Oregon
John A. Kitzhaber, MD, Governor

Department of Transportation
Office of the Director, MS 11
355 Capitol St NE
Salem, OR 97301-3871

DATE: November 5, 2014

TO: Oregon Transportation Commission

FROM: Matthew L. Garrett
Director

SUBJECT: **Consent 6** - Oregon 99E Facility Plan

Requested Action:
Request approval to adopt the Oregon 99E Corridor Segment Plan as a minor amendment to the Oregon Highway Plan (OHP), and adoption of the findings of this plan's compliance with the Oregon Department of Transportation's (ODOT) State Agency Coordination Agreement.

Background:
The Oregon 99E Woodburn to Aurora Corridor Segment Plan (WACSP) was developed to identify how to maintain or improve traffic operations and safety along a segment of Oregon 99E that begins just north of Woodburn and goes through Hubbard. The WACSP followed a process of analyzing existing and future corridor deficiencies, developing options to address the deficiencies, and identify recommended short- and long-term improvements based on comprehensive analysis and public input.

The WACSP's short-term recommendations are focused safety and operational improvements on intersections and corridor segments within or near Hubbard and Aurora. Examples of these recommendations are the addition of turn lanes and additional cross walks with improved lighting. Other recommendations include two-way center turn lanes and additional sidewalks and bike lanes. There is also a general need for wider shoulders along the length of the corridor to serve bicyclists. There are no current mobility deficiencies within the corridor.

The WACSP's long-term recommended improvements are intended to address the 40-50 percent traffic growth forecasted along this corridor segment over the next 20 years. This expected increase in traffic volume results in current OHP mobility targets not being met along two sub-sections of this corridor segment and roughly half of the study area intersections. The improvements that were identified in the WACSP at these locations (most are in the city of Hubbard) are modest enough in scope and expected cost that ODOT is willing to regard them as reasonably likely to be implemented during the 20 year planning horizon. Its implementation will result in the current OHP mobility targets being met in the future. These recommended long-term improvements are consistent with locally adopted transportation system plans.

ODOT has worked with the cities of Aurora, Hubbard, and Woodburn, and Marion County to develop the WACSP. It was reviewed and found consistent with the Marion County, Aurora, and Hubbard

comprehensive plans and transportation system plans. No portion of the WACSP is located within the city of Woodburn so no approval by that city is required. It has also been endorsed by the Mid-Willamette Valley Area Commission on Transportation. Letters from the County and Cities verifying state and local plan consistency are included in Appendix I of the facility plan. Appendix G contains findings of fact that demonstrate compliance with Statewide Goals and OHP policies. These findings of fact are included as part of the record in support of this adoption.

Attachments:
Attachment A - Oregon 99E Corridor Segment Plan
Attachment B - Findings of Compliance

Copies (w/attachments) to:

Jerri Bohard	Travis Brouwer	Tom Fuller	Clyde Saiki
Paul Mather	Mac Lynde	Kelly Jacobsen	Sonny Chickering
Lisa Nell	John Maher	Nancy Murphy	

Attachment A

Oregon 99E Corridor Segment Plan

Copies of the Oregon 99E Corridor Segment Plan can be obtained by downloading it at:

ftp://ftp.odot.state.or.us/Reg2Planning/OR99E_CSP/

Or contact:

Dan Fricke
ODOT Area 1 Planner
Planning, Building B
455 Airport Road SE
Salem, OR 97301
503-986-2663
Daniel.L.FRICKE@odot.state.or.us

Attachment B

Findings of Compliance with OAR 731-015-0065
Oregon 99E Corridor Segment Plan

ODOT's State Agency Coordination Agreement requires that the Oregon Transportation Commission (OTC) adopt findings of fact when adopting facility plans (OAR 731-015-0065). Pursuant to these requirements ODOT provides the following findings to support the OTC adoption of the Oregon 99E Corridor Segment Plan.

731-015-0065

Coordination Procedures for Adopting Final Facility Plans

(1) Except in the case of minor amendments, the Department shall involve DLCD and affected metropolitan planning organizations, cities, counties, state and federal agencies, special districts and other interested parties in the development or amendment of a facility plan. This involvement may take the form of mailings, meetings or other means that the Department determines are appropriate for the circumstances. The Department shall hold at least one public meeting on the plan prior to adoption.

***FINDING**: The Department has involved DLCD, the cities of Aurora, Hubbard, and Woodburn, and Marion County in development of this facility plan. An extensive public involvement program was also conducted and is documented in Appendix B and F of the Corridor Plan. The public meeting requirement is met by the Commission's adoption proceedings for this Corridor Plan.*

(2) The Department shall provide a draft of the proposed facility plan to planning representatives of all affected cities, counties and metropolitan planning organization and shall request that they identify any specific plan requirements which apply, any general plan requirements which apply and whether the draft facility plan is compatible with the acknowledged comprehensive plan. If no reply is received from an affected city, county or metropolitan planning organization within 30 days of the Department's request for a compatibility determination, the Department shall deem that the draft plan is compatible with that jurisdiction's acknowledged comprehensive plan. The Department may extend the reply time if requested to do so by an affected city, county or metropolitan planning organization.

***FINDING**: The plan has been reviewed and found consistent with the comprehensive plans of Marion County and the cities of Aurora and Hubbard. Letters from each jurisdiction documenting this finding is found in Corridor Plan Appendix I. The Corridor Plan has also been endorsed by the Mid-Willamette Valley Area Commission on Transportation.*

(3) If any statewide goal or comprehensive plan conflicts are identified, the Department shall meet with the local government planning representatives to discuss ways to resolve the conflicts. These may include:

(a) Changing the draft facility plan to eliminate the conflicts;

(b) Working with the local governments to amend the local comprehensive plans to eliminate the conflicts; or

(c) Identifying the conflicts in the draft facility plan and including policies that commit the Department to resolving the conflicts prior to the conclusion of the transportation planning program for the affected portions of the transportation facility.

***FINDING**: No statewide goal or comprehensive plan conflicts have been identified with the Corridor Plan. Corridor Plan Appendix G addresses consistency with adopted state, regional, and local plans.*

(4) The Department shall evaluate and write draft findings of compatibility with acknowledged comprehensive plans of affected cities and counties, findings of compliance with any statewide planning goals which specifically apply as determined by OAR 660-030-0065(3)(d), and findings of compliance with all provisions of other statewide planning goals that can be clearly defined if the comprehensive plan of an affected city or county contains no conditions specifically applicable or any general provisions, purposes or objectives that would be substantially affected by the facility plan.

***FINDING**: The Final Draft Corridor Plan is attached for the Commission's consideration. Corridor Plan Appendix G and I address compliance with applicable statewide planning goals and the comprehensive plans of Aurora, Hubbard, and Marion County.*

(5) The Department shall present to the Transportation Commission the draft plan, findings of compatibility with the acknowledged comprehensive plans of the affected cities and counties and findings of compliance with applicable statewide planning goals.

***FINDING**: The Final Draft Corridor Plan is attached for the Commission's consideration. Corridor Plan Appendix G address compliance with applicable statewide planning goals. Appendix I also contains documentation of the findings of consistency with the comprehensive plans of Marion County and the cities of Aurora and Hubbard.*

(6) The Transportation Commission shall adopt findings of compatibility with the acknowledged comprehensive plans of affected cities and counties and findings of compliance with applicable statewide planning goals when it adopts the final facility plan.

***FINDING**: The Final Draft Corridor Plan is attached for the Commission's consideration. Corridor Plan Appendix G and Appendix I address compliance with applicable statewide planning goals and compatibility with the local comprehensive plans of Marion County and the cities of Aurora and Hubbard.*

(7) The Department shall provide copies of the adopted final facility plan and findings to DLCD, to affected metropolitan planning organizations, cities, counties, state and federal agencies, special districts and to others who request to receive a copy.

***FINDING**: The Department will provide copies of the Adopted Oregon 99E Corridor Segment Plan, including all required findings to DLCD, Marion County, the cities of Aurora, Hubbard, and Woodburn, and others who request a copy.*

OR 99E Woodburn to Aurora Corridor Segment Plan

August 2014

Prepared for

Prepared by

Contents

Appendices

Section 1. Executive Summary

The OR 99E Woodburn to Aurora Corridor Segment Plan was developed to identify how to maintain or improve traffic operations and safety with a set of recommended short-term and long-term corridor improvements. The study followed a process of identifying existing and future corridor needs, developing improvement options to address the needs, and defining recommended improvements based on public input.

The existing needs are focused on intersections and corridor segments within or near Hubbard and Aurora. Examples of intersection needs are the lack of turn lanes and the need for additional crosswalks with lighting. Segment needs include two-way center turn lanes and additional sidewalks and bike lanes. There is also a general need for wider shoulders along the length of the corridor to serve bicyclists. There are no existing mobility needs within the corridor.

Additional future needs are related to the anticipated 40 to 50 percent traffic growth along the corridor. This results in ODOT's mobility targets not being met along two corridor segments and roughly half of the study area intersections. Although there are no other locations with non-mobility needs in the future, the higher traffic volumes will exacerbate the problems at the locations with existing needs.

Lower-cost improvement options were developed to address the existing and future needs, which were reviewed with the public at an open house meeting. In Aurora, there was opposition to all of the options except at Ottaway Avenue, because it was believed that the improvements would disrupt existing property access.

In Hubbard, the recommended improvements include intersection turn lanes, extension of the existing two-way center turn lane to the north, an additional southbound travel lane, and the addition of bike lanes, sidewalks, and pedestrian crossings.

In the rural portion of the corridor, a capacity/operational improvement is recommended at OR 99E/OR 551, as well as improvements at Dimmick Lane and Goudy Gardens Lane.

Section 2. Introduction

The OR 99E Corridor Plan identifies how to best improve or preserve existing and future highway operations and safety for the segment of OR 99E between Aurora (MP 24.55) and the Woodburn north urban growth boundary (UGB) (MP 30.86). The purpose of the study was to analyze the segment in order to reassess the function of the corridor, identify how to improve operations and safety, and preserve the highway's functional integrity.

This plan is the first of what may be several phases required to construct improvements along the corridor. Subsequent phases would consist of Phase 2 - environmental documentation to meet National Environmental Policy Act (NEPA) requirements, Phase 3 - preparation of construction plans, and Phase 4 – construction of improvements.

The plan reflects the information developed in the following study tasks:

- Public and Stakeholder Involvement
- Review Land Use and Transportation Plans and Policies
- Assess Existing Transportation Conditions
- Identify and Map Constraints
- Assess Future Transportation Conditions
- Develop Problem Statement and Evaluation Criteria
- Analyze and Refine Alternatives
- Recommend Corridor Improvements

Study Area

The limits of the study area are shown in Figure 1. Within the City of Aurora, OR 99E is abutted by a mixture of agricultural, commercial, and residential land uses. Most of the city's commercial land uses are adjacent to OR 99E or are within a few hundred feet of the highway.


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 1
Study Area
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
5
Grim Rd.
Scholl Rd.
99E
Hubbard
A St.
OR
Industrial Ave.
Carl Rd.
Woodburn
211
Legend
Study Corridor
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

Agricultural/rural land uses predominate in the area between Hubbard and Aurora. Some industrial and residential land uses are also present to the south of OR 551. Within the City of Hubbard, industrial and commercial are the primary land use types that abut OR 99E. The industrial land uses are concentrated mainly in the south end of the city and the commercial land uses are located mostly in the north end along both sides of the highway. Between Hubbard and the Woodburn north UGB, agricultural/rural is the predominant land use type.

Section 3. Corridor Conditions

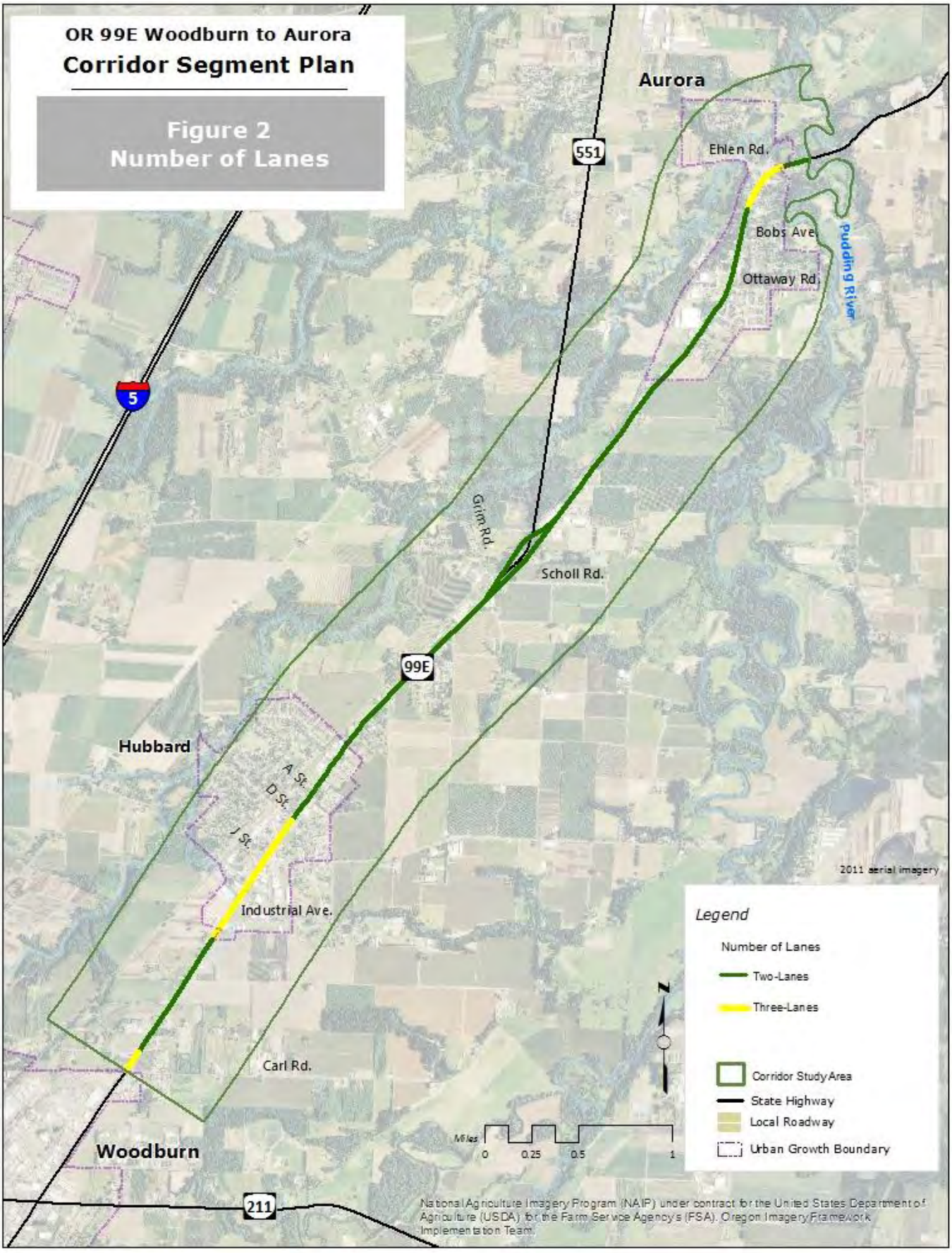
OR 99E serves multiple functions. As a commuter route it carries a significant volume of work trips with origins and destinations as far south as Salem and as far north as the Portland metropolitan area. It provides local access to businesses and residential areas, resulting in turning movements onto and off of the highway, particularly in Aurora and Hubbard. OR 99E also serves truck traffic as a regional truck route, and within the rural portions of the study area it is used by a variety of farm vehicles and equipment.

Within the study area, OR 99E is classified as a rural minor arterial in the ODOT Highway Design Manual (HDM) and as a regional truck route in the Oregon Highway Plan (OHP). The functional classifications in the HDM are used to determine the appropriate design standards for state highways, while the OHP classifications are used to establish access spacing and mobility targets.

As shown in Figure 2, OR 99E is primarily a two-lane facility, with short three-lane sections (two travel lanes and a median turn lane) in Aurora and Hubbard and at the southern end of the study area. There are no passing lanes. Right-turn and/or left-turn lanes are available at some of the intersections in Aurora and Hubbard.

OR 99E is located on a straight and level alignment within the study area. Operationally, speed limits range from between 30 and 40-mph in Aurora and Hubbard and 50 – 55-mph in the rural areas. Traffic signals are located along the highway at Liberty St./Ehlen Road in Aurora, OR 551 (Grim Rd. and Scholl Rd.), and D St. in Hubbard. Traffic control at all other intersections is provided by stop signs on the minor road approaches.

Two roads intersecting OR 99E within the study area are classified as arterials. OR 551 is a two-lane highway that connects OR 99E with I-5 to the north near Wilsonville. Ehlen Rd. connects OR 99E to I-5 directly west of Aurora. All other roads intersecting OR 99E are two-lane local facilities.


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 2
Number of Lanes
Aurora
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Pudding River
5
Grim Rd.
Scholl Rd.
99E
Hubbard
A St.
D St.
J St.
Industrial Ave.
Carl Rd.
Woodburn
211
2011 aerial imagery
Legend
Number of Lanes
Two-Lanes
Three-Lanes
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
N
Miles
0
0.25
0.5
1
National Agriculture Imagery Program (NAIP) under contract for the United States Department of Agriculture (USDA) for the Farm Service Agency's (FSA). Oregon Imagery Framework Implementation Team.

Existing Transportation Conditions and Needs

Two approaches were used in the analysis of existing transportation conditions. With the first approach, transportation data such as traffic volumes and roadway characteristics were collected and analyzed. The results of the analysis were compared to standards, and for locations that did not meet the standards, a need was identified. The second approach was to consider information on existing transportation needs from stakeholders, agency staff, and members of the Project Management Team (PMT). Existing transportation conditions and needs are summarized below; additional information can be found in Appendix A.

Mobility

Existing mobility needs were investigated for roadway segments and intersections by comparing the level of congestion to the appropriate ODOT mobility target. It was found that all of the segments operate well within the mobility targets. Similarly, all of the intersections analyzed along the corridor operate within the targets.

Stakeholders,[1] agency staff, and members of the PMT reported that congestion can occur during commute times and during special events, such as the Mt. Angel Oktoberfest, Tulip Festival, and the Hubbard Hops Festival.

Traffic Operations

Traffic operations needs were identified for unsignalized intersections where left-turn lanes or right-turn lanes may be needed.[2] Most of the turn lane needs are concentrated in and near Hubbard, where left-turn lanes are needed at the south

[1] Stakeholder input is summarized in Appendix B.

[2] The need for turn lanes at signalized intersections are typically determined based on capacity requirements.

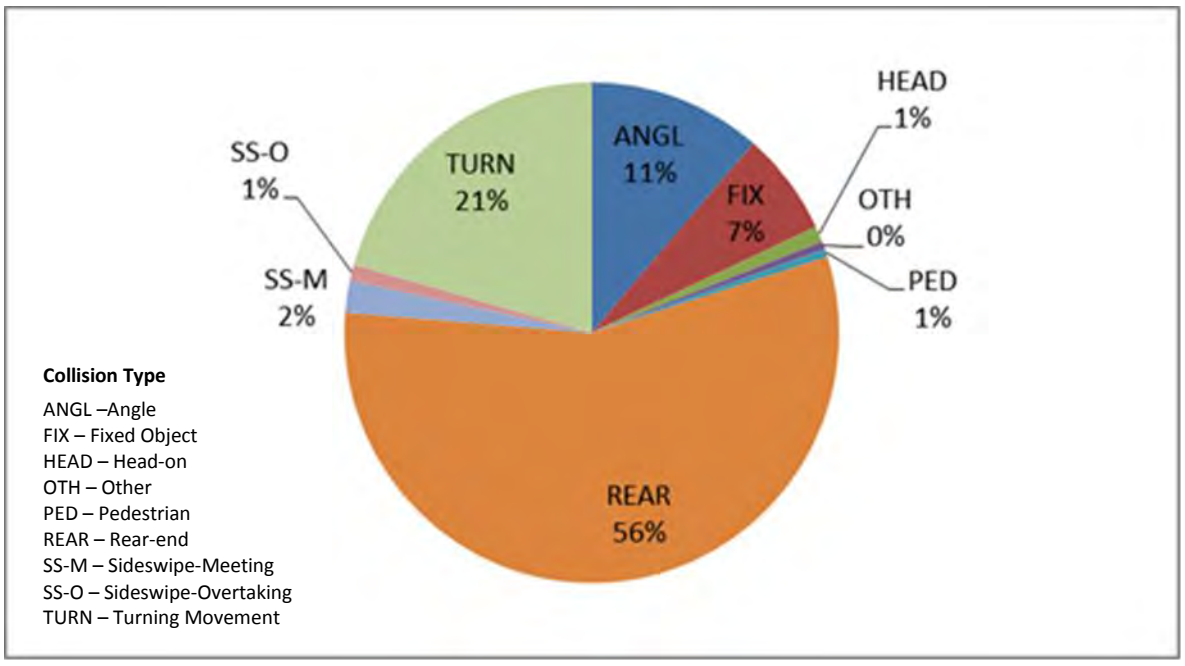
driveway for the Union 76 station, Elm St., and Parkway Blvd. Right-turn lanes are needed at the Union 76 station north driveway and J St. There are needs for both left and right-turn lanes at A St.

In Aurora, the only turn lane needs identified were at Ottaway Rd., where both a southbound left-turn lane and southbound right-turn lane are needed. In the rural portion of the corridor, the need for a southbound left-turn lane at Dimmick Lane was identified through the public involvement process.

Numerous traffic operations needs were reported by stakeholders, agency staff, and PMT members. Many of the comments were related to problems with turning vehicles and the need for two-way center lanes and turn lanes at intersections, particularly at locations within and near Aurora and Hubbard where these facilities do not exist.

Safety

Historical crash data indicated that the majority of the crashes (56%) are rear-end-type crashes. The next most common crash types are turn (21%) and angle (11%) crashes. These types of crashes are typically seen along corridors with higher traffic volumes and congested conditions.



The data also indicated that the crash rates for three segments are higher than the statewide average. These are the segment between Liberty St. and Orchard Ave. in Aurora and the segments between the Union 76 Driveways and D St. and D St. and Industrial Ave. in Hubbard. There is also one top 10% Safety Priority Index System (SPIS) site[3] to the north of D St. in Hubbard.

Among the stakeholders, agency staff, and PMT members, there were general concerns about unprotected left turns onto and off of OR 99E due to the lack of two-way left-turn lanes, intersection turn lanes, and sufficient shoulders at most locations. Another concern was the lack of lighting along the highway, especially at crosswalks. Safety problems identified for specific locations included driver confusion at the OR 99E/OR 551 intersections due to the configuration of the intersections.

[3] ODOT maintains the Safety Priority Index System (SPIS) for the identification and analysis of locations on the state highway system with potential safety needs. Each year, the system is used to produce reports of sites within each ODOT Region that are ranked within the top 10% of all SPIS sites statewide.

Geometrics

Existing geometric needs were identified for roadway segments and intersections by comparing existing geometric features to roadway standards. All lane widths are at least 11-12 feet, which meets or exceeds the standards for each analysis segment. The shoulder widths vary, with many locations not meeting the 6-foot standard.

There are several intersections where there are approach width, intersection angle, or sight distance needs for the minor road approaches.

Comments regarding geometric needs were focused on inadequate shoulder widths and skewed intersections. It was reported that wider shoulders are needed throughout the corridor to provide an adequate area for emergency and school bus stops as well as

bicycle and pedestrian use.

Access

Similar to many state highways which, in addition to serving through traffic demand, provide access to adjacent property, there

are areas along OR 99E with high concentrations of access points. The problems associated high access density are well understood, including reduced capacity, traffic operations and safety conflicts between slower-moving turning vehicles and higher-speed through-traffic, and degradation of the bicycle and pedestrian environment.

The Oregon Highway Plan (OHP) establishes access management spacing standards to improve safety and mobility by limiting turning conflicts. The maximum number of approaches that would be allowed based on the standards is exceeded along nearly all of the corridor.

Bicycle and Pedestrian

Bicycle counts and observed bicycle trips suggest the need for continuous bicycle facilities throughout the study area. These could be either bike lanes in the urban areas or shoulder bikeways in both the urban and rural areas. Based on ODOT's bicycle facility standards, the bicycle needs are concentrated within Aurora, Hubbard, and the area between OR 551 and Hubbard.

Pedestrian counts indicate that there are also needs for continuous pedestrian

facilities in both Aurora and Hubbard.

There were numerous comments from the stakeholders that conditions for bicycle

travel are unsafe throughout the corridor, particularly in the rural areas, where a need for wider shoulders was identified. Needs for continuous sidewalks and safe pedestrian crossings in the Hubbard area were also identified.

Corridor Health

The corridor health concept is based on the idea of measuring the "health" of the corridor within several different categories of performance, and then combining the measurements to provide a picture of overall corridor health. To apply this concept, a Corridor Health Tool was developed to calculate a composite health score for each corridor segment.

The Tool consists of a set of factors, weights, and formulas corresponding to the same areas of need described in the previous sections. It is used to calculate a composite health score for each corridor segment, which is assigned a good, fair, or poor rating according to the following categories:

- Good – 75 – 100
- Fair – 50 – 74
- Poor - < 50

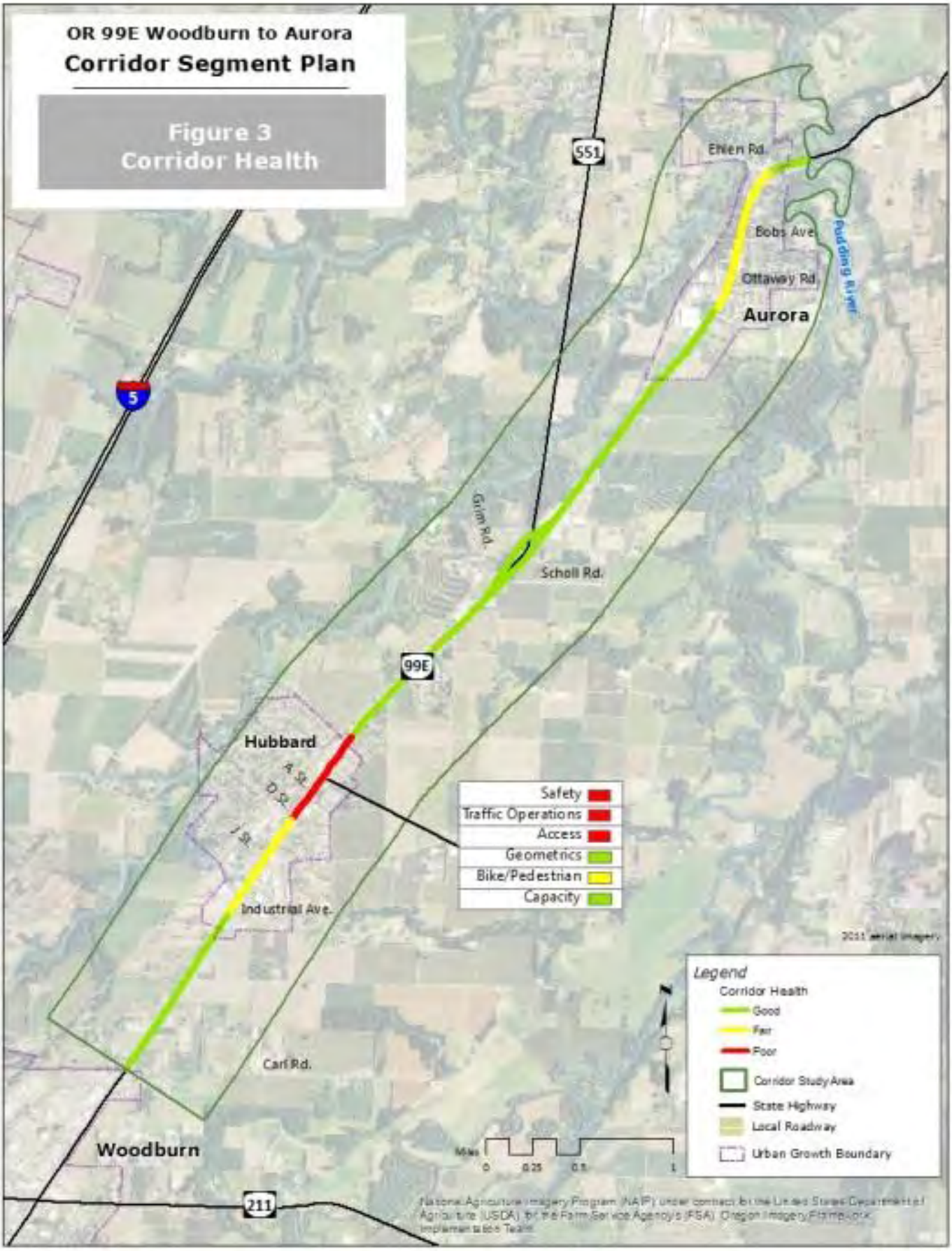
As shown in Figure 3, all of the corridor segments fall in the good or fair categories, with the exception of the segment between the Union 76 driveways and D St. in Hubbard. The poor rating in this segment is primarily related to the safety, traffic operations, and access needs.

Environmental and Land Use Constraints

Environmental and land use conditions were analyzed to determine whether there are environmental resources or land uses near OR 99E which may limit the ability to implement improvements to the highway. In addition to the information below, Appendix C provides detailed results of the environmental and land use analysis.

Potential Environmental Constraints

The focus of the environmental constraints analysis was on natural resources within the corridor study area. Environmental constraint maps were created showing environmentally sensitive areas ranked as having low, medium, or high significance regarding their potential to impact future transportation improvements.


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 3
Corridor Health
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
5
Grim Rd.
Scholl Rd.
99E
Hubbard
Industrial Ave.
Carl Rd.
Woodburn
211
Safety
Traffic Operations
Access
Geometrics
Bike/Pedestrian
Capacity
Legend
Corridor Health
Good
Fair
Poor
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

The only constraint area having a high level of significance was water quantity/quality, because storm water treatment would likely be required for any project within the study area. Two medium significance areas were identified near the OR 99E/OR 551 intersection (heavily wooded area within the right-of-way) and in Aurora (Aurora Colony Historic District). The Little Bear

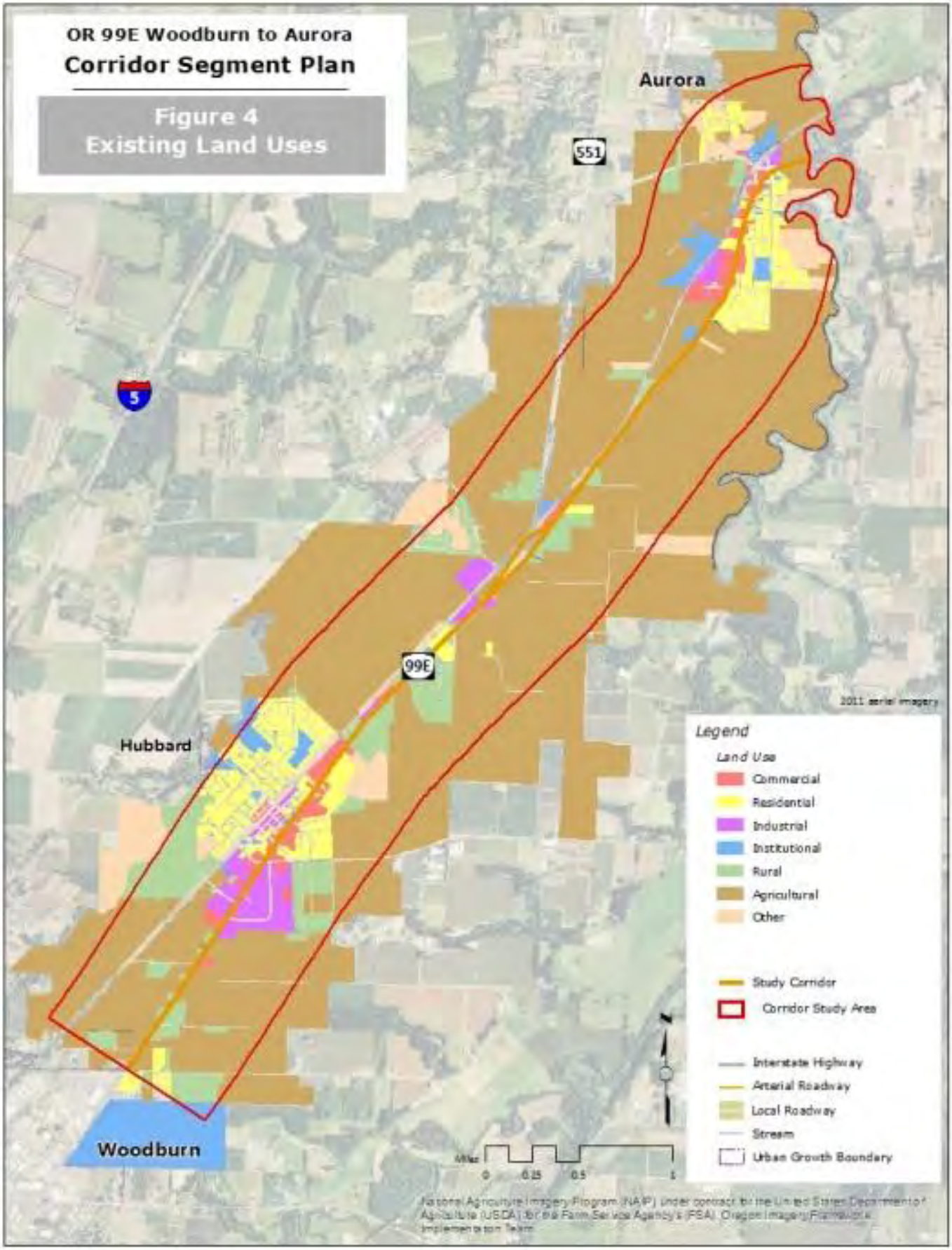
Creek near Schmidt Lane was identified as an area of low significance.

Potential Land Use Constraints

The corridor study area comprises a mixture of rural and urban land uses. As can be seen in Figure 4, the distribution of these uses varies by corridor segment. There do not appear to be any areas along the corridor where the ability to implement improvements would be limited by adjacent land uses. This assessment is based on the smaller scale of the expected future improvements, combined with the relatively large right-of-way width of the corridor (typically 100 feet). This would allow the improvements to be constructed without the need to encroach on abutting parcels.

Future Transportation Conditions and Needs

Future transportation conditions along the corridor were analyzed for the 2035 No-Build scenario, in which no transportation improvements were assumed beyond those that are currently programmed. The analysis was based on a set of traffic forecasts prepared as a part of the study. In general, the future volumes increase between 40 and 50 percent along OR 99E, with the highest volumes occurring on the north end of Aurora and the lowest volumes along the rural sections of the corridor. Future needs were examined for the same areas as the existing conditions analysis. Detailed information on future transportation conditions and needs is provided in Appendix D.


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 4
Existing Land Uses
Aurora
551
5
99E
Hubbard
Woodburn
2011 aerial imagery
Legend
Land Use
Commercial
Residential
Industrial
Institutional
Rural
Agricultural
Other
Study Corridor
Corridor Study Area
Interstate Highway
Arterial Roadway
Local Roadway
Stream
Urban Growth Boundary
Miles
0
0.25
0.5
1
National Agriculture Imagery Program (NAIP) under contract for the United States Department of Agriculture (USDA) for the Farm Service Agency's (FSA) Oregon Imagery Partnership Implementation Team

Mobility

The higher future traffic volumes resulted in the mobility targets not being met along the segments between the Pudding River and Liberty St. in Aurora and OR 551 and the Union 76 driveways. In both cases, the targets would be slightly exceeded. The future congestion levels would exceed the targets at roughly half of the study area intersections. Two of these are located in Aurora and four are in Hubbard.

Traffic Operations

Additional turn lane needs would occur at five intersections in the future. All of these are located in Aurora and Hubbard.

Safety

Future safety conditions were estimated using the Highway Safety Manual (HSM) procedures. Within the procedures, changes in crash rates are estimated based on differences between existing and future traffic volumes. The analysis indicated no changes in the future crash rates for either the roadway segments or intersections.

Geometrics

Future geometric needs may differ from existing needs depending on the level of future traffic volumes. Such a difference may occur where an existing geometric feature is adequate for lower volumes, but falls below the standard for higher future volumes. Based on ODOT's standards and the future volumes, however, no additional geometric needs were identified for either lane or shoulder widths.

Access

Similar to geometric needs, future access needs may vary compared to existing needs due to future volume increases. There would be no difference in needs based upon ODOT's access spacing standards, however, because the both the existing and future volumes are higher than the level at which the standards vary.

Bicycle and Pedestrian

The types of traffic-related bicycle and pedestrian conflicts identified in the existing conditions analysis will be accentuated by future traffic increases. These needs will grow even further if bicycle and pedestrian

volumes continue to increase.

Corridor Health

Although the corridor health scores for several of the segments were lower than the existing scores due to the degradation in future mobility and traffic operations, there would be no change in the good/fair/poor category ratings for any of the segments.

Section 4. Goals, Objectives, and Evaluation Criteria

A set of goals, objectives, and evaluation criteria was established to guide the development of improvement options for addressing the existing and future needs. The following Statement of Purpose and Need was defined to serve as the basis for the development of the goals, objectives, and evaluation criteria:

> To improve transportation safety and traffic operations while minimizing environmental and land use impacts and maintaining the character of the corridor. Existing and future problems are based on identified needs in the areas of safety, traffic operations, capacity, geometrics, access management, and bicycle and pedestrian facilities.

The goals describe the desired outcomes of future improvements to the corridor. The objectives identify actions to be taken to accomplish the goals. The evaluation criteria are measurable factors used in determining the extent to which the improvement alternatives will meet the goals and objectives.

Goal I: Improve Transportation Safety

- Objective 1: Reduce crashes

  Evaluation Criteria:

  - Potential reduction in crash rate/severity

- Objective 2: Improve roadway geometrics

  Evaluation Criteria:

  - Type/level of improvement[4]

- Objective 3: Provide adequate bicycle and pedestrian facilities

  Evaluation Criteria:

  - Type/level of improvement

Goal II: Maintain Traffic Operations

- Objective 1: Reduce traffic conflicts

  Evaluation Criteria:

  - Potential reduction in traffic conflicts

- Objective 2: Maintain mobility

  Evaluation Criteria:

[4] Type of improvement reflects the effectiveness of one improvement type compared to another. Level of improvement represents the extent of the improvement and degree of improvement, compared to standards.

- Potential reduction in congestion and delay

- Objective 3: Improve access density/spacing

  Evaluation Criteria:

  - Reduction in number of access points[5]
  - Improvement in access design

Goal III: Maximize Constructability of Transportation Improvements

- Objective 1: Minimize environmental impacts

  Evaluation Criteria:

  - Impacts to environmentally sensitive areas by level of significance

- Objective 2: Minimize land use impacts

  Evaluation Criteria:

  - Impacts to EFU-zoned parcels (rural areas) or developed parcels (urban areas)

- Objective 3: Minimize cost

  Evaluation Criteria:

  - Construction cost
  - Right-of-way requirement

- Objective 4: Recognize related plans and policies

  Evaluation Criteria:

  - Consistency with ODOT standards (including practical design principles) and local plans and policies

A further description of the development of the goals, objectives, and evaluation criteria is included in Appendix E.

[5] In areas not meeting spacing standards.

Section 5. Public Process

The OR 99E Corridor Segment Plan was a collaborative process among various public agencies, key stakeholders and the community. Throughout the study, the project team took time to understand multiple points of view, obtain fresh ideas and resource materials, and encourage participation from the community. Several methods were used to engage the community, including individual interviews, establishment of a project website, distribution of project information via a project mailing list and at public buildings, and two public meetings. This section summarizes this public process and the input provided by the community at the public meetings.

Corridor Issues

To obtain input on key issues for the corridor, interviews were held with stakeholders representing ODOT, local governments, the North Marion County School District, police and fire departments, and local businesses.

Overall, the stakeholders rated the corridor as "fair" to "good" in meeting transportation needs. The corridor was believed to be in good physical condition, but in need of improvements in the following areas:

- Better lighting
- Left-turn lanes
- Wider shoulders
- Lower speeds
- Bicycle and pedestrian facilities
- Improvements at key intersections

Open House #1

The first open house was held on April 25, 2012. The purpose of the open house was to provide the public an opportunity to review information on the study purpose and scope, study process, and existing and future projected conditions in the corridor. Another objective was to obtain comment on draft goals and objectives for the plan, key operational and safety issues within the corridor, potential solutions to address the issues, and the highest priority locations to investigate.

Open House #2

The second open house was held on

November 15, 2012 to provide an opportunity for the public to comment on improvement options for ten priority improvement locations along the corridor. This Top 10 list was established based on the corridor needs identified in the existing and future conditions analysis and the frequency of comments received from the stakeholders, agency staff, and the public regarding the need for improvement at a particular location. The locations are listed below, from north-to-south along the corridor.

