perceived problem by concerned citizens, after which the committee conducts a speed/volume survey to identify if the problem exists. Once the problem has been identified and classified, the committee discusses the various approaches to solving the problem. There are many different NTM options available to the committee, which are described in the technical appendix. Typically, the committee starts with lower cost solutions, such as education and enforcement and if it is deemed that either of these solutions are not having the desired effect, an engineering solution is selected by the committee. The implementation of the selected NTM solution may be funded by the city and/or the concerned citizens. Often the city pays for the logistics of the NTM implementation and the citizens pay for the material costs.

The city should continue this effort with additional traffic calming measures (where applicable) and work with the community to find the traffic calming solution that best meets their needs while maintaining roadway function. Table 8-2 lists common NTM applications that Tualatin Valley Fire and

Rescue typically supports as long as minimum street criteria are met. Any NTM project should include coordination with emergency agency staff to ensure public safety is not compromised.

Table 8-2: Traffic Calming Measures by Roadway Functional Classification

Traffic Calming Measure	Roadway Classification		
	Minor Arterial*	**Major Collector**	**Minor Collector/ Local Street**
Curb Extensions	Supported	Supported	Calming measures are alright on lesser response routes that have connectivity (more than two accesses) and are accepted and field tested by Tualatin Valley Fire and Rescue.
Medians	Supported	Supported	
Pavement Texture	Supported	Supported	
Speed Hump	Not Supported	Not Supported	
Raised Crosswalk	Not Supported	Not Supported	
Speed Cushion (provides emergency pass-through with no vertical deflection)	Not Supported	Not Supported	
Choker	Not Supported	Not Supported	
Traffic Circle	Not Supported	Not Supported	
Diverter (with emergency vehicle pass through)	Not Supported	Supported	
Meandering Alignments	Not Supported	Not Supported	

Note: Traffic calming measures are supported with the qualification that they meet Tualatin Valley Fire and Rescue guidelines including minimum street width, emergency vehicle turning radius, and accessibility/connectivity

Access Management

Access Management is a policy tool which seeks to balance mobility, 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 limits the number and spacing 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, such as Highway 43, 10th Street, and Willamette Falls Drive for maintaining traffic flow and mobility. Numerous driveways or street intersections increase the number of conflicts and potential for collisions and decrease mobility and traffic flow. The City of West Linn, 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 the City of West Linn:

- Develop formalized access management plans for specific major and minor arterial streets in the City of West Linn to provide a detailed assessment of current conditions, and document specific measures to maximize the capacity of each 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 on city street facilities should meet the recommended access spacing standards summarized in Table 8-3.

Table 8-3: Access Spacing Standards for City Street Facilities

Roadway Functional Classification	Area	Traffic Signals (miles)	Public Intersections (feet)	Private Driveways (feet)	Median Opening (feet)
Arterial	Urban	½	600	300	600
	Opportunity	¼	NA	NA	NA
Collector	All	¼	200	150	NA
Neighborhood Route	All	¼	150	100	NA
Local Residential Street	All	NA	100	50	NA
Local Commercial Street	All	NA	100	50	NA
				nated town centers.	
			llamette neighborhoods.		

Many existing roadways and/or driveways do not currently meet these standards. These access points were installed when traffic volumes were substantially lower and no access spacing criteria were mandated. With higher traffic volume in the future, the need for access control on all arterial and collector roadways is critical to allow for safe mobility.

Highway 43 Access Management Plan

Preserving capacity on state facilities is especially important, since a large number of regional trips are served daily on both of these facilities (I-205 and Highway 43) in West Linn. Substandard performance because of a lack of capacity could force drivers to look for alternative routes along city streets. Preservation of capacity through specific access spacing standards on state facilities is outlined in the *Oregon Highway Plan* (OHP)[2] for Highway 43. Table 8-4 lists the minimum access spacing standard requirements for segments of Highway 43, based on speed and functional classification.

Table 8-4: ODOT Access Spacing Standards for Highway 43

Location	Speed (mph)	Highway Classification	NHS*	Truck Route	Freight Route	Access Spacing Standard (ft)
MP 8.04 (City Limit) MP 11.29 (I-205 NB Off-Ramp)	35	Statewide	Yes	No	No	720
MP 11.29 (I-205 NB Off Ramp) 11.43 (City Limit)	35	District	No	No	No	350

Note: Minimum access management spacing for public road approaches is the existing city block spacing or the city block spacing as identified in the local comprehensive plan. Public road connections are preferred over private driveways and in Special Transportation Areas (STA) driveways are discouraged. However, where driveways are allowed and where land use patterns permit, the minimum access management spacing for driveways is 175 feet (55 meters) or mid-block if the current city block is less than 350 feet (110 meters)[3].
* National Highway System

Traffic Signal Spacing

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 queuing vehicles. Being nearly built-out, there will not likely be many new roads constructed within the City of West Linn. Currently all of the signalized

[2] *OAR 734-051 Highway Approaches, Access Control, Spacing Standards and Medians*, adopted per ORS 374.310(1).
[3] Oregon Department of Transportation (ODOT), 1999 *Oregon Highway Plan* (OHP)

intersections within the city are either along Highway 43 or are located at or near the two interchanges with I-205. However, as traffic volumes increase as a result of potential in-fill and regional growth, the need for new signals along the existing street system may be necessary to manage traffic flow. When this is the case, traffic signal warrants should be evaluated to determine if a traffic signal is an appropriate solution (if a deficiency exists). Traffic signals should only be implemented when deemed necessary by the city engineer to enhance safety and promote mobility. ODOT identifies ½ mile as the desirable spacing of signalized intersections on regional and statewide highways but recognizes that shorter signal spacing may be appropriate due to a number of factors including existing road layout and land use patterns[4]. Signal spacing below these standards should be studied in detail to consider traffic signal coordination and the impacts of vehicle flow and queuing within the area. At that time adjacent signals and the spacing between them can be evaluated.

Local Street Connectivity

The City of West Linn's many cul-de-sacs, steep topography, and major facilities such as Highway 43 and I-205 limit intercity connectivity. Therefore, many intercity trips are forced to travel along the few through streets that do connect across these barriers.

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 can also be reduced.

Some of the congestion on roads such as Rosemont Road, Salamo Road, or Hidden Springs Road could be improved through improved neighborhood connectivity. Improved connectivity in the area east of Highway 43 and in the Tanner Basin area can provide circulation to existing or future traffic signals that will result in less delay and better safety for access onto the highway. Several short roadway connections will be needed within neighborhood areas to connect disjointed local streets and to reduce out-of-direction travel for vehicles, pedestrians and bicyclists.

The proposed Local Connectivity Plan for the City of West Linn is shown in Figure 8-6. In most cases, the improvements would involve the changing of a streets functional classification from local street to neighborhood route. In limited cases, a short length of new road would be necessary for improved connectivity. The arrows on Figure 8-6 represent recommended connections and the general direction for the placement of the connection in existing configurations. In each case, the specific alignments and design may be modified dependent upon future development review.

The criteria 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 (may include paved roadway or trails)
- Every 530 feet, a grid for automobiles (local street or higher classification)

[4] MUTCD signal warrants must be met based on ODOT methodology and OAR 734-020-460 (1) A traffic signal shall not be installed unless one or more of the warrants identified in the MUTCD are met or will be met consistent with the requirements of OAR734-020-0490. The satisfaction of a warrant or warrants, however, is not in itself justification for a traffic signal. Installation of a signal must be approved by the State Traffic Engineer on a regional or state highway.

