

OR 22 (EAST) FACILITY PLAN

FINAL REPORT SUMMARY

Salem, Oregon
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Prepared for
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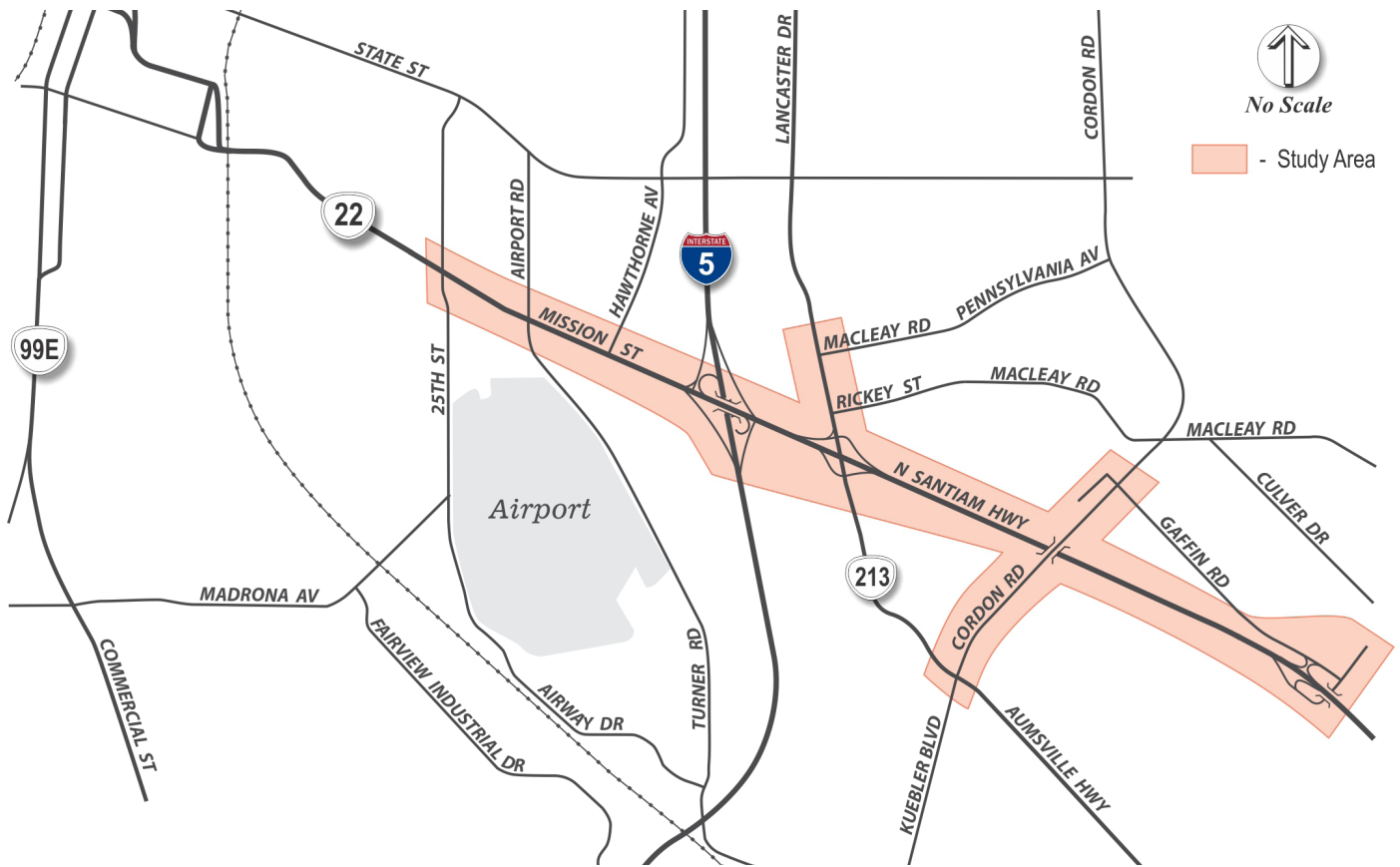
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INTRODUCTION

This document is intended to provide a summary of the results and findings of the OR 22 (East) Facility Plan. More details regarding the background, methodology, results, and recommendations can be found in the final report and its supplemental appendices.

The OR 22 (East) Facility Plan evaluates existing and future transportation operations and safety conditions on OR 22 (Mission Street) between 25th Street and Gaffin Road in Salem, as shown on Figure 1.