Top 10 Improvement Locations

1. OR 99E/2nd St./Main St. (north leg) - Aurora
2. OR 99E/3rd St./Main St. (south leg) - Aurora
3. OR 99E/Ottaway Ave. – Aurora
4. OR 99E/OR 551
5. Union 76 Station to D St. – Hubbard
6. OR 99E/A St. – Hubbard
7. D St. to South City Limit – Hubbard
8. OR 99E/J St. – Hubbard
9. OR 99E/Dimmick Lane
10. OR 99E/Goudy Gardens Lane

Preliminary Improvement Options

Preliminary improvement options to address the identified needs at each location were presented to the public at the second open house. The goals, objectives, and evaluation criteria were used as a guide in the development of the options, as well as existing land use and transportation policies.[6] The focus was to identify lower-cost options that would improve safety and maintain traffic operations and minimize environmental and land use impacts. Another objective was to develop improvement packages for each location that would address not only the primary need, but secondary needs within the vicinity.

In some cases, due to the type of need or specific characteristics of the location, only one improvement option was available. An example of this would be a location where there are conflicts between turning vehicles and through traffic. Here, the only option would be to provide a turn lane. Additional

[6] Existing land use and transportation policies are summarized in Appendix G.

details on the preliminary improvement options are contained in the cut sheets included in the Draft Recommended Improvements memo in Appendix H.

Table 1
Preliminary Improvement Options

Location		Needs	Improvement Options
No.	Description		
1	OR 99E/2nd St./ Main St. (north leg) - Aurora	■ Skewed intersections ■ Substandard sight distance	1. Consolidate OR 99E/2nd St. and OR 99E/Main St. (north leg).
2	OR 99E/3rd St./Main St. (south leg) - Aurora	■ Skewed intersection at OR 99E/Main St.	1. Close south leg of intersection 2. Consolidate OR 99E/Main St. (south leg) and OR 99E/3rd St.
3	OR 99E/Ottaway Ave. - Aurora	■ Turn lanes ■ Mobility (future) ■ Improved pedestrian safety	1. Combination of turn lane, capacity, and bike/pedestrian improvements.
4	OR 99E/OR 551	■ Poor intersection configuration ■ Mobility (future)	1. Reconstruct OR 99E/Grim Rd. and OR 99E/Scholl Rd. intersections as single, signal-controlled intersection. 2. Reconstruct intersections as roundabout.
5	Union 76 Station to D St. - Hubbard	■ Improved safety ■ Turn lanes ■ Access control ■ Sidewalks	1. Combination of turn lane and bike/pedestrian improvements. 2. Combination of two-way center turn lane and bike/pedestrian improvements.
6	OR 99E/A St. - Hubbard	■ Turn lanes ■ Mobility (future)	1. Combination of turn lane, capacity, and bike/pedestrian improvements. 2. Combination of turn lane, capacity, and bike/pedestrian improvements.
7	D St. to South City Limit - Hubbard	■ Bicycle facilities ■ Sidewalks	1. Combination of bike/pedestrian and capacity improvements.
8	OR 99E/J St. - Hubbard	■ Turn lane ■ Skewed intersection	1. Combination of turn lane, sight distance, capacity, and

Location		Needs	Improvement Options
No.	Description		
		▪ Substandard sight distance ▪ Mobility (future)	pedestrian improvements.
9	OR 99E/Dimmick Lane	▪ Turn lane ▪ Skewed intersection	1. Combination of turn lane and geometric improvements.
10	OR 99E/Goudy Gardens Lane	▪ Skewed intersection	1. Combination of geometric improvements.

The improvement options were screened using the evaluation criteria described in Section 3 and the findings were reviewed with the PMT. There was general agreement about the improvement concepts and the results of the evaluation. Minor revisions were made to the options based on the PMT input. The evaluation scores are shown in the cut sheets in included in the Draft Recommended Improvements memo in Appendix H.

Community Preferred Options

At Open House #2, the public was asked to provide input on which options they preferred. A total of 60 comments were received, some in favor of or opposing the options and others identifying alternative improvement concepts.

Within Aurora, a strong majority of the comments were opposed to the improvement options for OR 99E/2nd St./Main St. and OR 99E/Main St./3rd St. At both locations, it was believed that the improvements would hurt businesses and restrict parking. The existing configuration was preferred to both of the options for OR 99E/Main St./3rd St. There was, however, strong support for the improvement option at OR 99E/Ottaway Ave.

At OR 99E/OR 551, there was mixed support for Option 1 (single, signalized intersection), while a majority of the comments were opposed to Option 2 (roundabout). Comments were made that both options were too expensive and that the roundabout would be even more confusing than the existing intersections.

In the Hubbard area, there were positive responses to both of the options for the segment between the Union 76 station and D St. The crosswalk was noted as a desirable feature of both options, as well as the two-way center turn lane for Option 2. For the OR 99E/A St. intersection, there was more support for Option 1 than Option 2. This was due, in part, to the southbound right-turn lane included in Option 1, but not in Option 2.

There were no comments for or against the additional lane and bicycle/pedestrian improvements for the segment between D St. and the Hubbard south city limit. One commenter questioned whether there was enough traffic to warrant the additional lane improvement, while two others indicated that what was actually needed within this segment was a lighted crosswalk at the G St. intersection. There was support for the OR 99E/J St. improvement options, with the comment that there must be adequate room for truck turns, particularly from westbound J St. onto OR 99E.

The improvement options for both OR 99E/Dimmick Lane and OR 99E/Goudy Gardens Lane were supported. The highest level of support was received for a set of low-cost improvement options. Specific comments were that a crosswalk was needed at G St. in Hubbard, bicycle lane and sidewalk improvements would be acceptable, lighting improvements would have a significant benefit, and a reduction in the speed limits was needed.

A tally of the for/against comments by improvement location is shown in Table 2.

Table 2
Public Input on Improvement Options

Location		Option 1		Option 2	
No.	Description	For	Against	For	Against
1	OR 99E/2nd St./Main St. (north leg) (Aurora)	1	4	N/A	
2	OR 99E/3rd St./Main St. (south leg) (Aurora)	1	5	0	3
3	OR 99E/Ottaway Ave. (Aurora)	5	0	N/A	

Location		Option 1		Option 2	
No.	Description	For	Against	For	Against
4	OR 99E/OR 551	1	1	2	4
5	Union 76 Station to D St. (Hubbard)	1	0	1	0
6	OR 99E/A St. (Hubbard)	2	0	0	1
7	D St. to South City Limit (Hubbard)	0	0	N/A	
8	OR 99E/J St. (Hubbard)	2	0	N/A	
9	OR 99E/Dimmick Ln.	1	0	N/A	
10	OR 99E/Goudy Gardens Ln.	1	0	N/A	

More information on the public process is provided in Appendix F.

Section 6. Recommended Corridor Plan

The improvement options presented below are recommended for further investigation. Based on the public input received at Open House #2, evaluation results, and input from the PMT, these improvements best meet the goals, objectives, and needs of the corridor. All of the recommended options within Aurora and Hubbard are consistent with the Aurora TSP and Hubbard TSP.

Aurora

No improvement options are recommended for OR 99E/2nd St./Main St. (north leg) and OR 99E/2nd St./Main St. (south leg) in Aurora because the City of Aurora Planning Commission was not in favor of improvements at these locations.[7] It was felt that these would have negative impacts on business access and overall accessibility within the area, and that these locations should be left "as is". Similar comments were made at the second open house. While geometric deficiencies exist at these intersections, the proposed modifications are not recommended due to the opposition of the city and the fact that there are no identified safety or operational issues that would dictate improvements.

OR 99E/Ottaway Ave.

One option was considered for this location. It consists of turn lane, capacity, and bike/pedestrian improvements.

This option would result in the following benefits:

Improvement Option 1

[7] February 26th, 2013 email from Renata Wakeley, Mid-Willamette Valley COG, to Dan Fricke, ODOT Region 2.

- Reduced traffic conflicts along OR 99E due to turn lanes.
- Improved pedestrian environment with additional sidewalks and crosswalks (crosswalks would be signalized and illuminated in the future).
- Improved bicycle environment with addition of bicycle lanes.
- Future congestion level would meet both the OHP and HDM mobility targets for the Year 2035.

In addition, this option received strong public support and is consistent with the City of Aurora TSP.

OR 99E/OR 551

Option 1 for this location would reconstruct the existing OR 99E/Grim Rd. and OR 99E/Scholl Rd. intersections as a single, signal-controlled intersection. Option 2 would reconstruct these intersections as a roundabout. The total evaluation scores for the options were similar; however, there are several specific differences in the benefits and costs of each option.

Improvement Option 1

Option 1 could be constructed entirely within the existing right-of-way and would be more consistent with current ODOT design policy, which is oriented toward conventional intersection design rather than roundabouts. Drivers would also have more familiarity with signalized intersection operations than they initially would with roundabouts. There would be fewer special considerations required for truck movements with a standard intersection configuration compared to a roundabout. The single intersection would also be

located further away from the access to a trucking business in the southwest quadrant of the intersection and the Union Pacific rail line to the west.

An important benefit of Option #2 compared to Option #1 is that it would have greater long-term safety benefits for both traffic and pedestrians. The roundabout configuration would also have a greater potential for reducing traffic conflicts. In addition, the total cost of Option #1 would be slightly less than that of Option #2.

Although the evaluation scores for the two options were similar, Option #1 is recommended for further investigation because it received a more balanced level of public support than Option #2, which the public strongly opposed.

Hubbard

Union 76 Station to D St.

Both of the improvement options investigated for this location feature the same bicycle and pedestrian improvements in the vicinity of the Union 76 station, as well as a southbound right-turn lane at the north driveway of the station. The difference is the extent of the improvements to the south of the station. Option 1 includes only a northbound left-turn lane at the south driveway of the station, while Option 2 includes a two-way center turn lane extending south from the station to D St., together with bicycle lanes and sidewalks. While this results in a significant cost difference (see cut sheet in Appendix H), Option 2 is preferred because it:

- Received a higher total evaluation score.
- Addresses a significant need for a northbound/southbound turn refuge

Improvement Option 2

between the Union 76 station and D St.

- Provides continuous bike lanes and sidewalks between the Union 76 station and D St.

This option was also favored by the PMT and supported by the public.

OR 99E/A St.

Options 1 and 2 for OR 99E/A St. both include bicycle and pedestrian improvements within the intersection area, as well as a two-way center turn lane between Parkway Blvd. and D St., a southbound through/right-turn lane south of the intersection (as recommended in the Hubbard TSP), closure of 1st St. at A St., and a future traffic signal. The only difference between the options is that Option 1 features a southbound right-turn lane at A St., while Option 2 includes a southbound through/right-turn lane. Option 2 is preferred because:

- It received a slightly higher total evaluation score.
- The future congestion level would meet both the OHP and HDM mobility targets compared to the congestion level for Option 2, which would meet neither of the targets.
- The southbound through/right-turn lane improvement is consistent with the adopted Hubbard TSP, whereas the southbound right-turn only lane in Option 1 is not.

Improvement Option 2

Signalization of the intersection would be required to meet future mobility targets. Prior to implementation, a signal study would be needed. The proposed signal would then have to be approved by the State Traffic Engineer.

D St. to South City Limit

Only one option was considered for this segment, in which a southbound through/right-turn lane would be constructed together with bicycle lanes and sidewalks where they are not currently available. This option is consistent with the Hubbard TSP and would provide increased capacity for southbound vehicles as well as an enhanced bicycle/pedestrian environment within Hubbard.

Improvement Option 1

OR 99E/J St.

The improvement option for OR 99E/J St. includes a southbound through/right-turn lane (part of the D St. to South City Limit option above), as well as minor sight distance, striping, and pedestrian improvements. These would improve safety and provide additional intersection capacity. This option was supported by the public.

Improvement Option 1

OR 99E/Dimmick Lane

The OR 99E/Dimmick Lane improvement option would address turn lane and intersection skew angle needs identified by the PMT and public with the construction of a southbound left-turn lane and a minor intersection realignment. In addition, the Dimmick Lane approach would be widened to allow access/egress by large trucks.

Improvement Option 1

OR 99E/Goudy Gardens Lane

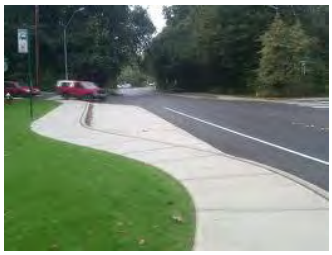
Similar to the OR 99E/Dimmick Lane improvement, this improvement option would realign the OR 99E/Goudy Gardens Lane intersection to reduce the skew angle and widen the Goudy Gardens Lane approach to accommodate large truck turning movements.

Improvement Option 1

Low-Cost Improvements

In addition to the improvements for the locations described above, a set of low-cost improvements is recommended for further investigation at the appropriate locations along the corridor. These are summarized in Table 3 below.

Table 3
Low-Cost Improvement Options

Improvement		Potential Improvement Locations
Reduction of Speed Limit		South of Aurora City limit
Rumble Strips		Along OR 99E shoulders within study area
Lighting Improvements		Provide lighting at crosswalks and intersections: • OR 99E/Main St. (crosswalk) • OR 99E/Ottaway Ave. (intersection) • OR 99E/Union 76 Station (crosswalk) • OR 99E/A St. (crosswalk) • OR 99E/ D St. (intersection)
Bus Pull-Outs		Bus stop locations along OR 99E within study area
Regular Maintenance of Pavement Markings		Locations with worn pavement markings

Improvement		Potential Improvement Locations
Crosswalks		Provide crosswalks with signing, striping, and lighting: • OR 99E/Main St. - Aurora • OR 99E/3rd St. - Aurora • OR 99E/Ottaway Ave. - Aurora • OR 99E/Union 76 Station - Hubbard • OR 99E/A St. - Hubbard • OR 99E/D St. - Hubbard • OR 99E/J St. - Hubbard
Bike Lanes and Sidewalks		Provide bike lanes and sidewalks along OR 99E within study area: • 1st St. to Bobs Ave. - Aurora • OR 99E/Ottaway Ave. - Aurora • Union 76 station to Hubbard south city limit

Short-Term Improvement Recommendations

Many of the proposed improvements address existing needs along the corridor, and so can be implemented in the short-term as soon as project development requirements have been met and funding becomes available. As shown in Table 4 and Figure 5, short-term improvements are recommended for all of the Top 10 priority improvement locations except OR 99E/2nd St./Main St. and OR 99E/3rd St./Main St. in Aurora, where local officials preferred that no changes be made, and OR 99E/OR 551. Many of these are relatively low-cost improvements focusing on traffic operations, safety, and bicycle/pedestrian improvements. They include turn lanes, minor realignment of intersection approaches, and installation of sidewalks, bike lanes, and pedestrian crossings.

Table 4
Recommended Short-Term Improvements

Location		Short-Term Improvements
No.	Description	
Aurora		
1	OR 99E/2nd St./Main St. (north leg)	No improvements recommended
2	OR 99E/3rd St./Main St. (south leg)	No improvements recommended
3	OR 99E/Ottaway Ave.	1. Construct northbound and southbound left- and right-turn lanes 2. Add striping for eastbound and westbound left-turn lanes 3. Construct bike lanes along both sides of OR 99E 4. Construct sidewalks on all intersection legs 5. Install crosswalks with ADA ramps and illumination on all intersection legs
4	OR 99E/OR 551	No improvements recommended
Hubbard		
5	Union 76 Station to D St.	1. Construct two-way center turn lane between Union 76 north driveway and D St. 2. Construct southbound right-turn lane at OR 99E/Union 76 north driveway 3. Construct sidewalks on both sides of OR 99E where currently not available 4. Install enhanced pedestrian crossing with ADA ramps at OR 99E/Union 76 south driveway 5. Construct bike lanes on both sides of OR 99E
6	OR 99E/A St.	1. Construct southbound right-turn lane* 2. Construct two-way center turn lane from Parkway Blvd. to D St. 3. Construct sidewalks on west side of OR 99E 4. Construct bike lanes on both sides of OR 99E 5. Construct enhanced pedestrian crossing on south

Location		Short-Term Improvements
No.	Description	
		side of intersection 6. Close 1st St. at A St.
7	D St. to South City Limit	1. Construct bike lanes on both sides of OR 99E 2. Construct sidewalks on both sides of OR 99E
8	OR 99E/J St.	1. Trim/remove vegetation on eastbound approach of J St. to improve sight distance 2. Add striping for westbound left-turn lane 3. Construct sidewalks and ADA ramps on all legs of intersection
9	OR 99E/Dimmick Ln.	1. Construct southbound left-turn lane 2. Realign Dimmick Ln. approach to north to "T" into OR 99E 3. Widen Dimmick Ln. approach to allow access/egress by large trucks
10	OR 99E/Goudy Gardens Ln.	1. Realign Goudy Gardens Ln. approach to south to "T" into OR 99E 2. Widen Goudy Gardens Ln. approach to allow access/egress by large trucks

* Would be converted to through/right-turn lane as long-range improvement.

Long-Term Improvement Recommendations

The long-term recommended improvements address needs that will be occurring within the 2035 time frame. As shown in Table 5 and Figure 6, these are primarily capacity improvements at Ottaway Ave. in Aurora and several locations in Hubbard, as well as conversion of OR 99E/OR 551 to a single, signalized intersection.


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 5
Recommended Short-Term Improvements
551
Ehlen Rd.
3
Bobs Ave
Ottaway Rd.
Aurora
Pudding River
5
Grim Rd.
Scholl Rd.
99E
5
6
Hubbard
A St.
D St.
7
J St.
8
Industrial Ave.
9
10
Dimmick Ln.
Goudy Gardens Ln.
Carl Rd.
Woodburn
211
2011 aerial imagery
Legend
1 Recommended Short-Term Improvement
Study Corridor
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0 0.25 0.5 1
National Agriculture Imagery Program (NAIP) under contract for the United States Department of Agriculture (USDA) for the Farm Service Agency's (FSA). Oregon Imagery Framework Implementation Team

Table 5
Recommended Long-Term Improvements

Location		Long-Term Improvements
No.	Description	
Aurora		
1	OR 99E/2nd St./Main St. (north leg)	No improvements recommended
2	OR 99E/3rd St./Main St. (south leg)	No improvements recommended
3	OR 99E/Ottaway Ave.	1. Install traffic signal
4	OR 99E/OR 551	Reconstruct OR 99E/Grim Rd. and OR 99E/Scholl Rd. intersections as a single, signal-controlled intersection: 1. Remove medians to north and south of existing intersections 2. Merge southbound OR 99E and southbound OR 551 to north of Grim Rd. intersection 3. Construct intersection with five lane cross section 4. Install traffic signal 5. Provide 6 foot-wide shoulders along new alignment
Hubbard		
5	Union 76 Station to D St.	No improvements recommended
6	OR 99E/A St.	1. Convert southbound right-turn lane to southbound through/right-turn lane* 2. Construct southbound through/right-turn lane south of intersection** 3. Install traffic signal
7	D St. to South City Limit	1. Construct southbound through/right-turn lane
8	OR 99E/J St.	1. Construct southbound through/right-turn lane**
9	OR 99E/Dimmick Ln.	No improvements recommended

Location		Long-Term Improvements
No.	Description	
10	OR 99E/Goudy Gardens Ln.	No improvements recommended

* See short-term improvements for this location.
** See improvement option for D St. to south city limit.


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 6
Recommended Long-Term Improvements
551
Ehlen Rd.
3
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
5
Grim Rd.
4
Scholl Rd.
99E
6
Hubbard
A St.
D St.
7
J St.
8
Industrial Ave.
Dimmick Ln.
Goudy Gardens Ln.
Carl Rd.
Woodburn
211
2011 aerial imagery
Legend
1 Recommended Long-Term Improvement
Study Corridor
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0 0.25 0.5 1
National Agriculture Imagery Program (NAIP) under contract for the United States Department of Agriculture (USDA) for the Farm Service Agency's (FSA). Oregon Imagery Framework Implementation Team.

Appendix A

Existing Transportation Conditions

DKS Associates
TRANSPORTATION SOLUTIONS

MEMORANDUM

TO: Dan Fricke, ODOT Region 2

FROM: Bob Schulte and Mike Tomasini

DATE: December 21, 2011

SUBJECT: **OR 99E WOODBURN TO AURORA CORRIDOR SEGMENT PLAN** **P# 09042-022**
Technical Memorandum #4 – Existing Transportation Conditions

INTRODUCTION

This memo documents the analysis of existing transportation conditions within the OR 99E Woodburn to Aurora Corridor Segment Plan study area. The findings of the analysis will be used in the development of proposed improvements to address transportation needs within the study area.

The purpose of the study is to analyze the OR 99E corridor segment between the Region 2 boundary north of Aurora (MP 24.55) and the Woodburn north UGB (MP 30.86) in order to reassess the function of the corridor, identify how to improve operations and safety, and preserve the highway's functional integrity. The goal of the plan is to determine how best to improve or preserve existing and future highway operations and safety. This effort includes the assessment of existing accesses, existing and future operational conditions, and environmental or other constraints and may result in the development of access deviations or alternative mobility standards if current standards cannot be met or maintained.

The limits of the study area are shown in Figure 1. Within the City of Aurora, OR 99E is abutted by a mixture of agricultural, commercial, and residential land uses. Most of the city's commercial land uses are adjacent to OR 99E or are within a few hundred feet of the highway. Agricultural/rural land uses predominate the area between Hubbard and Aurora. Some industrial and residential land uses are also present to the south of OR 551. Within the City of Hubbard, industrial and commercial are the primary land use types that abut OR 99E. The industrial land uses are concentrated mainly in the south end of the city and the commercial land uses are located mostly in the north end along both sides of the highway. Between Hubbard and the Woodburn north UGB, agricultural/rural is the predominant land use type.


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 1
Study Area
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
5
Grim Rd.
Scholl Rd.
99E
Hubbard
A St.
D St.
1 St.
Industrial Ave.
Carl Rd.
Woodburn
211
draft
2011 aerial imagery
N
Legend
Study Corridor
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

Two approaches were used in the analysis of existing transportation conditions. With the first approach, transportation data such as traffic volumes and roadway characteristics were collected and analyzed. The results of the analysis were compared to standards, and for locations that did not meet the standards, a need was identified. The second approach was to gather information on existing transportation needs from stakeholders, agency staff, and members of the Project Management Team (PMT). This information was obtained through stakeholder interviews, a PMT meeting, and a meeting with ODOT Region 2's roadway maintenance staff. The reported needs from these sources were catalogued, and field reconnaissance was conducted at the reported need locations to investigate the nature of the problems.

ROADWAYS

FACILITIES

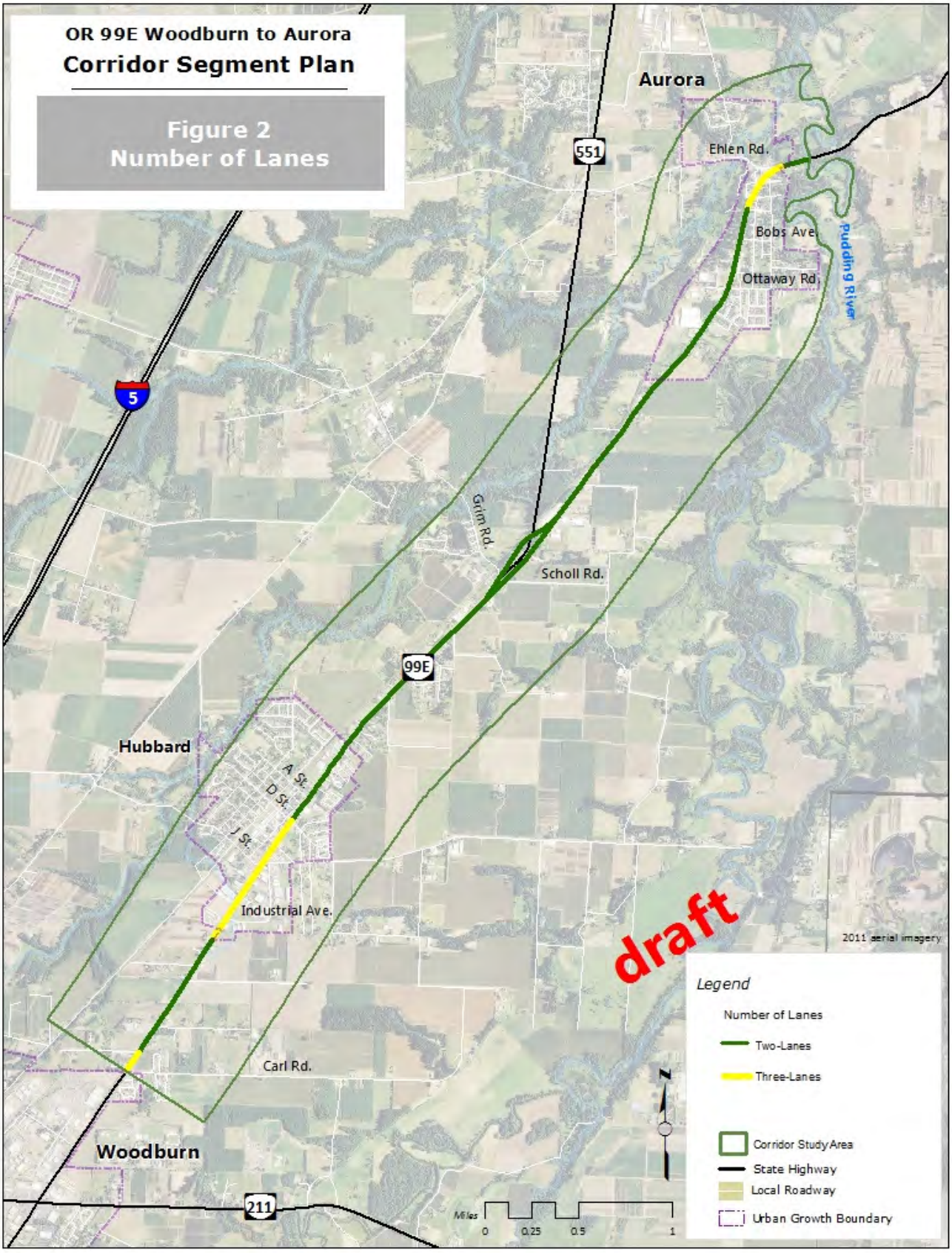
OR 99E

Within the study area, OR 99E is classified as a rural minor arterial in the ODOT Highway Design Manual (HDM) and as a regional truck route in the Oregon Highway Plan (OHP). The functional classifications in the HDM are used to determine the appropriate design standards for state highways, while the OHP classifications are used to establish access spacing and mobility standards.

OR 99E serves multiple functions. As a commuter route it carries a significant volume of work trips with origins and destinations as far south as Salem and as far north as the Portland metropolitan area. It provides local access to businesses and residential areas, resulting in turning movements onto and off of the highway, particularly in Aurora and Hubbard. OR 99E also serves truck traffic as a regional truck route, and within the rural portions of the study area it is used by a variety of farm vehicles and equipment.

As shown in Figure 2, OR 99E is primarily a two-lane facility, with short three-lane sections (two travel lanes and a median turn lane) in Aurora and Hubbard and at the southern end of the study area. There are no passing lanes. Right-turn and/or left-turn lanes are available at some of the intersections in Aurora and Hubbard.

OR 99E is located on a straight and level alignment within the study area. Operationally, speed limits range from between 30 and 40-mph in Aurora and Hubbard and 50 – 55-mph in the rural areas. Traffic signals are located along the highway at Liberty St. in Aurora, OR 551 (Grim Rd. and Scholl Rd.), and D St. in Hubbard. Traffic control at all other intersections is provided by stop signs on the minor road approaches.


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 2
Number of Lanes
Aurora
551
Ehlen Rd.
Bobs Ave
Ottaway Rd
Pudding River
5
Grim Rd.
Scholl Rd.
99E
Hubbard
A St.
D St.
J St.
Industrial Ave.
Carl Rd.
Woodburn
211
draft
2011 aerial imagery
Legend
Number of Lanes
Two-Lanes
Three-Lanes
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

Other Roads

Two roads intersecting OR 99E within the study area are classified as arterials. OR 551 (Wilsonville-Hubbard Highway) is classified as a rural minor arterial in the HDM and a regional highway in the OHP. It is a two-lane highway that connects OR 99E with I-5 to the north near Wilsonville. Ehlen Rd. is classified as an arterial in the Marion County Transportation System Plan and connects OR 99E to I-5 directly west of Aurora. All other roads intersecting OR 99E are two-lane local facilities.

TRAFFIC VOLUMES

AADT

As shown in Figure 3, annual average daily traffic volumes (AADT) vary widely along the corridor. The major changes in volume occur at the two connection points to I-5 - Ehlen Rd./Liberty St. in Aurora and OR 551. To the north of Liberty St., the volume is roughly 15,500 vehicles per day (vpd). Between Liberty St. and OR 551, the volumes drop to between 6,800 and 8,100 vpd. To the south of OR 551, the volumes increase again to between 15,200 and 16,400 vpd.

Hourly Volumes

The variation in traffic volumes by hour of the day is shown Figure 4 for three representative locations along the corridor. The volumes were obtained from 16-hour traffic counts conducted for 11 intersections within the study area.

The first location is just north of the intersection of OR 99E/Liberty St. The volume profile reflects the commuter traffic in the AM and PM peak periods, with higher volumes in the southbound direction in the morning and more balanced flows by direction in the afternoon peak. Commuter trips within the corridor have origins and destinations as far away as Portland and Salem. Many of vehicles at this location turn onto/off of OR 99E.

A commute trip pattern also occurs at the intersection of OR 99E/OR 551. Most of the AM peak hour traffic is headed northbound, while in the PM peak hour the highest volumes are in the southbound direction. Many of the commuters at this location likely have work trip destinations in the Portland metropolitan area.

At the intersection of OR 99E/D St. in Hubbard, the commute peaks are not as pronounced as at the intersections of OR 99E/Liberty St. or OR 99E/OR 551. The northbound traffic is fairly constant throughout the day, with the southbound direction showing more peaking during the PM peak.

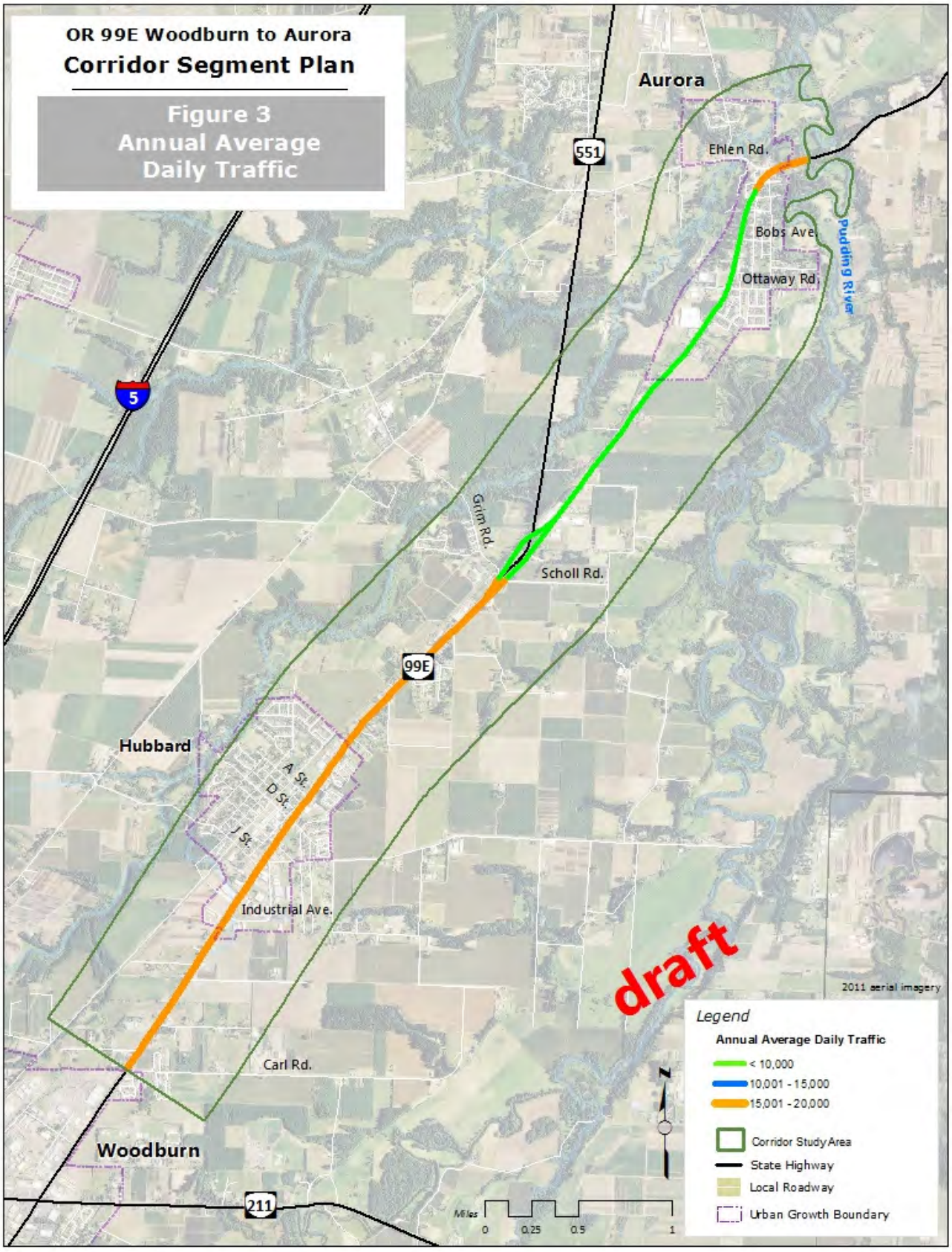

OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 3
Annual Average
Daily Traffic
Aurora
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Pudding River
5
Grim Rd.
Scholl Rd.
99E
Hubbard
A St.
D St.
J St.
Industrial Ave.
Carl Rd.
Woodburn
211
draft
2011 aerial imagery
Legend
Annual Average Daily Traffic
< 10,000
10,001 - 15,000
15,001 - 20,000
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
N
Miles
0
0.25
0.5
1

Figure 4a
Hourly Traffic Variation
OR 99E North of Liberty St.

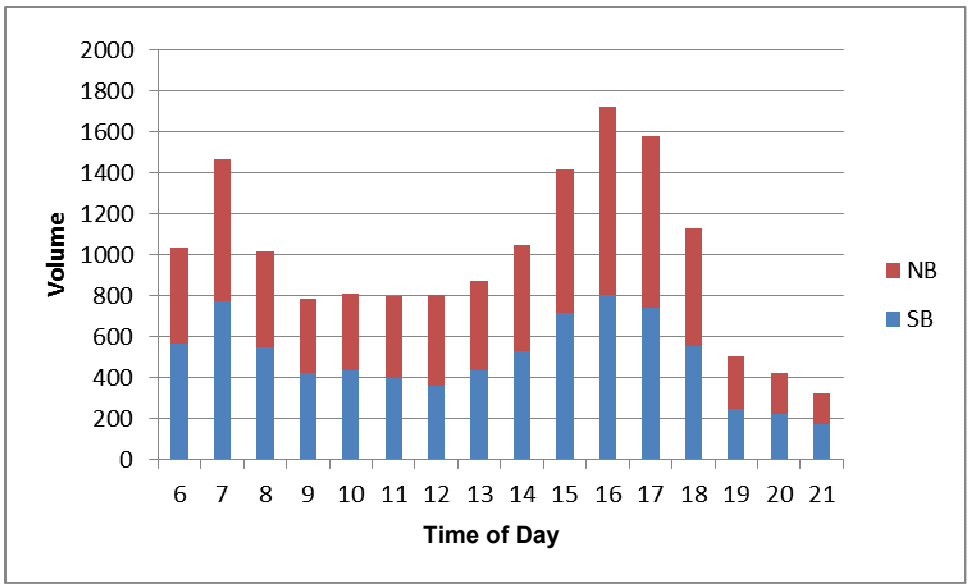


Figure 4b
Hourly Traffic Variation
OR 99E South of OR 551

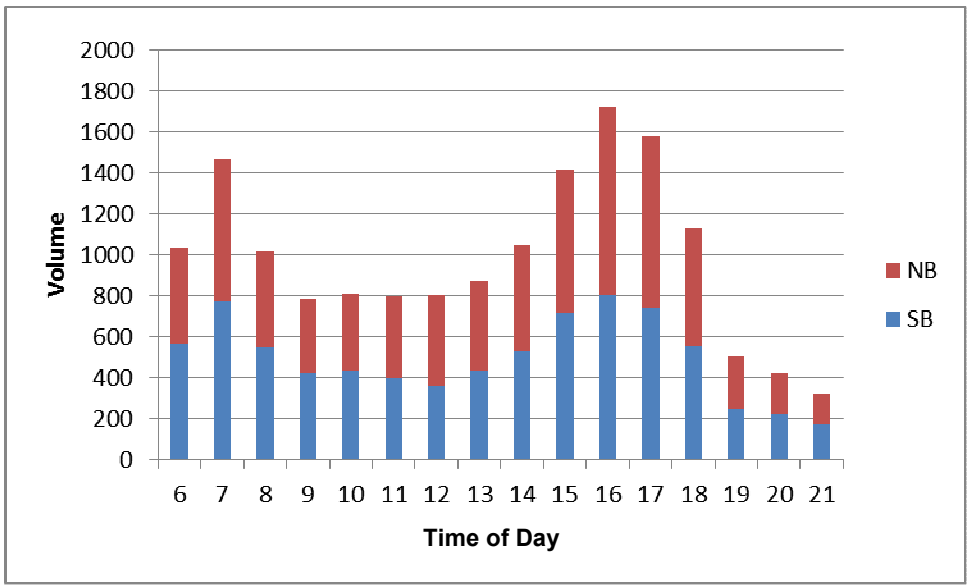
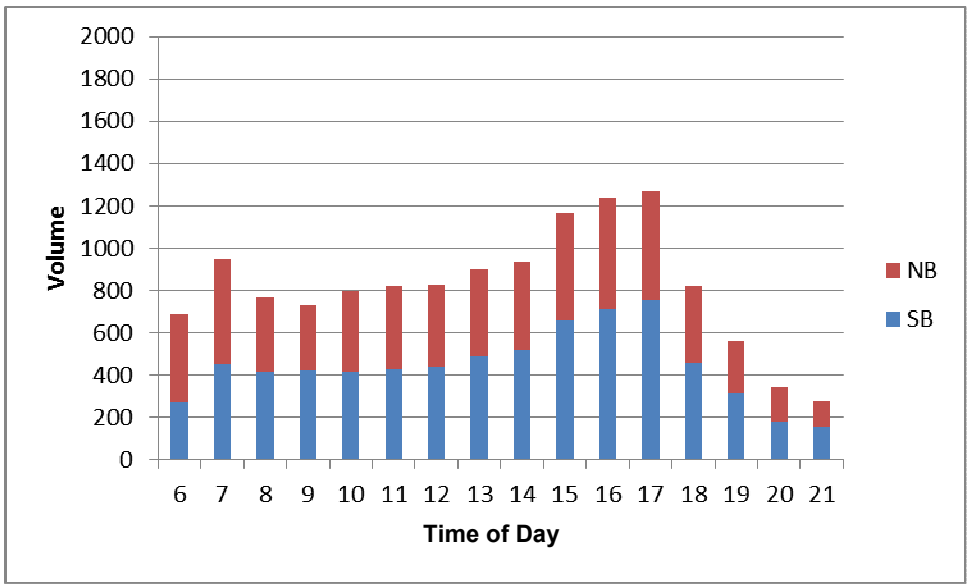


Figure 4c
Hourly Traffic Variation
OR 99E South of D St.



DHV

Design hour volumes (DHVs) are shown in Figure 5. These volumes correspond to the time period for which existing conditions were analyzed. The volumes were developed based on the traffic counts for the 11 study area intersections using the procedures contained in ODOT's Analysis Procedures Manual (APM).[1]

An examination of the count data showed that the system peak for all of the intersections occurs between 4:30 and 5:30 PM. Therefore, the counts for this hour were used in the development of the DHVs.

Because eight of the counts were conducted by ODOT prior to 2011, growth factors were applied to convert these counts to the 2011 time period. Following this, seasonal adjustment factors were applied to all of the counts to reflect the 30th highest hour. The "ATR seasonal trend method" described in the APM was used to determine the factors. This method was selected rather than the "on-site ATR method" or "ATR characteristics table method" because no ATR locations were found that met all of the similarity criteria for OR 99E within the study area. The final step in the process was to balance the exiting and entering DHVs between intersections where necessary.

[1] Oregon Department of Transportation, Analysis Procedures Manual, (2011).


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 5
Design Hour Volumes
Aurora
551
Ehlen Rd.
Bobs Ave
Ottaway Rd.
Pudding River
5
Grim Rd.
Scholl Rd.
99E
Hubbard
A St.
D St.
J St.
Industrial Ave.
Carl Rd.
Woodburn
211
draft
2011 aerial imagery
Legend
Design Hour Volumes
< 1,000
1,001 - 1,500
1,501 - 2,000
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

ROADWAY NEEDS

Existing roadway needs were analyzed in the areas of capacity, traffic operations, safety, geometrics, and access.

Capacity

Existing capacity needs were identified by comparing volume-to-capacity (v/c) ratio estimates for roadway segments and intersections to the appropriate v/c ratio standards. The applicable standards for regional highways are shown in Table 1. The standards reflect the proposed revisions to the OHP Policy 1F that went into effect in January, 2012.