LEGEND

- Local Street Connection
- Pedestrian/Bike Connection (No Autos)

NOTE: General connection route indicated. Precise alignments to be determined

DKS Associates
TRANSPORTATION SOLUTIONS

NO SCALE

Figure 8-6

FUTURE LOCAL STREET CONNECTIVITY IMPROVEMENTS

The arrows shown on Figure 8-6 indicate priority local and neighborhood connections only. Local connections for existing stub end streets, cul-de-sacs, or extended cul-de-sacs in the road network are, for the most part, not identified on this figure. Pedestrian connections from any cul-de-sac should be considered mandatory as future development and redevelopment occurs. The goal would continue to be improved city connectivity for all modes of transportation.

Topography and environmental conditions limit the level of connectivity in several areas of the City of West Linn. The area to the west of Highway 43 is recognized as being particularly challenging because of the steep terrain and the existing built-out nature of that area.

Transportation Demand Management

Transportation Demand Management (TDM) is a policy tool as well as a 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 City of West Linn 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 potential growth in trips.

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 (and revised in February 2007) 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.

Research has shown that a comprehensive set of complementary policies implemented over a large geographic area can have a measured effect on the number of vehicle miles traveled to/from that area. 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 would 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 8-5 provides a list of several strategies outlined in the ECO program that could be applicable to the West Linn area. However, the limited amount of commercial development in West Linn may restrict the potential impact for reducing traffic demand through implementation of these strategies. Due to the unique nature of the land use, an alternative strategy for the City to consider may be to enhance/expand commercial areas in the City to support greater local employment and reduce the reliance on commuter routes. While such an action may not reduce the total number of vehicle trips, expanding these local employment centers would still have the potential to reduce vehicle miles traveled (VMT) through reduction of trip distance.

Table 8-5: Transportation Demand Management Strategies

Strategy	Description	Potential Trip Reduction
Telecommuting	Employees perform regular work duties 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 reduced for high occupancy vehicles (HOV) such as carpools/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 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 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% (company subsidized van)
Other strategies	Includes: gift/awards for alternative mode use, walking program, company vehicles, guaranteed ride home program, paid time off. See report for details.	0-3% (per strategy)

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 West Linn area, region-wide TDM measures should help to reduce congestion. Setting TDM goals and policies for new development will be necessary to help implement TDM measures in the future. Metro has established non-SOV (Single Occupancy Vehicle) mode share targets to be achieved by 2040. The 2040 non-SOV modal target for town centers (as designated along the southern portion of Highway 43 in West Linn) is 45-55%, while industrial, employment, and neighborhood areas (the designations for remaining areas of West Linn) have a non-SOV modal target of 40-45%.[5]

The Metro 2025 Regional Demand Model provides an analysis tool for monitoring non-SOV trip percentages between the various RTP funding scenarios[6]. The forecasted non-SOV trip percentages take into account all RTP improvement projects (including transit, pedestrian, and bicycle system improvements. The RTP projects included in the 2025 financially constrained model are listed in Table 8-6.

Table 8-6: TDM Improvements included in the RTP 2025 Financially Constrained System

RTP #	Location	Improvement	Jurisdiction	Time-Line	Cost ($1,000s)
5062	Milwaukie town center area	Implements a transportation management association program with employers	TriMet/Milwaukie	2016-25	$200
5150	Oregon City Regional Center	Implements a transportation management association program with employers	TriMet/Oregon City	2016-25	$200
8050	SMART district	Regional employer outreach, transit marketing, vanpool and carpool, station cars and car sharing programs	Metro/SMART	2004-25	$1,500
8052	Financially Constrained	Regional employer outreach, transit marketing, vanpool and carpool, station cars and car sharing programs	Metro/TriMet	2004-25	$16,979
8053	Region-wide	Implementation of innovative transportation solutions in locations with high regional significance	Metro/TriMet	2004-25	$6,068
8054	Region-wide	Continue provision of ECO information clearinghouse services	Metro/DEQ	2004-25	$1,213
8055	Region-wide	Implementation of innovative transportation solutions in locations with high regional significance	Metro/TriMet	2004-25	$3,000
8056	Region-wide	Future implementation and sustainability of TMA's with employers	Metro/TriMet	2004-25	$4,000
			TOTAL		$33,160

Note: These regional improvements are assumed in Metro's RTP Financially Constrained System and do not correspond with the local improvements included in the action plan of this TSP.

[5] Based on the *2004 Metro Regional Transportation Plan*, Ordinance No. 03-1024 (July 8, 2004), page 1-65. These targets are also consistent with the 2035 Regional Transportation Plan update.

[6] An illustrative set of RTP improvement project scenario is not available for the more recent 2030 Regional Demand Model.

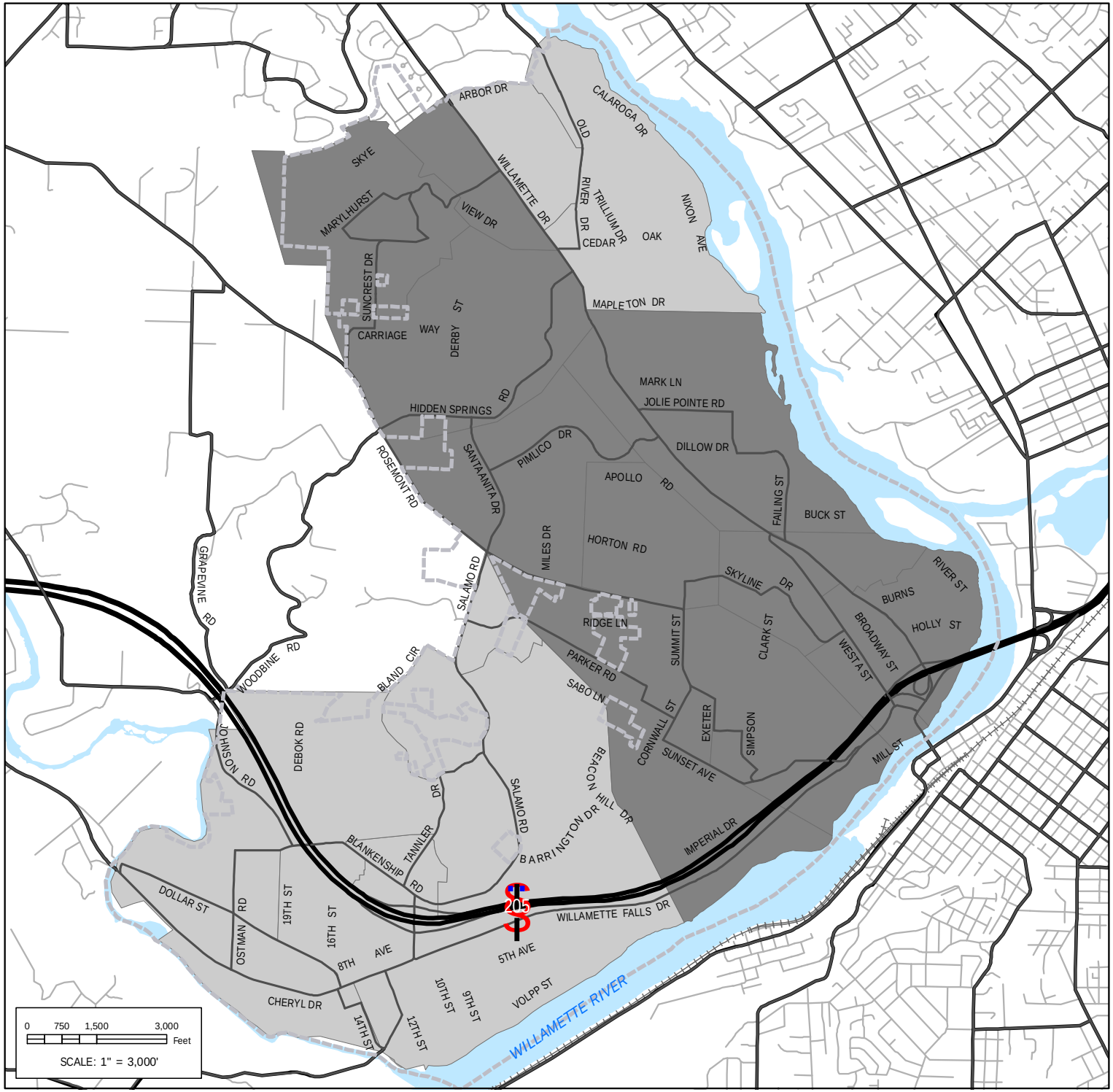
The overall West Linn study area forecasted non-SOV percentage with the RTP financially constrained improvements is 40.7%. Additional improvements in the RTP illustrative scenario[7] increase the overall non-SOV percentage to 42.2%, which corresponds to an increase of approximately 2%. Figure 8-7 shows the non-SOV percentage increase at the TAZ level, which shows the areas with the greatest growth toward meeting the 2040 targets previously identified (40-45% and 45-55% depending on location).