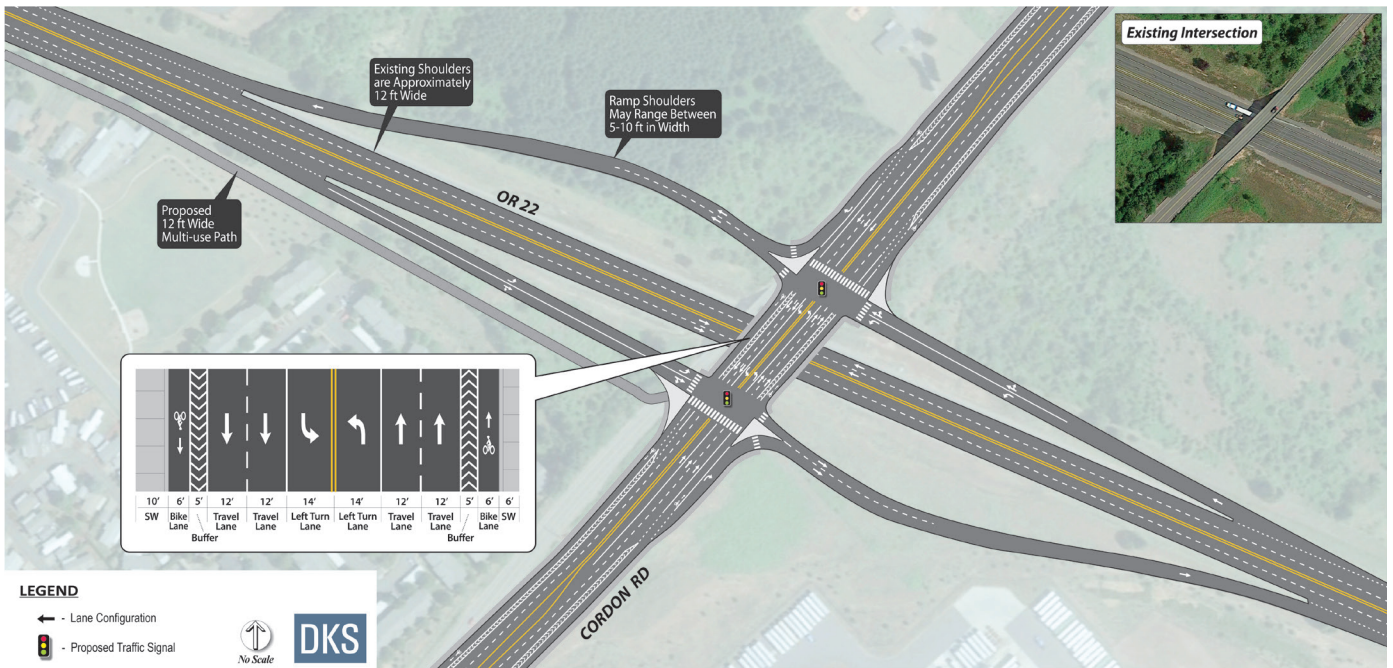
Figure 1.
OR 22 (East) Facility Plan Study Area Extents



The OR 22 (East) Facility Plan documents the existing conditions of the study area transportation system, as well as the forecasted future conditions for a 2035 horizon year. The primary objective of this plan is to identify system improvements that will create a safe and efficient facility for all roadway users. In addition to evaluating the study area intersections that exist today, this plan also considers a new interchange on OR 22 at Cordon Road.

Multiple interchange configurations were evaluated at OR 22 and Cordon Road based on the expected impacts on safety, operations, and land use. A tight diamond interchange would balance the needs for safety, mobility, property impacts, and cost effectiveness. In addition to a small footprint and limited right-of-way impacts, a major advantage of a tight diamond with signalized ramp terminals is that both intersections can run on a single controller, resulting in efficient operations. For these reasons, the tight diamond interchange form was assumed for analysis purposes in the OR 22 (East) Facility Plan, however further study will be required to determine the optimal interchange design at this location.

Figure 2.
Conceptual Design of OR 22/Cordon Road Interchange



This facility plan is the result of collaboration between agencies, jurisdictions, and the surrounding community to create a common vision for the future of the OR 22 corridor. The OR 22 (East) Facility Plan was developed for the Oregon Department of Transportation (ODOT), in partnership with the City of Salem and Marion County, and involvement from local stakeholders and members of the public. A complete list of stakeholders can be found in the appendix of the final report.

This document provides a high-level overview of the facility plan and key recommendations. The final OR 22 (East) Facility Plan should be referenced for further information on the assumptions, methodologies, results, and recommendations outlined below.

AGENCY PARTNERS

- ODOT
- City of Salem
- Marion County
- Mid-Willamette Valley Council of Governments
- Cherriots
- Department of Land Conservation and Development

BACKGROUND

This project is a continuation of past work to examine and improve the OR 22 (East) corridor, including the Southeast Salem Area Transportation Study (SESATS), conducted in 2005, and the Cordon Road Interchange Study (CRIS), completed in 2012. In addition to these two studies, there are several local, regional, and statewide planning documents, policies, and regulations that impact the study area of this facility plan. The plan summarizes relevant documents and presents key points from previous studies and regional policies.