Table 1
V/C Standards

Area	Segments/Signalized Intersections	Unsignalized Intersections*
Inside Urban Growth Boundary		
Non-MPO outside of STAs where non-freeway posted speed <= 35 mph, or a designated UBA	0.90	0.95
Non-MPO outside of STAs where non-freeway speed > 35 mph, but < 45 mph	0.85	0.90
Within STA	1.0	1.0
Outside Urban Growth Boundary		
Rural lands	0.80	0.85

Source: Table 6 of the OHP Policy 1F Proposed Revisions – Public Review Draft
* For unsignalized intersections, the v/c ratio is for the uncontrolled approaches.

Segment Capacity

For analysis purposes, roadway segments were defined by grouping together lengths of roadway that shared similar characteristics. Segment endpoints were established either where one of more of the characteristics changed or at signalized intersections. Table 2 shows the segments and the roadway characteristics considered for the segmentation.

Segment v/c ratio estimates were developed using the DHV estimates. The analysis was performed according to the methodology for two-lane rural highways outlined in the 2000 Highway Capacity Manual (HCM2000)[2] and the APM. With this methodology, the factors for determining the traffic flow rate include the percentages of trucks and buses and recreational vehicles and the peak hour factor. These factors reflect the effect of the various

[2] Transportation Research Board, Highway Capacity Manual, Special Report 209, (2000).

Table 2
Analysis Segments

Analysis Segment	From/To	Milepost	Speed Limit	AADT	Truck %	Lanes	Control
1	Pudding River - Liberty St.	24.55-24.88	45	15,500	6.21	2	Signal
2	Liberty St. - Orchard Ave.	24.88-25.70	30	8,100	6.21	3	--
3	Orchard Ave. – OR 551	25.70-27.54	50	6,800	6.21	2	Signal
4	OR 551 - Union 76 Dwys.	27.54-28.81	50	16,400	7.38	2	--
5	Union 76 Dwys. – D St.	28.81-29.26	35	15,200	7.38	2	Signal
6	D St. – Industrial Ave.	29.26-29.96	35	15,200	7.38	3	--
7	Industrial Ave. - Carl Rd.	29.96-30.86	50	16,100	7.38	2	--

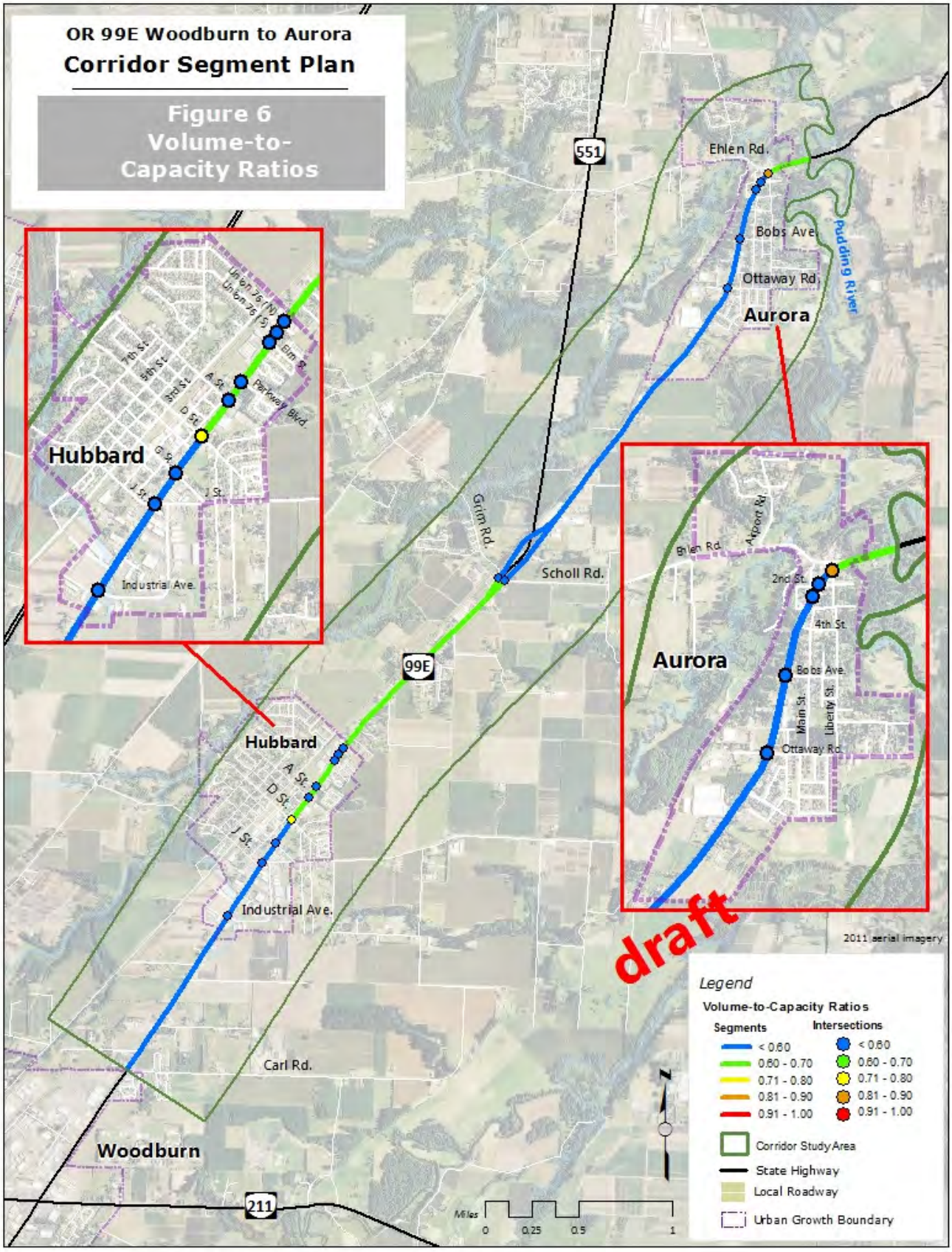
vehicle types on the traffic flow and capacity of a roadway. Table 3 and Figure 6 show the estimated v/c ratio for each of the seven segments. As can be seen, all of the segments operate well within the mobility standard.

Table 3
V/C Ratio – Roadway Segments

Analysis Segment	From/To	Milepost	Mobility Standard (V/C Ratio)	V/C Ratio
1	Pudding River - Liberty St.	24.55-24.88	0.80	0.62
2	Liberty St. - Orchard Ave.	24.88-25.70	0.95	0.35
3	Orchard Ave. – OR 551	25.70-27.54	0.85	0.34
4	OR 551 - Union 76 Dwys.	27.54-28.81	0.85	0.60
5	Union 76 Driveways – D St.	28.81-29.26	0.90	0.60
6	D St. – Industrial Ave.	29.26-29.96	0.90	0.53
7	Industrial Ave. - Carl Rd.	29.96-30.86	0.80	0.50

Intersection Capacity

V/C ratio estimates were also developed for the intersections shown in Figure 6 using the HCM2000 methodologies for signalized and unsignalized intersections. These methodologies


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 6
Volume-to-Capacity Ratios
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
Hubbard
Union Pacific (N)
Union Pacific (S)
Elm St.
7th St.
5th St.
3rd St.
A St.
Parkway Blvd.
D St.
G St.
J St.
Industrial Ave.
Grim Rd.
Scholl Rd.
99E
Hubbard
Carl Rd.
Woodburn
211
Aurora
Airport Rd.
Ehlen Rd.
2nd St.
4th St.
Bobs Ave.
Main St.
Liberty St.
Ottaway Rd.
draft
2011 aerial imagery
Legend
Volume-to-Capacity Ratios
Segments
< 0.60
0.60 - 0.70
0.71 - 0.80
0.81 - 0.90
0.91 - 1.00
Intersections
< 0.60
0.60 - 0.70
0.71 - 0.80
0.81 - 0.90
0.91 - 1.00
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

relationship of the critical volume of the intersection to the intersection capacity.

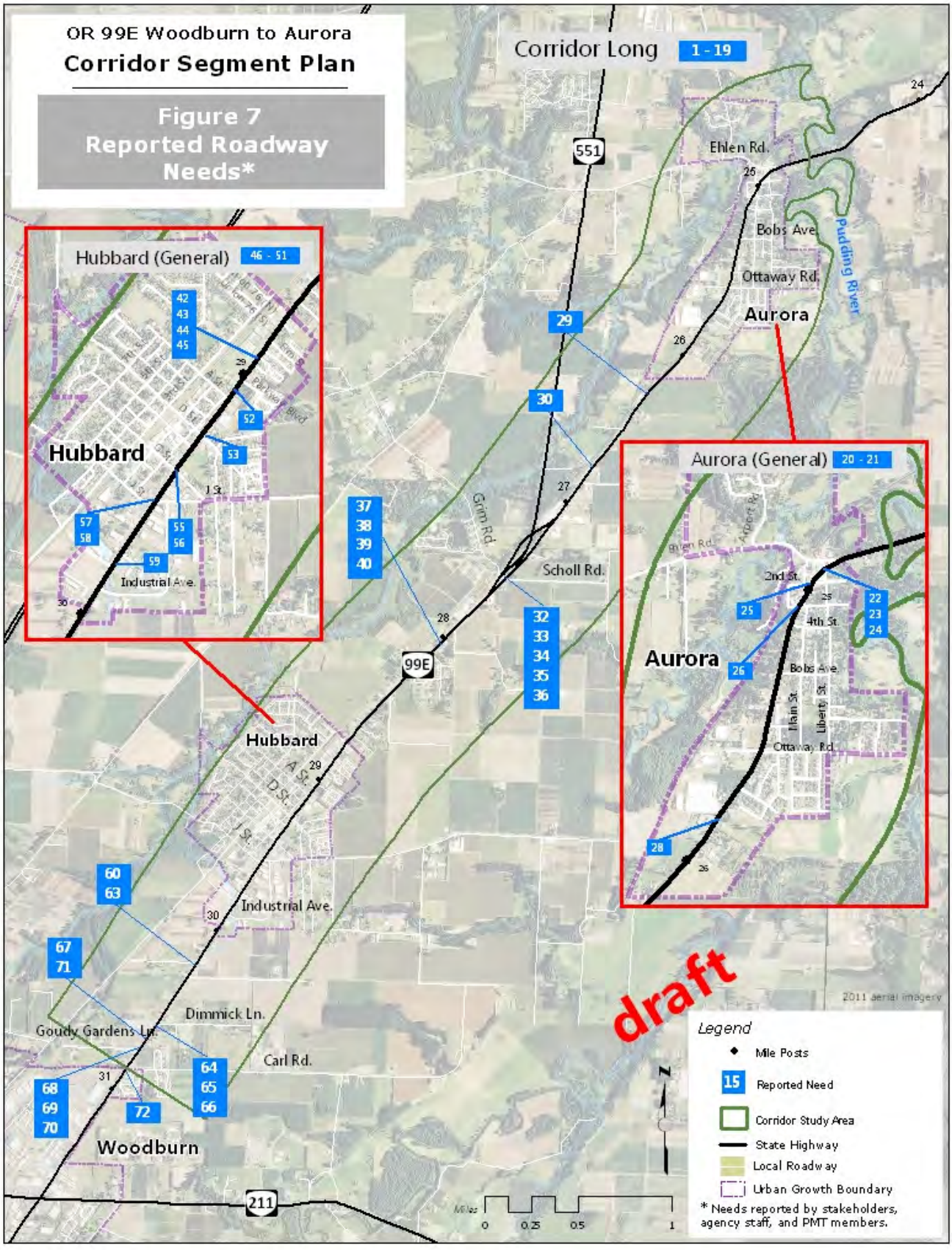
The results of the intersection capacity analysis are shown in Table 4 and Figure 6. All of the intersections currently operate within the mobility standards.

Table 4
V/C Ratio – Intersections

Intersection	Mobility Standard (V/C Ratio)	V/C Ratio
OR 99E/Liberty St.	1.0	0.90
OR 99E/Ottaway Rd.	0.90	0.23
OR 99E/OR 551 (Grim Rd.)	0.70	0.48
OR 99E/OR 551 (Scholl Rd.)	0.70	0.34
OR 99E/Union 76 N. Dwy.	0.85	0.07
OR 99E/Union 76 S. Dwy.	0.85	0.15
OR 99E/Elm St.	0.90	0.21
OR 99E/Parkway Blvd.	0.90	0.05
OR 99E/A St.	0.90	0.31
OR 99E/D St.	0.90	0.84
OR 99E/G St.	0.90	0.31
OR 99E/J St.	0.90	0.21
OR 99E/Industrial Ave.	0.90	0.06

Reported Capacity Needs

There were multiple comments from stakeholders, agency staff and PMT members about the general need for additional capacity along the corridor, as well at specific locations (see Figure 7 and Table A-1 in Appendix A). It was noted that the corridor becomes congested during commute times, particularly in the southbound direction north of Hubbard. Congestion also occurs when there are traffic incidents on I-5 and OR 99E is used as an alternate route and during special events in the area, such as the Mt. Angel Oktoberfest, Mt. Angel Tulip Festival and the Hubbard Hops Festival. In Aurora and Hubbard, needs were identified for continuous two-way center turn lanes through the entire city. Also in Hubbard, the need for a traffic signal at G St. was identified. General congestion was reported at the OR 551 intersections.


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 7
Reported Roadway Needs*
Corridor Long 1 - 19
Hubbard (General) 46 - 51
Aurora (General) 20 - 21
Hubbard
Aurora
Woodburn
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Pudding River
Grim Rd.
Scholl Rd.
Industrial Ave.
Dimmick Ln.
Goudy Gardens Ln.
Carl Rd.
2nd St.
4th St.
Main St.
Liberty St.
1 St.
A St.
D St.
99E
551
211
draft
2011 aerial imagery
Legend
Mile Posts
Reported Need
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
* Needs reported by stakeholders, agency staff, and PMT members.
Miles
0 0.25 0.5 1
N

Traffic Operations

Traffic operations needs were identified for unsignalized intersections where left-turn lanes or right-turn lanes may be needed.[3] Left-turn lanes may be needed to reduce the possibility of rear-end collisions or improve traffic flow by preventing left-turning vehicles from blocking the flow of through traffic. Right-turn lanes may be needed to reduce the delay of through vehicles behind right-turning traffic and to ease right-turns for drivers from the higher-speed through traffic stream.

Turn lane needs were determined using the turn lane criteria contained in the APM.[4] The volume criterion for left-turn lanes is based on the hourly opposing plus advancing volume per lane, hourly turning volume, and posted speed limit at an intersection. Thus, as the opposing plus advancing volume and/or turning volume increases, or as the speed limit increases, the volume threshold at which a turn lane should be considered decreases. The volume criterion for right turn lanes is based on the hourly approaching volume in the outside lane (through plus right-turn volume), hourly turning volume, and speed limit. As any of these factors increases, the volume threshold for a right-turn lane decreases.

The results of the analysis are shown in Figure 8. Most of the turn lane needs are concentrated in and near Hubbard, where left-turn lanes are needed at the south driveway for the Union 76 station, Elm St., and Parkway Blvd. Right-turn lanes are needed at Union 76 station north driveway and J St. There are needs for both left and right-turn lanes at A St.

At the south driveway for the Union 76 station and at Elm St., the volume thresholds for left-turn lane volume criterion were not met. Needs were identified at these locations, however, based on the "special cases" criterion for left-turn lanes described in the APM. With this criterion, sight distance, alignment, operating speeds, nearby access movements, and other safety-related concerns may be considered in determining the need for a left-turn lane.

At the Union 76 station driveway, the rationale for a northbound left-turn lane is that the left-turn volume is only one less than the threshold and it is located near the transition from a 35-mph to 55-mph speed zone. In addition, there are several other accesses nearby on both sides of the highway. The need for a southbound left-turn lane at Elm St. was identified for similar reasons, including a 50-mph speed zone less than 500 feet to the north and the proximity to a SPIS site just to the south where numerous rear-end collisions have occurred.

In Aurora, the only turn lane needs identified were at Ottaway Rd., where both a southbound left-turn lane and southbound right-turn lane are needed. No needs were identified in the rural portions of the corridor.

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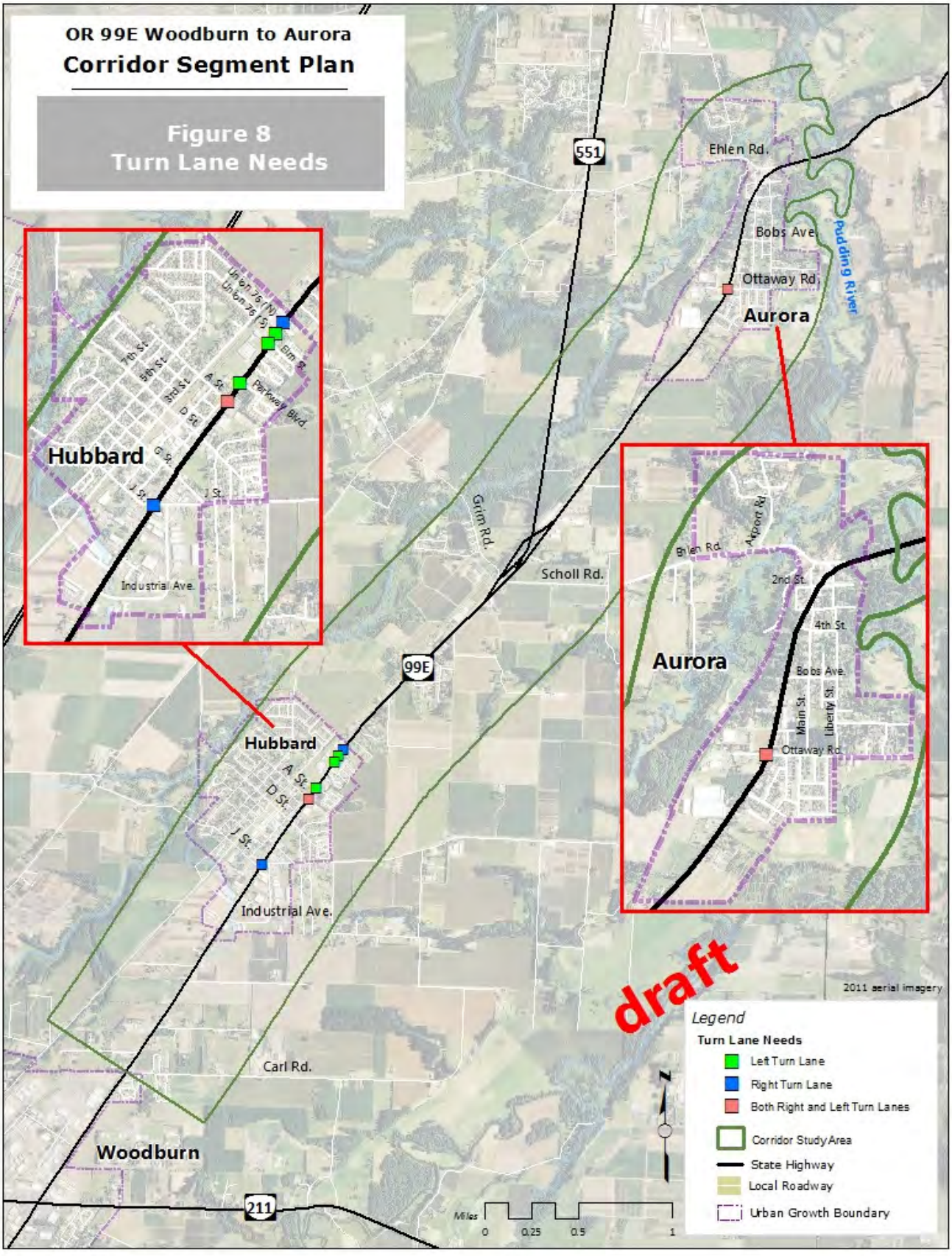
[3] The need for turn lanes at signalized intersections are typically determined based on capacity requirements.
[4] Oregon Department of Transportation, Analysis Procedures Manual, (2011).


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 8
Turn Lane Needs
551
Ehlen Rd.
Bobs Ave
Ottaway Rd.
Aurora
Pudding River
Hubbard
Union St (N)
Union St (S)
Elm St.
7th St.
6th St.
5th St.
A St.
Parkway Blvd.
D St.
G St.
J St.
Industrial Ave.
Grim Rd.
Scholl Rd.
99E
Ehlen Rd.
Airport Rd.
2nd St.
4th St.
Main St.
Liberty St.
Carl Rd.
Woodburn
211
draft
2011 aerial imagery
Legend
Turn Lane Needs
Left Turn Lane
Right Turn Lane
Both Right and Left Turn Lanes
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

The turn lane needs are summarized in Table 5 below.

Table 5
Turn Lane Needs

Intersection	Northbound		Southbound	
	LT	RT	LT	RT
OR 99E/Ottaway Rd.			√	√
OR 99E/Union 76 N. Dwy.				√
OR 99E/Union 76 S. Dwy.	√			
OR 99E/Elm St.			√	
OR 99E/Parkway Blvd.			√	
OR 99E/A St.	√			√
OR 99E/J St.		√		

Numerous traffic operations needs were reported by stakeholders, agency staff, and PMT members (see Figure 7 and Table A-1). Many of the comments were related to problems with turning vehicles and the need for two-way center lanes and turn lanes at intersections, particularly at locations within and near Aurora and Hubbard where these facilities do not exist. Other specific concerns noted were:

- Delays and backups caused by school buses stopping in the middle of the highway.
- Difficulty in turning onto the highway from side streets in Hubbard, except D St.
- Driver confusion with the lane drops/additions at OR 551 (Grim Rd. and Scholl Rd. intersections).
- Driver confusion with the lack of lane definition in the wide cross-section south of J St. in Hubbard.
- Delays caused by agricultural vehicles in August – October.

Safety

ODOT maintains the Safety Priority Index System (SPIS) for the identification and analysis of locations on the state highway system with potential safety needs. Each year, the system is used to produce reports of sites within each ODOT Region that are ranked within the top 10% of all SPIS sites statewide. The SPIS score is based on three years of crash data and considers crash frequency, crash rate, and crash severity. A roadway location is defined as a SPIS site if it has three or more crashes or one or more fatal crashes over the three-year period. SPIS sites are 0.10 mile sections on the state highway system.

To provide a more comprehensive assessment of overall safety conditions along roadway segments and intersections within the study area, two additional safety measures were developed. The crash frequency for roadway segments was calculated as the number of crashes per million vehicle miles traveled (MVM). The crash frequency for intersections was measured as the number of crashes per million entering vehicles (MEV). The crash rates were developed using data for the 2006 – 2010 time period.

A summary of overall safety conditions within the study area is provided below, followed by a description of conditions within each analysis segment, including SPIS sites.

Corridor Wide

Along the length of the corridor, there was a single fatality between 2006 and 2010. The other crashes were split about evenly between property damage only (PDO) and injury-type crashes. One pedestrian collision that resulted in an injury was recorded over the five-year period.

Figure 9
Crash Frequency by Category

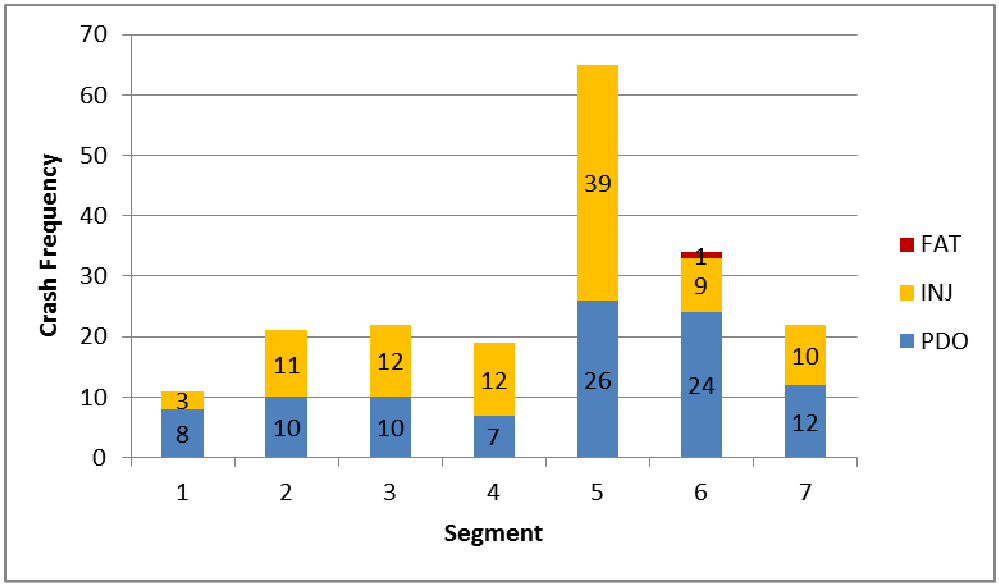
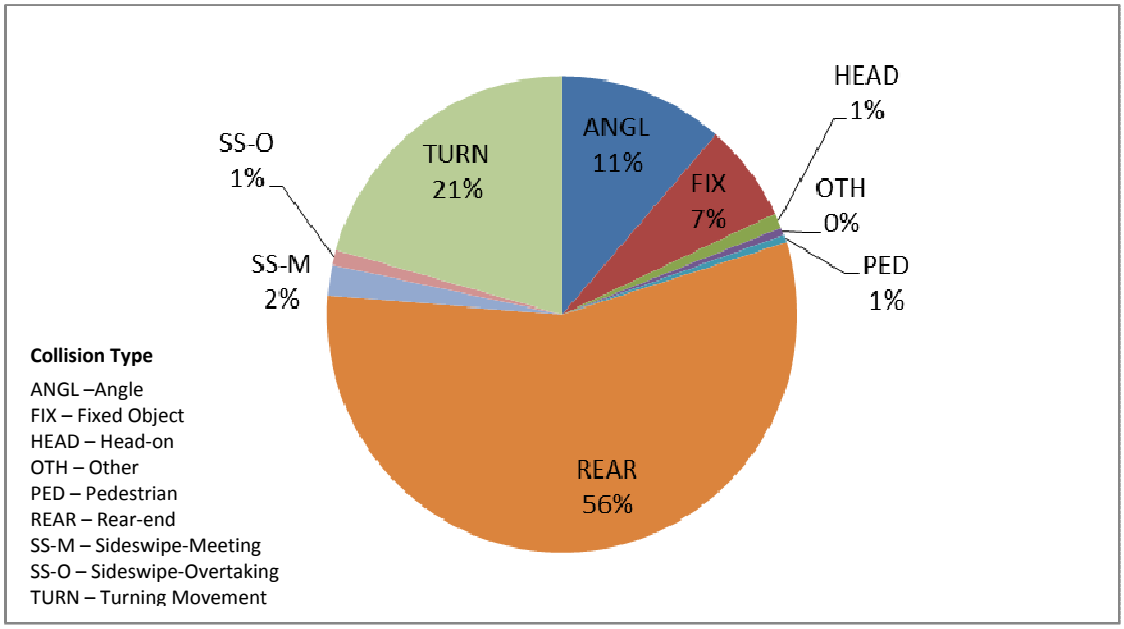


Figure 10 shows the breakdown of crashes by type for the entire corridor. The majority of the crashes (56%) were rear-end-type crashes. The next most common crash types were turn (21%) and angle (11%) crashes. These types of crashes are typically seen along corridors with higher traffic volumes and congested conditions.

Table 6 and Figure 11 show the crash rates by analysis segment, together with the statewide average crash rate for the corresponding segment type. For the purpose of comparing the crash rates to the statewide averages, Segments 3 and 4 are considered to be minor arterials in

Figure 10
Crash Frequency by Type



a rural area, while the other five segments are considered to be minor arterials in rural cities.

The data indicate that the crash rates for three of the seven segments are higher than the statewide average.

Table 6
Crash Rates – Segments

Analysis Segment	From/To	Milepost	Crash Frequency	Crash Rate (MVM)	Statewide Avg. Crash Rate*
1	Pudding River - Liberty St.	24.55-24.88	11	1.18	1.54
2	Liberty St. - Orchard Ave.	24.88-25.70	21	1.73	1.54
3	Orchard Ave. – OR 551	25.70-27.54	22	0.96	0.96*
4	OR 551 - Union 76 Dwys.	27.54-28.81	19	0.50	0.96*
5	Union 76 Dwys. – D St	28.81-29.26	65	5.21	1.54
6	D St. – Industrial Ave	29.26-29.96	34	1.75	1.54
7	Industrial Ave. - Carl Rd	29.96-30.86	22	0.83	1.54

* Unless marked with an asterisk, the statewide average crash rate shown is for minor arterials in rural cities. Asterisks indicate the crash rate for minor arterials in rural areas.

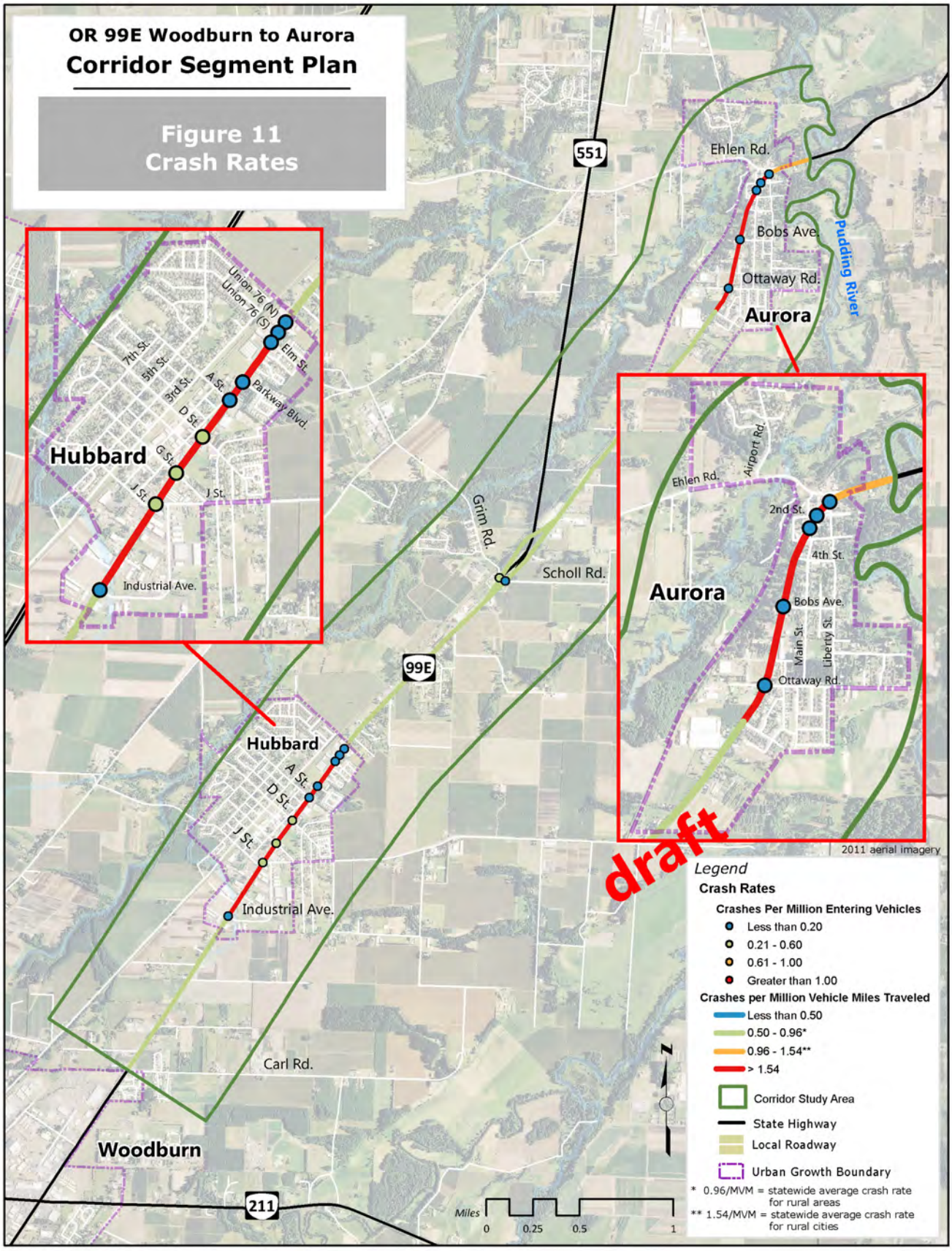

OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 11
Crash Rates
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
Union 76 (N)
Union 76 (S)
Elm St.
7th St.
5th St.
3rd St.
A St.
Parkway Blvd.
D St.
Hubbard
G St.
J St.
J St.
Industrial Ave.
Grim Rd.
Scholl Rd.
Airport Rd.
Ehlen Rd.
2nd St.
4th St.
Aurora
Bobs Ave.
Main St.
Liberty St.
Ottaway Rd.
99E
Hubbard
A St.
D St.
J St.
Industrial Ave.
Carl Rd.
Woodburn
211
draft
2011 aerial imagery
Legend
Crash Rates
Crashes Per Million Entering Vehicles
Less than 0.20
0.21 - 0.60
0.61 - 1.00
Greater than 1.00
Crashes per Million Vehicle Miles Traveled
Less than 0.50
0.50 - 0.96*
0.96 - 1.54**
> 1.54
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
* 0.96/MVM = statewide average crash rate for rural areas
** 1.54/MVM = statewide average crash rate for rural cities
N
Miles
0
0.25
0.5
1

Table 7 shows the crash rates for selected intersections along the corridor. Intersections with crash rates of 1.0 or higher are typically considered as candidates for additional analysis. None of the intersections have crash rates above 1.0.

Table 7
Crash Rates – Intersections

Intersection	Milepost	Crash Frequency	Intersection Crash Rate (MEV)
OR 99E/Liberty St.	24.88	5	0.14
OR 99E/2nd St.	24.95	1	0.06
OR 99E/Main St.	25.01	3	0.16
OR 99E/Bobs Ave.	25.30	0	0.00
OR 99E/Ottaway Rd.	25.56	3	0.17
OR 99E/OR 551 (Grim Rd.)	27.54	11	0.59
OR 99E/OR 551 (Scholl Rd.)	27.53	2	0.15
OR 99E/Union 76 Dwys.	28.79	1	0.03
OR 99E/Elm St.	28.90	4	0.13
OR 99E/Parkway Blvd.	28.93	1	0.03
OR 99E/A St.	29.11	5	0.17
OR 99E/D St.	29.26	16	0.50
OR 99E/G St.	29.41	15	0.51
OR 99E/J St.	29.54	6	0.22
OR 99E/Industrial Ave.	29.89	0	0.00

Segment 1 – Pudding River to Liberty St.

Most of the crashes within this segment were at the intersection of OR 99E/Liberty St. and involved rear-end type collisions.

Segment 2 – Liberty St. to Orchard Ave.

As in the rest of the corridor, the majority of the crashes within this segment were rear-end-type collisions. Most of the crashes occurred near the intersection of OR 99E/Ottaway Rd. This intersection is near the transition between the 55-mph zone in the rural segment to the south and the 35-mph zone in the Aurora. Excessive speed and lack of attention to the speed zone transition could be contributing factors to the high frequency of rear-end collisions within this segment.

Segment 3 – Orchard Ave. to OR 551

Within Segment 3, more than half of the crashes occurred at or near the intersection of OR99E/Grim Rd. Most of the crashes were rear-end or turn-type crashes, which are common at signalized intersections.

Segment 4 – OR 551 to Union 76 Driveways

Most of the crashes were rear-end or turn-type collisions and were evenly distributed throughout the segment.

Segment 5 – Union 76 Driveways to D St.

As shown in Figure 12, there is a SPIS site within Segment 5 to the north of D St. in Hubbard that was identified within the top 5% of SPIS sites statewide. The majority of crashes within this segment were rear-end-type collisions involving southbound vehicles. A particular concern is the higher percentage of injury crashes relative to the rest of the corridor. Potential causes could be excessive speed and lack of attention to the transition between 55-mph speeds to the north and 35-mph speeds within the segment.

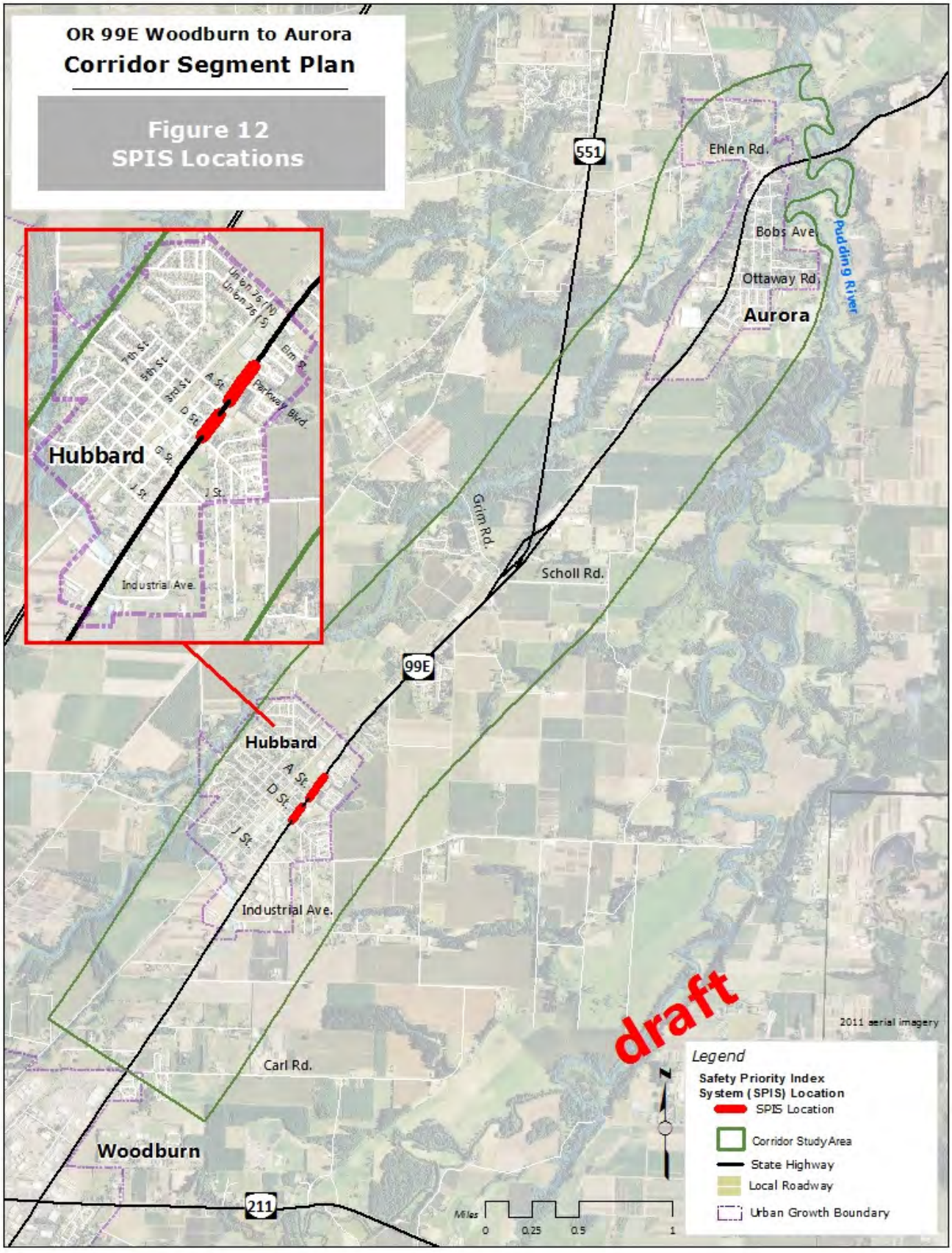
Segment 6 – D St. to Industrial Ave.

One fatal crash occurred within this segment at the intersection of OR 99E/Schmidt Ln. The crash involved a southbound vehicle on OR 99E and an eastbound left-turning vehicle. The cause of the crash was determined to be the failure of the left turning vehicle to yield the right-of-way. The driver of this vehicle was killed in the collision. No other crashes were recorded at this intersection.

Approximately one-half of the remaining crashes within this segment occurred at or near the intersection of OR 99E/G St. Most of these crashes were between vehicles traveling straight through the intersection on OR 99E and vehicles attempting to cross the highway from G St. This type of crash pattern indicates that gaps in the traffic stream may be limited and that drivers are unwilling to wait for adequate gaps to safely cross the intersection. The rear-end-type crashes were evenly distributed along the segment.

Segment 7 – Industrial Ave. to Carl Rd.

Most of the crashes were rear-end, fixed-object, or turn-type collisions. They occurred along the length of the segment, with no major concentrations of crashes.


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 12
SPIS Locations
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
Hubbard
Union Pacific (N)
Union Pacific (S)
7th St.
5th St.
3rd St.
A St.
D St.
G St.
J St.
Elm St.
Parkway Blvd.
Industrial Ave.
Grim Rd.
Scholl Rd.
99E
Hubbard
A St.
D St.
J St.
Industrial Ave.
Carl Rd.
Woodburn
211
draft
2011 aerial imagery
Legend
Safety Priority Index System (SPIS) Location
SPIS Location
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

Reported Safety Needs

Safety needs reported by stakeholders, agency staff, and PMT members are shown in Figure 7 and Table A-1. There were general concerns about unprotected left turns onto and off of OR 99E due to the lack of two-way left-turn lanes, intersection turn lanes, and sufficient shoulders at most locations. This is a particular problem when trucks and schools buses block the entire travel lane while waiting to make a turn. Compounding this problem is the high number of accesses along the highway.