These forecasted non-SOV percentages obtained by the travel demand model can only be achieved with significant improvements to the transportation system and implementation of trip reduction strategies. The City of West Linn should coordinate with Clackamas County and TriMet to implement strategies to assure that the TDM assumptions in the RTP (listed in Table 8-6) are implemented. The City of West Linn, 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.
- Update the City of West Linn Goals and Policies to adopt the 2040 Regional Non-SOV Modal Targets.
- 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.
- Continued implementation of motor vehicle parking ratios (minimum and maximum[8]) for new development.
- Continued implementation of building orientation and transit planning requirements for new development.
- Continued implementation of street connectivity requirements.
- Require new employment development to install bicycle racks.
- Implementation of bicycle, pedestrian, motor vehicle and transit system action plans as presented in this TSP.

[7] The additional illustrative project in the region is RTP #8051: Regional employer outreach, transit marketing, vanpool and carpool, station cars and car sharing programs

[8] Minimum parking ratios allow vehicular storage when travelers do not have the flexibility to choose transit. Maximum parking ratios assist TDM goals by capping the number of stalls available for vehicles.



West Linn Transportation System Plan

FIGURE 8-7

GROWTH IN NON SOV USE

LEGEND

Change in 2025 Non-SOV
(Priority Minus Fin. Constrained)

- 1 Percent or Less
- 2 Percent

Other

- West Linn City Limits
- Railroad
- Water

DKS Associates
TRANSPORTATION SOLUTIONS

2030 Transportation Demand Management Scenario

The implementation of various TDM strategies are generally aimed at reducing the trips that begin and end within the City, specifically with a trip end in the downtown area. The target trips for reduction in West Linn make up approximately 9% of the total number of trips[9] on the street system. As the trips are focused in the downtown core; the trip reduction is significantly less in the rest of the City.

The system improvements that make up this scenario include build-out of each of the multi-modal plans presented in this TSP (pedestrians, bicycles, transit, TDM). The 2030 forecasts for this scenario are based on potential reduction that could be achieved with each of these elements in place. These TDM measures are estimated to have approximately a 2% reduction of trips locally (and 5% reduction in trips regionally), which was applied to the 9% of target trips yielding an estimated trip reduction of 3%. This scenario focuses on improvements that are alternatives to increasing facility capacity for motor vehicles and (for comparative purposes) does not include capacity improvements in West Linn.

The v/c ratios were compared between the 2030 No-Build and 2030 Transportation Demand Management Scenarios to quantify the impacts that the implementation of TDM measures may have on the West Linn street system. The highest change in v/c ratios generally occurred along Highway 43 and Hidden Springs Road. The drop in v/c ratio of these areas was generally 0.03 to 0.04, but ranged from 0.01 to 0.06 along these roads. Similar impacts occurred throughout the city, with many roads exhibiting changes less than 0.02. This indicates that the relative changes due to this scenario would have a limited impact on the transportation system.

While a comprehensive TDM program may not address the transportation operational issues in West Linn during the PM peak times, employers that have more than 100 employees should be required to implement a van pool program, flexible working hours or another transportation demand management strategy that would influence regional trips be implemented and administered by these large employers to obtain compliance with OAR 340-242-0010 (through 0290). Setting TDM goals and policies for new development will be necessary to implement TDM measures in the future.

Safety

The analysis in the Existing Conditions Chapter revealed that there are currently no major safety issues at any of the intersections studied for this TSP. ODOT uses the safety priority index system (SPIS) to prioritize safety improvements based on crash frequency and severity on state facilities. A potential southbound climbing lane for trucks traveling on I-205 out of West Linn is the only location in West Linn identified in the Top 5% Report[10]. No locations along Highway 43 were listed.

There are, however, several strategies for improving safety in the City of West Linn that are consistent with the prior TSP. These strategies are aimed at identifying priorities that meet the goals and policies of the city and should be carried forward with this TSP.

- Work with other agencies such as Clackamas County, ODOT, the school district, as well as local businesses and neighborhood groups to help prioritize and fund safety programs in a coordinated approach
- Develop a citywide safety priority system which identifies high accident locations, ranks the locations and identifies safety mitigation measures
- Consider installation of red light photo equipment where appropriate
- Address safety issues on an as needed basis

[9] Excluding though traffic on I-205

[10] *Top 5 Percent Report*, ODOT Traffic-Roadway Section, August 30, 2007.

Maintenance

The City of West Linn has a Pavement Management System (PMS) program in place for cost effective maintenance treatments and strategies for city streets. A PMS program is a systematic method of organizing and analyzing information about pavement conditions. As a management tool, it aids the decision-making process by determining the magnitude of the problem, the optimum way to spend funds for the greatest return on the dollar, and the consequences of insufficient funding or of spending allotted money unwisely. The City of West Linn seeks to maintain an annual program of pavement management and monitors conditions in setting priorities for overlays, slurry seals and joint sealing. With over 106 miles of roadway to maintain, road maintenance is one of the largest transportation expenditures.

Motor Vehicle Alternatives Analysis

To accommodate future growth in local and regional traffic volumes and mitigate operational deficiencies revealed in the road system operational analysis, additional capacity improvements are recommended at multiple study intersections. The following sections summarize the evaluation of intersection capacity and connectivity improvements along city streets and specific recommended improvements along the Highway 43 corridor and the 10th Street/I-205 interchange area.

The future capacity deficiencies of study intersections were presented in Chapter 4, Table 3. Table 8-8 summarizes the Base 2030 PM peak hour operations for the 21 intersections, grouped by traffic control type, that are projected to not meet performance standards without additional improvements. The projected future performance for each location is listed, as well as the performance standard for the intersection (based on jurisdiction and other factors, as appropriate) that is exceeded. The 13 study intersections that are not listed in Table 8-8 are projected to meet 2030 PM peak hour performance standards as indicated in Chapter 4, Table 3.