Several of the local, regional, and statewide planning documents have a common goal – to improve the safety, mobility, and efficiency of the transportation network in the Salem-Keizer area. Many plans specifically identify the OR 22 (East) corridor as a vital component of the transportation system for passenger vehicles, freight, bicycles, and pedestrians. The benefits of providing an interchange connection between OR 22 (East) and Cordon Road were discussed in several of the documents. The recommendations presented in the final report were developed in accordance with the goals, objectives, regulations, and planned improvements outlined in the aforementioned planning documents.

EXISTING CONDITIONS

The existing conditions of the study area transportation system were evaluated on the basis of safety, operations, and environmental considerations. The final report presents a summary of the existing roadway facilities (including bicycle, pedestrian, and transit facilities), observed traffic patterns, roadway and intersection safety performance, intersection operational performance, and key environmental features within the study area.

Safety Performance

The existing safety performance of the OR 22 (East) corridor was evaluated using ODOT's most recent Safety Priority Index System (SPIS) findings, the ODOT All Roads Transportation Safety (ARTS) project findings, and an analysis of the past five years of collision data.

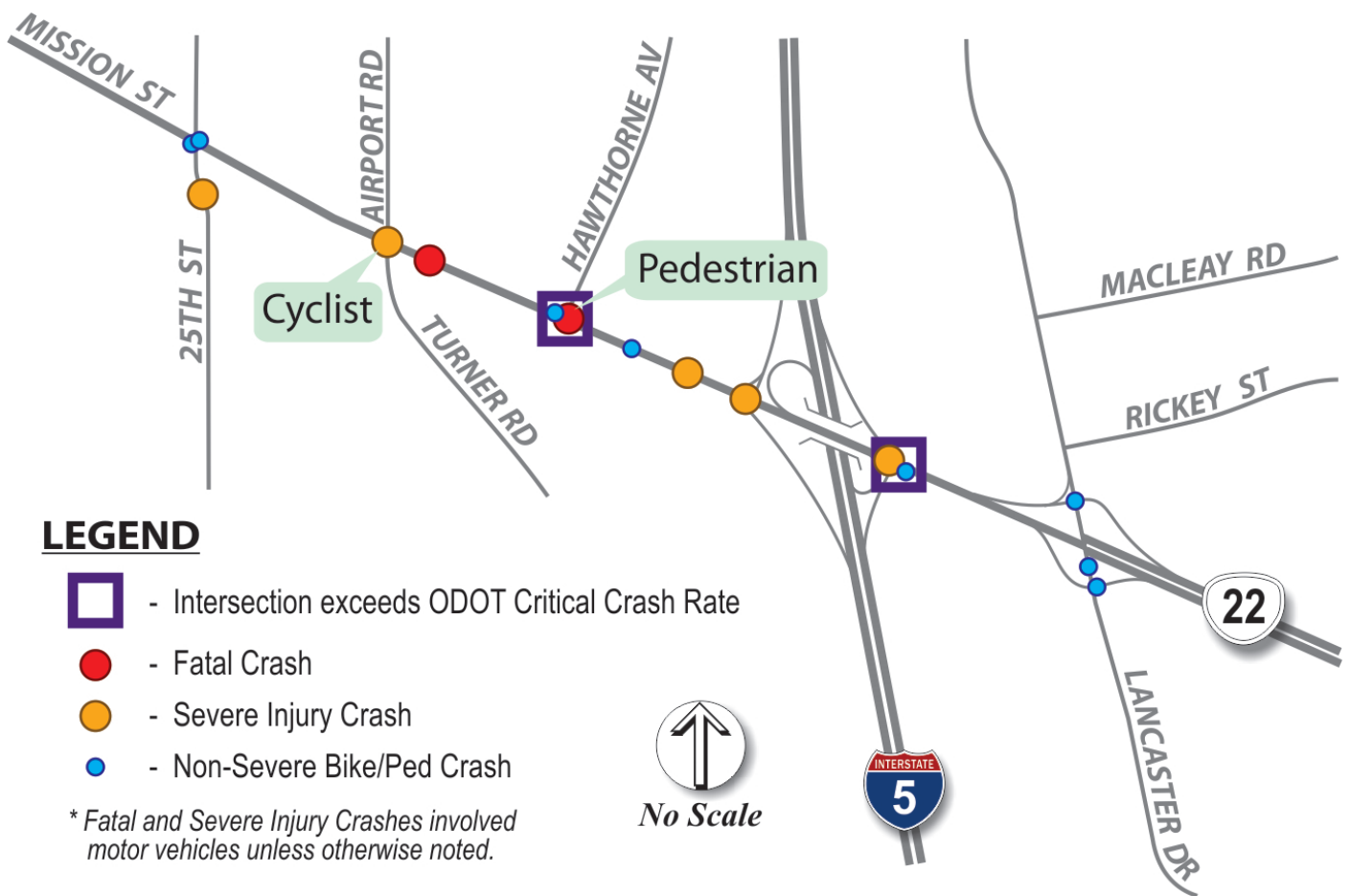
The raw collision data was obtained from the ODOT Crash and Analysis Reporting Unit for the most recent five years (2009-2013) of collision data along OR 22 and the adjacent streets. The severity of a crash is determined by the most severe injury of any participant in the crash, and falls into one of five categories: fatal, severe injury (Injury A), noticeable injury (Injury B), possible injury (Injury C), and property damage only (PDO).