Other concerns include the lack of lighting along the highway, especially at crosswalks, and the large speed zone changes throughout the corridor. The need for better maintenance of lane and shoulder striping, rumble strips, and reflectors to improve visibility of the highway was also mentioned. Other safety problems are related to driver behavior, such as passing on the right in the shoulder and disobeying traffic signals.

Safety problems identified for specific locations included driver confusion at the OR 99E/OR 551 intersections due to the configuration of the intersections and a safety need at OR 99E/G St. intersection in Hubbard.

Geometrics

Existing geometric needs were identified for roadway segments and intersections by comparing existing geometric features to roadway standards.

Segment Geometrics

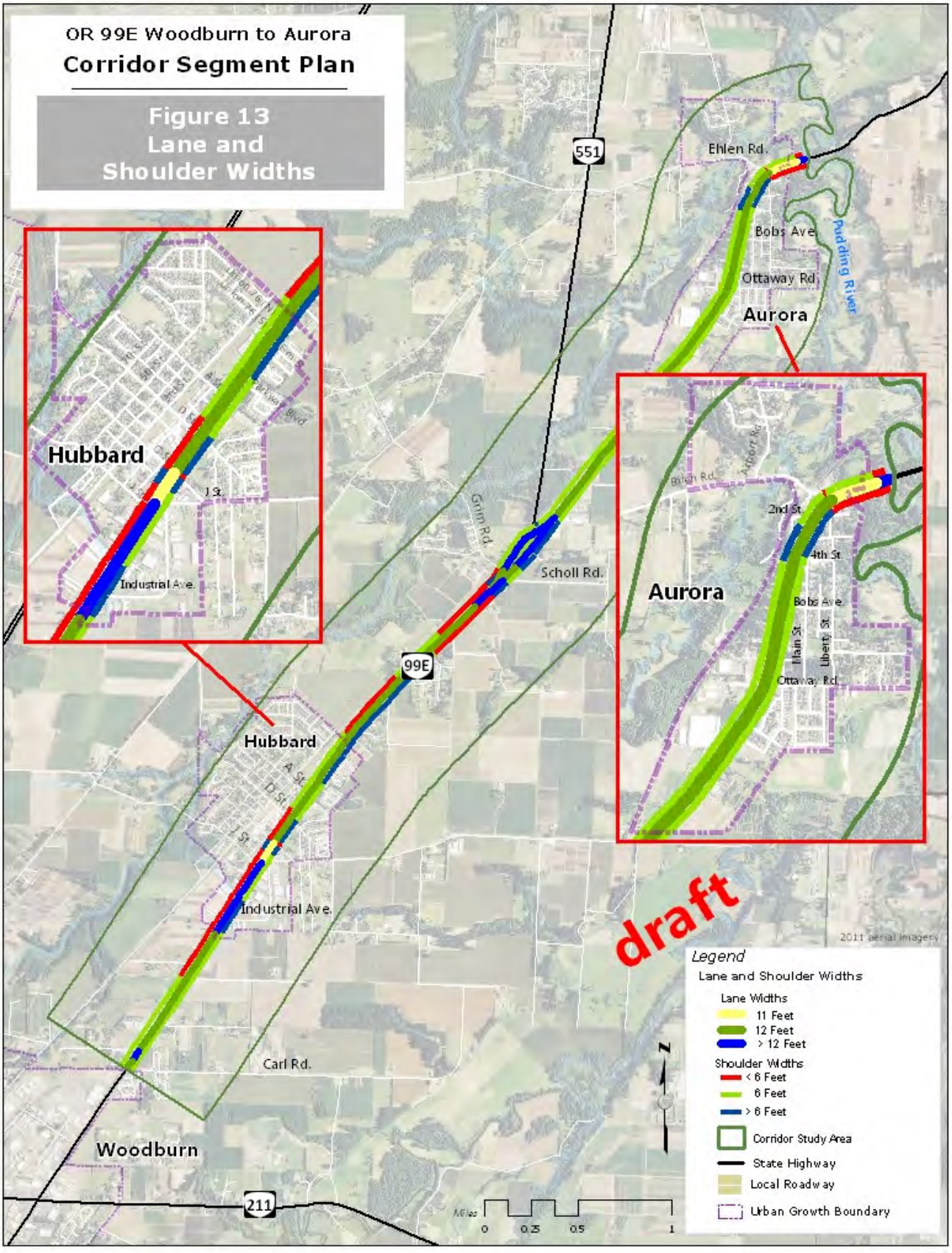
Within the study area, the lane width standard for OR 99E is 11 feet and the shoulder width standard is 6 feet.[5]

Existing lane and shoulder widths are shown in Table 8 and Figure 13. All lane widths are at least 11-12 feet, which meets or exceeds the standards for each analysis segment. The shoulder widths vary, with many locations not meeting the 6-foot standard. These locations are shown in Figure 14.

Intersection Geometrics

For intersections, geometric needs were analyzed for the minor road approaches. Approach width, approach grade, intersection angle, and intersection sight distance were investigated and compared to AASHTO standards.

[5] Oregon Department of Transportation, Highway Design Manual, (2003).


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 13
Lane and
Shoulder Widths
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
Hubbard
J St.
Industrial Ave.
Grim Rd.
Scholl Rd.
99E
Aurora
2nd St.
4th St.
Bobs Ave.
Main St.
Liberty St.
Ottaway Rd.
Hubbard
A St.
D St.
J St.
Industrial Ave.
draft
2011 aerial imagery
Carl Rd.
Woodburn
211
Legend
Lane and Shoulder Widths
Lane Widths
11 Feet
12 Feet
> 12 Feet
Shoulder Widths
< 6 Feet
6 Feet
> 6 Feet
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1
N

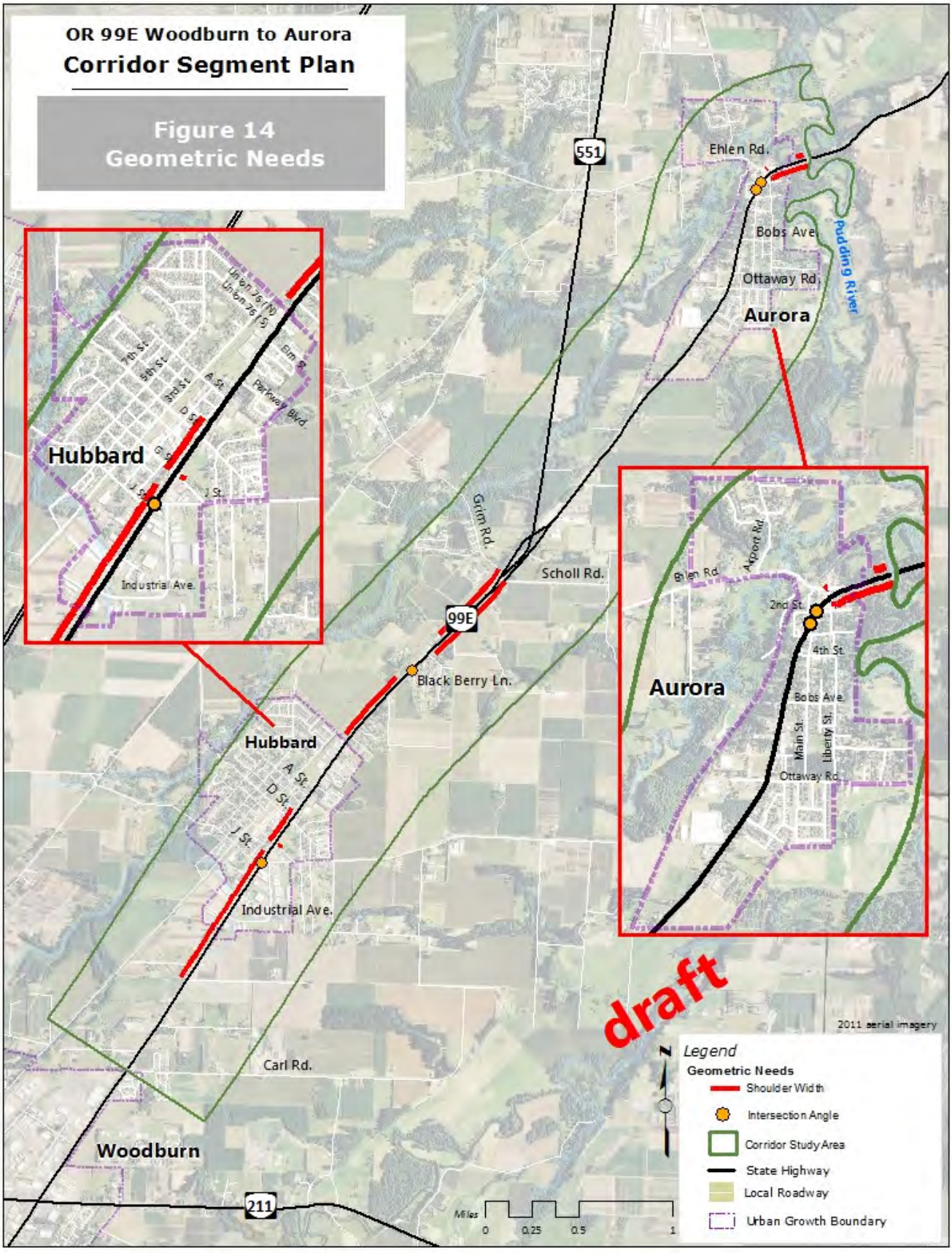

OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 14
Geometric Needs
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
Hubbard
Union St (N)
Union St (S)
7th St.
5th St.
3rd St.
A St.
D St.
G St.
J St.
Elm St.
Parkway Blvd.
Industrial Ave.
Grim Rd.
Scholl Rd.
99E
Black Berry Ln.
Hubbard
A St.
D St.
J St.
Industrial Ave.
Carl Rd.
Woodburn
211
Aurora
Ehlen Rd.
Airport Rd.
2nd St.
4th St.
Bobs Ave.
Main St.
Liberty St.
Ottaway Rd.
draft
2011 aerial imagery
Legend
Geometric Needs
Shoulder Width
Intersection Angle
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
N
Miles
0
0.25
0.5
1

Table 8
Lane and Shoulder Widths

Analysis Segment	From/To	Milepost	Lane Width (ft.)*	Left Shoulder Width (ft.)*	Right Shoulder Width (ft.)*
1	Pudding River - Liberty St.	24.55-24.88	11-14	**4-6**	**3-4**
2	Liberty St. - Orchard Ave.	24.88-25.70	11-14	**5-16**	**5-14**
3	Orchard Ave. – OR 551	25.70-27.54	12-16	**4-16**	**5-8**
4	OR 551 - Union 76 Dwys.	27.54-28.81	12-18	**3-6**	**5-14**
5	Union 76 Dwys. – D St.	28.81-29.26	12-14	**4-21**	6-19
6	D St. – Industrial Ave.	29.26-29.96	11-20	**3-10**	**5-11**
7	Industrial Ave. - Carl Rd	29.96-30.86	12-20	**5-6**	6

* Bold values indicate shoulder width does not meet standard.

Intersection approach widths should be a minimum of 22 feet, based on the lane width standard width of 11 feet. Only the intersection of Saunders Ln. near Hubbard did not meet this standard.

Approach grades should be 3 percent or lower for all roadways.[6] The approach grades along OR 99E are nominal and none of the intersections investigated failed to meet this standard.

The intersection angle should be no less than 60 degrees.[7] Intersections where this standard is not met are 2nd St. and Main St. in Aurora, Black Berry Ln., and J St. in Hubbard. These intersections are shown in Figure 14.

At intersections identified as having a skewed alignment based on field reconnaissance or comments received from stakeholders, agency staff, and the PMT, the intersection sight distance was measured. Sight distance deficiencies were found at the following intersections:

- Westbound approach of OR 99E/2nd St. – The sight distance to the south of 255 feet does not meet the standard of 335 feet due to the intersection angle and an obstruction caused by vehicles in a parking lot on the south side of the street.

[6] AASHTO, A Policy on the Geometric Design of Highways and Streets, (2004).
[7] AASHTO, A Policy on the Geometric Design of Highways and Streets, (2004).

- Eastbound approach of OR 99E/G St. – Although this intersection is not skewed, the sight distance to the south of 220 feet does not meet the standard of 390 feet because of obstructions caused by a utility pole and parked vehicles on the south side of the approach.
- Eastbound approach of OR 99E/J St. – The sight distance to the north and south from the stop bar is limited due to the intersection angle and obstructions caused by vegetation on the north and south sides of the street.

Reported Geometric Needs

Comments regarding geometric needs were focused on inadequate shoulder widths and skewed intersections. It was reported that wider shoulders are needed throughout the corridor to provide an adequate area for emergency and school bus stops as well as bicycle and pedestrian use. Skewed intersections were reported at several locations, including 2nd St. and 3rd St. in Aurora, J St. in Hubbard, and Dimmick Ln., Goudy Gardens Ln., and Carl Rd. This is particularly a problem at intersections with higher truck volumes, making turns onto/off of the highway difficult for trucks.

Access

Similar to many state highways which, in addition to serving through traffic demand, provide access to adjacent property, there are areas along OR 99E with high concentrations of access points. The problems associated high access density are well understood, including reduced capacity, traffic operations and safety conflicts between slower-moving turning vehicles and higher-speed through-traffic, and degradation of the bicycle and pedestrian environment.

In order to better understand access conditions along the corridor, an inventory of existing approaches was conducted including public streets and private driveways. For each approach, information was collected on the physical location, characteristics, approach type, tax lot identification number(s), property owner(s), business name and address, and type of use. The data was assembled from a combination of sources, including field reconnaissance, ODOT road inventory data, Marion County and Mid-Willamette Valley COG tax lot data, and information from the ODOT R/W Research Unit. This information is summarized in the figures and table contained in Appendix B.

In addition to the inventory data, information was obtained on existing access control. ODOT has acquired access control in limited areas along the corridor. Where access control exists, there is no right-of-access between the property and the highway as the result of either the acquisition or elimination by law of the right-of-access. Where no right-of-access is present, an approach cannot legally exist and an application for an approach permit cannot be accepted unless there is a reservation of access. Access control is shown at the following locations in the Appendix B figures by a red line along the highway right-of-way:

- Near Liberty St. in Aurora
- North and south of OR 551
- Adjacent to weigh stations
- South end of corridor south of Dimmick Ln.

Reservations of access represent specific locations where access rights remain, including maximum allowable approach width and, in certain cases, use restrictions. A reservation of access affords the property owner the right to apply for an approach permit but does not guarantee ODOT approval of a driveway at the requested location. Existing reservations of access can be relocated or slightly modified upon approval of ODOT through a process referred to as "indenture of access." As shown in in the Appendix B figures, reservations of access exist at only four locations along the corridor near the weigh station on the west side of the highway and to the south of Dimmick Ln. on the east side of the highway.

The OHP establishes access management spacing standards to improve safety and mobility by limiting turning conflicts. These standards, which apply to both driveways and public streets, vary depending on posted speed and the character of surrounding land uses.

Using the approach inventory data, the existing access spacing within the study area was compared to ODOT's spacing standards to identify areas that do not meet the standards.[8] Table 9 presents the results of the evaluation, showing the number of approaches by segment along each side of the highway and comparing the average approach spacing (total number of approaches divided by segment length) to the applicable spacing standard.

Table 9
Access Spacing

Analysis Segment	From/To	Milepost	No. of Approaches		Average Approach Spacing			No. of Approaches Allowed
			East-side	West-side	Std. (ft.)	East-side	West-side	
1	Pudding River - Liberty St.	24.55-24.88	4	3	750	436	581	2
2	Liberty St. – 4th St.	24.88-25.10	4	8	175	290	145	7
3	4th St. – Orchard Ave.	25.10-25.70	24	11	425	132	288	7
4	Orchard Ave. – Aurora SCL	25.70-25.95	7	3	830	189	440	2
5	Aurora SCL – Grim Rd.	25.95-27.54	20	20	990	420	420	8

[8] Standards reflect the approach spacing requirements contained in SB 264 that went into effect on January 1, 2012.

Table 9 (cont.)
Access Spacing

Analysis Segment	From/To	Milepost	No. of Approaches		Average Approach Spacing			No. of Approaches Allowed
			East-side	West-side	Std. (ft.)	East-side	West-side	
6	Grim Rd. – Hubbard NCL	27.54-28.81	36	25	830	186	268	8
7	Hubbard NCL – J St.	28.81-29.51	18	23	425	205	161	9
8	J St. – Schmidt Ln.	29.51-29.78	7	7	750	204	204	2
9	Schmidt Ln. - Carl Rd	29.78-30.86	16	13	830	356	439	7

While this level of analysis does not identify specific properties where the spacing standards are not met, it does reflect the degree to which the overall spacing is consistent with the standards. The right-most column of the table indicates the maximum number of approaches that would be allowed according to the standards. This number is exceeded for all of the segments except Segment 2 (Liberty St. – 4th St.) on the east side of the highway. The largest differences are for Segment 3 (4th St. – Orchard Ave.), Segments 5 and 6 (Aurora SCL to Hubbard NCL), and Segment 7 (Hubbard NCL to J St.).

BICYCLE AND PEDESTRIAN

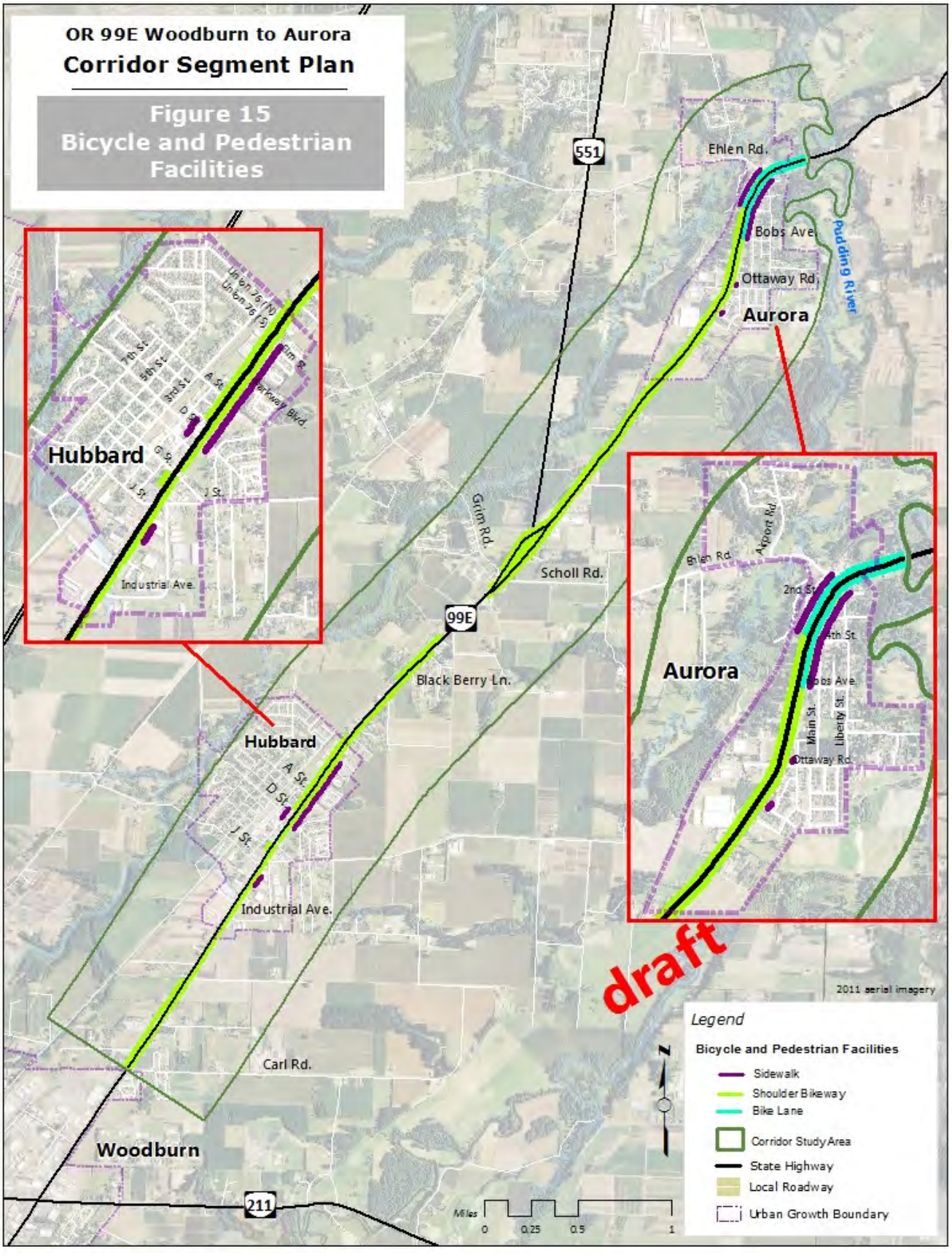
FACILITIES

Existing bicycle and pedestrian facilities are shown in Figure 15. Within Aurora, bicycle lanes or shoulder bikeways are provided along most of OR 99E, with sidewalks available primarily to the north of Bobs Ave. There are no bike lanes in Hubbard and shoulder bikeways exist mainly on the east side of the highway. Sidewalks are concentrated on the east side of the highway to the north of D St. Within the rural portions of the study area, continuous shoulder bikeways are available on both sides of OR 99E between Aurora and OR 551. To the south of OR 551, they are provided intermittently. There are no pedestrian facilities in the rural areas.

BICYCLE AND PEDESTRIAN VOLUMES

Bicycles and pedestrian volumes were collected as a part of the 16-hour vehicle turning movement counts that were available for the study. These volumes are shown in Table 10.

Higher bicycle volumes occur in Hubbard compared to Aurora. Within both areas, there is a relatively large amount of pedestrian activity. It is noted that the volumes for the locations in Aurora, particularly the bicycle volumes, may be understated due to what appeared to be irregularities in the count data.


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 15
Bicycle and Pedestrian Facilities
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Puddin g River
Hubbard
Union Pacific (N)
Union Pacific (S)
7th St.
5th St.
3rd St.
A St.
D St.
G St.
J St.
Flim St.
Parkway Blvd.
Industrial Ave.
Grim Rd.
Scholl Rd.
99E
Black Berry Ln.
Hubbard
A St.
D St.
J St.
Industrial Ave.
Carl Rd.
Woodburn
211
Aurora
Ehlen Rd.
Airport Rd.
2nd St.
4th St.
Bobs Ave.
Main St.
Liberty St.
Ottaway Rd.
draft
2011 aerial imagery
Legend
Bicycle and Pedestrian Facilities
Sidewalk
Shoulder Bikeway
Bike Lane
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

In addition to the locations shown in Table 10, bicycle and pedestrian trips were observed in the rural portions of the corridor.

Table 10
16-Hour Bicycle and Pedestrian Volumes

Intersection	Bicycle Volume	Pedestrian Volume
OR 99E/Liberty St.	0	0
OR 99E/2nd St.	0	92*
OR 99E/Main St.	1	37
OR 99E/Bobs Ave.	3	1
OR 99E/Ottaway Rd.	4	5
OR 99E/OR 551 (Grim Rd.)	3	6
OR 99E/OR 551 (Scholl Rd.)	2	6
OR 99E/Union 76 N. Driveway	11	30
OR 99E/Union 76 S. Driveway	11	12
OR 99E/Elm St.	22	149
OR 99E/Parkway Blvd.	3	38
OR 99E/A St.	17	N/A
OR 99E/D St.	9	166
OR 99E/G St.	6	61
OR 99E/J St.	16	23
OR 99E/Industrial Ave.	16	31

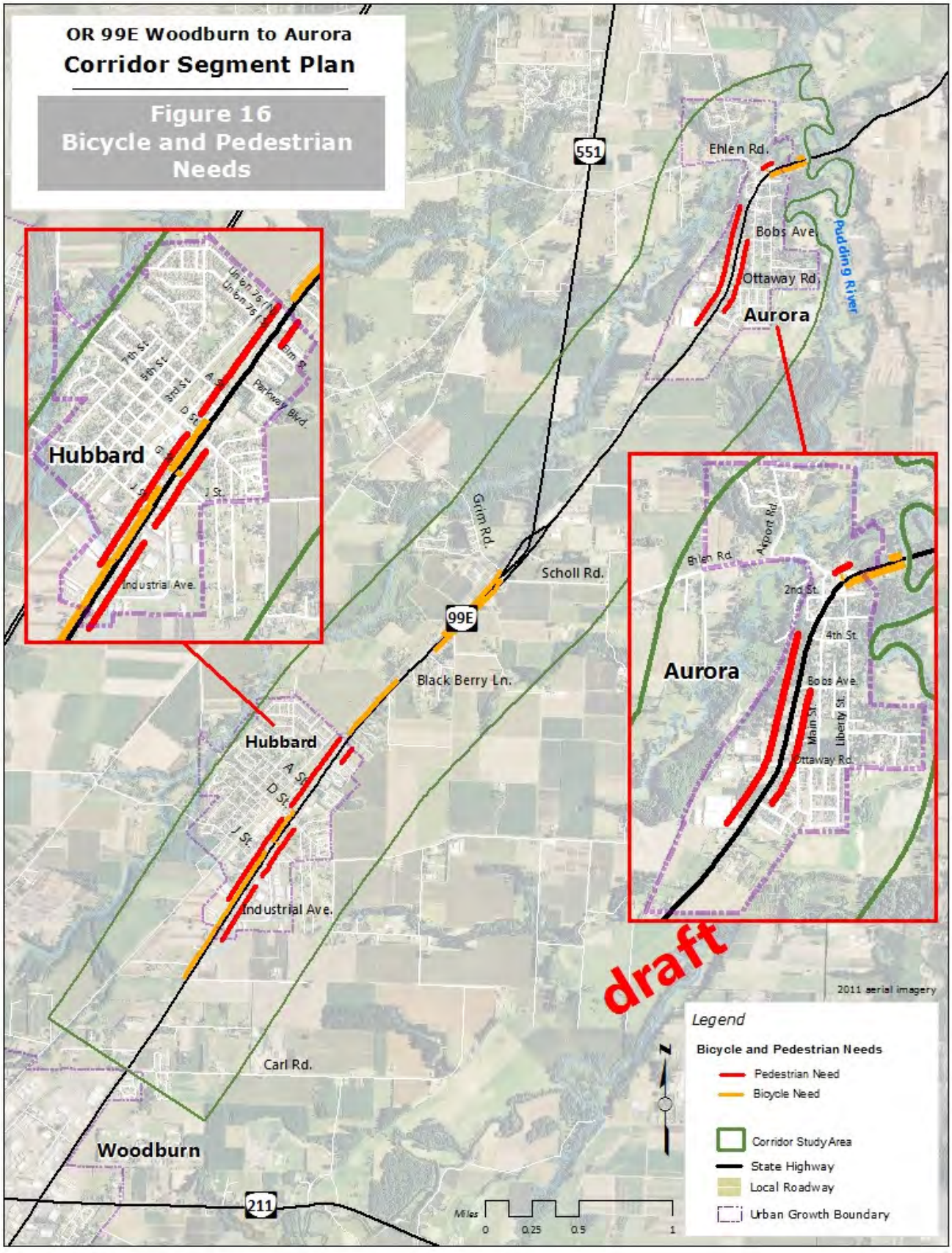
* Pedestrian counts available for 9:00 AM – 2:00 PM period only

NEEDS

The counts and observed bicycle trips suggest the need for continuous bicycle facilities throughout the study area. These could be either bike lanes in the urban areas or shoulder bikeways in both the urban and rural areas.

ODOT's standard width for bike lanes is six feet.[9] The recommended shoulder bikeway width is the same as the shoulder width standard of six feet. Bicycle facility needs can be defined where these standards are not met. These locations are shown in Figure 16. Within Aurora, bicycle needs exist on the east side of the highway from Liberty St. to the northern end of the study area. Between OR 551 and Hubbard, there are bicycle needs where the shoulder widths are less than the 6-foot standard. A need also exists on the west side of OR 99E from roughly D St. in Hubbard to Ingalls Rd. south of town.

[9] ODOT, Highway Design Manual, (2003).


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 16
Bicycle and Pedestrian Needs
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
Hubbard
Grim Rd.
Scholl Rd.
99E
Black Berry Ln.
Industrial Ave.
Carl Rd.
Woodburn
211
Airport Rd.
2nd St.
4th St.
Main St.
Liberty St.
draft
2011 aerial imagery
Legend
Bicycle and Pedestrian Needs
Pedestrian Need
Bicycle Need
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

The pedestrian counts indicate that there are also needs for continuous pedestrian facilities in both Aurora and Hubbard. The need for sidewalks in urban areas is described in the HDM, which states that "Sidewalks should be provided on all urban highways within city limits with the possible exception of limited access expressways."[10]

ODOT's sidewalk width standard is six feet.[11] Figure 16 shows existing pedestrian needs at locations along OR 99E in Aurora or Hubbard where either this standard is not met or there are no sidewalks. As can be seen, there are pedestrian needs on the west side of the highway in Aurora to the south of 4th St. and on the east side of the highway to the south of Bobs Ave. In Hubbard, pedestrian needs exist along both sides of the highway in most parts of the city. In rural areas where sidewalks are not practical, the HDM indicates that paved shoulders, which are currently provided along OR 99E in these areas, can serve pedestrians as well as bicyclists.

There were numerous comments from the stakeholders that conditions for bicycle travel are unsafe throughout the corridor, particularly in the rural areas (see Figure 17 and Table A-1 in Appendix A). A need was identified for wider shoulders in these areas to accommodate bicyclists.

The lack of continuous sidewalks along OR 99E within Hubbard was reported as a pedestrian need. The need for safe crossing areas was also noted, such as near the Union 76 station north of Hubbard, where there is a high volume of pedestrian crossings from the mobile home park on the east side of the highway. Within the rural areas, it was noted that school children walking along the highway to/from school bus stops is very unsafe. A comment was also made that pedestrians walking along the highway between Hubbard and Aurora need to be accommodated.

CORRIDOR HEALTH

Corridor Health Concept

The U.S. Department of Transportation recommends the use of a multiple criteria to analyze needs and prioritize transportation projects and investments in rural areas.[12] Following this guidance, a Corridor Health Tool was applied to OR 99E within the study area. The corridor health concept is based on the idea of measuring the "health" of the corridor within several different categories of performance, and then combining the measurements to provide a picture of overall corridor health.

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[10] ODOT, Highway Design Manual, (2003).
[11] ODOT, Highway Design Manual, (2003).
[12] U.S. Department of Transportation, Planning for Transportation in Rural Areas, (2001).


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 17
Reported Bicycle
and Pedestrian Needs
Corridor Long
5, 11, 19
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
Hubbard
Industrial Ave.
Parkway Blvd.
Elm St.
Union St. (N)
Union St. (S)
7th St.
5th St.
3rd St.
A St.
D St.
G St.
J St.
Grim Rd.
Scholl Rd.
99E
Airport Rd.
2nd St.
4th St.
Main St.
Liberty St.
Dimmick Ln.
Goudy Gardens Ln.
Carl Rd.
Woodburn
211
41
48
54
31
27
61
62
63
draft
2011 aerial imagery
Legend
Mile Posts
15
Reported Need
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

Development of Factors, Weights, and Formulas

The Corridor Health Tool comprises a set of factors, weights, and formulas that are used to calculate a composite health score for each corridor segment. The factors correspond to the same areas of need described in the previous sections, i.e., capacity, traffic operations, safety, geometrics, access, and bicycle and pedestrian facilities.

A set of weights was developed for the factors, with the sum of the weights equal to 100. The weights were determined based on input received from the PMT members. The members were asked to identify an appropriate weight for each factor. The responses were then averaged to obtain the final weights.

Formulas were developed to calculate scores for the factors. The formulas were set up to produce scores ranging from zero to one, with a score of 1 representing "perfect" health and a score of zero indicating very poor conditions or performance. The weights and formulas for each factor are shown in Table 11.

Table 11
Corridor Health Score Weights and Formulas

Factor	Weight	Scoring Formula
Safety	33.33	=0.5/X if X $\geq$ 0.5; else 1 Where: X = 0.7*(Fatal +Injury Crash Rate for Segment/ Average for Facility Category) + 0.3*(Total Crash Rate for Segment/ Average for Facility Category)
Traffic Operations	18.33	=1-min(Turn Lane Need Density, Max. Turn Lane Need Density)/Max. Turn Lane Need Density*
Access	10.00	=min(Avg. Spacing/Spacing Standard, 1)
Geometrics	10.00	=0.2*min(Lane Width/Lane Width Standard,1)+0.8*min(Shoulder Width/Shoulder Width Standard,1)
Bicycle/Pedestrian Facilities	15.00	=(0.5*% of Segment with Adequate Sidewalks+0.5*% of Segment with Adequate Bike Facilities)/100**
Capacity	13.33	=min((1-VC)/(1-VC Standard),1)

* Turn lane need density is the number of turn lanes (left turn+right turn) needed per mile. Maximum turn lane need density represents the worst need condition, for which a value of 16 was assumed.

** In the rural segments, sidewalks were excluded, so the formula was: % of Segment with Adequate Bike Facilities/100.

The factor scores were multiplied by the weights to produce an overall corridor health score for each segment ranging between 0 and 100, with 100 representing the best score attainable and 0 being the worst score.

Results

The corridor health scores are shown in Table 12 and Figure 18. For ease of understanding, the the segments were assigned to good, fair, and poor categories of corridor health based on the scores. The scores corresponding to each category are the following:

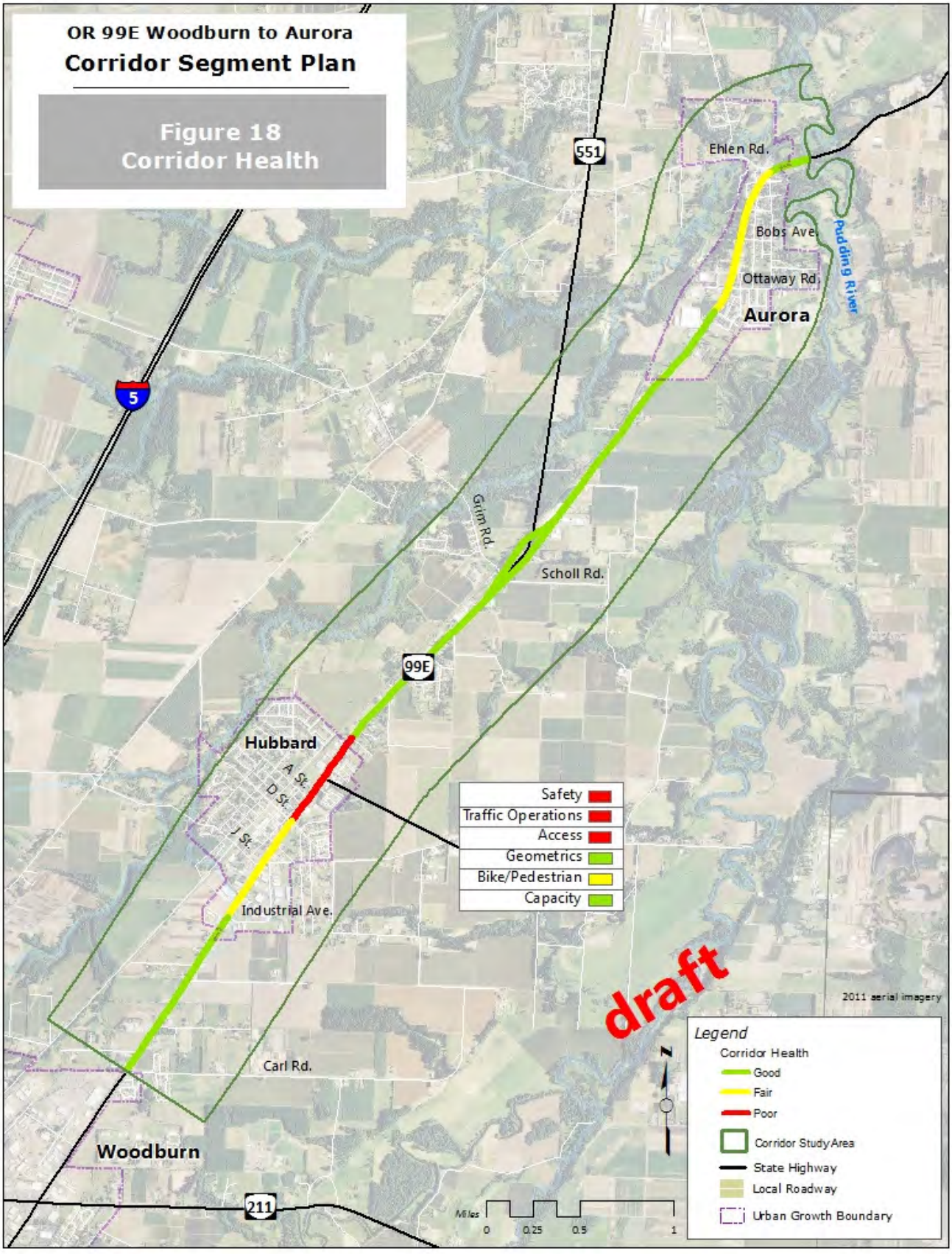
- Good – 75 – 100
- Fair – 50 – 74
- Poor - < 50

Table 12
Corridor Health Scores

Analysis Segment	From/To	Milepost	Health Score						
			Safety	Traffic Ops.	Access	Geom.	Bike/ Ped.	Cap.	Total Score
1	Pudding River - Liberty St.	24.55-24.88	1.00	1.00	0.68	0.79	0.51	1.00	87.38
2	Liberty St. - Orchard Ave.	24.88-25.70	0.43	0.85	0.26	0.92	0.65	1.00	64.82
3	Orchard Ave. – OR 551	25.70-27.54	1.00	1.00	0.53	0.88	1.00	1.00	94.07
4	OR 551 - Union 76 Dwys.	27.54-28.81	1.00	1.00	0.29	0.83	0.43	1.00	82.64
5	Union 76 Dwys. - D St.	28.81-29.26	0.14	0.17	0.33	0.92	0.69	1.00	43.98
6	D St. – Industrial Ave.	29.26-29.96	0.65	0.91	0.26	0.83	0.29	1.00	67.00
7	Industrial Ave. - Carl Rd.	29.96-30.86	1.00	1.00	0.64	0.96	0.78	1.00	92.59

The total scores for all of the segments fall in the good or fair categories, with the exception of Segment 5. The primary factors contributing to the poor score for Segment 5 are safety, traffic operations, and access.

The traffic operations, geometrics, and capacity scores fall in the good category for all of the segments except Segment 5, where the score for traffic operations is poor. Access conditions are generally poor along the corridor, with only three of the segments in the fair category. The scores for bicycle and pedestrian facilities vary widely, ranging from a high of 100 for Segment 3 to a low of 29 for Segment 6.