Capacity analysis has been performed for the Highway 43 corridor and the 10th Street/I-205 interchange area. To utilize previous analysis efforts, study intersections were combined into three general groups:

- Highway 43,
- 10th Street/I-205 interchange area, and
- Other West Linn intersections (generally located along Rosemont Road or other areas not associated with the first two groups).

Some of the alternatives considered for each group include local improvements such as lane channelization or traffic control. 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 may be required for arterial and collector facilities. Different signal spacing standards may be applied to lower classifications of roadways. The Traffic Signal Spacing section includes additional information regarding traffic signals on ODOT facilities.

Roundabouts may be a feasible alternative to traffic signals when two-way or all-way stop control do not provide adequate intersection capacity. Roundabouts generally require a diameter of approximately 130-200 feet, limiting implementation in some areas (such as those that are previously developed) due to geometric constraints. However, the center area of the roundabout provides an opportunity for landscaping, which is helping it to gain popularity in both urban and rural design. The capacity of roundabouts is limited by the amount of circulating traffic. Care should be taken to locate roundabouts away from rail crossings and traffic signals in order to avoid issues regarding vehicle queues.

Table 8-8: 2030 Base PM Peak Hour Level of Service ï Intersections Not Meeting Standards

	Future Base Case (2030)			Performance Standard		
Intersection	**LOS**	**Average Delay (s)**	**Volume/ Capacity (v/c)**	**Agency**	**Maximum Allowed**	**Standard Met?**
Signalized Intersections						
Highway 43 / Hidden Springs Rd	D	42.8	**1**	ODOT	v/c 0.99	**No**
Highway 43 / I-205 SB	E	69.1	**>1.0**	ODOT	v/c 0.85	**No**
10th St / Blankenship Dr	**F**	>80.0	**>1.0**	ODOT	v/c 0.85	**No**
10th St / I-205 SB	**F**	>80.0	**>1.0**	ODOT	v/c 0.85	**No**
All-Way Stop Intersections						
Salamo Rd / Rosemont Rd	**F**	>50.0	>1.0	City	LOS D	**No**
Willamette Falls Dr / 10th St	**F**	>50.0	>1.0	City	LOS D	**No**
Unsignalized Intersections						
Highway 43 / Arbor Dr	B/**F**	>50.0	0.04/**>1.0**	ODOT	v/c 0.99/0.90	**No**
Highway 43 / Jolie Pointe Rd	B/**F**	>50.0	0.12/**>1.0**	ODOT	v/c 0.99/0.90	**No**
Highway 43 / Pimlico Dr	C/**F**	>50.0	0.37/**>1.0**	ODOT	v/c 0.99/0.90	**No**
Highway 43 / Holmes St	B/**F**	>50.0	0.03/**>1.0**	ODOT	v/c 0.99/0.90	**No**
Highway 43 / Burns St	D/**F**	>50.0	0.49/**>1.0**	ODOT	v/c 1.1/0.90	**No**
Highway 43 / Willamette Falls Dr	D/**F**	>50.0	0.77/**>1.0**	ODOT	v/c 0.99/0.90	**No**
Willamette Falls Dr / Sunset Ave	A/**E**	47.6	0.67/0.74	City	LOS D	**No**
Rosemont Rd / Carriage Way	A/**F**	>50.0	0.12/0.51	City	LOS D	**No**
Rosemont Rd / Hidden Springs Rd	B/**F**	>50.0	0.07/>1.0	City	LOS D	**No**
Salamo Rd / Parker Rd	A/**F**	>50.0	0.13/0.79	City	LOS D	**No**
Blankenship Rd / Tannler Dr	B/**F**	>50.0	0.19/>1.0	City	LOS D	**No**
10th St / 8th Ave	B/**F**	>50.0	0.18/>1.0	City	LOS D	**No**
Willamette Falls Dr / 12th St	B/**F**	>50.0	0.44/>1.0	City	LOS D	**No**
Willamette Falls Dr / Dollar St (East)	A/**F**	>50.0	0.15/0.74	City	LOS D	**No**
Willamette Falls Dr / Ostman Rd	B/**F**	>50.0	0.01/0.23	City	LOS D	**No**
Willamette Falls Dr / Dollar St (West)[11]	A/**F**	>50.0	0.13/0.71	City	LOS D	**No**

Notes: LOS = Level of Service
Delay = Average vehicle delay in the peak hour for entire intersection in seconds.
MOE = Measure of Effectiveness
Unsignalized Intersection Operations:
A/A = Major street turn LOS / Minor street turn LOS
Delay = Worst Case for Minor Street
#/# = Major street turn v/c / Minor street turn v/c

Highway 43 Corridor

The *West Linn OR 43 Conceptual Design Plan*[12] analyzed intersections along the Highway 43 corridor and addressed multi-modal circulation concepts to guide future design. The plan maintains the current cross-section of one travel lane in each direction in order to keep the local character and meet community concerns, while not impacting existing right of way. Improvements such as adding left turn lanes to the median and traffic control would be made in some locations to increase capacity. However, due to the stated constraints, performance standards would still not be met at several locations, and design exceptions would need to be pursued from ODOT.

[11] This intersection is an unauthorized connection across PGE property that will be closed when Clackamas County replaces the bridge over the Tualatin River.
[12] West Linn OR 43 Conceptual Design Plan – Final Report, June 29, 2007.

The performance standards listed in the Oregon Highway Plan are applied to determine if the existing lane and control configurations at a location can provide sufficient capacity. The appropriate mobility standards for each location are listed previously in Table 8-8. If these performance standards are not met, capacity improvements that are sufficient to meet the design standards provided in the Oregon Design Manual apply. Signalized intersections through that corridor that are improved must meet a v/c standard of 0.80, as a statewide non-freight route inside a metropolitan planning organization (MPO). Unsignalized intersections (and Willamette Falls Drive as a District Road) must be improved to a v/c standard of 0.85. Operations of the study intersections along Highway 43 with the addition of the proposed concept plan improvements (which were not included in Table 8-8) are listed in Table 8-9.

Table 8-9: 2030 Weekday PM Peak Hour Level of Service ï Hwy 43 Concept Plan Improvements

	W/ Proposed Improvements			Performance Standard		
Intersection	**LOS**	**Average Delay (Sec)**	**Volume/ Capacity (v/c)**	**Agency**	**Maximum Allowed**	**Standard Met?**
Signalized Intersections						
Highway 43 / Hidden Springs Rd	D	42.7	**0.99**	ODOT	v/c 0.80	**No**
Highway 43 / Pimlico Dr	D	40.9	**0.99**	ODOT	v/c 0.80	**No**
Highway 43 / I-205 SB*	E	69.1	**>1.0**	ODOT	v/c 0.80	**No**
Unsignalized Intersections						
Highway 43 / Arbor Dr*	B/**F**	>50.0	0.04/**>1.0**	ODOT	v/c 0.80/0.85	**No**
Highway 43 / Jolie Pointe Rd*	B/**F**	>50.0	0.12/**>1.0**	ODOT	v/c 0.80/0.85	**No**
Highway 43 / Holmes St*	B/**F**	>50.0	0.03/**>1.0**	ODOT	v/c 0.80/0.85	**No**
Highway 43 / Burns St*	D/**F**	>50.0	0.49/**>1.0**	ODOT	v/c 0.80/0.85	**No**
Highway 43 / Willamette Falls Dr*	D/**F**	>50.0	0.77/**>1.0**	ODOT	v/c 0.85/0.85	**No**

Notes: LOS = Level of Service
Delay = Average vehicle delay in the peak hour for entire intersection in seconds.
Unsignalized Intersection Operations:
A/A = Major street turn LOS / Minor street turn LOS
Delay = Worst Case for Minor Street
#/# = Major street turn v/c / Minor street turn v/c
** Improvements to increase intersection capacity at this location are not included in Highway 43 Conceptual Design Plan. Operations are listed for 2030 Base Case (which assumes no improvements).*

Most of the locations are not included in the Plan or have limited capacity improvements. The eight locations that do not meet performance standards under the 2030 Base Case would also not meet standards with the Conceptual Design Plan improvements in place.