Figure 3 summarizes key collisions and safety findings along the OR 22 (East) Study corridor. Two study intersections along OR 22 (East) exceed the average ODOT State Highway Critical Crash Rates for similar urban three-leg and four-leg signalized intersections (0.51 and 0.86, respectively).

The most prevalent collision types of all severity levels are rear-end and turning collisions. Together they account for approximately 65 percent of the reported collisions, which is typical for urban highways with signalized intersections. The majority of turning collisions were related to drivers not yielding or turning improperly.

There were two fatal collisions along OR 22 (East) during the study period. The first occurred at the intersection of Mission Street (OR 22) and Hawthorne Avenue and involved a pedestrian that was struck by a passenger vehicle that ran a red light. The second occurred on the segment of Mission Street (OR 22) just east of Airport Road/Turner Road and resulted from a head-on collision between two motor vehicles.

Figure 3.
Collision Data (2009-2013)



A total of five severe injury crashes were reported during the study period, one of which involved a cyclist. Three of the collisions were rear end collisions while the other two were turning and angle related. Three collisions occurred during the daytime and two occurred at night where street lights were present.

Ten collisions along OR 22 (East) involved a bicycle or pedestrian during the study period. Seven of the bicycle and pedestrian collisions occurred along OR 22 (East) while three occurred on Lancaster Drive in the vicinity of OR 22 (East).