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 18
Corridor Health
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
5
Grim Rd.
Scholl Rd.
99E
Hubbard
A St.
D St.
J St.
Industrial Ave.
Carl Rd.
Woodburn
211
Safety
Traffic Operations
Access
Geometrics
Bike/Pedestrian
Capacity
draft
2011 aerial imagery
Legend
Corridor Health
Good
Fair
Poor
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
N
Miles
0
0.25
0.5
1

Appendix A

REPORTED NEEDS

Table A-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Reported Needs

Location	Milepost(s)	Reported Need				
		No.	Description	Type*	Frequency**	Source
OR 99E Pudding River (Aurora) to Woodburn North UGB Mileposts 24.67 – 30.86						
Corridor-Long	24.67 – 30.86	1	Too many accesses along highway.	A	2	Stakeholder interviews
Corridor-Long	24.67 – 30.86	2	Skewed intersections, e.g., Dimmick Ln.	G	1	Stakeholder interviews
Corridor-Long	24.67 – 30.86	3	General congestion in corridor at commute times, particularly in southbound direction coming into Hubbard.	C	3	Stakeholder interviews
Corridor-Long	24.67 – 30.86	4	Passing on right on shoulder.	O	1	Stakeholder interviews
Corridor-Long	24.67 – 30.86	5	Lack of bike lanes very unsafe – bike lanes needed.	B	5	Stakeholder interviews
Corridor-Long	24.67 – 30.86	6	Left-turn conflicts.	O	4	Stakeholder interviews
Corridor-Long	24.67 – 30.86	7	Problems in morning and afternoon with school buses stopping in middle of highway, resulting in back-ups. School bus turnouts or wider shoulders needed.	G,O	4	Stakeholder interviews
Corridor-Long	24.67 – 30.86	8	Congestion occurs when highway is used as alternate route due to problems on I-5.	C	1	Stakeholder interviews
Corridor-Long	24.67 – 30.86	9	Two-way center turn lanes needed.	O	1	Stakeholder interviews
Corridor-Long	24.67 – 30.86	10	Adequate maintenance of lane and shoulder striping.	O	1	Stakeholder interviews
Corridor-Long	24.67 – 30.86	11	Wider shoulders needed for bicycle and pedestrian use and vehicle pull-out area. School children walk along side of highway – very unsafe.	G,B,P	2	Stakeholder interviews
Corridor-Long	24.67 – 30.86	12	More traffic signals would improve emergency vehicle response times.	O	1	Stakeholder interviews
Corridor-Long	24.67 – 30.86	13	High speeds a problem.	S	1	Stakeholder interviews
Corridor-Long	24.67 – 30.86	14	Passing lanes needed.	S	1	Stakeholder interviews
Corridor-Long	24.67 – 30.86	15	Lighting needed, particularly for pedestrians.	S	1	Stakeholder interviews
Corridor-Long	24.67 – 30.86	16	High speeds and traffic volumes at pick-up/drop-off time for elementary school children. Drivers ignore school bus stop signs and go around.	S	1	Stakeholder interviews
Corridor-Long	24.67 – 30.86	17	Rumble strips and reflectors need to be re-installed to improve roadway delineation during dark, rainy months. This was not done after last repaving job.	S	1	Stakeholder interviews
Corridor-Long	24.67 – 30.86	18	Increase number of Canby Transit bus stops so that riders don't have to walk so far along side of highway.	S	1	Stakeholder interviews
Corridor-Long	24.67 – 30.86	19	Safe crossing areas needed for pedestrians at key locations – lighting and pavement markings. Also safe speeds needed in these areas.	P	1	Stakeholder interviews
Aurora	24.83 – 25.82	20	Additional capacity needed – two-way center turn lane or additional travel lanes.	C	1	Stakeholder interviews
Aurora	24.83 – 25.82	21	Continuous two-way center turn lane needed through town.	C	1	Agency staff
Liberty St.	24.88	22	Signal timing makes truck turns difficult.	O	1	Stakeholder interviews
Liberty St.	24.88	23	Turn lane needed.	O	1	Stakeholder interviews
Liberty Rd.	24.88	24	Vehicle backups at railroad crossing to west of intersection interfere with traffic operations at intersection.	O	1	Stakeholder interviews
2nd St.	24.95	25	Skewed intersection – needs to be straightened.	G	1	Agency staff
3rd St.	25.05	26	Section of Main St. between OR 99E and 3rd St. needs to be closed, with straightening of OR 99E/3rd St. intersection.	G	1	Agency staff
Ottaway Rd.	25.56	27	Lighting needed for crosswalk.	P	1	Stakeholder interviews
Aurora SCL	25.82	28	Speeds too high coming into Aurora; distance for transition from 55 mph (M.P. 25.95) to 35 mph (M.P. 25.70) too short.	S	1	Stakeholder interviews
Aurora SCL to OR 551	25.82 – 27.54	29	Agricultural vehicles cause delays in peak agricultural season (Aug. – Oct.); also put mud on highway.	O	1	Agency staff

* A = Access, C = Capacity, G = Geometric, O = Traffic Operations, S = Safety, B = Bike, P = Pedestrian

** Number of comments received.

Table A-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Reported Needs

Location	Milepost(s)	Reported Need				
		No.	Description	Type*	Frequency**	Source
Aurora SCL to Hubbard NCL	25.82 – 28.84	30	Lighting needed.	S	1	Stakeholder interviews
Aurora SCL to Hubbard NCL	25.82 – 28.84	31	Unsafe conditions for bicycle use.	B	1	Stakeholder interviews
OR 551	27.54	32	Safety problem at this location. Example - drivers use single lane approach in northbound direction as two lanes; would be safer if it were two lanes. Also, intersection of SB OR 99E/SB OR 551 should be located further away from OR 99E/Grim Rd. intersection.	S	4	Stakeholder interviews
OR 551	27.54	33	Driver confusion with lane drop south of Grim Rd. intersection in SB direction and exit to OR 551 north of Scholl Rd. intersection in NB direction.	O	2	Stakeholder interviews
OR 551	27.54	34	Congestion	C	2	Stakeholder interviews
OR 551	27.54	35	Existing intersections at Grim Rd. and Scholl Rd. need to be replaced with interchange.	O	1	Agency staff
Grim Rd.	27.54	36	Lack of access for emergency services to North Marion School District schools via Grim Rd. if there is incident or blockage at rail crossing to west of OR 99E/Grim Rd. intersection.	S	1	Stakeholder interviews
North of Hubbard	27.54 – 28.84	37	Tight corners at some intersections – makes turns difficult for large trucks.	G	1	Stakeholder interviews
OR 551 to Hubbard NCL	27.54 – 28.84	38	Speeds too high.	S	1	Stakeholder interviews
OR 551 to A St.	27.54 – 29.11	39	Two-way center turn lane needed.	O	2	Stakeholder interviews
Weigh station to Hubbard	28.18 – 29.26	40	Turn lanes needed.	O	1	Stakeholder interviews
Union 76 station	28.82	41	Pedestrians cross highway between mobile home park and Union 76 station – unsafe, signal needed.	P	1	Stakeholder interviews
Union 76 station to D St.	28.82 – 29.26	42	Crashes due to lack of left turn lanes.	S	2	Stakeholder interviews, agency staff
Union 76 station to D St.	28.82 – 29.26	43	Access control needed.	A	2	Stakeholder interviews, agency staff
Hubbard NCL to D St.	28.84 – 29.26	44	Bottleneck in this section.	O	1	Stakeholder interviews
Hubbard NCL to D St.	28.84 – 29.26	45	Two-way center turn lane needed – many rear-end crashes.	S	1	Stakeholder interviews
Hubbard	28.84 – 30.02	46	Four lanes with two-way center turn lane needed through Hubbard.	O	3	Stakeholder interviews
Hubbard	28.84 – 30.02	47	Left-turn lanes needed.	O	3	Stakeholder interviews
Hubbard	28.84 – 30.02	48	No safe place for bicyclists and pedestrians other than new sidewalk north of D St.	B,P	1	Stakeholder interviews
Hubbard	28.84 – 30.02	49	Additional capacity needed – two-way center turn lane or additional travel lanes.	C	1	Stakeholder interviews
Hubbard	28.84 – 30.02	50	Three-lanes needed on highway for entire distance through town.	O	1	Stakeholder interviews
Hubbard	28.84 – 30.02	51	Very difficult to access highway from side streets other than at signal at D St. – often need to make three right-turns to make a left-turn.	O	2	Stakeholder interviews
South of Parkway Blvd.	29.02 – 29.16	52	This section is 2011 Top 5% SPIS site.	S	1	PMT meeting
D St.	29.26	53	Drivers disobey signal.	S	1	Stakeholder interviews
D St. to J St.	29.26 – 29.54	54	Extend sidewalk on east side of highway from D St. to J St.	P	1	Stakeholder interviews
G St.	29.41	55	May be safety and/or operational issues.	O,S	1	Stakeholder interviews
G St.	29.41	56	Lack of signal creates congestion, operational problems due to significant volumes on G St.	C,O	1	Stakeholder interviews
J St.	29.54	57	Signal needed.	O	1	PMT meeting
J St.	29.54	58	Skewed intersection – needs to be straightened.	G	1	Agency staff
J St. to Hubbard SCL	29.54 - 30.02	59	Wide cross-section makes lane definition confusing.	O	1	Stakeholder interviews
Hubbard SCL to Woodburn NCL	30.02 – 30.86	60	Lighting needed.	S	1	Stakeholder interviews
Hubbard SCL to Woodburn NCL	30.02 – 30.86	61	Pedestrians need to be accommodated in this section.	P	1	Stakeholder interviews
Hubbard SCL to Woodburn NCL	30.02 – 30.86	62	Unsafe conditions for bicycle use.	B	2	Stakeholder interviews
Hubbard SCL to Woodburn NCL	30.02 – 30.86	63	High bicycle crash rate, also fatal crashes involving passing and vehicles in ditches. 6' paved shoulders needed for bikes and emergency stopping.	B,G	1	Agency staff
Dimmick Ln.	30.57	64	Left-turn conflicts	O	1	Stakeholder interviews
Dimmick Ln.	30.57	65	Skewed intersection – needs to be straightened. Trucks turning right from Dimmick Ln. onto highway cut corner due to inadequate turn radius -trailers end up in ditch, street signs are knocked over.	G	4	Stakeholder interviews, PMT meeting, agency staff

Table A-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Reported Needs

Location	Milepost(s)	Reported Need				
		No.	Description	Type*	Frequency**	Source
Dimmick Ln.	30.57	66	Gravel approach on Dimmick Ln. makes acceleration onto highway difficult – county roads should be paved.	O	1	Stakeholder interviews
North of Woodburn NCL	30.57 – 30.86	67	Use of this section as speed trap by police is dangerous because it decreases traffic flow.	S	1	Stakeholder interviews
Goudy Gardens Ln.	30.74	68	Left-turn conflicts.	O	1	Stakeholder interviews
Goudy Gardens Ln.	30.74	69	Skewed intersection – needs to be straightened.	G	3	Stakeholder interviews, PMT meeting, agency staff
Goudy Gardens Ln.	30.74	70	Gravel approach on Goudy Gardens Ln. makes acceleration onto highway difficult – county roads should be paved.	O	1	Stakeholder interviews
North of Woodburn NCL	30.82	71	Change in number of lanes in northbound direction causes accidents – longer transition from two lanes to one lane needed.	S	2	Stakeholder interviews
Carl Rd.	30.85	72	Skewed intersection – needs to be straightened.	G	1	Agency staff

Appendix B

ACCESS INVENTORY

Table B-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
1	East	915+69	30.69	15	Asphalt	Private				-	Residential
2	East	904+99.70BK =1615+00AH	30.64	40	Concrete	Private			16868	-	Residential
3	East	911+47	30.61	20	Asphalt	Private			16898	-	Residential
4	East	908+83	30.56	20	Concrete	Private				-	Residential
5	East	908+30	30.55	25	Asphalt	Public			-	-	Public Street - Dimmick Ln NE
6	East	908+83	30.54	18	Asphalt	Private				Turf and Forage Grass Seed	Retail
7	East	909+88	30.52	25	Asphalt	Private					
8	East	914+10	30.44	20	Asphalt/ Gravel	Private			-	-	Field Access
9	East	915+16	30.42	20	Asphalt/ Gravel	Private			-	-	Field Access
10	East	924+00	30.28	30	Asphalt	Public			-	-	Public Street - Ingalls Lane NE
11	East	926+11	30.24	50	Asphalt/ Gravel	Private			-	Berry Good Farms (12417 Ingalls Ln NE)	Retail
12	East	929+80	30.17	200	Asphalt	Private			17308	Atlas Truck Parts	Automobile Care Center
13	East	935+61	30.06	25	Asphalt	Private			17314	-	Residential
14	East	944+59	29.89	45	Asphalt	Public			-	-	Public Street - Industrial Ave
15	East	946+17	29.86	10	Asphalt	Private			2384	Sabas Auto Repair	Automobile Care Center
16	East	947+23	29.84	12	Asphalt	Private			2424	-	Residential
17	East	951+11	29.76	35	Asphalt	Public			-	-	Public Street - Schmidt Lane
18	East	952+16	29.74	15	Asphalt	Private			2614	Mid-Valley Cycle	Automobile Care Center

Table B-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
19	East	952+69	29.73	15	Dirt	Private				-	Residential
20	East	953+22	29.72	15	Dirt	Private				-	Residential
21	East	954+80	29.69	12	Dirt	Private			-	-	Field Access
22	East	957+44	29.64	35	Concrete	Private			2844, 2754	"The Hub" A Campus of North Marion Fellowship, Godwin Pumps of America, Inc., All-Resistant Coatings	Church
23	East	962+93.3	29.54	54	Asphalt	Public			-	-	Public Street - J Street
24	East	964+51	29.51	33	Asphalt	Private				Turf and Forage Grass Seed	Retail
25	East	967+36.8	29.45	15	Asphalt/ Gravel	Private				Hubbard Self Storage	Storage Units
26	East	968+95	29.42	150	Asphalt	Private			3284		
27	East	969+50	29.41	35	Asphalt	Public			-	-	Public Street - G Street
28	East	975+30	29.3	20	Asphalt	Private			3325	Texaco	Gas Station
29	East	975+30	29.3	34	Concrete	Private			3724	Mariscos Morales, A & D Physicians of Natural and Physical Medicine	Restaurant, Medical
30	East	977+5	29.26	20	Asphalt	Public			-	-	Public Street - D Street
31	East	980+66	29.2	36	Concrete	Private			3776	Furniture Outlet	Retail

Table B-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
32	East	984+89	29.12	44	Concrete	Private			3884	Potelco Inc	Power
33	East	985+94	29.1	58	Concrete	Private			3925	Hubbard Auto Electric	Automobile Care Center
34	East	987+00	29.08	32	Concrete	Private			3954	Pacific NW Transmission & Auto Repair	Automobile Care Center
35	East	990+17	29.02	36	Asphalt	Public			-	-	Public Street - Parkway Boulevard
36	East	991+34.1	29	45	Concrete	Private			4084		
37	East	993+45	28.96	25	Asphalt	Public			-	-	Public Street - Basilio Drive
38	East	995+03	28.93	40	Asphalt	Public			-	-	Public Street - Rudometkin Drive
39	East	996+62	28.9	24	Asphalt	Public			-	-	Public Street - Elm Street
40	East	998+73	28.86	25	Asphalt	Private			4400	Sherwood Mobile Manor	Mobile Home Park
41	East	1000+31	28.83	30	Asphalt	Private			4515, 4524	-	Residential
42	East	1001+90	28.8	20	Asphalt	Private			4464	-	Residential
43	East	1002+84.2	28.77	38	Asphalt	Private			4560	Jeff Vier's Nursery Supply	Nursery
44	East	1004+01	28.76	30	Asphalt	Private			4560	Jeff Vier's Nursery Supply	Nursery
45	East	1006+12	28.72	23	Asphalt	Private			18508	-	Residential
46	East	1006+65	28.71	24	Asphalt	Private			18514	-	Residential
47	East	1007+70	28.69	17	Asphalt	Public			-	-	Public Street - Saunders Lane
48	East	1009+29	28.66	25	Asphalt	Private				-	Residential

Table B-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
49	East	1010+87	28.63	35	Asphalt	Private			-	-	Private Street - Rosebud Lane, Peggy's Place NE
50	East	1013+04.1BK =1012+98.7AH	28.6	24	Asphalt	Private				-	Residential
51	East	1013+72	28.58	23	Asphalt	Private			18598, 18607, 18608	-	Residential
52	East	1015+30	28.55	29	Asphalt	Private			18610	-	Residential
53	East	1015+30	28.55	25	Asphalt	Private			18618	-	Residential
54	East	1016+36	28.53	35	Asphalt	Private			-	-	Field Access
55	East	1016+89	28.52	23	Asphalt	Private			18648	-	Residential
56	East	1017+42	28.51	24	Asphalt	Private			18668	-	Residential
57	East	1019+00	28.48	20	Asphalt	Private			18688	-	Residential
58	East	1020+06	28.46	30	Asphalt	Private			18698	-	Residential
59	East	1021+64	28.43	25	Asphalt	Private			-	-	Field Access
60	East	1022+17	28.42	24	Asphalt	Private			18708	-	Residential
61	East	1024+28	28.38	45	Asphalt	Private			18754	-	Residential
62	East	1024+28	28.38	50	Gravel	Private			18768	-	Residential
63	East	1030+62	28.26	40	Asphalt	Private			18837	-	Residential
64	East	1031+14	28.25	25	Asphalt	Private				-	Residential
65	East	1033+26	28.21	38	Asphalt	Public			-	-	Public Street - Black Berry Lane
66	East	1035+90	28.16	30	Asphalt	Private			18908	-	Residential
67	East	1038+01	28.12	38	Asphalt	Private			18968	-	Residential
68	East	1039+06	28.1	55	Asphalt	Public			-	-	Public Street - Shirley Ave NE
69	East	1040+65	28.07	32	Asphalt	Private			19008	-	Residential
70	East	1042+23	28.04	30	Asphalt	Private			19008	-	Residential

Table B-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
71	East	1042+76	28.03	30	Asphalt	Private				-	Residential
72	East	1045+40	27.98	145	Asphalt	Public			-	-	Weight station entrance
73	East	1049+10	27.91	50	Asphalt	Public			-	-	Public Street - Stauffer Road NE
74	East	1061+77	27.67	20	Asphalt	Public			-	-	Weigh station exit
75	East	1062+30	27.66	100	Asphalt/ Gravel	Private			19308	Sun Gro Horticulture	Business
76	East	1064+94	27.61	43	Asphalt	Private			19318		
77	East	1068+10	27.55	25	Asphalt	Private			19598	-	Residential
78	East	1068+40	27.53	40	Asphalt	Public			-	-	Public Street - Scholl Road NE
79	East	1077+90	27.35	15	Asphalt	Private			19518	-	Residential
80	East	1079+65.2BK =1079+64.8AH	27.33	15	Asphalt	Private			19518	-	Residential
81	East	1079+65.2BK =1079+64.8AH	27.33	15	Asphalt	Private			19520		
82	East	1084+34	27.25	30	Asphalt	Private			19598	-	Residential
83	East	1086+45	27.21	80	Asphalt	Private			19658	-	
84	East	1087+51	27.19	45	Asphalt	Public				-	Public Access - U-Turn
85	East	1091+73	27.11	42	Asphalt	Private			19748		
86	East	1094+90	27.05	42	Asphalt	Private			19727	Olds Mobile Park	Mobile Home Park
87	East	1096+48.6	27.02	42	Asphalt	Private				-	Residential
88	East	1098+59	26.98	25	Asphalt	Private			-	-	Field Access
89	East	1101+23	26.93	28	Asphalt	Private				Bountiful Farms Inc. Nursery	Nursery
90	East	1102+90	26.88	62	Asphalt	Public			-	-	Public Street -

Table B-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
											Fobert Road NE
91	East	1105+77.5	26.81	66	Asphalt	Private			19957	Blue Diamond Growers	Business
92	East	1114+75	26.64	35	Asphalt	Private			-	-	Field Access
93	East	1126+36	26.42	22	Asphalt	Private			20298	-	Residential
94	East	1127+42	26.4	22	Asphalt	Private			20298	-	Residential
95	East	1128+47	26.38	30	Asphalt	Private			20337	-	Residential
96	East	1140+62	26.15	33	Asphalt	Private			20498		
97	East	1150+65	25.96	32	Asphalt	Private			20668	Calorwash Nursery	Nursery
98	East	1151+71	25.94	22	Asphalt	Private			20668	Calorwash Nursery	Nursery
99	East	1154+87	25.88	28	Asphalt	Private			20668	Calorwash Nursery	Nursery
100	East	1156+46	25.85	25	Asphalt	Private			-	-	Field Access
101	East	1157+51	25.83	25	Asphalt	Private			-	-	Field Access
102	East	1158+57	25.81	85	Asphalt	Private			20898	-	Residential
103	East	1160+68	25.77	23	Asphalt	Private			20738	-	Residential
104	East	1161+74	25.75	20	Asphalt	Private					
105	East	1164+38	25.7	55	Asphalt	Public			-	-	Public Street - Orchard Ave NE
106	East	1165+43	25.68	20	Asphalt	Private			20761	-	Residential
107	East	1165+96	25.67	50	Asphalt	Private			20808	-	Residential
108	East	1167+74.5	25.65	25	Asphalt	Private			20828	-	Residential
109	East	1168+27	25.64	27	Asphalt	Private				-	Residential
110	East	1168+80	25.63	35	Asphalt	Private			20893	-	Residential
111	East	1169+32	25.62	25	Asphalt	Private			20898	-	Residential
112	East	1170+38	25.6	23	Asphalt	Private			20958	-	Residential
113	East	1171+44	25.58	25	Asphalt	Private			20948	-	Residential
114	East	1171+96	25.57	15	Asphalt	Private			20978	-	Residential
115	East	1172+60	25.56	40	Asphalt	Public			-	-	Public Street -

Table B-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
											Ottaway Road NE
116	East	1174+18	25.53	33	Asphalt	Private			20978	The Aurora Law Office	Office
117	East	1174+71	25.52	30	Asphalt	Private			21032	Drive Thru Coffee, Faye's One Family Hair Styling	Drive-Through, Hair Salon
118	East	248+40.3BK =1175+06.7AH	25.51	30	Gravel/Dirt	Private			21032	Drive Thru Coffee	Drive-Through, Hair Salon
119	East	223+27	25.5	30	Asphalt	Private			21078		
120	East	224+85	25.47	30	Asphalt	Private			21128	South End Antique Mall	Retail
121	East	228+55	25.4	25	Asphalt	Private			21169	Toby J's Custom Log Furniture	Retail
122	East	229+08	25.39	28	Asphalt	Private					
123	East	230+13	25.37	35	Asphalt	Private			21200	Four Seasons Autobody	Automobile Care Center
124	East	231+72	25.34	25	Asphalt	Private			21268	-	Residential
125	East	233+83	25.3	50	Asphalt	Public			-	-	Public Street - Bobs Ave NE
126	East	237+00	25.24	13	Concrete	Private			21328	North America Merchandising Services, Inc	Business
127	East	237+52	25.23	17	Concrete	Private			21399	Auroro Market and Deli	Convenience Market
128	East	240+69	25.17	32	Asphalt	Private			21368	White Rabbit Bakery	Restaurant
129	East	244+39	25.1	30	Asphalt	Public			-	-	Public Street - 4th Street NE
130	East	247+03	25.05	59	Asphalt	Public			-	-	Public Street - 3rd Street NE

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OR 99E Woodburn to Aurora Corridor Segment Plan
Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
131	East	222+00	25.01	59	Asphalt	Public			-	-	Public Street - Main Street
132	East	220+35.1	24.95	50	Asphalt	Public			-	-	Public Street - 2nd Street NE
133	East	214+25.77BK =215+33.2AH	24.88	54	Asphalt	Public			-	-	Public Street - Liberty Street NE
134	East	210+00	24.82	15	Asphalt	Private				-	Residential
135	East	214+22	24.74	36	Asphalt	Private				-	Residential
136	East	204+67	24.71	36	Asphalt	Private			21788	-	Residential
137	West	205+19	24.7	22	Asphalt	Private				-	Residential
138	West	202+03	24.76	21	Asphalt	Private			21757	-	Residential
139	West	214+25.77BK =215+33.2AH	24.88	80	Asphalt	Public			-	-	Public Street - 1st Street NE
140	West	1206+92	24.91	35	Concrete	Private			21678	Shell	Gas Station
141	West	1206+39	24.92	35	Concrete	Private				Aurora Colony Grocery, Shell	Gas Station, Convenience Market
142	West	1204+80	24.95	59	Asphalt	Public			-	-	Public Street - 2nd Street NE
143	West	1201+64	25.01	65	Asphalt	Public			-	-	Public Street - Main Street NE
144	West	1201+11	25.02	14	Concrete	Private			21527	Antique Mall	Retail
145	West	1200+58	25.03	30	Concrete	Private			15018 2nd Street	Aurora Colony Auction House, D&S Spa Gifts (Hair Salon)	Retail, Hair Salon
146	West	1199+52	25.05	55	Asphalt	Public			-	-	Public Street - 3rd Street NE
147	West	1197+94	25.08	30	Concrete	Private				KLM Excavating, Inc.	Business

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Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
148	West	1194+24	25.15	15	Asphalt	Private			21399	Eric's Bike Shop	Business
149	West	1193+72	25.16	20	Asphalt	Private			21399		
150	West	1188+44	25.26	45	Asphalt	Private			21399	Plan It Financial Insurance	Business
151	West	1186+85	25.29	30	Concrete	Private			21288	-	Residential
152	West	1184+74	25.33	30	Asphalt	Private			21288	-	Residential
153	West	1183+68	25.35	35	Asphalt	Private			21288	-	Residential
154	West	1183+16	25.36	40	Asphalt	Private			21288	-	Residential
155	West	1177+35	25.47	25	Asphalt	Private			21099	Corban Auto Repair Plus!	Automobile Care Center
156	West	1173+12	25.55	18	Asphalt	Private					
157	West	1172+60	25.56	45	Asphalt	Public			-	-	Public Street - Ottaway Road NE
158	West	1167+74.5	25.64	40	Asphalt	Private			-	-	Field Access
159	West	1160+35	25.78	40	Asphalt	Private			20727	Oregon Flowers Inc	Business
160	West	1158+24	25.82	48	Asphalt	Private			20727	Oregon Flowers Inc	Business
161	West	1157+18	25.84	38	Asphalt	Private				North Marion Community Church	Church
162	West	1140+81	26.15	34	Asphalt	Private				North Marion Community Church	Church
163	West	1139+76	26.17	41	Gravel	Private				-	Residential
164	West	1132+36	26.31	28	Asphalt	Private				-	Residential
165	West	1131+84	26.32	25	Asphalt	Private				-	Residential
166	West	1128+14	26.39	30	Asphalt	Private				-	Residential
167	West	1127+61	26.4	40	Asphalt	Private				-	Residential
168	West	1126+03	26.43	26	Asphalt	Private			20498	-	Residential

Table B-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
169	West	1125+50	26.44	22	Asphalt	Private			20498	-	Residential
170	West	1122+33	26.5	44	Asphalt	Private				-	Residential
171	West	1120+22	26.54	48	Asphalt	Private			20357	Oregon Valley Greenhouse	Nursery
172	West	1118+11	26.58	70	Asphalt	Private			20357	Oregon Valley Greenhouse	Nursery
173	West	1116+00	26.62	30	Asphalt	Private					
174	West	1118+64	26.57	25	Asphalt	Private			20197	-	Residential
175	West	1106+49	26.8	20	Asphalt	Private				-	Residential
176	West	1102+80	26.87	20	Asphalt	Private				-	Residential
177	West	1100+68	26.91	22	Asphalt	Private				-	Access
178	West	1096+48.6	27.02	50	Asphalt	Private			19726	A A Ok Mini Storage	Storage Units
179	West	1100+18.2	27.06	56	Asphalt	Private			19727	A A Ok Mini Storage	Storage Units
180	West	1093+31	27.19	45	Asphalt	Public					
181	West	1074+83	27.54	45	Asphalt	Public			-	-	Public Street - Grim Road NE
182	West	1063+50	27.62	42	Asphalt	Private					
183	West	924+48.6BK =1057+90AH	27.74	30	Asphalt/ Gravel	Private			19287	Sun Gro Horticulture	Business
184	West	1052+79	27.83	65	Asphalt	Private			19287	Sun Gro Horticulture	Business
185	West	1049+10	27.9	25	Asphalt	Private			19137	-	Residential
186	West	1048+04	27.92	45	Asphalt	Private			19107	-	Residential
187	West	1045+93	27.96	42	Asphalt	Private			19167	-	Residential
188	West	1045+40	27.97	53	Asphalt	Private			19067	-	Residential
189	West	1040+12	28.07	20	Asphalt	Public			-	-	Weight station entrance
190	West	1031+14	28.24	50	Asphalt	Public			-	-	Weight station exit

Table B-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
191	West	1027+45	28.31	25	Gravel	Private			18837	-	Residential
192	West	1026+92	28.32	25	Gravel	Private			18807	-	Residential
193	West	1026+39	28.33	57	Asphalt/ Gravel	Private			18803	Willamette Memorials	Business
194	West	1024+28	28.37	48	Gravel	Private			18797	Sure Tread	Automobile Care Center
195	West	1022+70	28.4	30	Asphalt	Private				Grande Valley Ornamental Iron	Business
196	West	1021+11	28.43	20	Asphalt	Private			18707		
197	West	1019+53	28.46	34	Asphalt	Private			-	-	Field Access
198	West	1016+36	28.52	23	Asphalt	Private			-	-	Field Access
199	West	1013+04.1BK =1012+98.7AH	28.6	20	Asphalt	Private					
200	West	1010+23	28.63	25	Asphalt	Private			18607, 18598	-	Residential
201	West	1008+12	28.67	50	Asphalt	Private			18607, 18598	-	Residential
202	West	1007+06	28.69	50	Asphalt	Private					
203	West	1006+01	28.71	25	Asphalt	Private				Gravel and Grading	Business
204	West	1004+42	28.74	70	Asphalt	Private			4517	Tim's Diesel Truck Repair	Automobile Care Center
205	West	1003+37	28.76	45	Asphalt	Private			4517	Tim's Diesel Truck Repair	Automobile Care Center
206	West	1002+84.2	28.77	45	Asphalt	Private			4455	Hubbard 76	Gas Station
207	West	1000+20	28.82	50	Asphalt	Private			4455	Hubbard 76	Gas Station
208	West	998+09	28.86	45	Asphalt	Private			4415	Galaxy Stone Works	Business
209	West	997+03	28.88	35	Asphalt	Private				NW Leisure Products LLC	Business

Table B-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
210	West	993+33	28.95	55	Asphalt	Private			4215	Advantage Self Storage of Hubbard (Budget Truck Rental)	Storage Units
211	West	989+11	29.03	25	Asphalt/ Gravel	Private					
212	West	988+05	29.05	25	Asphalt/ Gravel	Private			3975	Garcia's Upholstery	Business
213	West	985+50	29.11	34	Asphalt	Public			-	-	Public Street - A Street
214	West	977+50	29.26	76	Asphalt	Public			-	-	Public Street - D Street
215	West	976+97	29.31	40	Asphalt	Public			-	-	Public Street - E Street
216	West	976+44	29.32	35	Asphalt	Private			3075 E Street	Senor Lopez Authentic Mexican Food	Restaurant
217	West	975+91	29.33	10	Concrete	Private			3425		
218	West	975+38	29.34	30	Asphalt	Private			3365	Bonnets and Curls, Hair Design by Jeff, James Barbershop	Hair Salon
219	West	972+83.3	29.35	65	Asphalt	Private			3365	Bonnets and Curls, Hair Design by Jeff, James Barbershop	Hair Salon
220	West	972+30	29.36	50	Asphalt	Private			3345	Burger Hut	Restaurant
221	West	971+24	29.38	30	Asphalt	Private			3235	Hubbard Shell and Towing	Gas station

Table B-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
222	West	970+19	29.4	30	Asphalt	Private			3235	Hubbard Shell and Towing	Gas station
223	West	969+50	29.41	43	Asphalt	Public			-	-	Public Street - G Street
224	West	968+44	29.43	104	Asphalt	Private			3295	777 Deli Market Grocery	Convenience Market
225	West	967+36.8	29.45	17	Asphalt	Private			3235	Select Cars and Trucks	Car Sales
226	West	966+84	29.46	25	Asphalt	Private			3235	Selects Cars and Trucks	Car Sales
227	West	966+31	29.47	20	Asphalt	Private			3235	Select Cars and Trucks	Car Sales
228	West	964+72	29.5	30	Asphalt	Private			3054, 3135		
229	West	964+20	29.51	28	Asphalt	Private			3092	Drive in Car Wash LLC	Car Wash
230	West	962+93.3	29.54	47	Asphalt	Public			-	-	Public Street - J Street
231	West	9625+63	29.61	29	Asphalt	Private			2845	Modern Motion Sports	Automobile Care Center
232	West	9624+05	29.64	36	Asphalt	Private				Taveras Auto Repair	Automobile Care Center
233	West	9622+46	29.67	20	Asphalt	Private			2785	Reliable Auto Body and Service	Automobile Care Center
234	West	9621+93	29.68	30	Concrete	Private			2755, 2735	Westside Drywall and Insulation	Business
235	West	9621+41	29.69	11	Gravel	Private					
236	West	9619+82	29.72	50	Asphalt	Private			2625, 2655	Nursery Connections	Nursery
237	West	9615+07	29.81	45	Asphalt	Public			-	-	Public Street -

Table B-1
OR 99E Woodburn to Aurora Corridor Segment Plan
Existing Approaches

Approach Number	Side of Hwy.	Eng. Station	Milepost	Width (ft.)	Material	Public/ Private	Tax ID #	Property Owner(s)	Business Address- OR 99E	Business Name	Use
											Schmidt Lane NE
238	West	939+35	29.95	45	Asphalt	Private			17589	Sign Shop Vinyl Signs and Banners, Fleet Service Northwest, Inc, RV and Boat Covered Storage, Pro Marine, Auto Detailing	Automobile Care Center
239	West	938+54.1	29.99	45	Dirt	Private			-	-	Field Access
240	West	937+56.7BK =937+63.7AH	30.03	20	Gravel	Private			17589	-	Residential
241	West	933+34	30.11	20	Dirt	Private			17408	-	Residential
242	West	929+64	30.18	30	Asphalt	Public			-	-	Public Street - Jones Road NE
243	West	924+89	30.27	40	Asphalt/ Gravel	Private			17198	-	Residential
244	West	916+97	30.42	20	Gravel	Private			-	-	Field Access
245	West	916+44	30.43	20	Gravel	Private			-	-	Field Access
246	West	911+69	30.52	20	Gravel	Private			17021	-	Residential
247	West	909+58	30.56	90	Asphalt	Private			16998	S & K Nursery	Nursery
248	West	906+94	30.61	35	Asphalt/ Gravel	Private					
249	West	900+07	30.74	35	Asphalt	Public			-	-	Public Street - Goudy Garden Ln NE

Appendix B

Summary of Stakeholder Input

320 WOODLARK BUILDING
813 SW ALDER STREET
PORTLAND, OREGON 97205-3111
503/225-0192 • FAX 503/225-0224
coc@coganowens.com • www.coganowens.com

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OWENS
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COMMUNICATIONS
CONFLICT RESOLUTION
SUSTAINABLE DEVELOPMENT
ENVIRONMENTAL PROJECT MANAGEMENT
GOVERNMENTAL/COMMUNITY RELATIONS

October 19, 2011

OREGON HIGHWAY 99E WOODBURN-AURORA CORRIDOR SEGMENT PLAN TECHNICAL MEMORANDUM #1

PURPOSE OF TECHNICAL MEMORANDUM

The purpose of this technical memorandum is to document the results of stakeholder interviews and proposed public involvement activities for the Oregon Highway 99E Woodburn-Aurora Corridor Segment Plan. Included are:

A. Summary of key issues from stakeholder interviews
B. Compilation of interview results
C. Interview questionnaire
D. Proposed Public Involvement Program

A. SUMMARY OF STAKEHOLDER INTERVIEWS

Interviewees

To obtain input on critical issues as early as possible in the project, interviews with 15 key stakeholders were conducted in-person or by telephone between October 4 and October 13, 2011. Interviewees included:

- Dan Fricke – ODOT Region 2 Project Manager
- Dave Dryden – Hubbard Police Chief
- Dan Brown – City of Woodburn Public Works Director
- Bruce Warner – Hubbard Council Member
- Karen Odenthal – Marion County Public Works
- Zach Elliot – Director of Security, North Marion County School District
- Bill Hansen – Hubbard Fire Chief
- Walt (no last name) – Co-owner Imperial Gardens Nursery (Goudy Garden Lane/99E)
- Jaime Estrada - Hubbard Public Works Director
- Terri Gonzalez – General Manager at Hubbard Chevrolet, past President of Hubbard Business and Economic Development
- Brent Earhart – Aurora Police Chief
- Deedee Jenkins – Location Safety Manager at First Student (school bus services)
- Rod Yoder – Aurora Fire Chief
- Jason Inman – Manager of Mini-Storage/U-Haul on 99E between Hubbard and Aurora
- Jason Myers – Marion County Sherriff

General Perceptions on Corridor Conditions

Interviewees described the current overall condition of the highway corridor in terms of meeting transportation needs as good to fair. Overall, the facility is seen to be in good physical repair but improvements are needed including expanded capacity, left turn lanes, wider shoulders, lower speeds, better lighting, facilities for cyclists and pedestrians, and intersection improvements at certain key locations.

Key Current and Future Safety and Operational Issues

Key current safety and operational issues identified include

- Left turn lanes onto and off of OR 99E. Specific locations include north from A Street in Hubbard to Grim Road and north of Woodburn to Hubbard for the businesses on the east side of the highway. Because these sections of road have only two lanes, traffic slows or stops when one vehicle needs to turn left onto a business driveway. There are no turning lanes or safe shoulder space for through vehicles to pass.
- Grim Road/551/99E intersection is identified as being particularly dangerous. There are two signals within 50 feet at this intersection and it was explained that people "create" two lanes out of one depending on which direction they are headed. Locals understand this de-facto lane creation but out-of-town traffic gets confused and it is unclear where a vehicle needs to be to head to either I-5 or continue to Oregon City.
- Traffic congestion caused by school buses stopping through traffic at peak travel times along the corridor.
- Lack of turning and passing lanes and unsafe conditions associated with people disobeying traffic signals (including school bus stop signs) and passing on the right on shoulders.
- Lack of pedestrian facilities (sidewalks).
- Driver confusion at the Grim Road intersection and the G Street intersection in Hubbard.
- Dangerous intersection angles at Dimmick Lane and Goudy Gardens, including insufficient length of pavement before it transitions to gravel and limited visibility because of road angle.
- Merging safely onto 99E from gravel roads generally.
- Poor lighting and visibility along the corridor at night and in the rain.

Interviewee opinions vary in terms of bicycle and pedestrian usage of the corridor. Opinions range from there being "no problem" with bikes and pedestrians along the corridor because people don't use it that way or because pedestrians and bikes shouldn't be on the highway. Others feel that there should be bicycle and pedestrian facilities along the entire corridor to encourage different commute preferences and to improve safety for current cyclists and pedestrians. Safe and secure crosswalks and proper lighting are identified as being needed at key segments along the corridor where residential areas on one side of the highway access businesses on the other side.

In terms of future planning issues, respondents state that increases in traffic volume and growth should be planned for. Urbanization between Woodburn and Hubbard, rail crossings, and

seasonal traffic levels associated with events are identified as key future issues. Specific improvements identified as likely being need in the future include:

- Left turn lanes at various locations in the corridor.
- Expansion to a four or five-lane highway through the entire corridor.
- Above or below grade rail road crossings along the corridor to reduce back-up when a train is moving through (train traffic has been increasing).
- Lower speeds along the corridor to better accommodate businesses and residences.
- Crosswalks at key locations for increased pedestrian safety.

Potential Solutions

Nearly all interviewees feel that left-turn lanes would solve many of the congestion problems along the corridor. Other solutions:

- Installation of a traffic signal at G Street in Hubbard
- Extending four lanes further out between Woodburn and Hubbard and Hubbard and Aurora.
- Widening of the shoulders to provide for bus refuges as well as a safer space for bicycles and pedestrians and vehicles pulled over in an emergency.
- To help with night and rain visibility, improved lighting and replacement of rumble strips and reflectors (they were removed in the last re-paving).
- Correcting the geometry of the intersections at Dimmick Lane and Goudy Gardens.
- Intersection improvements, including additional paving and redesign.
- Reassessment of appropriate speeds.

Funding is identified as the primary constraint to addressing identified issues.

Recommended Outreach Strategies

A variety of methods for outreach are identified as necessary to inform/involve property owners, businesses and residents in the corridor, including:

- Project website with a link on each city's webpage.
- Newsletter mail-out with utility bills.
- Targeted mailings to businesses and residences within rural areas.
- Open houses.
- Information posted in the *Woodburn Independent*.
- To reach Spanish speaking members of the area, contacting *La Pantera*, a local Spanish-language radio station, and working with churches.

Miscellaneous Comments

It is noted that this project is one of a number of transportation planning projects recently completed or underway in the corridor and that there is the need to continuously message that these various projects are being coordinated. A clear message is also needed as to why this project is being undertaken at this time.

B. COMPILATION OF INTERVIEW RESULTS

See separate file

C. INTERVIEW QUESTIONNAIRE

Attached below

D. PUBLIC INVOLVEMENT PROGRAM

Project Purpose and Goal

The purpose of the OR 99E Woodburn-Aurora Corridor Segment Plan is to:

- Analyze the corridor segment north of the Woodburn urban growth boundary (UGB) to the Region 2 boundary north of Aurora (the "study area");
- Re-assess the function of the corridor;
- Identify how to improve operations and safety; and
- Preserve the highway's functional integrity along the corridor segment.

The overall goal of the OR 99E Woodburn-Aurora Corridor Segment Plan is to determine how best to improve or preserve existing and future highway operations and safety.

Overview

This Public Involvement Program (PIP) for the OR 99E Woodburn – Aurora Corridor Segment Plan (CSP) provides a roadmap to ensure involvement of landowners, businesses, users and other interested parties of the OR 99E Corridor within the study area. The PIP will ensure the CSP meets the project purpose and goal statement and public and agency expectations to the greatest degree possible. The PIP is intended to constructively engage the public in the project through a variety of means, solicit comments and concerns about the corridor, respond to those concerns, and identify alternative approaches to meet the vision and goals of the plan.

Demographic Context

According to Census 2010 data, Woodburn, Hubbard and Aurora all had population gains between 2000 and 2010. The largest population growth in numbers was in the Hispanic population which grew by 4,520 people in the region, with most Hispanic and Latino population growth occurring in Woodburn. The percentage of Native American and Alaska Natives grew significantly in all three jurisdictions, with growth rates of 103.7% in Woodburn, 44.3% in Hubbard, and 400% in Aurora. However, their overall population shares remain small, between 2.2% and 3.9%. Of special interest, there is a unique population of Russian Orthodox Old Believers in Woodburn, the largest population settlement of this group in North America.

In 2010, Woodburn had 24,080 people, with a growth rate of 19.8% between 2000 and 2010. Hispanics and Latinos make up a majority of the population in Woodburn, with 58.9% of the population share. The Hispanic population in Woodburn grew 40.9% during the ten-year period. White/non-Latinos are the second largest population segment in Woodburn with 38.5% of the population share. Other population segments (Native American, Asian, Pacific Islands, Afro-American) comprise 2.6% of the population share.

Hubbard grew by 27.8% overall between 2000 and 2010 and has a current population of 3,173. White/non-Latinos make up 59.2% of the population share followed by Hispanics and Latinos with 36.3%. People of other ethnic groups make up 4.5% of Hubbard's population.