Widening Highway 43 to a 5-lane section with two travel lanes in each direction was investigated to determine the potential capacity benefit. The existing right of way (ROW) along Highway 43 is generally 60-80 feet. In addition to structure impacts, approximately 500,000 ft^2 of ROW would need to be acquired in order to widen the facility to a 96 ft, 5-lane section. It was determined that most of the intersections along the corridor would meet performance standards. However, the Highway 43/I-205 Southbound ramps and Highway 43/Willamette Falls Drive would need additional improvements in order to meet performance standards.

The intersection of Highway 43/Willamette Falls Drive lies between the signalized intersection of Highway 43/I-205 Northbound Off-Ramp and the Oregon City Bridge. These physical features constrain the ability for realignment of the intersection, and also meter (or limit) the potential traffic arriving at the intersection. In order to meet future intersection performance standards, a traffic signal could be added in coordination with the adjacent existing signal at the I-205 Off Ramps. Table 8-10 lists the performance of all study intersections along Highway 43 with the corridor widened to a 5-lane section and a traffic signal at Willamette Falls Drive.

Table 8-10: 2030 Weekday PM Peak Hour Level of Service ï Hwy 43 5-Lane Widening and Improvements

		Future Base Case			Highway 43 5-Lane Section			Performance Standard		
Intersection # on Map	Intersection	LOS	Average Delay (Sec)	Volume/ Capacity (v/c)	LOS	Average Delay (Sec)	Volume/ Capacity (v/c)	Agency	Maximum Allowed	Standard Met?
	Signalized Intersections									
2	Highway 43 / Marylhurst Dr-Lazy River Way	C	26.7	0.94	B	11.3	0.55	ODOT	v/c 0.80	Yes
4	Highway 43 / Cedaroak Dr	B	18.3	0.82	C	30.8	0.79	ODOT	v/c 0.80	Yes
5	Highway 43 / Hidden Springs Rd	D	42.8	**1**	C	26.6	0.80	ODOT	v/c 0.80	Yes
8	Highway 43 / West A St	C	31.1	0.97	B	14.1	0.59	ODOT	v/c 0.80	Yes
12	Highway 43 / Hood St-McKillican St	E	62.7	1.07	D	36.1	0.76	ODOT	v/c 0.80	Yes
13	Highway 43 / I-205 SB*	E	69.1	**>1.0**		*unchanged*		ODOT	v/c 0.80	**No**
14	Highway 43 / I-205 NB*	B	10.2	0.41		*unchanged*		ODOT	v/c 0.80	Yes
15	Highway 43 / Willamette Falls Dr	D/**F**	>50.0	0.77/**>1.0**	C	29.3	0.72	ODOT	v/c 0.80	Yes
	Unsignalized Intersections									
1	Highway 43 / Arbor Dr	B/**F**	>50.0	0.04/**>1.0**	B/F	>50	0.04/0.68	ODOT	v/c 0.80/0.85	Yes
3	Highway 43 / Walling Way	B/**F**	>50.0	0.00/0.92	B/E	36.9	0.04/0.47	ODOT	v/c 0.80/0.85	Yes
6	Highway 43 / Jolie Pointe Rd	B/**F**	>50.0	0.12/**>1.0**	B/D	27.0	0.12/0.33	ODOT	v/c 0.80/0.85	Yes
7	Highway 43 / Pimlico Dr**	C/**F**	>50.0	0.37/**>1.0**	B	14.8	0.61	ODOT	v/c 0.80	Yes
9	Highway 43 / Holmes St	B/**F**	>50.0	0.03/**>1.0**	A/C	17.3	0.00/0.09	ODOT	v/c 0.80/0.85	Yes
10	Highway 43 / Lewis St	B/**F**	>50.0	0.01/0.54	B/C	20.7	0.01/0.10	ODOT	v/c 0.80/0.85	Yes
11	Highway 43 / Burns St**	D/**F**	>50.0	0.49/**>1.0**	C	23.4	0.54	ODOT	v/c 0.80	Yes

Notes: *LOS = Level of Service*
Delay = Average vehicle delay in the peak hour for entire intersection in seconds.
MOE = Measure of Effectiveness

Unsignalized Intersection Operations:
A/A = Major street turn LOS / Minor street turn LOS
Delay = Worst Case for Minor Street
#/# = Major street turn v/c / Minor street turn v/c
** Five lane section already exists and performance is unchanged under this scenario*
*** Traffic signal improvement also added*

10th Street Interchange Area

The *10th Street Area Plan*[13] includes analysis of intersections along and in proximity to the 10th Street corridor. Through coordination with the 10th Street Traffic Task Force, the following three groups of improvement alternatives were developed and evaluated:

- Group A: 10th Street Capacity Enhancements
- Group B: Willamette Falls Drive Enhancements and Management Tools
- Group C: Major System Improvements.

Details regarding the configuration and performance of each group of improvements are located in the Plan. Recommendations were made following the analysis of each group of alternatives. These recommendations included dropping or advancing the consideration for improvements based on their performance and other evaluation criteria. Several recommendations for additional project consideration or further analysis in the TSP include:

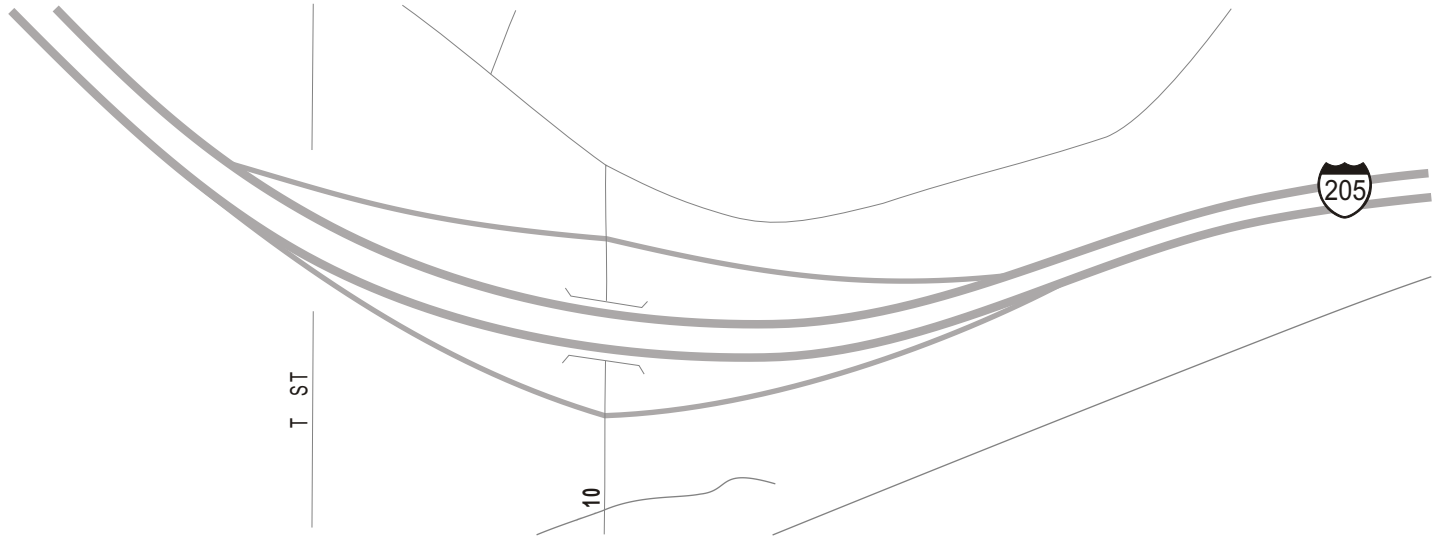
- Advancing most individual projects from Group A to the motor vehicle master plan list,
- Determine appropriate intersection control for Willamette Falls Drive/ 10th Street,
- Consider Group B projects for inclusion in TSP,
- Advance the single point urban interchange (SPUI) on 10th Street for consideration, and
- Advance preference for additional I-205 capacity.

The potential for replacing the diamond ramp configuration of the 10th Street/I-205 interchange with a SPUI (Figure 8-8) was evaluated based on the recommendations of the prior analysis. The ramps are closely spaced with the adjacent signalized intersections at 8th Court and Blankenship Road under the existing configuration. The adjacent intersections are located approximately 1,000 feet apart (inside edge to inside edge), with the ramps occupying 650 feet of that space. The current location of the ramps limits vehicle storage at signalized intersections to approximately 150 feet for Blankenship Road and 250 feet for 8th Court. Consolidating the ramps into a SPUI would allow the space between adjacent intersections to increase, providing additional storage for potential vehicle queues.

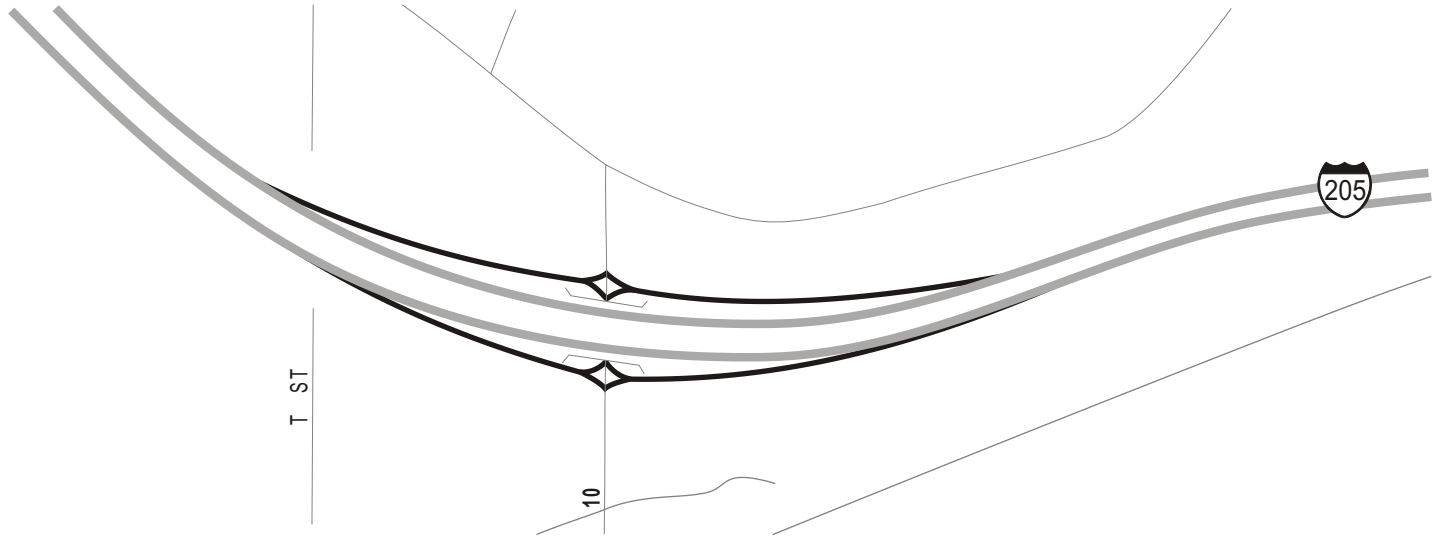
Measurements of several SPUI locations in the region[14] indicate that approximately 350-400 feet (measured between the outside edges of the ramps) would be required along 10th Street for the ramp configuration. This would allow approximately 300 feet of storage to each adjacent intersection. Note that the increase of storage would also require realignment of the ramps. An operational analysis of the SPUI indicated that it would operate at LOS D with v/c = 0.88 for the 2030 PM peak hour.

The operational impact of replacing the current 10th Street interchange configuration with a split-diamond interchange (configuration is shown in Figure 8-8) was also analyzed. This alternative would include a second crossing at 13th Street that (connected to the 10th Street crossing with one-way frontage roads), that would reduce reliance on 10th Street for local access to and from Interstate 205. While the implementation of a split diamond configuration and the associated traffic shifts would improve operations, several of the adjacent study intersections would not meet performance standards without additional improvements. In addition, the adjacent current land use is not consistent with the commercial land use surrounding other split-diamond locations in the region, and the historical residential neighborhoods of West Linn would not be compatible with the additional traffic and noise. Study intersection operations for this alternative are listed in Table 8-11.

[13] *City of West Linn TSP Update - 10th Street Area Plan*, prepared by DKS Associates, November 2, 2007.
[14] These locations consisted of Market Street/I-5 in Salem and four locations in Vancouver, WA.



Existing Configuration



Single Point Urban Interchange (SPUI)

Split Diamond Interchange

DKS Associates
TRANSPORTATION SOLUTIONS

NO SCALE

Figure 8-8

10TH STREET INTERCHANGE CONFIGURATION ALTERNATIVES

Table 8-11: 2030 Weekday PM Peak Hour Intersection Operations ï Split Diamond Alternative

	Future Base Case (2030)			2030 Split Diamond Alt			
Intersection	**LOS**	**Delay (Sec)**	**Volume/ Capacity (v/c)**	**LOS**	**Delay (Sec)**	**Volume/ Capacity (v/c)**	**Standard Met?**
Signalized Intersections							
10th St / Blankenship Rd	**F**	>80.0	>1.0	**F**	>80.0	0.86	**N**
10th St / I-205 SB Ramps	F	>80.0	**>1.0**	F	>80.0	**0.93**	**N**
10th St / I-205 NB Ramps	E	64.3	**>1.0**	D	36.0	**0.92**	**N**
13th St / I-205 SB Ramps	-	-	**-**	B	11.8	**0.64**	Y
13th St / I-205 NB Ramps	-	-	**-**	B	12.0	**0.55**	Y
All-Way Stop Intersections							
10th St / Willamette Falls Dr	**F**	>50.0	**>1.0**	**F**	>50.0	**>1.0**	**N**
Unsignalied Intersections							
Blankenship Rd / Tannler Dr	B/**F**	>50.0	0.19/>1.0	B/**F**	>50.0	0.14/>1.0	**N**
10th St / 8th Ave	B/**F**	>50.0	0.18/>1.0	B/**F**	>50.0	0.17/>1.0	**N**
Willamette Falls Dr / 12th St	B/**F**	>50.0	0.44/>1.0	B/**F**	>50.0	0.43/>1.0	**N**

Notes: LOS = Level of Service
Delay = Average vehicle delay in the peak hour for entire intersection in seconds.
MOE = Measure of Effectiveness
Unsignalized Intersection Operations:
A/A = Major street turn LOS / Minor street turn LOS
Delay = Worst Case for Minor Street
#/# = Major street turn v/c / Minor street turn v/c

A summary for the 10th Street interchange alternatives is presented in Table 8-12.