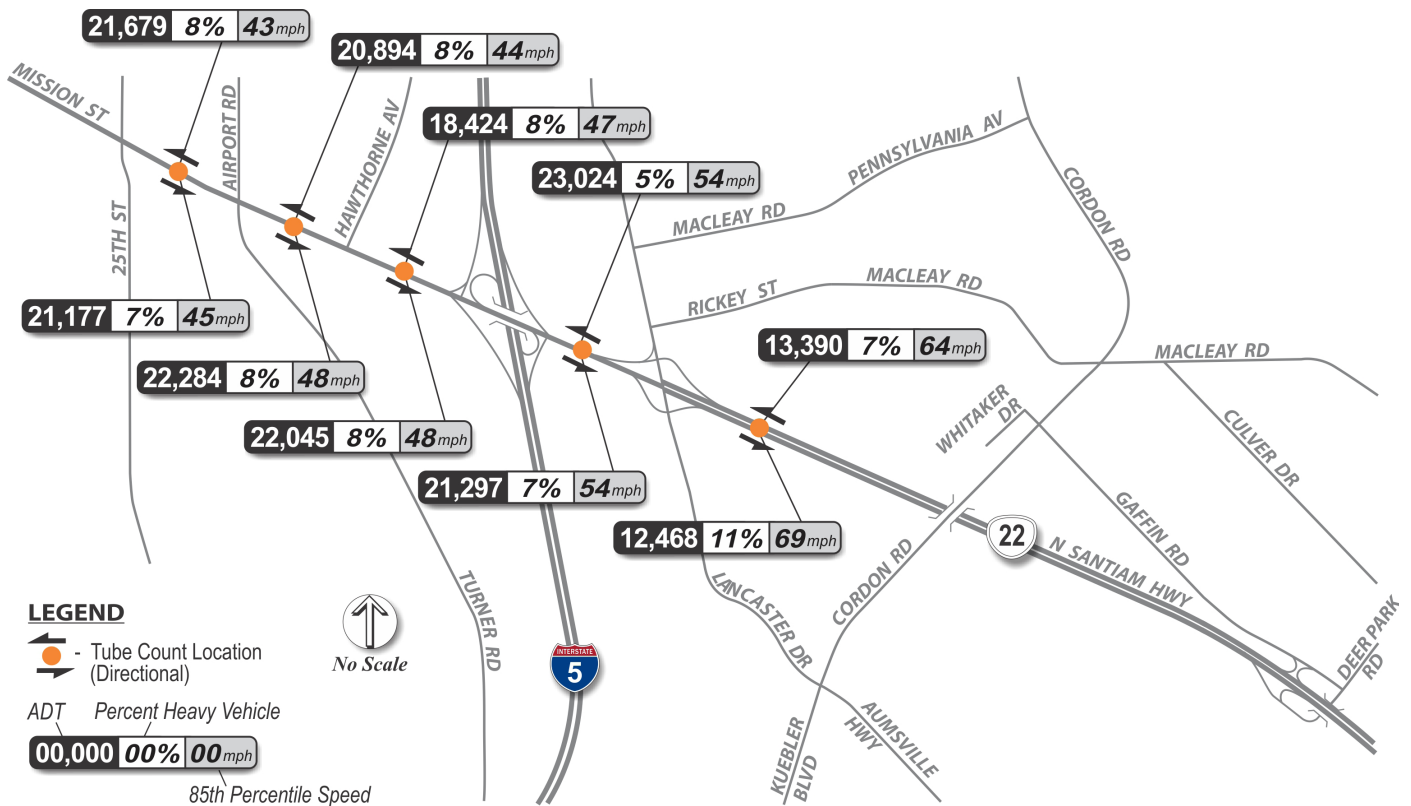
Operational Performance

The following is a brief summary of the existing traffic conditions of the OR 22 (East) study corridor, including segment volumes, bicycle and pedestrian volumes, and intersection operations.

Segment Traffic Volumes

Directional 24-hour traffic volumes were collected on OR 22 (East) between 25th Street and Cordon Road. As shown on Figure 4, traffic volumes are highest west of Lancaster Drive while 85th percentile speeds are highest east of I-5.

Figure 4.
24-hour Traffic Volume Counts along OR 22



Bicycle and Pedestrian Volumes

The study area includes residential, industrial, and office uses as well as several shopping centers that generate pedestrian and bicycle trips within the study area. The intersection with the highest volume of bicyclists and pedestrians is Mission Street (OR 22) at 25th Street with 28 total pedestrian crossings and six total bicycles during the peak hour. This intersection has crosswalks across the north, south, and west legs. There is a near side transit stop located on the east leg, approximately 100 feet upstream from the intersection, and a far side transit stop located on the south leg, approximately 250 feet downstream from the intersection.

Intersection Operations

The existing operational performance of the study intersections was evaluated using Synchro™ software, which employs methodology from the 2010 *Highway Capacity Manual*¹ for unsignalized intersections and 2000 *Highway Capacity Manual*² for signalized intersections. The existing traffic volumes and roadway configurations were used to determine intersection levels of service (LOS) and volume-to-capacity (v/c) ratios. Several intersections do not meet mobility targets.

- Mission Street (OR 22)/25th Street
- OR 22/I-5 Northbound Ramps
- Mission Street (OR 22)/Airport Road
- Gaffin Road/Cordon Road

A traffic signal is currently being constructed at the Gaffin Road/Cordon Road intersection. The proposed interchange at Cordon Road will also relieve some of the traffic demand on Lancaster Drive and on Gaffin Road.

FUTURE (2035) CONDITIONS

The first step in analyzing the future conditions was to forecast 2035 traffic volumes at each of the study intersections using the Mid-Willamette Valley Council of Governments' (MWVCOG) Salem-Keizer Area Transportation Study (SKATS) VISUM model. The MWVCOG model that was used included the planned interchange at OR 22 and Cordon Road (currently assumed to be a diamond interchange).

2035 Intersection Operations

For all but two of the study intersections, the 2035 operations analysis evaluated the performance of existing infrastructure (traffic control, lane geometry, etc.) under future traffic volumes. However, the analysis did include planned state and city improvement projects that are expected to be completed by 2035, including the signalization of the Cordon Road/Gaffin Road intersection and the proposed OR 22/Cordon Road interchange.

¹ 2010 *Highway Capacity Manual*, Transportation Research Board, Washington, D.C., 2010.