Aurora grew by 40.2% between 2000 and 2010, but is still a small community of 918 people. White/non-Latinos make up the largest share of the population with 85.5%. Hispanics and Latinos comprise 10.9% of the population, while 3.6% of the population falls into the "some other race" category.

Public Involvement Objectives

The following draft public involvement objectives are proposed:

- Ensure the study purpose and goals have broad support internally and among local governments, stakeholders and the public, and that the CSP meets the purpose and goals.
- Identify issues and values of the diverse Woodburn, Hubbard, and Aurora communities and ensure that they are reflected in the CSP.
- Engage a wide range of stakeholders in all aspects of the planning process.
- Use a variety of strategies, including traditional and electronic media, to engage residents and the business community. This includes those who do not normally participate in studies for economic, demographic and/or cultural reasons.
- Provide opportunities for participation by linguistically and culturally diverse stakeholders, as well as mobility-challenged stakeholders. Given that Latinos comprise a significant portion of the study area's population, it is especially critical to ensure that project informational materials and public involvement opportunities are available in Spanish.
- Provide timely and useful information about the project.
- Solicit and record comments and concerns; address and/or respond to concerns.
- Ensure that advisory bodies established for the planning process have adequate and timely opportunities to review and comment on draft plan elements.

Task 2: Public and Stakeholder Involvement

2.1 Obtain Stakeholder Input/Finalize PIP

- Contact members of PMT to identify stakeholders.
- Assess the demographic profile of each jurisdiction in the study area to identify additional key stakeholder groups.
- Contact local organizations within distinct cultural-linguistic populations to identify stakeholders.

- Following consultation with the Project Management Team (PMT), conduct a minimum of 10 interviews.
- Prepare a summary of stakeholder interview results and revise the draft PIP as needed to finalize public involvement activities (Technical Memorandum #1).

Schedule: August 25 - October 14, 2011.

2.2 Conduct Public Involvement Activities

2.2.1: Develop and Manage Project Website

- Develop website
    - Website addresses will be easy to read and remember for both English and Spanish speaking populations.
    - Website will contain project information, meeting dates, comment forms, and contact information in both English and Spanish (using Google "translate" function).
    - Website will have a form for requesting further information in English or Spanish.
- Update and manage website
    - Website will be updated and maintained according to deliverables or events in the project schedule.

Schedule: Initial website set-up by October 14, 2011; website updates at appropriate milestones during the project.

2.2.2: Develop and Maintain Project Mailing List

- Create a project mailing list comprising:
    - agency representatives
    - key stakeholders
    - property owners
    - businesses
    - chambers of commerce
    - institutions within the study area
    - public meeting attendees
    - other interested parties
- Maintain list throughout project to ensure it is up-to-date.

Schedule: Initial mailing list assembled by October 6, 2011; maintenance/updates throughout the project.

2.2.3: Develop Fliers and Other Informational Pieces

- Work with PMT to craft messages and information to be included in public informational pieces.

- Develop fliers or other informational pieces to provide information and seek input from interested parties about the project and planning process, as well as opportunities for public involvement. Include opportunities to comment as appropriate.
- Distribute up to three mailings to affected property owners, businesses and residents along the corridor and to other interested parties in the study area. It is assumed that these mailings will be scheduled in conjunction with the development of:
    - Draft problem statement and evaluation criteria
    - Draft improvement alternatives
    - Draft CSP

Schedule: Distribution of informational pieces at key project milestones identified above (to be confirmed with PMT).

2.2.4: Conduct Appropriate Outreach

- Identify appropriate civic institutions and local businesses to contact through interview process.
- Ensure timely updates and outreach to institutions and local businesses during all phases of project
- Conduct up to four meetings with civic institutions and local businesses. Based upon level of interest, business/property owner briefings may be conducted
- In consultation with PMT, identify the most appropriate mechanisms to distribute information/seek input from parties unlikely to attend public meetings. Direct distribution of materials to shoppers, churches and schools may be considered.

Schedule: Outreach at key project milestones to be determined in consultation with PMT.

2.2.5: Distribute Information at City Halls, Libraries and Other Public Buildings

- Provide project information in English and Spanish at city halls, libraries and public buildings in the form of:
    - Traveling story boards
    - Posters
    - Take-away quarter sheets

Schedule: Distribution of information at key project milestones to be determined in consultation with PMT.

2.2.6: Translate Written Materials into Spanish as Needed

- Translate written materials into Spanish; provide access to Russian translation.

Schedule: Ongoing

2.2.7: Organize/Conduct Public Meeting #1 Following Development of Problem Statement

- Identify appropriate and accessible location for public meeting.
- Notify stakeholders of meeting purpose and location.

- Prepare media notices.
- Organize and facilitate public meeting, including agenda, informational materials, storyboards, questionnaire and other comment opportunities.
- Ensure Spanish-speaking participants are accommodated.
- Prepare meeting summary.

Schedule: Approximately March 29, 2012.

2.2.8: Organize/Conduct Public Meeting #2 Following Alternatives Development

- Identify appropriate and accessible location for public meeting.
- Notify stakeholders of meeting purpose and location.
- Prepare media notices.
- Organize and facilitate public meeting, including agenda, informational materials, storyboards, questionnaire and other comment opportunities.
- Ensure Spanish-speaking participants are accommodated.
- Prepare meeting summary.

Schedule: Approximately June 7, 2012.

2.2.9: Prepare Technical Memorandum #2 on Public Involvement Activities
Schedule: Approximately August 16, 2012

Task 2 Deliverables:

- List of and summary of interviews with 10 key stakeholders
- Draft and final public involvement program
- Technical Memorandum #! – stakeholder Interview Results and proposed public Involvement Activities
- Project website
- Project mailing list
- Flyers and other information materials as directed by PMT
- Up to three direct mailings
- Up to four presentation to civic institutions
- Distribution of information at public locations
- Translations as needed
- Public meeting to review study purpose and objectives
- Public meeting to obtain comments on project alternatives
- Technical Memorandum #2 – Summary of Public Involvement Activities

OR HIGHWAY 99E WOODBURN-AURORA CORRIDOR SEGMENT PLAN
Stakeholder Interviews Questionnaire

The OR 99E Woodburn-Aurora Corridor Segment Plan will analyze that segment of OR 99E north of the Woodburn urban growth boundary (UGB) to the ODOT Region 2 boundary north of Aurora. The Plan will assess the function of the corridor to identify how to improve highway operations and safety. Stakeholder input is being sought at the front end of this project to identify safety and operational issues to be addressed in the planning process, as well as the most appropriate techniques to involve affected parties.

Date: _____
Name: _____
Affiliation: _____

1) How do you use the corridor? How frequently?

2) What involvement have you had in planning processes addressing OR Highway 99E?

3) How would you describe the current overall condition of the highway corridor in terms of meeting transportation needs?

4) a. What would you identify as the key safety and operational issues? Please explain and identify specific locations.

b. How do you feel these safety and operational issues can best be addressed?

c. What are the primary constraints to addressing these issues?

d. What are the top three safety or operational improvements needed? Please identify specific locations?

5) Are there other improvements needed for purposes of bicycle and pedestrian safety not identified above? Please identify specific locations.

6) What's your long-term (20-year) vision for this corridor segment?

7) Looking into the future, do you see any future safety or operational issues in the corridor that we should be planning for now?

8) a. Who are the key stakeholders to involve in this project?

b. What techniques would work best to inform/involve property owners, businesses and residents in the corridor?

9) How would you like to be informed and involved as this project proceeds? ____ Newspaper articles
____ Public notices ____ Website ____ Other (Please explain) _____

10) Is there anything else you'd like to add about the Corridor Segment Plan project?

Appendix C

Environmental and Land Use Constraints

DKS Associates
TRANSPORTATION SOLUTIONS

MEMORANDUM

TO: Dan Fricke, ODOT Region 2

FROM: Bob Schulte

DATE: October 24, 2011

SUBJECT: **Hwy. 99E Woodburn to Aurora Corridor Segment Plan** P# 09042-022
Technical Memorandum #5 – Environmental and Land Use Constraints

This memorandum describes the results of an analysis of environmental and land use conditions within the study area. The purpose of the environmental analysis was to determine whether there are environmental resources near the OR 99E which may limit the ability to implement improvements to the highway. The land use analysis was conducted to identify potential existing and future land uses that may be in conflict with traffic operations and safety along OR 99E and to determine if there are existing land uses near the highway that would limit future improvements.

POTENTIAL ENVIRONMENTAL CONSTRAINTS

The focus of the environmental constraints analysis was on natural resources within the corridor study area. The environmental study area (ESA) is defined as all areas within the OR 99E right-of-way between the Pudding River to the north (MP 24.71) and the City of Woodburn urban growth boundary to the south (MP 30.85). The ESA passes through the cities of Aurora and Hubbard and is characterized by areas of residential and commercial development along with areas dominated by agricultural uses. Right-of-way width varies from 80 to 400 feet, but is typically 100 feet wide with most of the area made up of impervious roadway surfaces, maintained grassy areas, and roadside drainage features.

This study is based on review of existing ODOT environmental reports, Oregon Biodiversity Information Center (ORBIC) data, national and local wetland inventory maps, soil surveys, aerial imagery, United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) species data, and other current on-line data and mapping resources. A field reconnaissance of the entire ESA was conducted in October, 2011 following initial data collection and review. The purpose of the field reconnaissance was to verify results of desktop

research and to document existing habitat conditions, water/wetland resources, and any other environmental constraints encountered within the ESA.

Following the field reconnaissance, environmental constraint maps were created based on aerial imagery of the ESA. These constraint maps show environmentally sensitive areas ranked as having low, medium, or high significance regarding their potential to impact future transportation improvements. In addition to the environmental constraint maps, results of the study have been summarized below. Environmental constraints not associated with natural resources were not the focus of this investigation. Nonetheless, additional issues were added to the environmental constraints table shown on the following page to highlight potential future areas of study.

Water Quantity/Quality Impacts

For water quality impacts, major environmental regulations normally covered in the National Environmental Policy Act (NEPA) process include the Clean Water Act (CWA) and Section 1424(e) of the Safe Water Drinking Act (SWDA). The CWA's primary purpose is to prevent the discharge of pollutants into waterways, with the main regulations stemming from Section 402, commonly known as the National Pollutant Discharge Elimination System (NPDES). The SWDA is the main federal law that protects the quality of drinking water in the United States. For water quality impacts, the major environmental regulations normally covered in the NEPA process include local floodplain ordinances and Section 402 of the CWA.

Methods

Research into the potential water quality and quantity impacts that could occur as a result of this project was primarily accomplished through on-line research. Oregon's 2010 Integrated Report Database was researched for information on the Pudding River.[1]
FEMA data was evaluated via FEMA provided Google Earth kmz files to determine if the ESA fell within the 100-year floodplain or a designated floodway of a nearby waterway.

Results Summary

Based on the information obtained from DEQ, the Pudding River is not listed on the DEQ 303d list. The DEQ 303(d) list identifies waters in the state of Oregon that do not meet water quality standards and requires the development of total maximum daily loads for pollutants of concern. The project is not anticipated to affect drinking water; therefore, no SWDA requirements should apply. If unexpected impacts do occur, additional studies may be necessary.

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[1] DEQ, 2011. Oregon's 2010 Integrated Report. Accessed October 14, 2011 on-line at www.deq.state.or.us/wq/assessment/rpt2010/search.asp.

Table 1
Environmental Constraints Summary

Environmental Constraint	Level of Significance	Requires Further Study		Comments
		Yes	No	
Water Quantity/Quality	High	X		• Storm water treatment is likely to be required for any project within the ESA.
Biology	Low	X		• No federal or state listed species were identified within the ESA. • Rare plant surveys should be completed for Nelson's checker-mallow and Kincaid's lupine in any areas where vegetation disturbance is expected. • A No Effect memo, at a minimum, will need to be prepared to document the lack of ESA-listed species and their critical/suitable habitat present and to document the lack of effect on ESA-listed salmonids downstream of the ESA.
Wetlands and Other Waters of the U.S. and State	Low		X	• One water (Little Bear Creek) was identified within a culvert running through the ESA. • No wetlands were identified within the ESA. • Wetlands and waters do exist beyond the limits of ESA and a formal delineation may be required if the ESA is expanded beyond existing right-of-way limits shown in this study.
Air Quality, Noise & Energy	Low		X	• Environmental study area (ESA) is not located in any designated non-attainment area.
Hazardous Materials	Low	X		• Several potential hazardous materials concerns were identified near the project corridor, including leaking USTs, cleanup sites, and areas where hazardous materials may be used or stored. Any project that involves excavation or right-of-way acquisition will likely require a Phase I Environmental Site Assessment.

Table 1 (cont.)
Environmental Constraints Summary

Environmental Constraint	Level of Significance	Requires Further Study		Comments
		Yes	**No**	
Historical, Cultural, and Archeological	Medium	X		• The ESA is located within the Aurora Colony Historic District which is listed on the National Registry of Historic Places. Further evaluation of the presence of historic resources as well as a determination of effect for any resources present will likely need to be completed. • Archaeological investigations may be necessary for any areas where excavation is planned.
Section 4(f) and 6(f)	Low		X	• No 6(f) resources identified within the ESA. • If the project results in any effect to cultural resources, a 4(f) evaluation may be required.

No portion of the ESA falls within any FEMA designated floodplain or floodway, however, the Pudding River floodplain is located immediately adjacent to the toe of the OR 99E roadway fill prism at the northern end of the ESA. Additionally, a flood hazard area is identified for Little Bear Creek immediately adjacent to the western edge of the ESA. If any impacts are expected to fall outside of OR 99E right-of-way at these locations, an evaluation of floodplain impacts may be necessary and fill impacts would likely require mitigation to balance floodplain impacts. A Section 401 Water Quality Certification from the Oregon Department of Environmental Quality (DEQ) may be required if federal permits are sought for projects that create new impervious surfaces within the ESA. The certification will require a formal storm water management plan that identifies storm water treatment methods to be utilized to ensure that the project does not increase the pollutant load of the receiving waters. The storm water management plan would need to be submitted to the US Army Corps of Engineers (USACE) as a component of the permit package and reviewed and approved by DEQ. It is also possible that ODOT may review and approve the storm water management plan internally if the project does not require an individual permit from the USACE.

Even if impacts to jurisdictional waters are avoided, thereby negating the need for an USACE permit, the project will still be required to provide storm water treatment pursuant to ODOT's Storm Water Management Program policies and guidelines if there is any increase in impervious surface. Additionally, ODOT storm water standards require treatment if any project reconstructs an existing roadway, changes the contributing impervious area, modifies storm water drainage, or replaces or enlarges stream crossing structures. Storm water treatment that meets ODOT and NMFS standards should be incorporated for any projects that impact impervious surfaces as listed above. Storm water treatment is considered to have a high level of significance when it comes to its potential to affect future projects within the ESA.

If any proposed project within the ESA results in one acre or more of soil disturbance, an NPDES 1200-C permit will be required from DEQ. It is possible that this project will be covered by ODOT's 1200-CA permit, although this will depend on a project-specific decision by ODOT. ODOT has begun leaning toward individual 1200-C permits on projects that have significant soil disturbance and that might benefit from having the permit transferred to the contractor upon award.

Biological Resource Impacts

Federally funded transportation projects are required to comply with several federal environmental regulations with regard to biological resources, including the NEPA, State and Federal Endangered Species Acts (ESA), and the Magnuson-Stevens Act (MSA). If there is a threatened, endangered, or proposed species, or their designated critical habitat is within the vicinity of the project, then impacts need to be formally assessed. Protected biological resources include plants, reptiles and amphibians, mammals, birds, fish, and invertebrate species. Additionally, if a waterway has been designated as Essential Fish Habitat by NMFS, then potential impacts need to be addressed.

In addition to the ESA, migratory avian species[2] are protected under the Migratory Bird **Treaty** Act (MBTA), which established federal responsibilities for the protection of nearly all species of birds, as well as their eggs and nests. The MBTA made it illegal for people to "take" migratory birds, their eggs, feathers, or nests. "Take" is defined in the MBTA to include an attempt, by any means or in any manner, at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof.

Methods

Methodologies utilized to assess existing biological resources in or near the project area consisted of the in-house review of available on-line mapping and data sources, an ORBIC database search (provided by ODOT), as well on-site reconnaissance.

On-line resources included USFWS county-wide species lists,[3] StreamNet data,[4] National Oceanic and Atmospheric Administration (NOAA) EFH Mapper,[5] and Oregon Department of State Lands (DSL) Online Spatial Mapping.[6]

Following the accumulation of the on-line data and mapping, a site reconnaissance was conducted by qualified OBEC staff in October, 2011. During the reconnaissance, the entire ESA was traversed and additional data was collected regarding the presence of currently listed or proposed species, or suitable habitat to support these species.

Results Summary

The USFWS has identified the following ESA-listed species as potentially occurring in Marion County, Oregon: the northern spotted owl, Oregon chub, golden paintbrush, Willamette daisy, water howellia, Bradshaw's desert parsley, Kincaid's lupine, and Nelson's checker-mallow. Additionally, Upper Willamette River steelhead and Chinook salmon were identified using Streamnet[7] as being present within the Pudding River watershed near the ESA.

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[2] USFWS, 2011a. Federally Listed, Proposed, Candidate Species and Species of Concern Under The Jurisdiction of the Fish and Wildlife Service which may occur within Coos County, Oregon. Accessed on-line October 13, 2011 at www.fws.gov/oregonfwo/Species/Lists/Documents/County/COOS%20COUNTY.pdf

[3] USFWS, 2011a. Federally Listed, Proposed, Candidate Species and Species of Concern Under The Jurisdiction of the Fish and Wildlife Service which may occur within Coos County, Oregon. Accessed on-line October 13, 2011 at www.fws.gov/oregonfwo/Species/Lists/Documents/County/COOS%20COUNTY.pdf

[4] StreamNet, 2011. StreamNet Fish Data for the Northwest website. Accessed October 10, 2011 at www.streamnet.org/mapping_apps.cfm

[5] NOAA, 2011. Essential Fish Habitat Mapper. Accessed October 16, 2011on-line at http://sharpfin.nmfs.noaa.gov/website/EFH_Mapper/map.aspx.

[6] DSL, 2011. Department of State Lands: Online Spatial Mapping. Accessed October 14, 2011 on-line at http://tualatin.dsl.state.or.us/public/viewer.htm.

[7] StreamNet, 2011. StreamNet Fish Data for the Northwest website. Accessed October 10, 2011 at www.streamnet.org/mapping_apps.cfm

ORBIC data provided by ODOT did not identify any state or federally-listed species within two miles of the ESA. Furthermore, due to the developed nature of the ESA, limited suitable habitat for the species listed above is present. No critical habitat for any listed species was identified within the ESA, although the Pudding River, located immediately adjacent to the northern edge of the ESA, is listed as critical habitat. It is unlikely that any listed species are present within the ESA. However, detailed surveys for Nelson's checker-mallow and Kincaid's lupine should be conducted during the flowering season in any vegetated areas that may be disturbed as part of any future project, due to the potential for suitable habitat in some areas of the ESA. No suitable habitat for northern spotted owl, Oregon chub, golden paintbrush, Willamette daisy, water howellia, or Bradshaw's desert parsley was identified within the ESA. Therefore, further evaluations for these species within this ESA are not warranted.

Although limited within the ESA, trees and vegetation are present and are abundant immediately outside of right-of-way in many areas. Additionally, a stand of mature fir trees is located at the intersection of OR 99E and OR 551 (Appendix A). Any vegetation or tree removal should be planned to avoid the nesting season of species protected by the MBTA (most bird species in Oregon). Conducting vegetation removal between September 1 and March 1 is the best way to avoid impacting MBTA species.

Although not present within the ESA, Upper Willamette River steelhead and Chinook and their critical habitat are located in the downstream watershed. Any action that may result in water quality impacts will need to be fully evaluated for the potential to affect these species downstream. Water quality impacts commonly associated with roadway projects that may impact fish species include the creation or alteration of impervious surface area and storm water treatment facilities. Special attention will be needed to ensure that adequate storm water treatment is provided as part of any future project that affects storm water within the ESA.

Impacts to Wetlands and Other Waters of the U.S. and State

Several federal and state regulations govern impacts to wetlands and waters, including the CWA and the Oregon Removal-Fill Law. The main section of the CWA pertaining to wetlands and waters is Section 404, which establishes permit programs for the discharge of dredged or fill material into waters of the U.S. The CWA is primarily administered by the USACE. Similarly, Oregon's Removal-Fill Law, administered by the DSL, requires permit authorizations for any removal, fill, and/or alteration activity within waters of the state. Projects requiring impacts to jurisdictional waters, including wetlands, may require authorization from the USACE and/or DSL.

Methods

Research into potential impacts to wetlands and waters within the ESA was initiated on-line

using several available on-line data and mapping resources such as, but not limited to, NWI maps,[8] soil maps,[9] ORWAP online mapper[10] and other available on-line spatial mapping resources.

These sources were reviewed to provide potential indicators of wetland conditions and the presence of waterways within the ESA. Potential resources were highlighted on an aerial photo and verified during the field investigation, which was conducted in October, 2011 by qualified OBEC environmental staff. During the site visit, the entire ESA was traversed. No formal wetland delineation was conducted during the field reconnaissance, but the presence of topographic breaks and vegetation indicative of wetlands was evaluated for the entire project area. Areas shown as having hydric soils present were given special attention.

Results Summary

One water (Little Bear Creek, Figure 2 and Appendix A) was identified as potentially being present within the ESA prior to the field reconnaissance. During the field review, the location of Little Bear Creek was verified. Existing maps show the creek originating on the east side of OR 99E just outside of the ESA, north of Schmidt Lane NE, then flowing westerly below OR 99E in a culvert. Only the western end of the culvert could be located during the site visit and it appeared that the eastern extent of the creek is culverted beyond right-of-way onto private property. A wetland is shown as surrounding Little Bear Creek just west of the ESA and its presence was visually confirmed. It appears that recent development may have altered the wetland boundary near the edge of right-of-way.

Several wetlands, as well as the Pudding River, were mapped near the northern boundary of the ESA. However, they were determined to be located outside of the OR 99E right-of-way (Figures 7-9, 11). This section of right-of-way is characterized by a tall and steep roadway fill prism comprised of minimal vegetative cover consisting of upland, weedy species. There are also a number of roadside ditches within the project area that do not clearly connect to any waters or wetlands. Most of the ditches are well maintained or lacking vegetation entirely (Appendix A). Several ditches drain directly into storm inlets, primarily within the city of Hubbard. The ditches did not exhibit defined beds or banks or an ordinary high water mark. All ditches appeared to be constructed in and draining only uplands. No potential wetlands were identified within the ESA.

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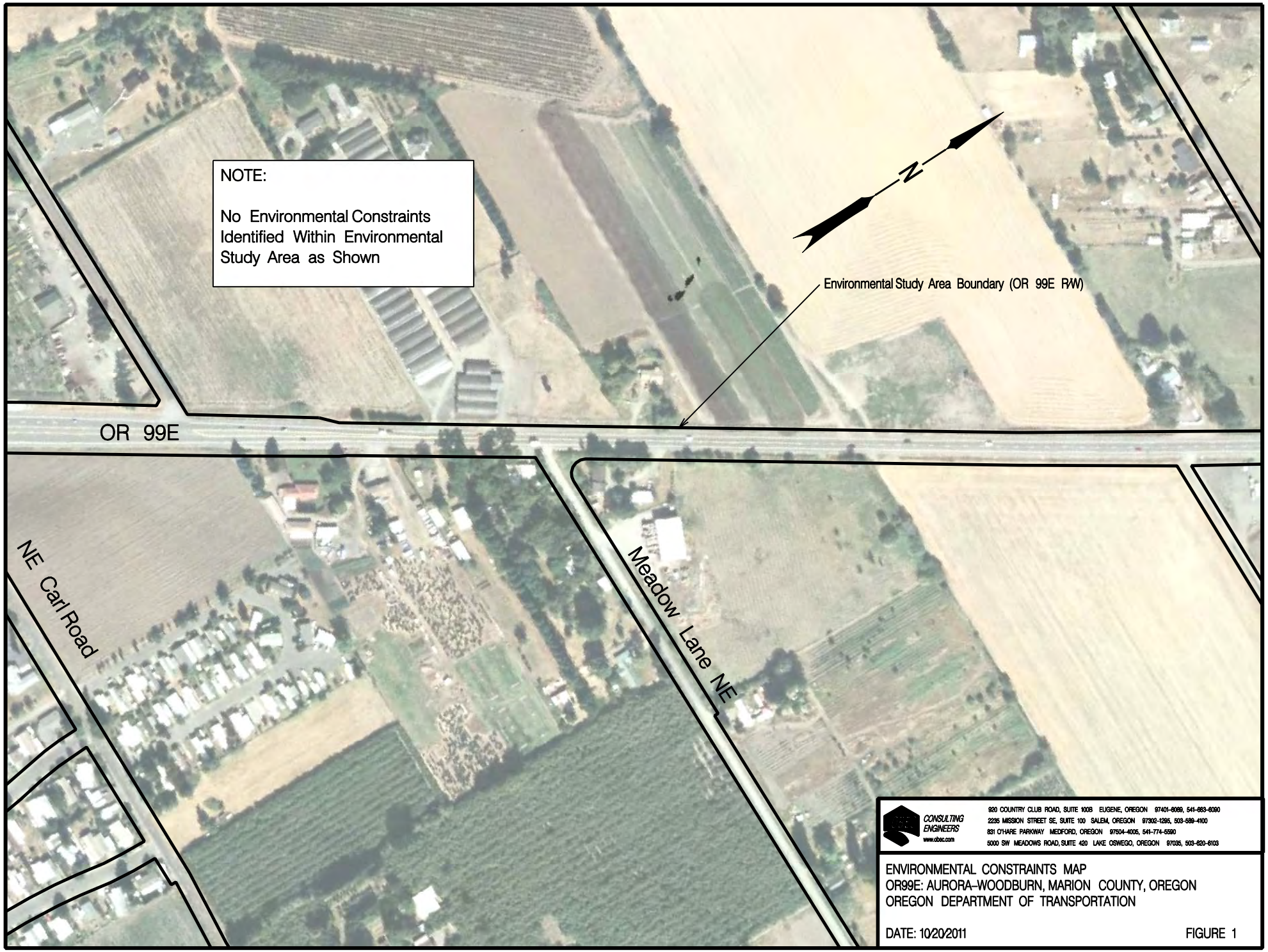
[8] USFWS, 2011a. Federally Listed, Proposed, Candidate Species and Species of Concern Under The Jurisdiction of the Fish and Wildlife Service which may occur within Coos County, Oregon. Accessed on-line October 13, 2011 at www.fws.gov/oregonfwo/Species/Lists/Documents/County/COOS%20COUNTY.pdf

[9] NRCS, 2011. NCRS Web Soil Survey. Accessed on-line October 10, 2011 at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

10 ORWAP, 2011. Oregon Explorer Rapid Wetland Assessment Protocol mapper. Accessed on-line October 10, 2011 at http://oe.oregonexplorer.info/wetlands/orwap/



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ENVIRONMENTAL CONSTRAINTS MAP
OR99E: AURORA–WOODBURN, MARION COUNTY, OREGON
OREGON DEPARTMENT OF TRANSPORTATION

DATE: 10/20/2011 FIGURE 1

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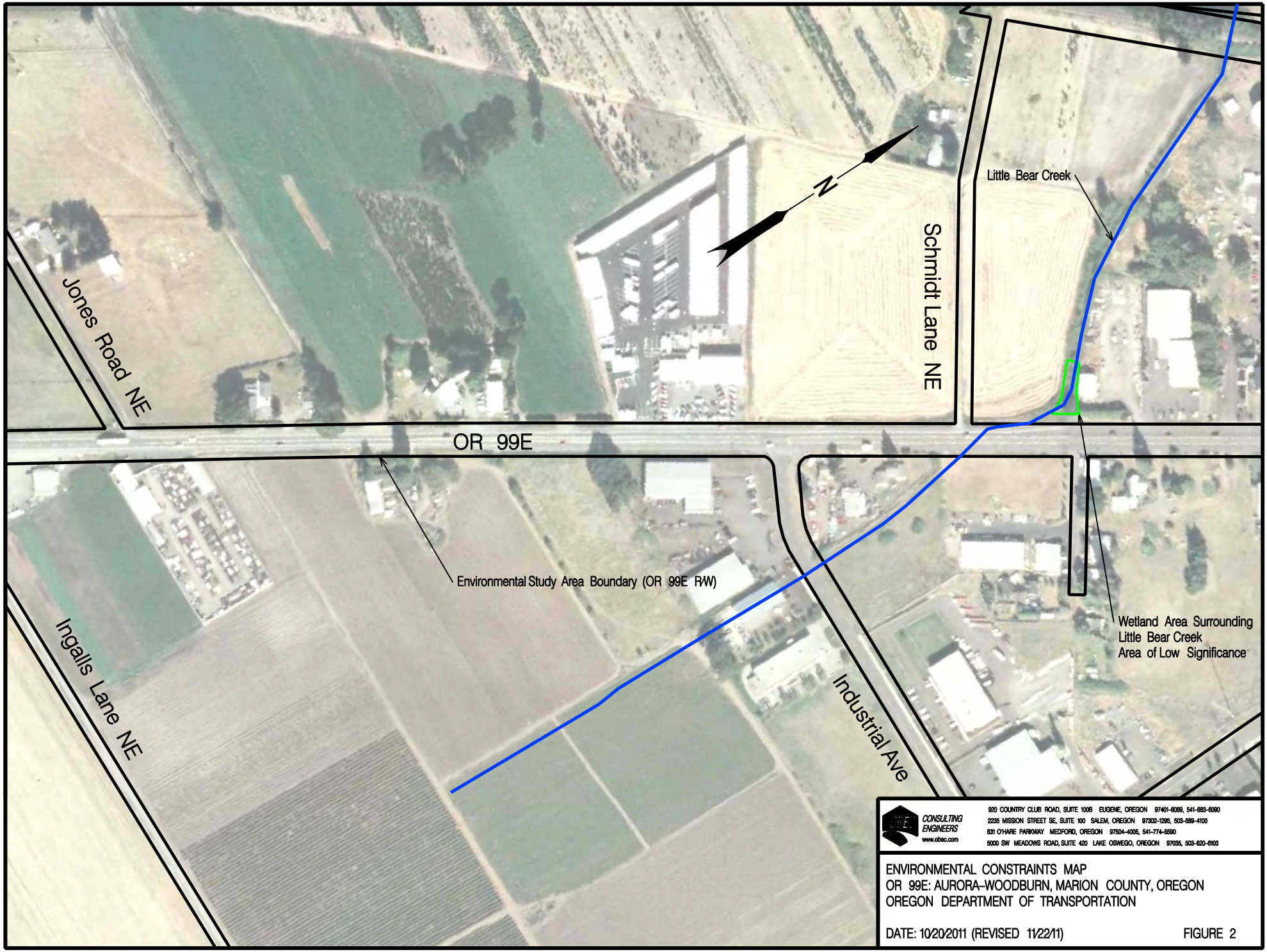

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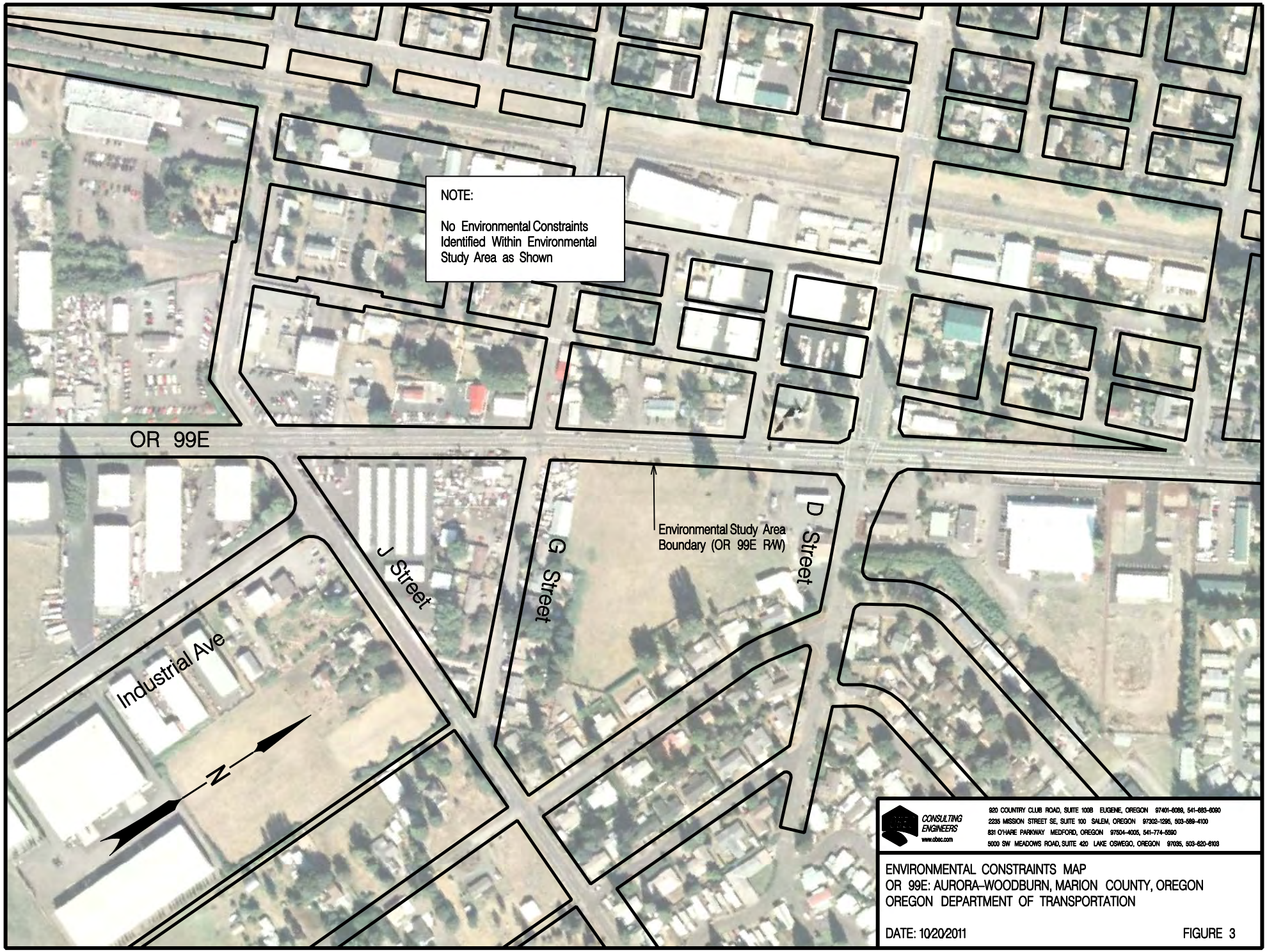
ENVIRONMENTAL CONSTRAINTS MAP
OR 99E: AURORA–WOODBURN, MARION COUNTY, OREGON
OREGON DEPARTMENT OF TRANSPORTATION

DATE: 10/20/2011 (REVISED 11/22/11) FIGURE 2



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OREGON DEPARTMENT OF TRANSPORTATION

DATE: 10/20/2011 FIGURE 3

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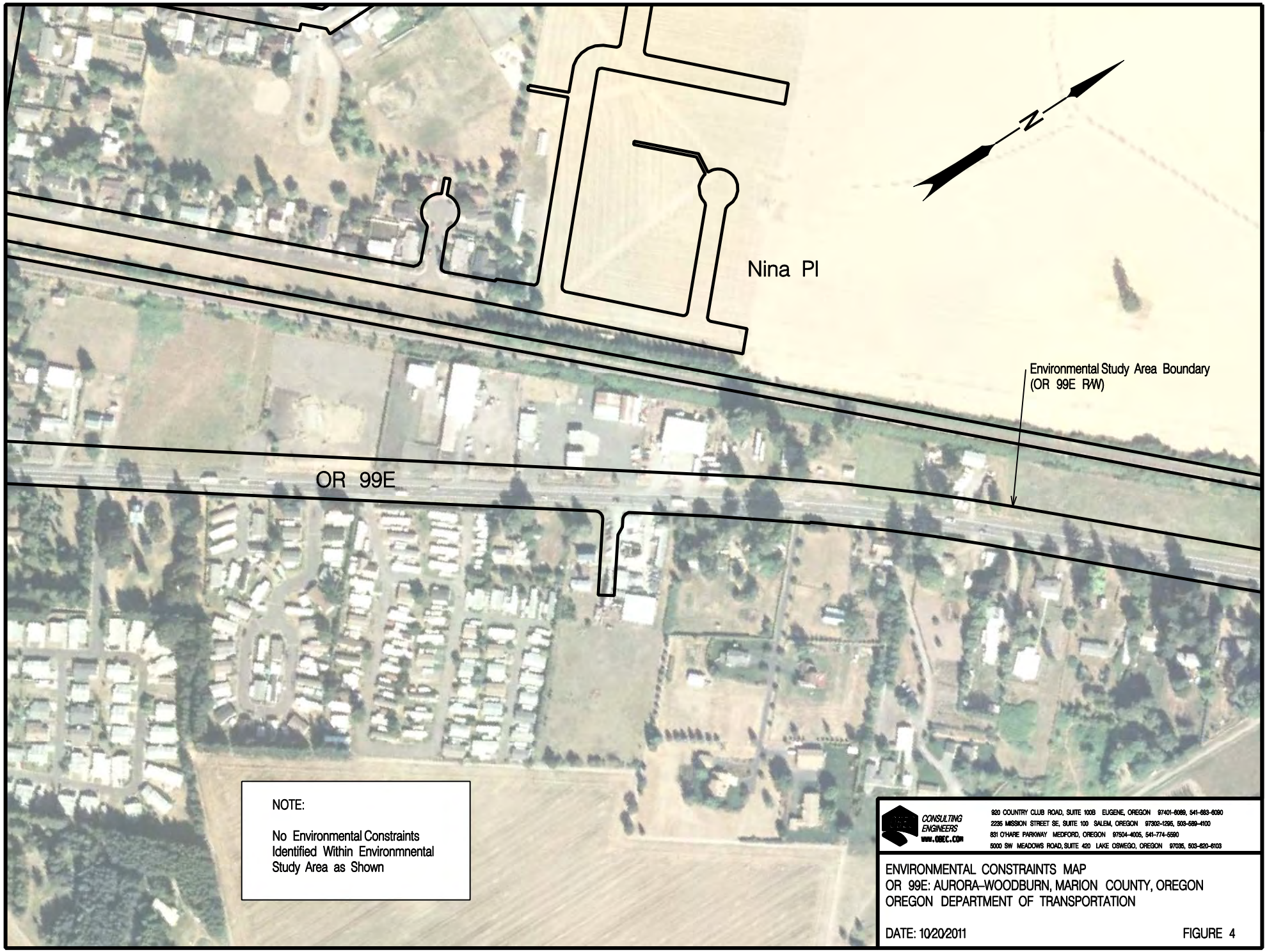

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ENVIRONMENTAL CONSTRAINTS MAP
OR 99E: AURORA–WOODBURN, MARION COUNTY, OREGON
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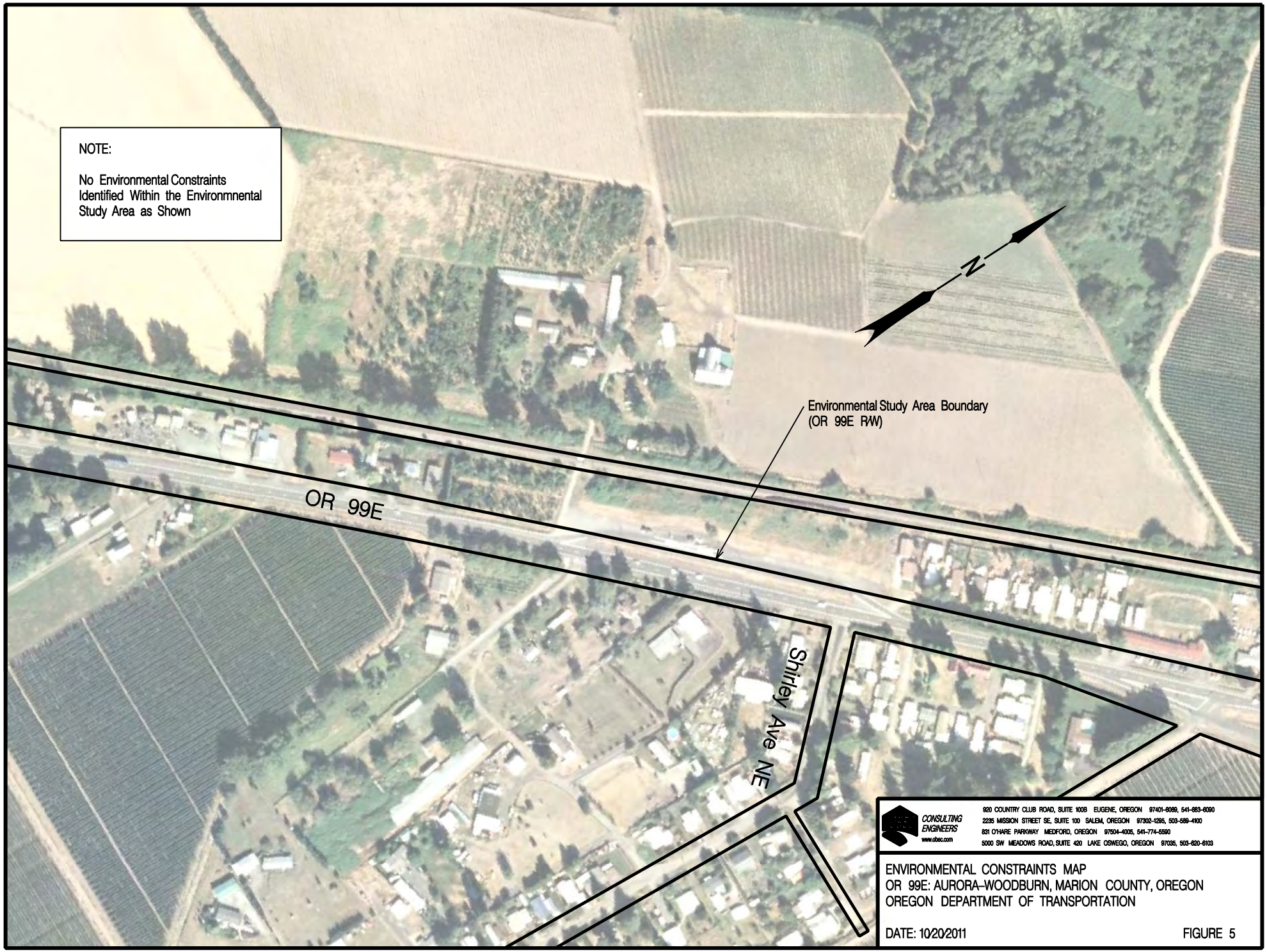
DATE: 10/20/2011 FIGURE 4