Table 8-12: 10th Street Interchange Alternative Benefit Comparison

Alternative	Affordable Cost	Limited Land Use impacts	Traffic Operations	Intersection Spacing	Local Circulation
Minor Improvements (Turn lanes, traffic control)	●	●	◐	○	○
SPUI	◐	●	◐	◐	○
Split Diamond	○	○	●	○	●

Level of Benefit:
○ Limited
◐ Moderate
● Highest

Other Locations

Improvements for intersections that were not included in the two other groups (Highway 43 corridor or 10th Street Interchange Area) were analyzed independently. All remaining intersections are under the jurisdiction of City of West Linn and would meet performance standards with improvements to lane configuration or traffic control. Table 8-13 includes the 2030 PM peak hour intersection operations at locations that would not meet performance standards without the inclusion of local improvements[15].

[15] The improvements and cost estimates that are assumed at each locations are listed in Table 8-13.

Table 8-13: 2030 Weekday PM Peak Hour Intersection Operations ï Other West Linn Locations

	Future Base Case (2030)			Future (2030) + Improvements			
Intersection	**LOS**	**Delay (Sec)**	**Volume/ Capacity (v/c)**	**LOS**	**Delay (Sec)**	**Volume/ Capacity (v/c)**	**Standard Met?**
Signalized Intersections							
Salamo Rd / Rosemont Rd	**F**	>50.0	**>1.0**	C	26.6	0.86	Y
Rosemont Rd / Hidden Springs Rd	B/**F**	>50.0	0.07/**>1.0**	C	21.0	0.72	Y
Salamo Rd / Parker Rd	A/**F**	>50.0	0.13/0.79	B	14.7	0.57	Y
Willamette Falls Dr / Sunset Ave	A/**E**	47.6	0.67/0.74	B	12.1	0.77	Y
Unsignalized Intersections							
Rosemont Rd / Carriage Way	A/**F**	>50.0	0.12/0.51	A/C	23.5	0.12/0.27	Y
Willamette Falls Dr / Dollar St (East)	A/**F**	>50.0	0.15/0.74	A/D	31.4	0.15/0.34	Y
Willamette Falls Dr / Ostman Rd	B/**F**	>50.0	0.01/0.23	B/D	32.2	0.01/0.11	Y

Notes: LOS = Level of Service
Delay = Average vehicle delay in the peak hour for entire intersection in seconds.
MOE = Measure of Effectiveness
Unsignalized Intersection Operations:
A/A = Major street turn LOS / Minor street turn LOS
Delay = Worst Case for Minor Street
#/# = Major street turn v/c / Minor street turn v/c

Master Plan and Action Plan

The Motor Vehicle Master Plan is a list of potential motor vehicle projects to meet the identified needs of motor vehicles using the transportation system in West Linn. This list is an overall plan and summarizes the "wish list" of motor vehicle projects in West Linn. The intention of the list is to address all potential projects that meet system needs, regardless of priority or funding requirements. A Motor Vehicle Action Plan project list was created to identify those Motor Vehicle Master Plan projects that are reasonably expected to be funded by the year 2030, which meets the requirements of the updated Transportation Planning Rule[16]. The Action Plan consists of projects that the City should give priority to in allocating funding and/or pursuing additional funding. As development occurs, streets are rebuilt and other opportunities (grant programs) arise, projects on the Master Plan could be pursued as well.

The Motor Vehicle Master Plan and Action Plan projects identified in the TSP update analysis are included in Table 8-14. Note that all projects included in the Action Plan are also included in the broader context of the Master Plan. 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. Figure 8-9 depicts the approximate locations of the Motor Vehicle Master Plan projects.

Inclusion of an improvement project in the TSP does not commit the City or ODOT to allow, construct or participate in funding the specific improvement. Projects on the State Highway System that are contained in the TSP are not considered reasonably likely to be funded projects until they are programmed into the Statewide Transportation Improvement Plan (STIP). As such, projects proposed

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

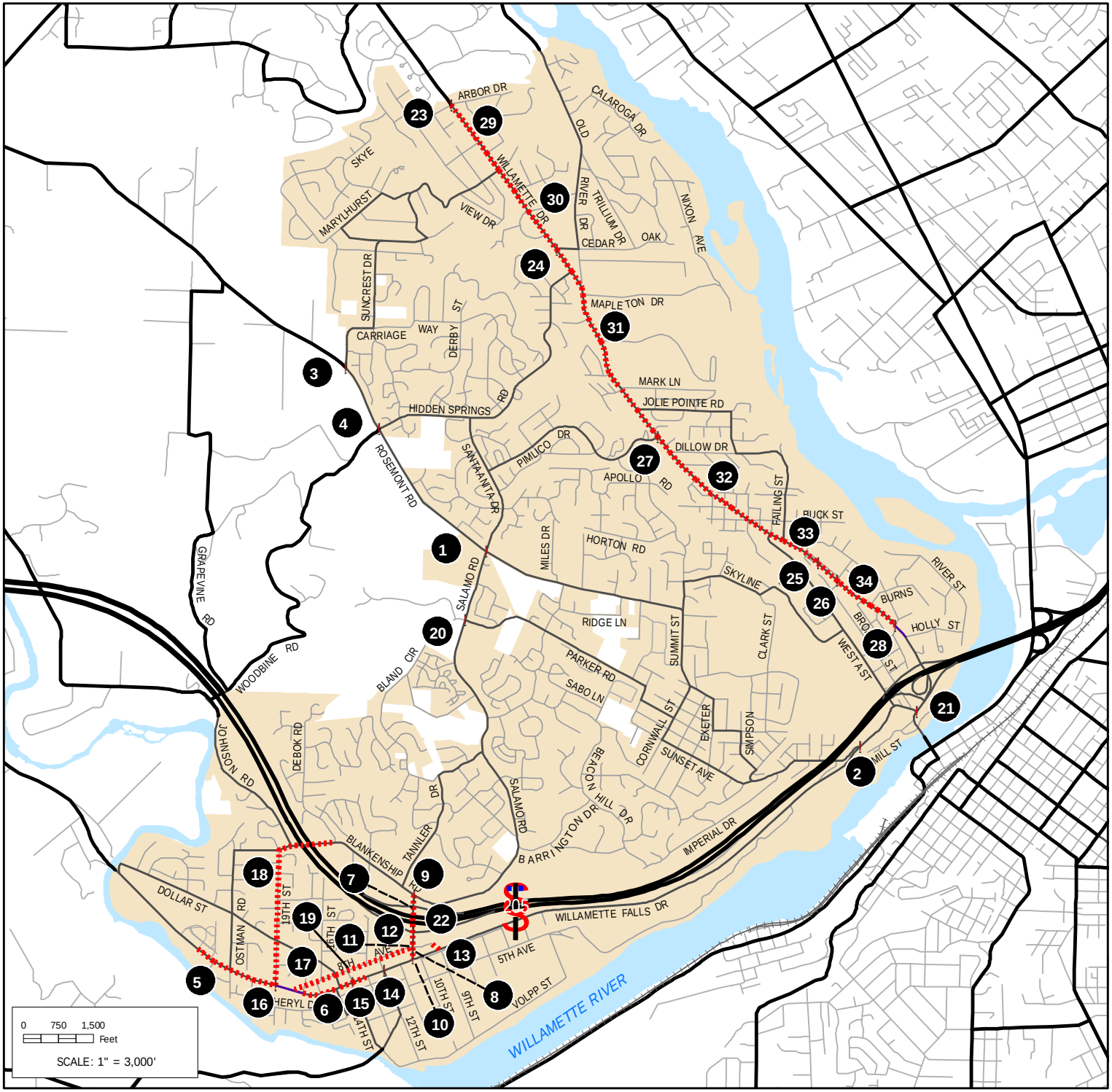
in the TSP that are located on a State highway cannot be considered mitigation for future development or land use actions until they are programmed into the STIP. Unanticipated issues related to project funding, as well as the environment, land use, the economy, changes in the use of the transportation system, or other concerns may be causes for re-evaluation of alternatives discussed below and possible removal of a project from consideration for funding or construction. Highway projects that are programmed to be constructed may have to be altered or canceled at a later time to meet changing budgets or unanticipated conditions.