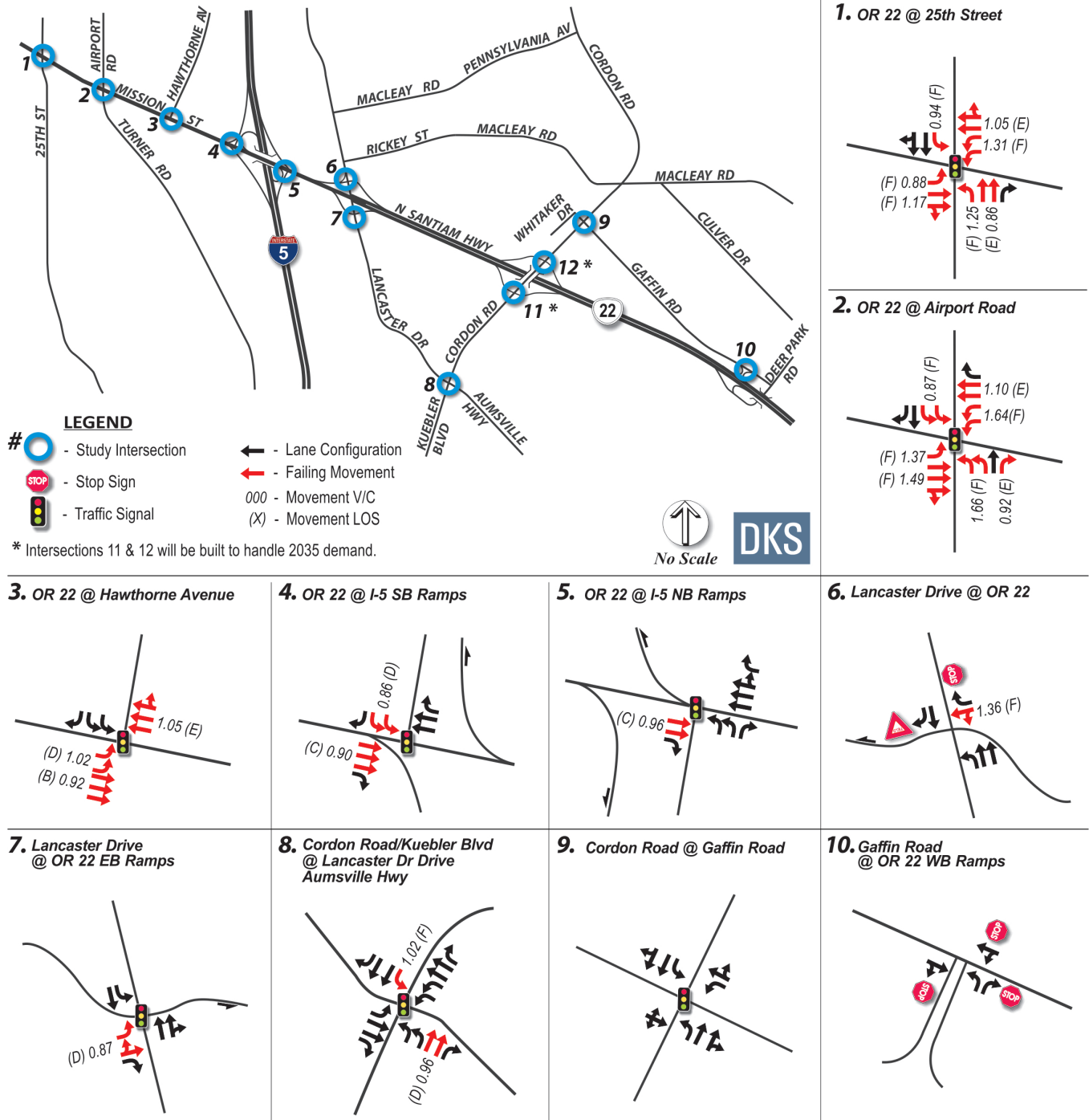
² 2000 *Highway Capacity Manual*, Transportation Research Board, Washington, D.C., 2000.

There are several intersections that are not expected to meet operating standards under 2035 traffic forecasts.

- Mission Street (OR 22) /25th Street (v/c 1.10)
- Mission Street (OR 22)/Airport Road (v/c 1.28)
- Mission Street (OR 22)/Hawthorne Avenue (v/c 0.89)
- OR 22/I-5 Southbound Ramps (v/c 0.88)
- OR 22/I-5 Northbound Ramps (v/c 0.94)
- Lancaster Drive/OR 22 Westbound Ramps (v/c 1.36)

The failing movements at each intersection are depicted graphically on Figure 5.

Figure 5.
2035 Future 30th Highest Volumes
Failing Movements



Future Planned Projects

The final report identified a list of either “committed” or “included” projects in the 2015 Salem-Keizer Area Transportation Study (SKATS) Regional Transportation System Plan (TSP) that are within the OR 22 (East) study area (there were no projects listed in the 2012 Salem TSP with committed funding). These projects were considered when developing recommended improvements. The final report also identified locations in the 2015 ODOT ARTS Hot-Spot Project List that are within the OR 22 (East) study area. These projects are currently being scoped by ODOT and implementation will depend on the final prioritization rankings. A list of the future planned projects can be found in the final report.

IDENTIFIED SYSTEM DEFICIENCIES

Several of the study intersections will fail to meet current mobility targets under 2035 traffic demands without capacity improvements. These intersections are listed in Table 1 along with a description of the capacity improvements that would be required to meet mobility targets in 2035.

Table 1. Summary of Deficient Intersections and Necessary Improvements

INTERSECTION	NECESSARY IMPROVEMENTS TO MEET MOBILITY TARGETS IN 2035
Mission Street (OR 22)/25th Street	Add third WB left-turn lane (requires SB receiving lane), add third WB thru lane, add third EB thru lane, add separate EB right-turn lane; Or, construct a grade-separated interchange
Mission Street (OR 22)/Airport Road-Turner Road	Add third WB left-turn lane (requires SB receiving lane), add WB shared thru-right lane, add fourth EB thru lane, add separate EB right-turn lane, add a second EB left-turn lane (requires NB receiving lane); Or, construct a grade-separated interchange
Mission Street (OR 22)/Hawthorne Avenue	Add a separated WB right-turn lane, add a second SB right-turn lane.
OR 22/I-5 Southbound Ramp Terminal	Add a third SB left-turn lane (requires bridge widening)
OR 22/I-5 Northbound Ramp Terminal	Add a third EB thru lane (requires bridge widening)
Lancaster Drive/OR 22 Westbound Ramp Terminal	Signalize intersection, add a second WB right-turn lane
Cordon Road/Gaffin Road	Add a shared thru-right turn lane to the NB and SB approaches (requires widening of Cordon Road)

Alternative Mobility Targets

Along OR 22 (East), the operational analysis identified six intersections which are not expected to meet ODOT’s existing mobility targets under forecasted 2035 traffic volumes, even with implementation of feasible intersection improvements.