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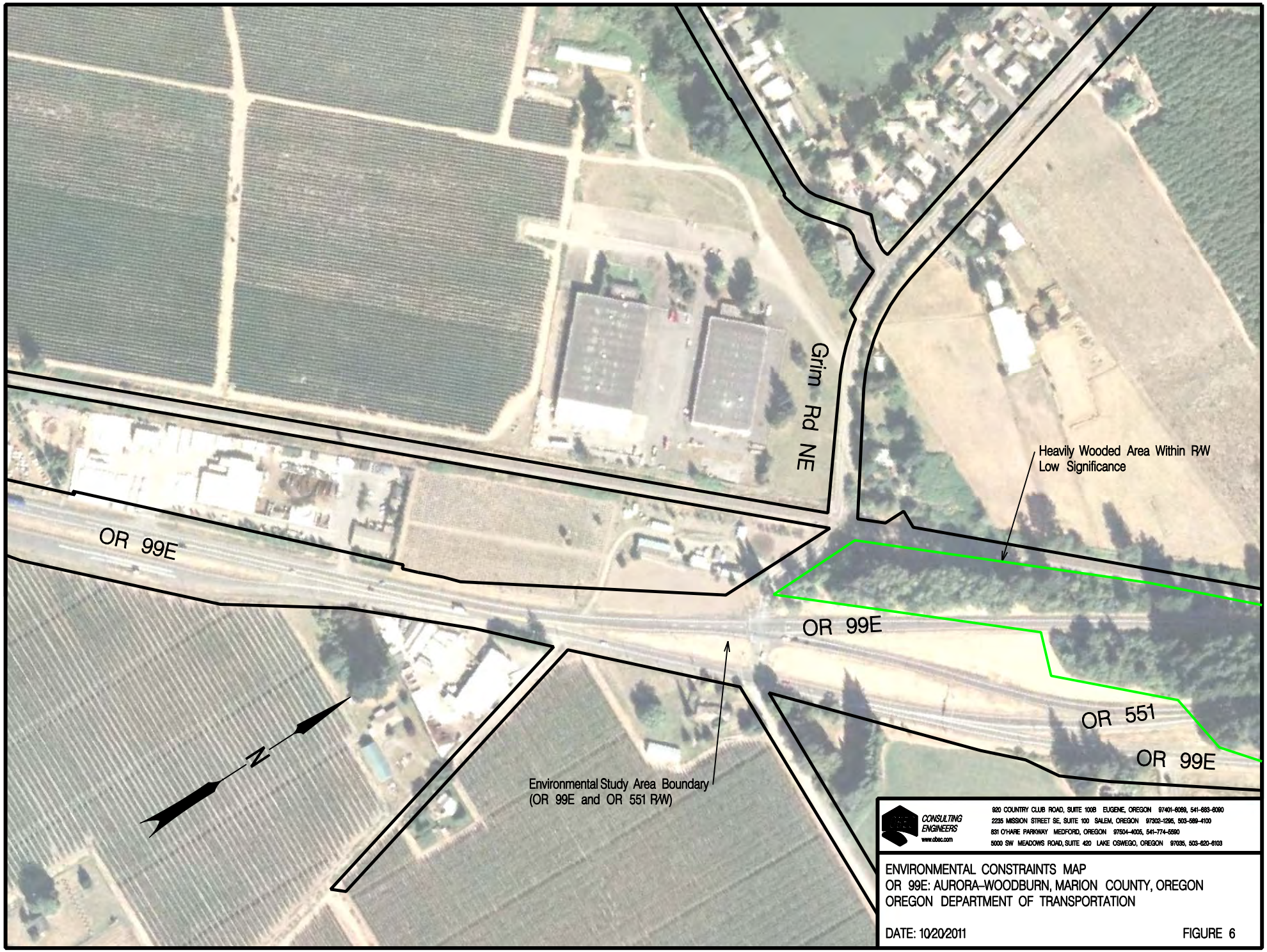
ENVIRONMENTAL CONSTRAINTS MAP
OR 99E: AURORA–WOODBURN, MARION COUNTY, OREGON
OREGON DEPARTMENT OF TRANSPORTATION

DATE: 10/20/2011 FIGURE 5



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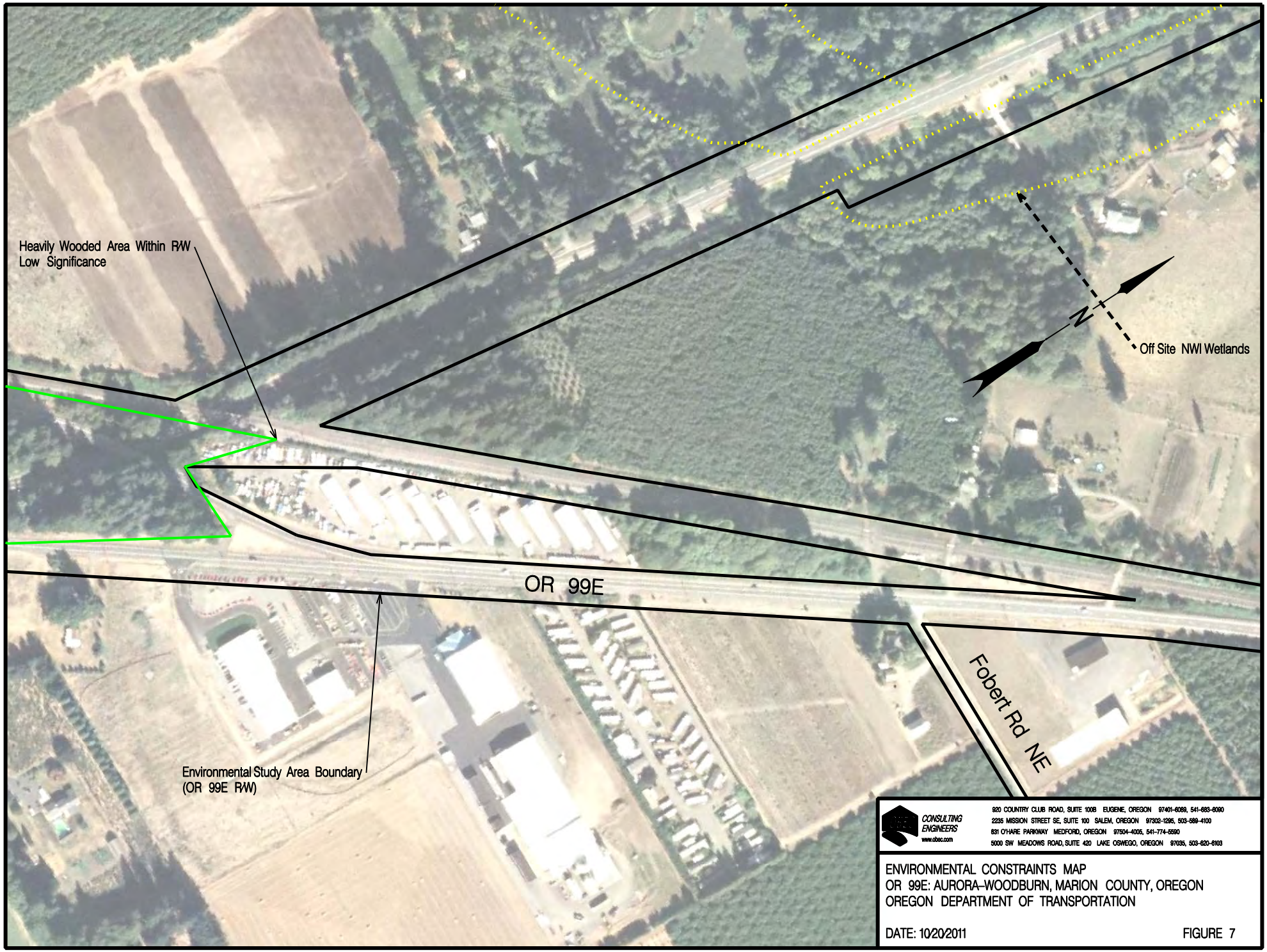
ENVIRONMENTAL CONSTRAINTS MAP
OR 99E: AURORA–WOODBURN, MARION COUNTY, OREGON
OREGON DEPARTMENT OF TRANSPORTATION

DATE: 10/20/2011 FIGURE 6



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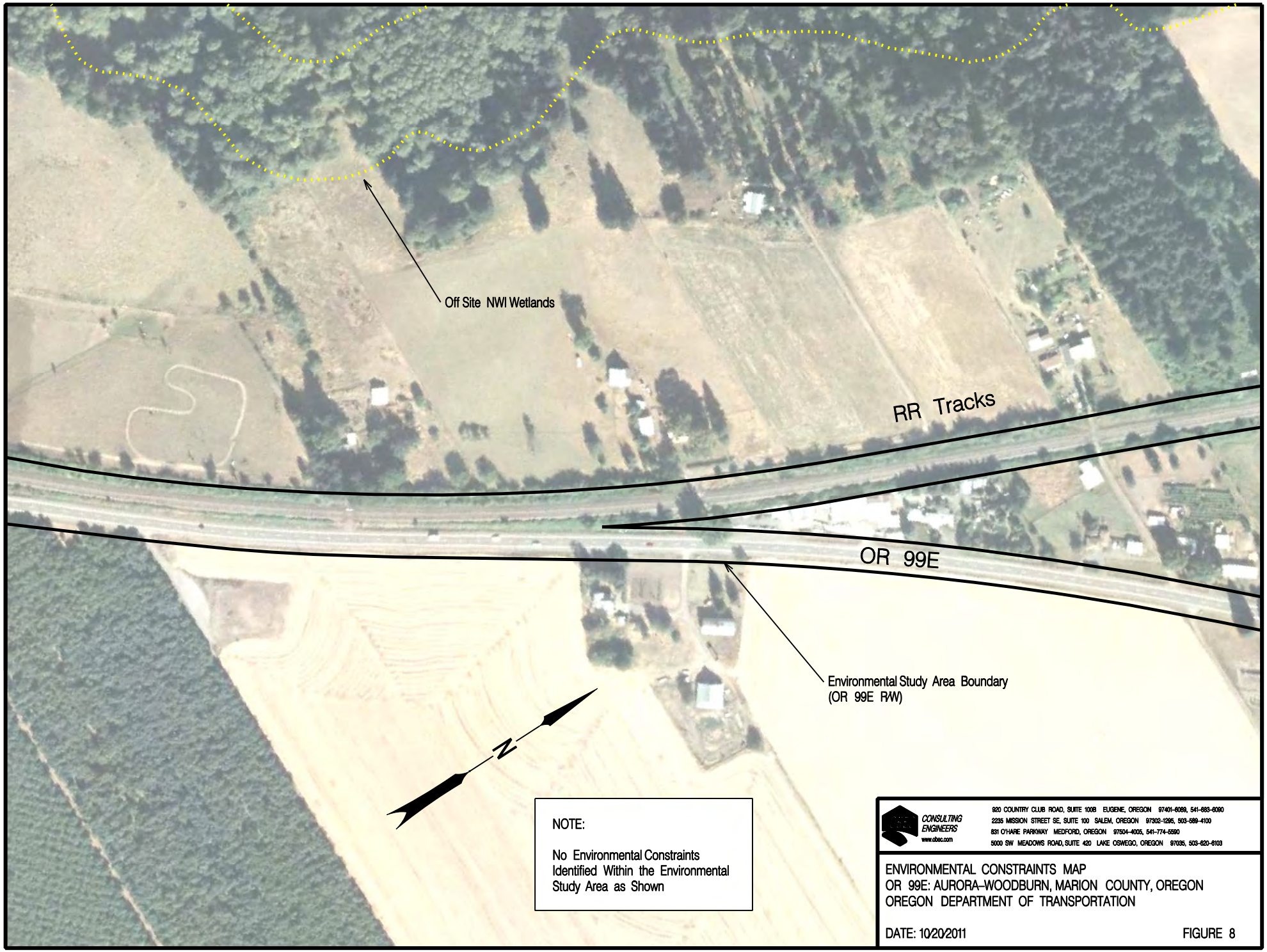
ENVIRONMENTAL CONSTRAINTS MAP
OR 99E: AURORA–WOODBURN, MARION COUNTY, OREGON
OREGON DEPARTMENT OF TRANSPORTATION

DATE: 10/20/2011 FIGURE 7



NOTE:

No Environmental Constraints Identified Within the Environmental Study Area as Shown

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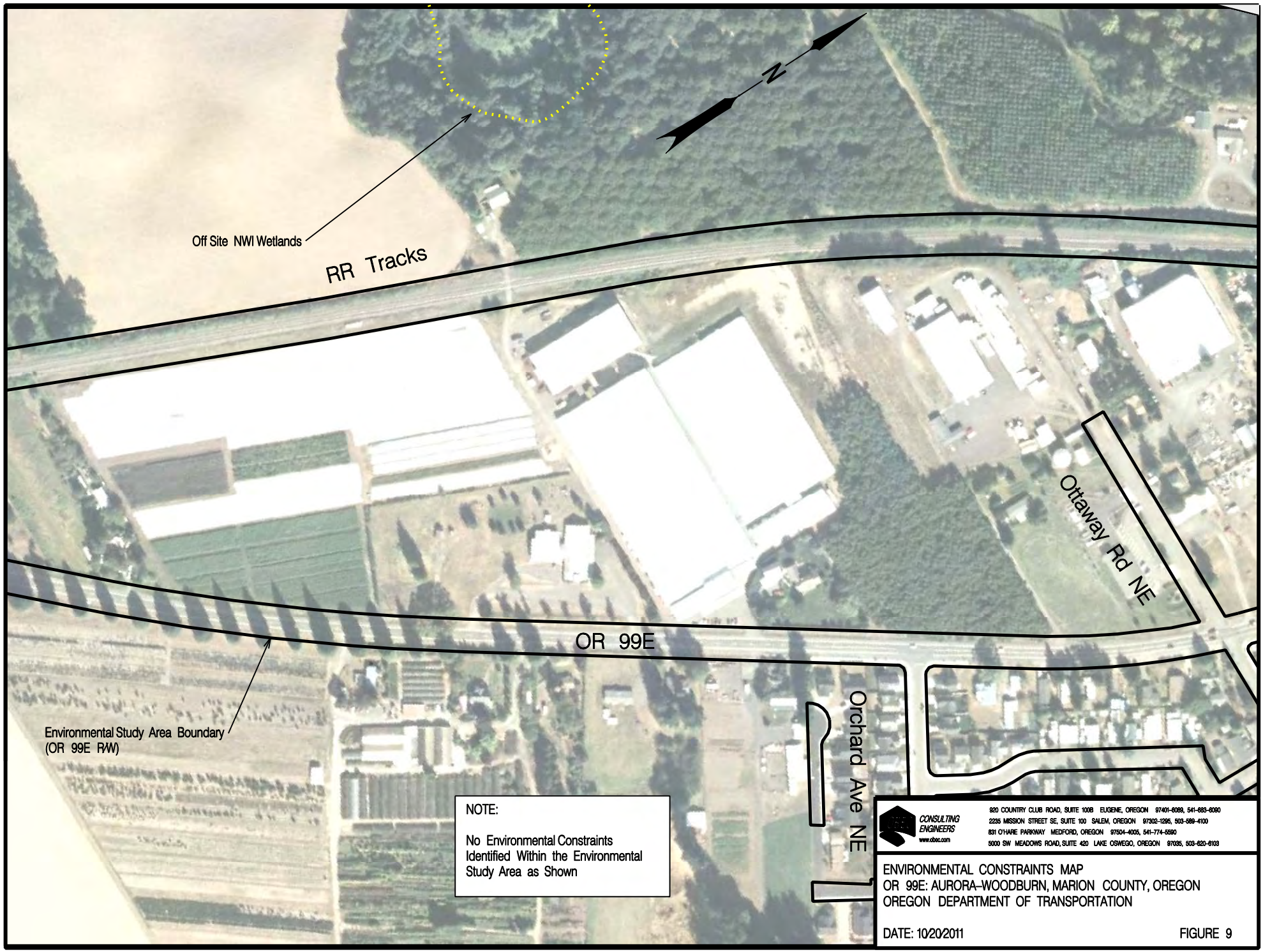
OR 99E: AURORA–WOODBURN, MARION COUNTY, OREGON
OREGON DEPARTMENT OF TRANSPORTATION

DATE: 10/20/2011 FIGURE 8



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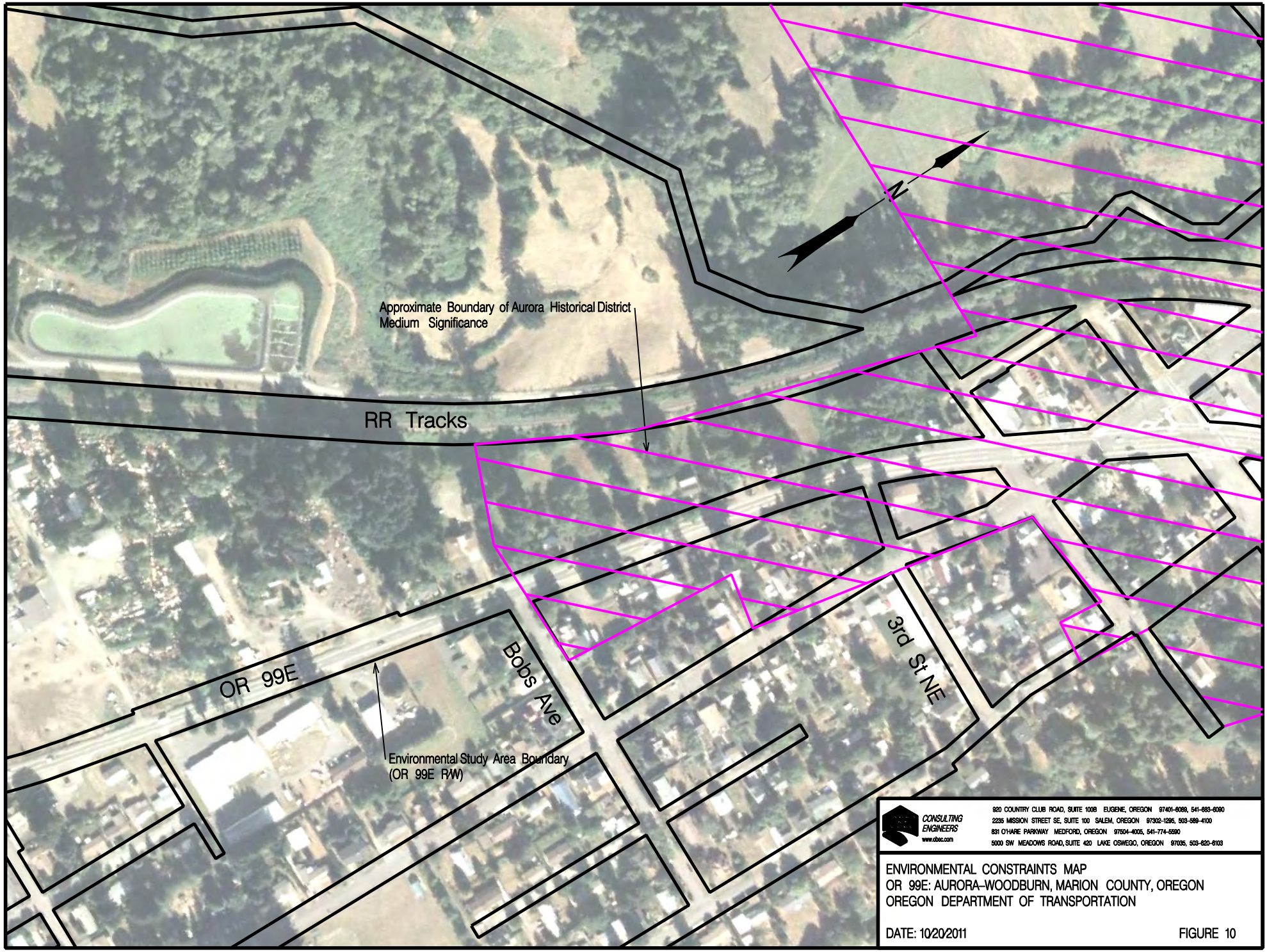
OR 99E: AURORA–WOODBURN, MARION COUNTY, OREGON
OREGON DEPARTMENT OF TRANSPORTATION

DATE: 10/20/2011 FIGURE 9



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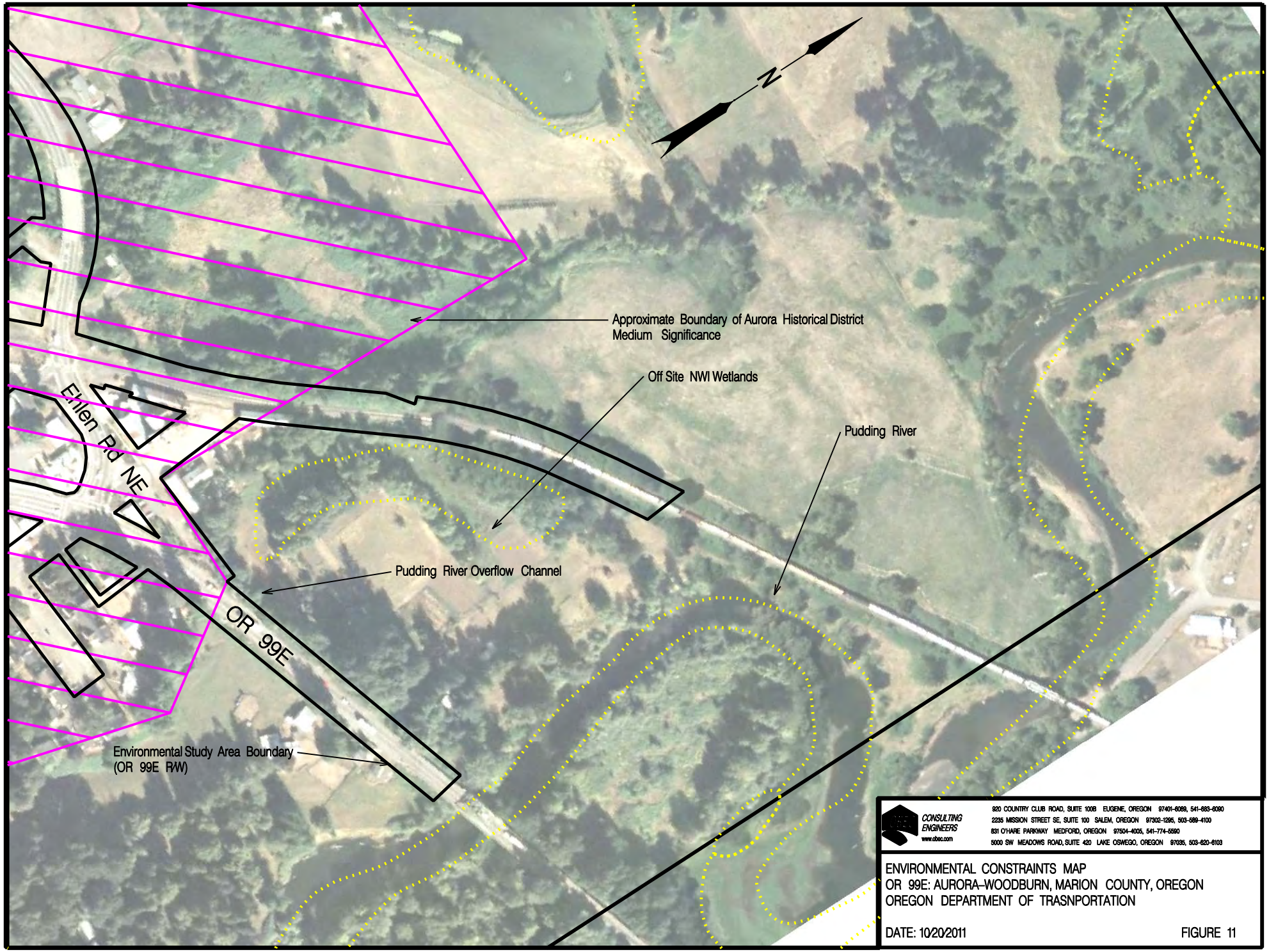
ENVIRONMENTAL CONSTRAINTS MAP
OR 99E: AURORA–WOODBURN, MARION COUNTY, OREGON
OREGON DEPARTMENT OF TRANSPORTATION

DATE: 10/20/2011 FIGURE 10



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ENVIRONMENTAL CONSTRAINTS MAP
OR 99E: AURORA–WOODBURN, MARION COUNTY, OREGON
OREGON DEPARTMENT OF TRASNPORTATION

DATE: 10/20/2011 FIGURE 11

Little Bear Creek is the only water within the project area and it represents a low level of significance with regard to constraining future transportation improvements within the ESA. A removal-fill permit may be needed if the culvert is replaced, but it is not expected that any replacement culvert will need to meet fish passage requirements. Although this creek is a tributary to Mill Creek which is fish bearing, it is only present within a small culvert within the ESA and it appears to come to an end immediately upstream of the ESA in an agricultural field. The only areas of high significance were identified outside of the ESA and included the Pudding River and adjacent potential wetlands.

POTENTIAL LAND USE CONSTRAINTS

Potential land use constraints include existing or future land uses within the study area that can contribute to traffic operations/safety conflicts on OR 99E as well as existing land uses abutting the highway that may limit the ability to construct improvements. The identification of potential land use - traffic conflicts was based on observations made during field reconnaissance and an assessment of future development potential within the study area. The determination of potential land use constraints for future improvements was based on an assessment of the anticipated improvement types and available ROW width.

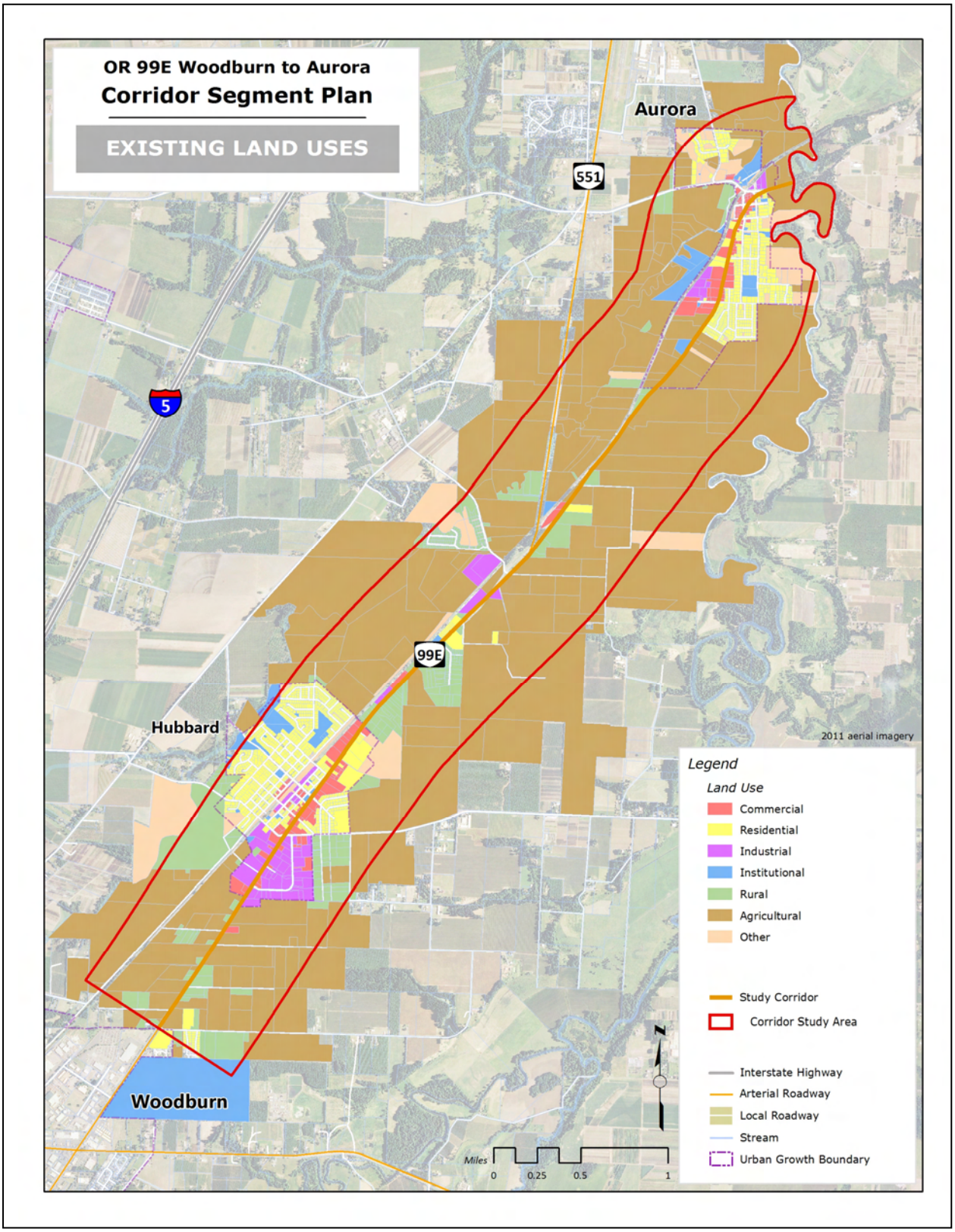
Existing Land Use

The corridor study area comprises a mixture of rural and urban land uses, which are shown by tax lot in Figure 12.[11] As can be seen, the distribution of these uses varies by corridor segment:

- **Woodburn north Urban Growth Boundary (UGB) - Hubbard south UGB:** Agricultural/rural is the predominant land use type between the Woodburn and Hubbard UGB's.
- **City of Hubbard:** Industrial and commercial are the primary land use types that abut OR 99E within the City of Hubbard. The industrial land uses are concentrated mainly in the south end of the city to the south of "J" Street. The commercial land uses are located mostly to the north of "J" Street along both sides of OR 99E. Some residential land uses also abut OR 99E on the north end of town.
- **Hubbard north UGB to Aurora south UGB:** Agricultural/rural land uses predominate the area between the Hubbard and Aurora UGB's. Some Industrial and residential land uses are also present to the south of OR 551.
- **City of Aurora:** Within the City of Aurora, OR 99E is abutted by a mixture of agricultural, commercial, and residential land uses. Most of the city's commercial land uses are adjacent to OR 99E or are within a few hundred feet of the highway. The abutting residential and agricultural land uses are found mostly found near the City's south UGB.

[11] Based on tax lot data obtained from City of Hubbard, City of Aurora, and Marion County.

Figure 12


OR 99E Woodburn to Aurora
Corridor Segment Plan
EXISTING LAND USES
Aurora
551
5
99E
Hubbard
Woodburn
2011 aerial imagery
Legend
Land Use
Commercial
Residential
Industrial
Institutional
Rural
Agricultural
Other
Study Corridor
Corridor Study Area
Interstate Highway
Arterial Roadway
Local Roadway
Stream
Urban Growth Boundary
Miles
0
0.25
0.5
1

Potential Existing Land Use – Traffic Operations/Safety Conflicts

Field visits were conducted[12] to identify potential conflicts between existing land uses adjacent to the highway and traffic operations/safety. The following criteria were used to identify tax lots with potential conflicting uses:

- Site generates a significant number of vehicle trips.
- Site has improper or inadequate access design.
- Site has continuous (uncontrolled) access to highway.
- Vehicles accessing site have impact on highway operations.
- Vehicles accessing site significantly reduce speed of other vehicles on highway.
- Vehicles accessing site block one or both travel lanes.

Table 2 and Figure 13 show the tax lots with potential conflicting uses.

Future Land Use

Planned/Committed Projects

As shown in Figure 14, there are currently three planned projects within the Cities of Aurora and Hubbard that have been approved for development.[13] These are:

- Nine-lot residential subdivision at intersection of Ehlen Rd./Airport Rd. in Aurora.
- 50,100 s.f. commercial development at intersection of OR 99E/Ottaway Rd. NE in Aurora.
- 9,300 s.f. industrial building between "J" St. and Schmidt Ln. in Hubbard.

Currently, there are no planned developments within the Marion County portion of the study area.

Development Potential

Another general indicator of the possible future intensity of traffic accessing/egressing OR 99E is the zoning of land adjacent to or near the highway, because different land uses generate different levels and types of traffic. For instance, single-family dwelling units typically generate only a few trips a day, while high-intensity commercial and industrial uses can generate many times that number of trips.

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[12] Field visits were conducted on October 14th and 16th, 2011 by DKS Associates staff.
[13] Information received from Renata Wakeley and Suzanne Dufner, Mid-Willamette Valley Council of Governments on October 6th and 7th, 2011.

Figure 13

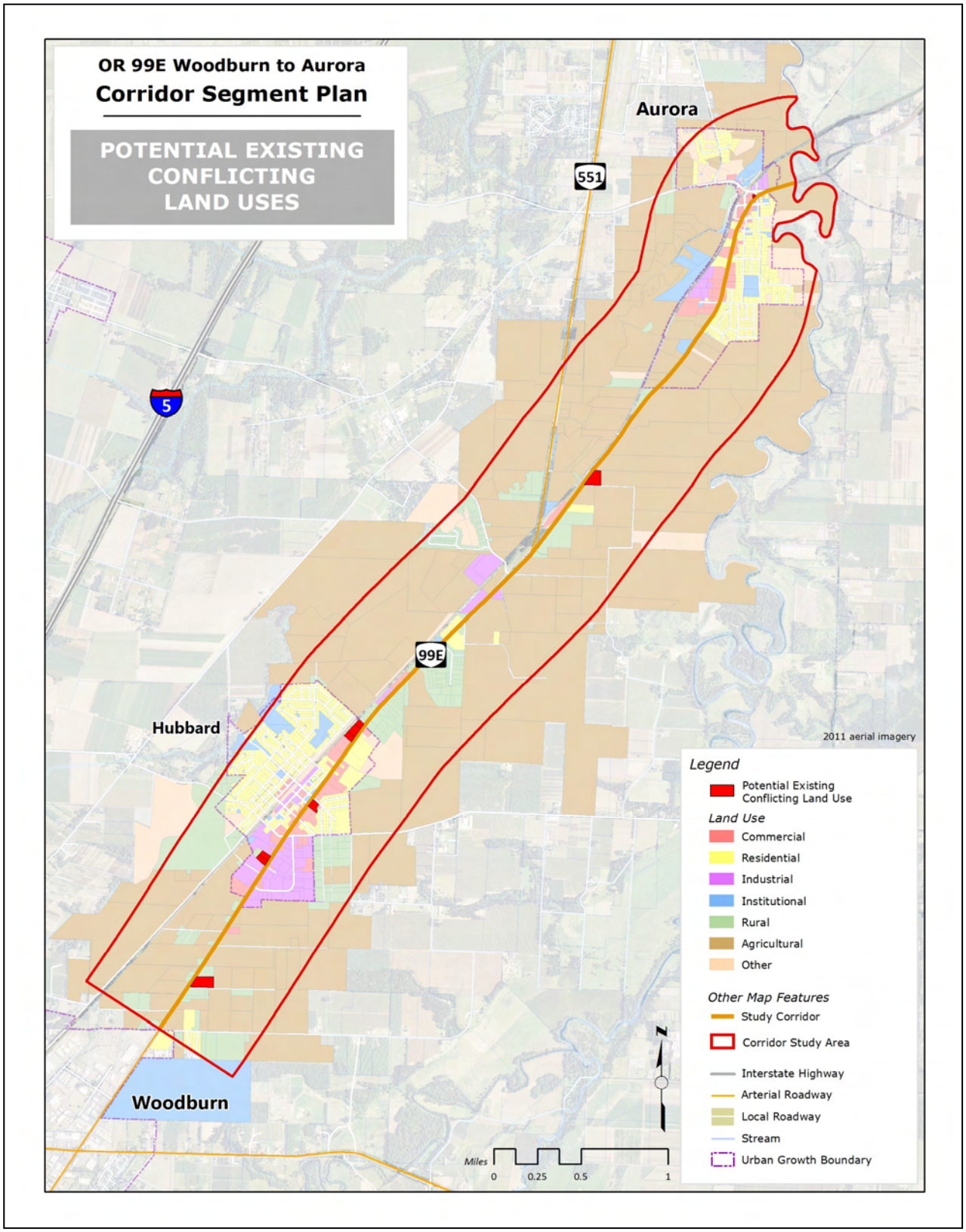

OR 99E Woodburn to Aurora
Corridor Segment Plan
POTENTIAL EXISTING CONFLICTING LAND USES
Aurora
551
5
99E
Hubbard
Woodburn
2011 aerial imagery
Legend
Potential Existing Conflicting Land Use
Land Use
Commercial
Residential
Industrial
Institutional
Rural
Agricultural
Other
Other Map Features
Study Corridor
Corridor Study Area
Interstate Highway
Arterial Roadway
Local Roadway
Stream
Urban Growth Boundary
Miles
0
0.25
0.5
1

Figure 14

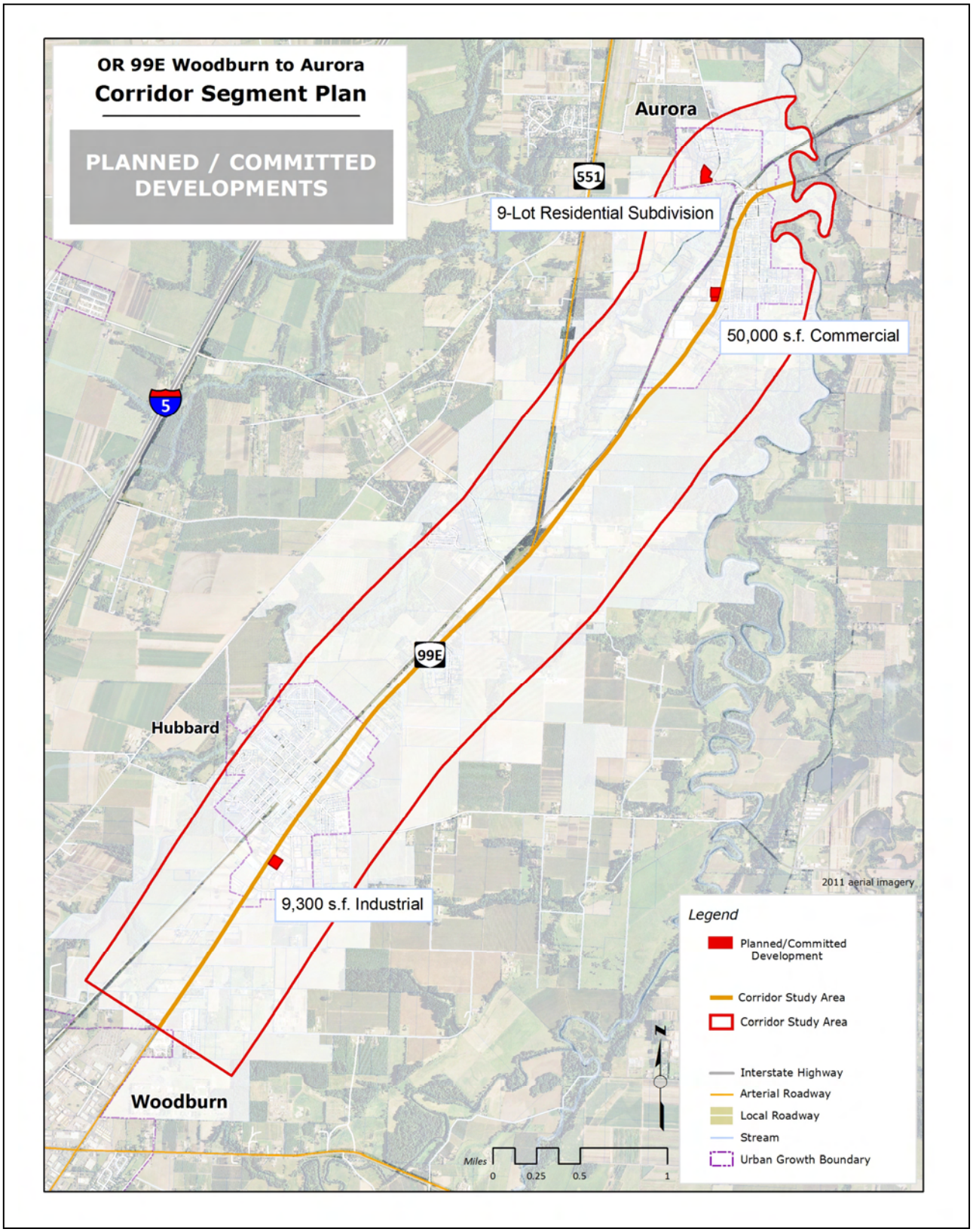

OR 99E Woodburn to Aurora
Corridor Segment Plan
PLANNED / COMMITTED DEVELOPMENTS
Aurora
551
9-Lot Residential Subdivision
50,000 s.f. Commercial
5
99E
Hubbard
9,300 s.f. Industrial
Woodburn
2011 aerial imagery
Legend
Planned/Committed Development
Corridor Study Area
Corridor Study Area
Interstate Highway
Arterial Roadway
Local Roadway
Stream
Urban Growth Boundary
Miles
0
0.25
0.5
1

Table 2
Potential Existing Conflicting Land Uses

Business Name	Tax Lot	Address	Land Use	Notes
Leather's Oil (Shell gas station)	041W12CD03200	21687 Hwy. 99E NE (Aurora)	Gas station and convenience store	The two driveways for this gas station are located near the signalized intersection of OR 99E/Ehlen Rd. The driveways access both OR 99E and the busy Liberty St.
Blue Diamond Receiving Station	041W2300300	19988 Hwy. 99E NE (n/o OR 551)	Agricultural	Trucks likely need to slow down considerably to access the site during the harvest season.
Tim's Diesel Truck Repair	041W27CD01300	4517 Pacific Hwy. 99E (Hubbard)	Commercial	This site generates roughly 10 truck trips per day entering/exiting the highway.[14]
Union 76	041W34BB00100	4515 Pacific Hwy. 99E (Hubbard)	Gas station and convenience store	Access is available only from OR 99E. Previous studies have identified this site as a cause of operational and safety problems. This finding is confirmed by traffic counts which indicate a PM peak hour volume of 90 vehicles entering/exiting the site.
Roofline Supply and Delivery	041W34BB00300	4415 Pacific Hwy. 99E (Hubbard)	Commercial	This site may generate turning traffic from large delivery trucks entering and exiting the site.
Hubbard Market and Texaco Gas Station	041W34BC02500	3574 Pacific Hwy. 99E (Hubbard)	Gas station and convenience store	This site has a right-in-right-out driveway on OR 99E and a second access on "D" St.
Nursery Connections	041W33DC00200	2655 Pacific Hwy. 99E (Hubbard)	Industrial	This site shares a driveway with the adjacent tax lot to the south. The configuration of the gate and fence between the tax lots causes large trucks to block the through lanes on OR 99E while entering the site. A large truck traveling southbound on OR 99E was observed using the southbound through lane, center turn lane, and northbound through lane to enter the site.
Unknown	041W33DC00300	2625 Pacific Hwy. 99E (Hubbard)	Industrial	This site is adjacent to Nursery Connections. Large trucks accessing this location may encounter difficulties similar to those for Nursery Connections.
Turf and Storage	051W0401800	17018 Hwy. 99E NE (between Woodburn and Hubbard)	Agricultural	Large truck access to this site is available via Dimmick Ln. Trucks accessing the site need to slow down from 55-mph on the highway, requiring other vehicles to slow due to the lack of turn lanes.