Table 8-14: Motor Vehicle Master Plan and Action Plan Projects

Project Number	Location	Description	Plan	Cost ($1,000)
		City of West Linn Facility Projects		
1	Salamo Road / Rosemont Road	Add a traffic signal when warranted	Action	$250
2	Willamette Falls Drive / Sunset Avenue	Add a traffic signal when warranted	Action	$250
3	Rosemont Road / Carriage Way	Add a center median on Rosemont Road to allow two-stage left turn from Carriage Way	Action	$1,420
4	Rosemont Way / Hidden Springs Road	Add a traffic signal when warranted and northbound/southbound left turn lanes on Rosemont Road	Action	$750
5	Willamette Falls Drive / Ostman Road	Widen Willamette Falls Drive with center median 500 ô o ı each side of intersection to allow for two-stage left turn from Ostman Rd	Action	$1,285
6	Willamette Falls Drive / Dollar Street (east)	Wi d e n Wi l l a me t t e F a l l s D r i v (each side of intersection for two-stage left turn from Dollar St	Action	$1,420
7	10th Street (I-205 SB Ramps to 8th Court)	Widen to 5-lane section with center turn lane and 2 travel lanes each direction	Action	$1,625
8	10th Street (8th Ave to Willamette Falls Drive)	Add through lanes on 10th Street for a total of 2 lanes in each direction. Prohibit northbound left turn movement and replace left turn lane with ped island.	Action	$480
9	Blankenship Road / 10th Street	Add 2nd eastbound right turn lane and restripe westbound approach to have exclusive left turn and shared left-thru lane	Action	$500
10	10th Street / Willamette Falls Drive	Change/upgrade traffic control to either signal or roundabout	Action	$800
11	10th Street / 8th Avenue	Add right-in right-out access at the time of 8th Court extension.	Action	$20
12	10th Street / I-205 NB Ramps	Add turn lanes (northbound right turn lane, stripe southbound approach to have dual left turn lanes and one thru lane, add exclusive NB Off-ramp left turn lane, and widen NB On-ramp to have two receiving lanes to support dual SB left turn movement)	Action	$1,000
13	8th Court	Extend 8th Ct to Willamette Falls Dr. to provide additional access to 8th Court retail. (Concurrently make 10th Street/ 8th Avenue right-in right-out access.)	Action	$2,000
14	Willamette Falls Drive /12th Street	All way stop control/ traffic signal when warrants are met	Action	$250
15	Willamette Falls Drive /14th Street	All way stop control when warrants are met	Action	$10

Project Number	Location	Description	Plan	Cost ($1,000)
16	Willamette Falls Drive /19th Street	All way stop control when warrants are met	Action	$10
17	8th Avenue	Modify Dollar St connection to reconnect to 8th Avenue, and provide alternative route for local trips.	Action	$1,000
18	19th Street / Blankenship Road	Upgrade to current City standards from Blankenship Rd/Debok Road to Willamette Falls Drive	Master	$5,895
19	8th Avenue	Upgrade from 10th Street to Dollar Street	Action	$1,695
20	Salamo Road / Parker Road	Add a traffic signal when warranted	Action	$250
		ODOT Facility Projects		
21	Highway 43 / Willamette Falls Drive	Add a traffic signal that is coordinated with adjacent signal at I-205 NB Off Ramps	Action	$250
22	I 205/10th Street Interchange	Construct a long-term interchange improvement (SPUI or Split Diamond)	Master	$15,000-$30,000*
		ODOT Facility Projects (Highway 43 Concept Plan Improvements)		
23	Highway 43 / Arbor Drive	Add left turn lanes on Highway 43 (cost included in Highway 43 segment cost, listed below)	Action	$0
24	Highway 43 / Cedar Oak Drive	Realign shopping center driveway located to the southeast with intersection	Action	$500
25	Highway 43 / Holmes Street	Modify circulation to allow exit only traffic from Holmes Street	Action	$10
26	Highway 43 / Lewis Street	Modify circulation to prohibit left turns out from Lewis Street	Action	$10
27	Highway 43 / Pimlico Drive	Add a traffic signal when warranted	Action	$250
28	Highway 43 / Hood Street /McKillican Street	Modify traffic signal timing to have protected/permitted phasing on Hood and McKillican	Action	$50
29	North City Limit to Marylhurst	Highway 43 Improvements**	Action	$2,920
30	Marylhurst to Hidden Springs	Highway 43 Improvements**	Action	$4,195
31	Hidden Springs to Pimlico	Highway 43 Improvements**	Action	$5,385
32	Pimlico to Buck	Highway 43 Improvements**	Action	$3,335
33	West A Street to Webb	Highway 43 Improvements**	Action	$2,065
34	Webb to Hood-McKillican	Highway 43 Improvements**	Action	$1,910
			City of West Linn Projects Subtotal	$20,650
			ODOT Facility Projects Subtotal	$15,250-$30,250
			ODOT Facility Projects (Highway 43 Concept Plan) Subtotal	$20,630
			Total Cost	$56,530-$71,530

Notes:
**Cost of SPUI would be approximately $15,000,000 while the split diamond configuration would cost approximately $30,000,000*
*** Refer to Highway 43 Concept Plan for details*



West Linn

Transportation System Plan

FIGURE 8-9

MOTOR VEHICLE MASTER PLAN PROJECT LOCATIONS

LEGEND

- Facility Improvement
- ! Intersection Improvement
- ## Project Number
- Railroad
- Water
- City Limits

DKS Associates
TRANSPORTATION SOLUTIONS