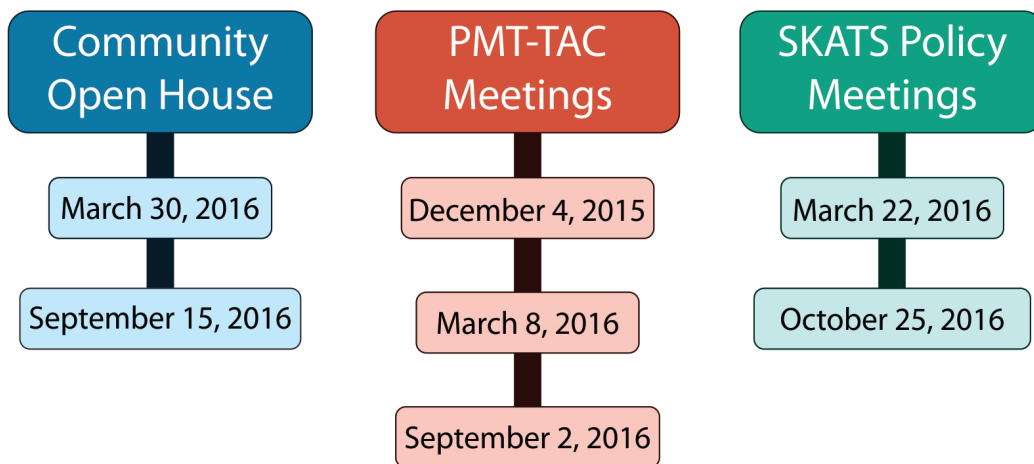
- Mission Street (OR 22)/25th Street
- Mission Street (OR 22)/Airport Road
- Mission Street (OR 22)/Hawthorne Avenue
- OR 22/I-5 Southbound Ramps
- OR 22/I-5 Northbound Ramps
- Lancaster Drive/OR 22 Westbound Ramps

The final report documents the need for alternative mobility targets (AMTs) for the OR 22 (East) study corridor and describes the methodology applied to determine the recommended AMTs. Representatives from the City of Salem, Marion County, and ODOT were all involved in the process of identifying study locations that warranted AMT evaluation and the selection of the final recommended AMTs. The recommended AMTs for the OR 22 (East) study corridor can be found in the final report.

PUBLIC INVOLVEMENT

Industry, commercial development and residential areas are all key elements of the OR 22 (East) corridor. In addition, it is a critical freight and expressway route and is used by cyclists and pedestrians. The project team conducted interviews with key stakeholders and garnered feedback from project advisory committees to identify ideas and concerns for the corridor. A list of interested parties and stakeholders formed the basis for targeted outreach and recruiting to the two Open Houses. Additional information related to the public involvement process, including detailed summaries of public comments and a list of stakeholders, can be found in the final report.

Figure 5.
Open House and Advisory Group Meeting Dates



RECOMMENDED SYSTEM IMPROVEMENTS

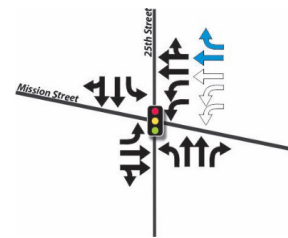
The final report summarizes the recommended system improvements for the OR 22 (East) corridor. The recommended safety improvements include upgrading signal hardware and software, providing enhanced pedestrian crossings, constructing a separated multi-use path, improving bicycle and pedestrian network connectivity, expanding transit services, constructing the Cordon Road Interchange to improve mobility along OR 22 (East), and other specific intersection improvements.

The recommended intersection improvements are summarized with accompanying figures depicting the existing (solid black arrows) and recommended lane configuration (hollow arrows are unchanged lanes, blue arrows are new or re-configured lanes). Conceptual figures for these recommendations can be found in the final report.

Mission Street (OR 22)/25th Street

Construct a dedicated westbound right lane on Mission Street (OR 22). This addition would require acquiring right-of-way and would impact the adjacent property owner.

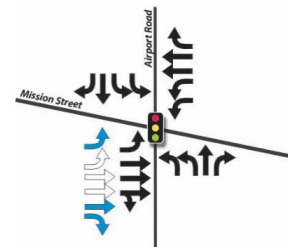
With the improvements shown in the figure, the peak hour intersection operations are enhanced but would still not meet the current mobility target. Recommended alternative mobility target (0.95 v/c) would be met.



Mission Street (OR 22)/Airport Road-Turner Road

Reconstruct the intersection to allow the northbound and southbound dual left turns to operate simultaneously. Construct a second eastbound left turn lane (which would require an additional receiving lane on the north leg of the intersection) and construct a dedicated eastbound right turn lane. These additions would require removing the existing raised median along the west leg and acquiring the right-of-way.

With these improvements, the peak hour intersection operations would improve but would not meet current mobility targets. Recommended alternative mobility target (0.90 v/c) would be met.



Mission Street (OR 22)/Hawthorne Avenue

Construct a westbound right turn lane. This addition would require right-of-way and would impact the landscape strip adjacent to Costco.

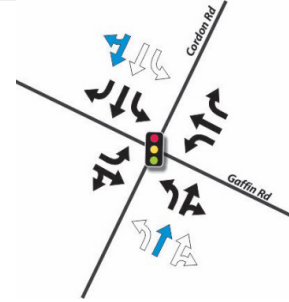
With these improvements, the peak hour intersection operations would improve but would not meet current mobility targets. Recommended alternative mobility (0.90 v/c) target would be met.



Gaffin Road/Cordon Road

In addition to the planned signalization of this intersection, widen Cordon Road to a five-lane cross-section (two through travel lanes in each direction).

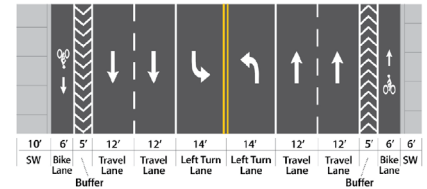
With these changes the operating conditions of the intersection would improve and will meet current mobility targets.



Cordon Interchange

Construct an interchange between OR 22 and Cordon Road. If a tight-diamond configuration is selected, the bridge structure should provide two through travel lanes, a single left turn lane, buffered bicycle lanes, and wide sidewalks in both directions. Figure 2, presented previously on page 2, depicts a conceptual design for the interchange.

If constructed according to the conceptual design, the interchange terminal intersections are expected to meet current mobility targets. The final report documents additional analysis of the Cordon Road interchange. An interchange consideration matrix was developed to highlight the characteristics of different interchange functional forms being considered for the Cordon Road Interchange.



Conceptual designs of selected recommended improvements are provided in the final report, including intersection improvements, a preliminary concept for the Cordon Road interchange, and a potential alignment for a multi-use path.

EVALUATION OF RECOMMENDED IMPROVEMENTS AND PRIORITIZATION

The final report discusses the evaluation methodology used to consider the community wide impacts, direct benefits, and estimated costs of each recommended improvement. A set of six focus areas served as the framework for the evaluation methodology: transportation impacts, environmental considerations, social and economic impacts, and community values. The goals associated with each focus area and the associated criteria are summarized in the final report.

The evaluation of cost effectiveness was combined with the level of public support for each project to determine a final prioritized list of recommended improvements. The prioritized list of recommended improvements is presented in Table 2.

Table 2: Prioritization of Recommended Improvements

LOCATION	IMPROVEMENT	SHORT, MEDIUM, LONG TERM	EVALUATION SCORE	PLANNING LEVEL COST ESTIMATE
OPERATION IMPROVEMENTS				
Mission Street (OR 22)/ 25th Street	Install Westbound Right Turn with Storage Lane	Short	3.0	\$350,000
Mission Street (OR 22)/ Airport Road-Turn Road	Install Eastbound Right Turn with Storage Lane	Short	3.0	\$350,000
	Improve North/South Intersection Geometry	Short	3.6	\$500,000
	Install Eastbound Left Turn with Storage Lane (Dual Lefts)	Long	2.0	\$350,000
Mission Street (OR 22)/ Hawthorne Avenue	Install Westbound Right Turn with Storage Lane	Short	3.0	\$350,000
OR 22/Cordon Road	Construct an Interchange with the recommended Signalized Intersections and Lane Configuration	Long	3.2	\$30,000,000
Cordon Road/Gaffin Road	Install Northbound Through Lane on Cordon Road	Long	3.4	\$500,000
	Install Southbound Through Lane on Cordon Road	Long	3.4	\$500,000
Corridor	Adaptive Signal Timing	Medium	3.8	\$225,000
SAFETY IMPROVEMENTS				
Multiple Intersections	Improve the Signal Hardware	Short	3.4	\$42,000
Mission Street (OR 22)/25th Street	Install Pedestrian Refuge Island on West Leg	Short	3.8	\$250,000
BIKE/PED/TRANSIT IMPROVEMENTS				
Corridor	Construct a separated Multi-use Path ¹	Long	3.3	\$475,000
Corridor	Infill Existing Gaps in Bicycle Lane Network	Medium	2.1	\$25,000

¹ Begins at 25th Street and continues to Cordon Road.