[14] Information obtained from Tim's Diesel Truck Repair.

Figure 15 shows the distribution of zoning along OR 99E within the study area. The zoning categories shown are a combination of the categories for the Cities of Aurora and Hubbard and Marion County. Although many of the categories are similar, each jurisdiction has one or more categories that are unique. Table 3 lists the zoning categories and associated codes for each jurisdiction.

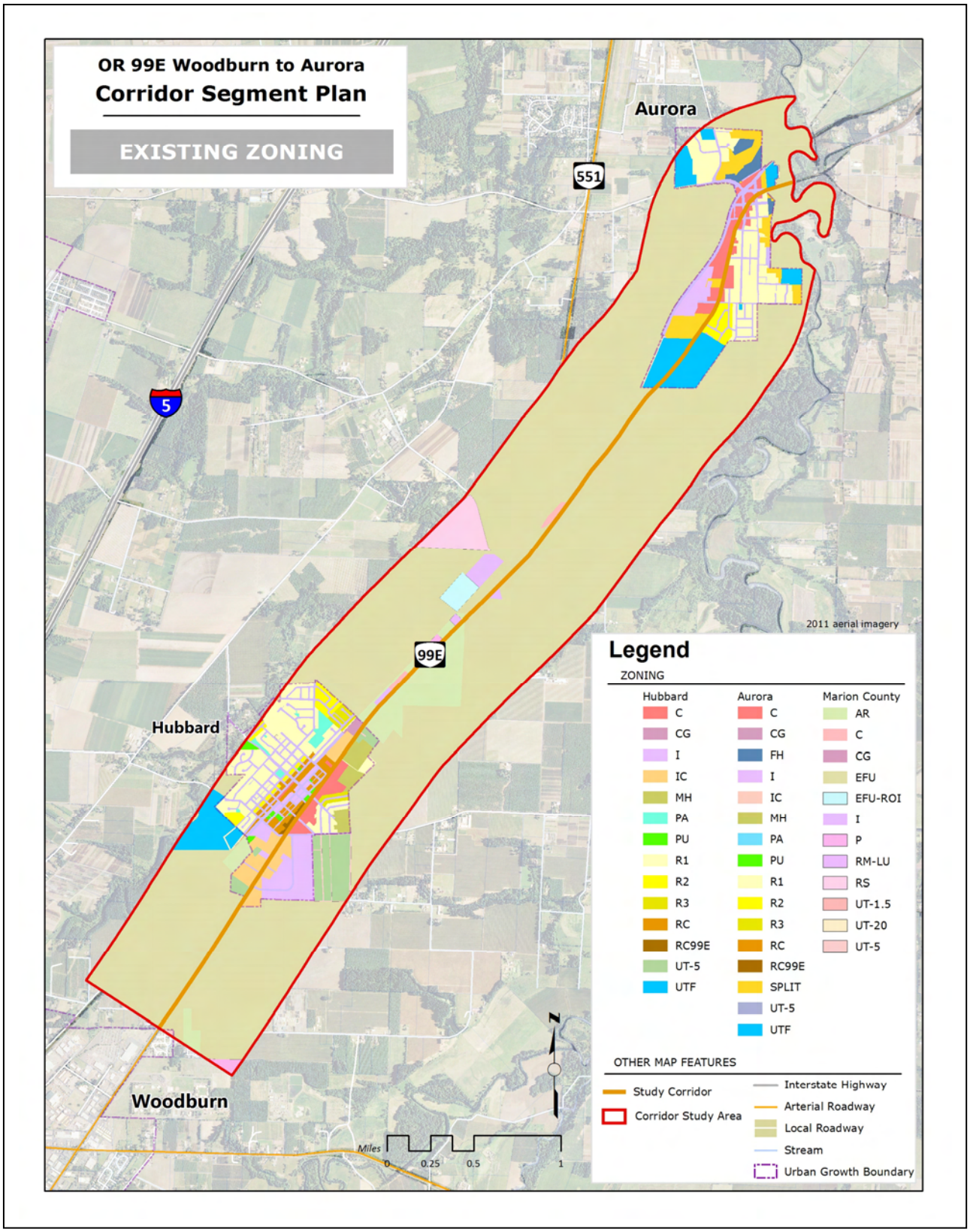
As would be expected, the most intensive zoning lies within the Hubbard and Aurora UGBs. Within the Hubbard UGB, the area adjacent to OR 99E is zoned primarily industrial on the south end, with commercial, residential commercial – 99E, and industrial commercial zoning in the center of town. On the north end of the UGB, there is a mixture of industrial commercial, general commercial, and mobile home zoning.

The zoning along OR 99E to the north of the Hubbard UGB consists of rural residential, commercial and industrial. Near the OR 99E/OR 551 intersection, there is a cluster of land with industrial, Exclusive Farm Use – Resolution of Intent (EFU – ROI), and rural service zoning.

Table 3
Jurisdictional Zoning Categories

Zoning Category	Zoning Code		
	Hubbard	**Aurora**	**Marion County**
Agricultural (Primary)	N/A	N/A	EFU
Agricultural	N/A	N/A	EFU-ROI
Commercial	C	C	C
General Commercial	CG	CG	CG
Flood Hazard	N/A	FH	N/A
Industrial	I	I	I
Industrial Commercial	IC	IC	N/A
Mobile Home	MH	MH	N/A
Public Area	PA	PA	P
Public Use	PU	PU	N/A
Rural Residential	N/A	N/A	AR
Low-Density Residential	R1	R1	N/A
Moderate-Density Residential	R2	R2	N/A
High-Density Residential	R3	R3	N/A
Residential Commercial	RC	RC	N/A
Residential Commercial OR 99E	RC99E	RC99E	N/A
Rural Service	N/A	N/A	RS
Split (multiple zoning designations)	N/A	Split	N/A
Urban Transition Farm	UTF	UTF	N/A
Urban Transition Farm – 1.5 Acre	N/A	N/A	UT-1.5
Urban Transition Farm – 5 Acre	UTF-5	UTF-5	UT-20
Urban Transition Farm – 20 Acre	N/A	N/A	UT-5

Figure 15


OR 99E Woodburn to Aurora
Corridor Segment Plan
EXISTING ZONING
Aurora
551
5
99E
Hubbard
Woodburn
2011 aerial imagery
Legend
ZONING
Hubbard
C
CG
I
IC
MH
PA
PU
R1
R2
R3
RC
RC99E
UT-5
UTF
Aurora
C
CG
FH
I
IC
MH
PA
PU
R1
R2
R3
RC
RC99E
SPLIT
UT-5
UTF
Marion County
AR
C
CG
EFU
EFU-ROI
I
P
RM-LU
RS
UT-1.5
UT-20
UT-5
OTHER MAP FEATURES
Study Corridor
Corridor Study Area
Interstate Highway
Arterial Roadway
Local Roadway
Stream
Urban Growth Boundary
Miles
0
0.25
0.5
1

There is a relatively large area with Urban Transition Farm zoning on the south end of the Aurora UGB. The remainder of the land along OR 99E in Aurora is zoned primarily commercial, with small pockets of Split (multiple zone designations) and residential zoning. At the north end, there is also an area with Urban Transition Farm zoning.

The remainder of the study area has low-intensity EFU zoning.

Nearly all of the land along OR 99E within these zoning categories is already developed. To obtain a better idea about where additional traffic generation may occur within these areas in the future, information about buildable land was obtained from the Mid-Willamette Valley Council of Governments (MWCOG).[14] This included both vacant tax lots with development potential as well as tax lots with existing development that could be redeveloped within the next 20 years. The buildable land information was produced as a part of the comprehensive plan development process for the Cities of Hubbard and Aurora. This information was not available for Marion County because they are not required to produce this data as a part of their comprehensive planning process.

The tax lots with development or redevelopment potential are shown in Figure 16. In Hubbard, there are 10 parcels totaling 17-acres in the southern portion of the UGB area that are designated as industrial in the Comprehensive Plan. To the north, there are six commercial tax lots immediately adjacent to the highway totaling 6-acres with development/redevelopment potential. Also within this area, there is a relatively large (3-acre) buildable parcel abutting the highway with an industrial designation. The remaining parcels located away from the highway are mostly smaller and have a residential or commercial designation.

Within Aurora, the largest buildable tracts are located in the southern portion of the UGB area near the highway and on the north end about 1/3-mile from OR 99E near the intersection of Ehlen Rd./Airport Rd. Both of these areas are designated as residential in the City of Aurora Comprehensive Plan. There is also a scattering of smaller redevelopable residential parcels on the east side of Aurora.

To the west of OR 99E, there are four relatively large industrial tax lots. Commercially buildable land is concentrated in three smaller parcels to the west of the OR 99E/Ehlen Rd. intersection and in three parcels near Ottaway Rd.

<u>Potential Future Land Use – Traffic Operations/Safety Conflicts</u>

Figure 17 shows the tax lots associated with potential future land use – traffic operations/safety conflicts. These consist of the tax lots associated with the existing conflicts from Figure 13

[14] Information received from Kimberly Sapunar, Mid-Willamette Valley Council of Governments on October 5th, 2011.

Figure 16

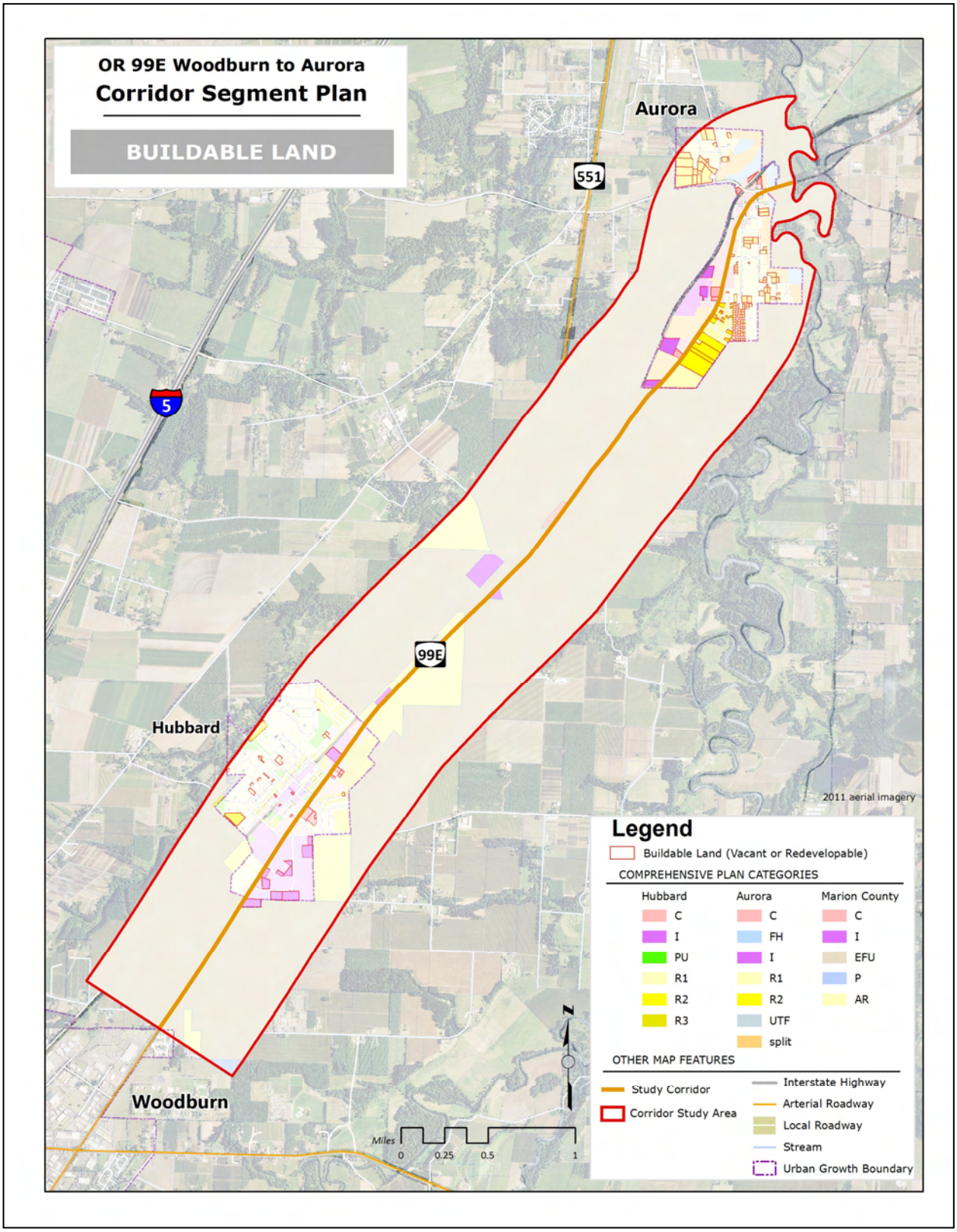
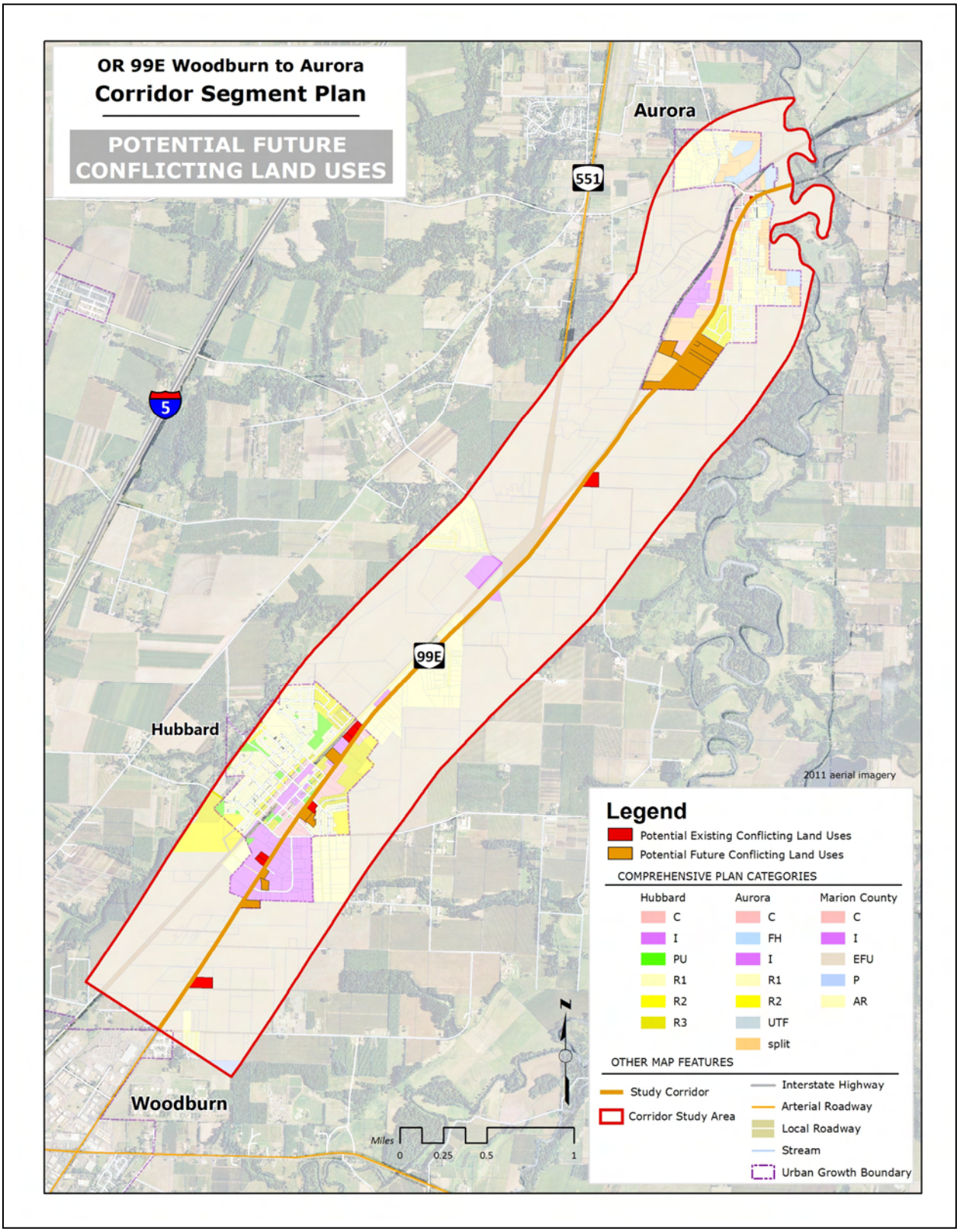

OR 99E Woodburn to Aurora
Corridor Segment Plan
BUILDABLE LAND
Aurora
551
5
99E
Hubbard
Woodburn
2011 aerial imagery
Legend
Buildable Land (Vacant or Redevelopable)
COMPREHENSIVE PLAN CATEGORIES
Hubbard
C
I
PU
R1
R2
R3
Aurora
C
FH
I
R1
R2
UTF
split
Marion County
C
I
EFU
P
AR
OTHER MAP FEATURES
Study Corridor
Corridor Study Area
Interstate Highway
Arterial Roadway
Local Roadway
Stream
Urban Growth Boundary
N
Miles
0
0.25
0.5
1

Figure 17


OR 99E Woodburn to Aurora
Corridor Segment Plan
POTENTIAL FUTURE CONFLICTING LAND USES
Aurora
551
5
99E
Hubbard
Woodburn
2011 aerial imagery
Legend
Potential Existing Conflicting Land Uses
Potential Future Conflicting Land Uses
COMPREHENSIVE PLAN CATEGORIES
Hubbard
C
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PU
R1
R2
R3
Aurora
C
FH
I
R1
R2
UTF
split
Marion County
C
I
EFU
P
AR
OTHER MAP FEATURES
Study Corridor
Corridor Study Area
Interstate Highway
Arterial Roadway
Local Roadway
Stream
Urban Growth Boundary
N
Miles
0
0.25
0.5
1

(shown in red) , as well as parcels included in the developable/redevelopable areas identified in the previous section (shown in brown). As can be seen, almost all of the potentially conflicting uses are located with the Hubbard and Aurora UGB areas. In Hubbard, these are distributed fairly evenly from the south end to the north end within the industrial and commercial areas abutting the highway. Future development of the industrial sites would need to include proper access permitting and design to minimize the impact of large trucks entering/exiting the sites.

Within Aurora, the future conflicting uses are concentrated in the south end of the UGB area within the residential tax lots to the east of the highway and the commercial and industrial parcels to the west of OR 99E. The residential parcels are vacant and comprise more than 22 acres of land. They could be developed at a maximum density of about nine dwelling units per acre, which would add about 190 dwelling units to this area. For the industrial parcels, special accommodations may need to be made for large vehicles accessing these sites.

Limiting Land Uses

There do not appear to be any areas along the corridor where the ability to implement improvements would be limited by adjacent land uses. This assessment is based on the anticipated types of improvements and the amount of available ROW. It is not expected that improvements requiring a large amount of land, such as multi-lane widenings, will be identified in this study. Most of the improvements will likely be smaller in scale, such as two-way center turn lanes or intersection turn lanes. Given the smaller ROW requirements for these types of improvements and the relatively large ROW width of the corridor (typically 100’), it is expected that the improvements can be constructed within the existing ROW and therefore there would be no need for encroaching on the abutting parcels.

CONCLUSION

Overall, the ESA contains very few environmental constraints related to natural resources or other environmental factors. Water quality is the only constraint identified as being "significant" due to the likely need for storm water treatment for any project that affects impervious surfaces or existing storm water treatment within the ESA. Cultural resources were ranked as medium priority due to the presence of the Aurora Colony Historic District and the likely need for archaeological and historic resource evaluations. All other categories were given low significance, mostly due to their absence within the ESA. If project boundaries are expanded in the future to include areas outside of the right-of-way shown in this study, further investigation may be necessary.

With regard to land use constraints, there are only a few areas with potential existing land use - traffic operations/safety conflicts. These are located mainly in the Hubbard area and likely result in relatively minor problems such as slowing on the highway and general congestion near the site access points. Potential future land use – traffic conflicts were identified in both Hubbard and Aurora based on approved development projects and an assessment of the

development potential in these areas over the next 20 years. Future conflicts in the Marion County portion of the study area were not identified due to the lack of buildable land data. Due to the small amount of developable/redevelopable land available within the study area, it does not appear that the future traffic conflicts associated with these uses will be significant. Constraints for improvements related to roadside development are not anticipated because the improvements will likely be small enough to implement within the existing ROW.

Appendix A
Environmental Constraint Site Inspection Photographs

Photo 1: View of a roadside ditch along the western edge of the environmental study area, just south of Aurora. The ditch is dominated by blackberry and horsetail.

Photo 2: View of a roadside ditch along the western edge of the environmental study area, between OR 99E and the ODOT weigh station at MP 28. Ditch is well maintained and consists of primarily grasses with no defined bed or banks.

Appendix A (cont.)
Environmental Constraint Site Inspection Photographs

Photo 3: View of the heavily wooded areas at the OR 551 and OR 99E intersection.

Photo 4: View of Little Bear Creek and associated mapped wetlands immediately adjacent to the environmental study area.

Appendix D

Future Transportation Conditions

DKS Associates
TRANSPORTATION SOLUTIONS

MEMORANDUM

TO: Dan Fricke, ODOT Region 2

FROM: Bob Schulte and Mike Tomasini

DATE: February 28, 2011

SUBJECT: **OR 99E WOODBURN TO AURORA CORRIDOR SEGMENT PLAN** **P# 09042-022**
Technical Memorandum #6 – Future Transportation Conditions

INTRODUCTION

This memo documents the analysis of future 2035 transportation conditions within the OR 99E Woodburn to Aurora Corridor Segment Plan study area. The findings of the analysis will be used together with the results of the existing conditions analysis in the development of proposed improvements to address transportation needs within the study area. The analysis was conducted for the future No-Build scenario.

TRAFFIC FORECASTS

The 2035 traffic forecasts were developed based on a combination of future year volumes estimated using the historical trends method described in ODOT's Analysis Procedures Manual (APM)[1] and the traffic forecasts developed for the City of Aurora Transportation System Plan and the City of Hubbard Transportation System Plan Update.

The first step in the forecasting process was the development of the trend line forecasts for the analysis intersections along the corridor. Twenty-year traffic growth factors were calculated for each corridor segment using the 2010 and 2030 volumes contained in ODOT's 2010 Transportation Volume Tables. The 20-year growth factors were converted to annual growth rates, then the appropriate rate was applied to the 2011 volumes for each intersection to derive the 2035 forecasts.

The trend line forecasts were compared to the TSP forecasts and it was found that the Aurora TSP forecasts were, on average, about 17% higher. This was the case even though the Aurora

[1] Oregon Department of Transportation, Analysis Procedures Manual, (2011)

TSP forecasts were for the year 2030 rather than 2035. With Hubbard the opposite was true, where the trend line forecasts were roughly 20% higher than the TSP forecasts.

To maintain as much consistency with the TSP forecasts as possible, it was decided that the TSP volumes should be used as the controls for estimating future volumes along the entire corridor. Using the Aurora TSP volumes[2] first as the control, the entering and exiting volumes for the intersections to the south of Aurora were adjusted (balanced) to match the entering and exiting volumes for the the southernmost analysis intersection in Aurora (OR 99E/Ottaway Rd.). For the intersections in the rural segment between Aurora and Hubbard, the adjustments were made to the volumes produced using the historical trends method. Within Hubbard, the adjustments were made to the Hubbard TSP volumes.

The same procedure was followed to develop future volume estimates using the Hubbard TSP volumes as the control. Thus, the volumes for all of the intersections to the north of Hubbard were adjusted to match the entering and exiting volumes for the northernmost analysis intersection in Hubbard (OR 99E/Elm St.). For the intersections in the rural segment between Hubbard and Aurora, the adjustments were made to the trend line volumes, while in Aurora, the Aurora TSP volumes were adjusted.

The future year volume estimates based on the Aurora and Hubbard TSP volume controls appeared to be reasonable compared to the original trend line and TSP forecasts. To minimize the deviation from the original TSP forecasts, final TSP-adjusted volumes were calculated by taking the average of the volumes for each intersection developed using the Aurora TSP and Hubbard TSP control volumes. The results are shown in Table 1, together with the percentage difference between the original forecasts and the average TSP-adjusted volumes.

Table 1
2035 Design Hour Volume Forecasts*

Intersection	Original Forecast		Adjusted Volume		Avg. Adj. Volume	Percentage Difference
	Source	Volume	Aurora TSP Control	Hubbard TSP Control		
OR 99E/Liberty St.	TSP	2,865	2,865	2,575	2,720	-5.1%
OR 99E/2nd St.	TSP	1,835	1,835	1,545	1,690	-7.9%
OR 99E/Main St.	TSP	1,925	1,925	1,625	1,775	-7.8%
OR 99E/Bobs Ave.	TSP	1,900	1,900	1,600	1,750	-7.9%
OR 99E/Ottaway Rd.	TSP	2,135	2,135	1,835	1,985	-7.0%

[2] Because the Aurora TSP forecasts for 2030 were already higher than the 2035 trend line forecasts, the TSP forecasts were not factored up to 2035 levels.

Table 1 (cont.)
2035 Design Hour Volume Forecasts*

Intersection	Original Forecast		Adjusted Volume		Avg. Adj. Volume	Percentage Difference
	Source	Volume	Aurora TSP Control	Hubbard TSP Control		
OR 99E/OR 551/Grim Rd.	Trend line	1,631	1,854	1,744	1,799	10.3%
OR 99E/Scholl Rd.	Trend line	1,236	1,265	1,120	1,193	-3.5%
OR 99E/Union 76 N. Dwy.	Trend line	2,751	2,471	2,181	2,327	-15.4%
OR 99E/Union 76 S. Dwy.	Trend line	2,748	2,475	2,185	2,331	-15.2%
OR 99E/Elm St.	TSP	2,153	2,500	2,205	2,354	9.3%
OR 99E/Parkway Blvd.	TSP	2,189	2,485	2,190	2,339	6.9%
OR 99E/A St.	TSP	2,241	2,535	2,245	2,391	6.7%
OR 99E/D St.	TSP	2,371	2,650	2,390	2,521	6.3%
OR 99E/G St.	TSP	2,178	2,441	2,201	2,322	6.6%
OR 99E/J St.	TSP	2,040	2,286	2,061	2,174	6.6%
OR 99E/Industrial Ave.	TSP	1,892	2,120	1,895	2,008	6.1%

* Volumes shown are total entering vehicles.

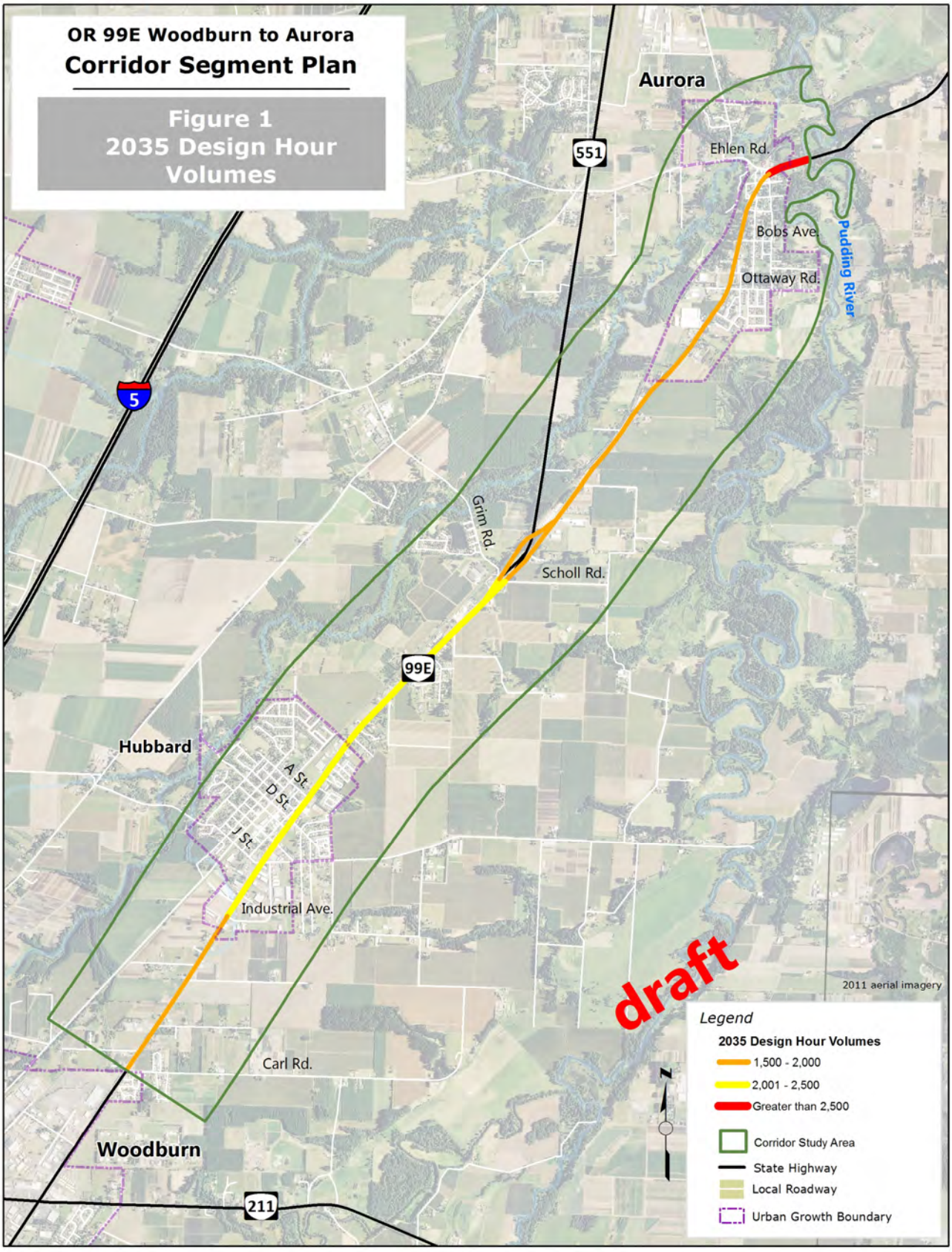
As would be expected, the average adjusted volumes are lower than the original TSP forecasts in Aurora and higher in Hubbard. The percentage difference is between 5 and 10 percent for most locations, with about a 15% difference at the OR 99E/Union 76 Driveways.

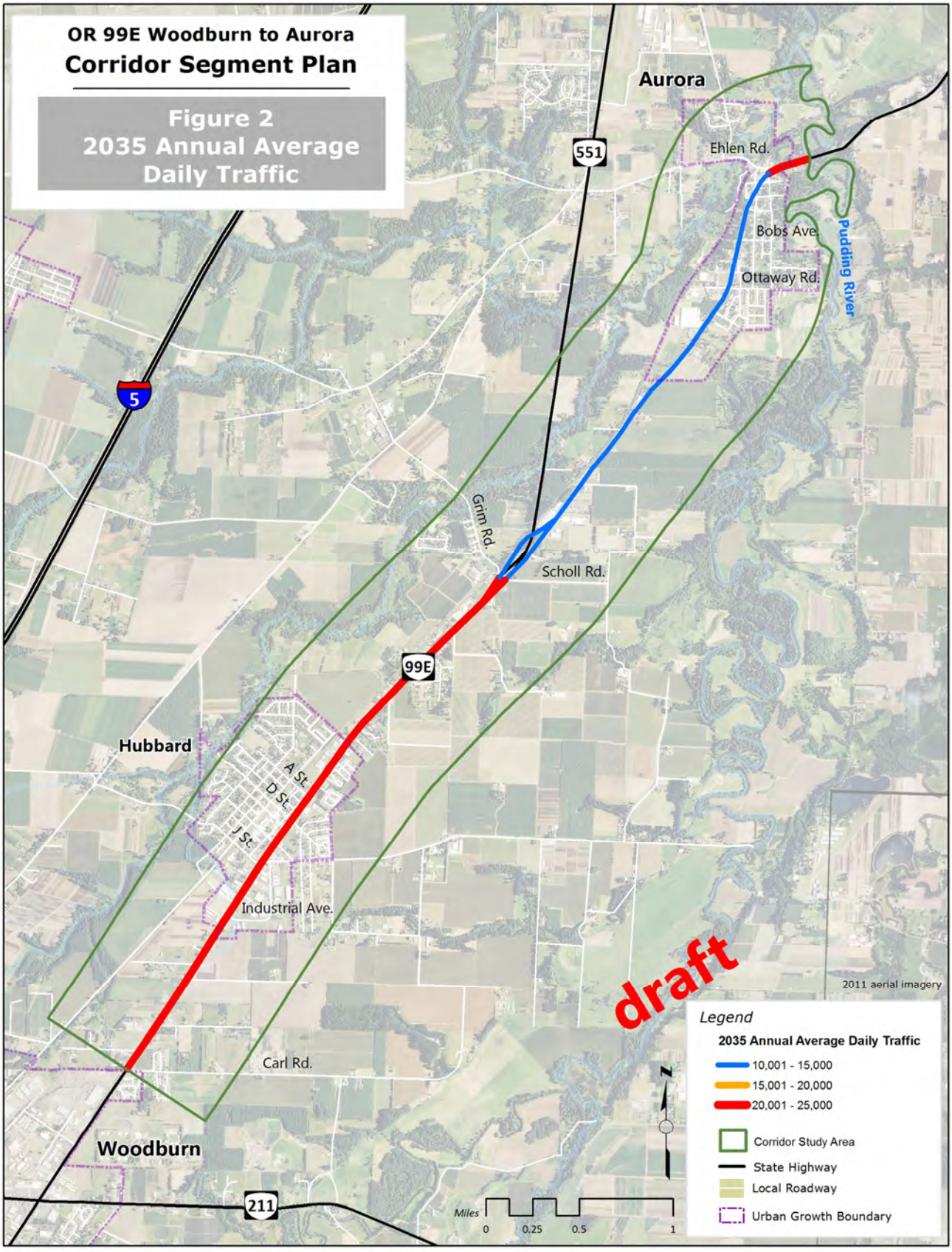
Future segment DHVs were calculated by summing the entering and exiting volumes for the intersections. As shown in Figure 1, 2035 DHVs are the highest to the north of Liberty St. in Aurora. The lowest volumes occur between Aurora and the OR 99E/OR 551 intersections and to the south of Hubbard, ranging from 1,500 - 2,000 vpd. Between the OR 99E/OR 551 intersections and Hubbard, the DHVs range between 2,000 and 2,500 vpd. In general, the volume increases from 2011 to 2035 are between 40 and 50 percent.

The 2035 AADT volumes are shown in Figure 2. Volumes exceed 20,000 vpd along all of the corridor segments, with the exception of the segments between Liberty St. and Orchard Ave. in Aurora and Orchard Ave. and the OR 99E/OR 551 intersections, where the volumes range from 10,000 – 15,000 vpd.

ROADWAY NEEDS

Future roadway needs were examined in the areas of capacity, traffic operations, safety, geometrics, access, and bicycle and pedestrian facilities.


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 1
2035 Design Hour Volumes
Aurora
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Pudding River
5
Grim Rd.
Scholl Rd.
99E
Hubbard
A St.
D St.
J St.
Industrial Ave.
Carl Rd.
Woodburn
211
draft
2011 aerial imagery
Legend
2035 Design Hour Volumes
1,500 - 2,000
2,001 - 2,500
Greater than 2,500
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
N


OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 2
2035 Annual Average Daily Traffic
Aurora
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Pudding River
5
Grim Rd.
Scholl Rd.
99E
Hubbard
A St.
D St.
J St.
Industrial Ave.
Carl Rd.
Woodburn
211
draft
2011 aerial imagery
Legend
2035 Annual Average Daily Traffic
10,001 - 15,000
15,001 - 20,000
20,001 - 25,000
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

Capacity

Future capacity needs were identified by comparing volume-to-capacity (v/c) ratio estimates for roadway segments and intersections to the appropriate v/c ratio targets. The applicable standards for regional highways are shown in Table 1. The standards reflect the revisions to the OHP Policy 1F that went into effect in January, 2012.

Table 2
V/C Targets

Area	Segments/Signalized Intersections	Unsignalized Intersections*
Inside Urban Growth Boundary		
Non-MPO outside of STAs where non-freeway posted speed <= 35 mph, or a designated UBA	0.90	0.95
Non-MPO outside of STAs where non-freeway speed > 35 mph, but < 45 mph	0.85	0.90
Within STA	1.0	1.0
Outside Urban Growth Boundary		
Rural lands	0.80	0.85

Source: Table 6 of the OHP Policy 1F Highway Mobility Policy

* For unsignalized intersections, the v/c ratio is for the uncontrolled approaches.

Segment v/c ratio estimates were developed based on the 2035 DHVs for the same analysis segments used in the existing conditions analysis. The analysis was performed according to the methodology for two-lane rural highways outlined in the 2000 Highway Capacity Manual (HCM2000)[3] and the APM. With this methodology, the factors for determining the traffic flow rate include the percentages of trucks and buses and recreational vehicles and the peak hour factor. These factors reflect the effect of the various vehicle types on the traffic flow and capacity of a roadway. The same factor values were used in the future conditions analysis as in the existing conditions analysis.

Table 3 and Figure 3 show the estimated v/c ratio for each of the seven segments. As can be seen, the mobility target is met for all of the segments except Segments 1 and 4, where v/c ratio is slightly higher than the target.

[3] Transportation Research Board, Highway Capacity Manual, Special Report 209, (2000).

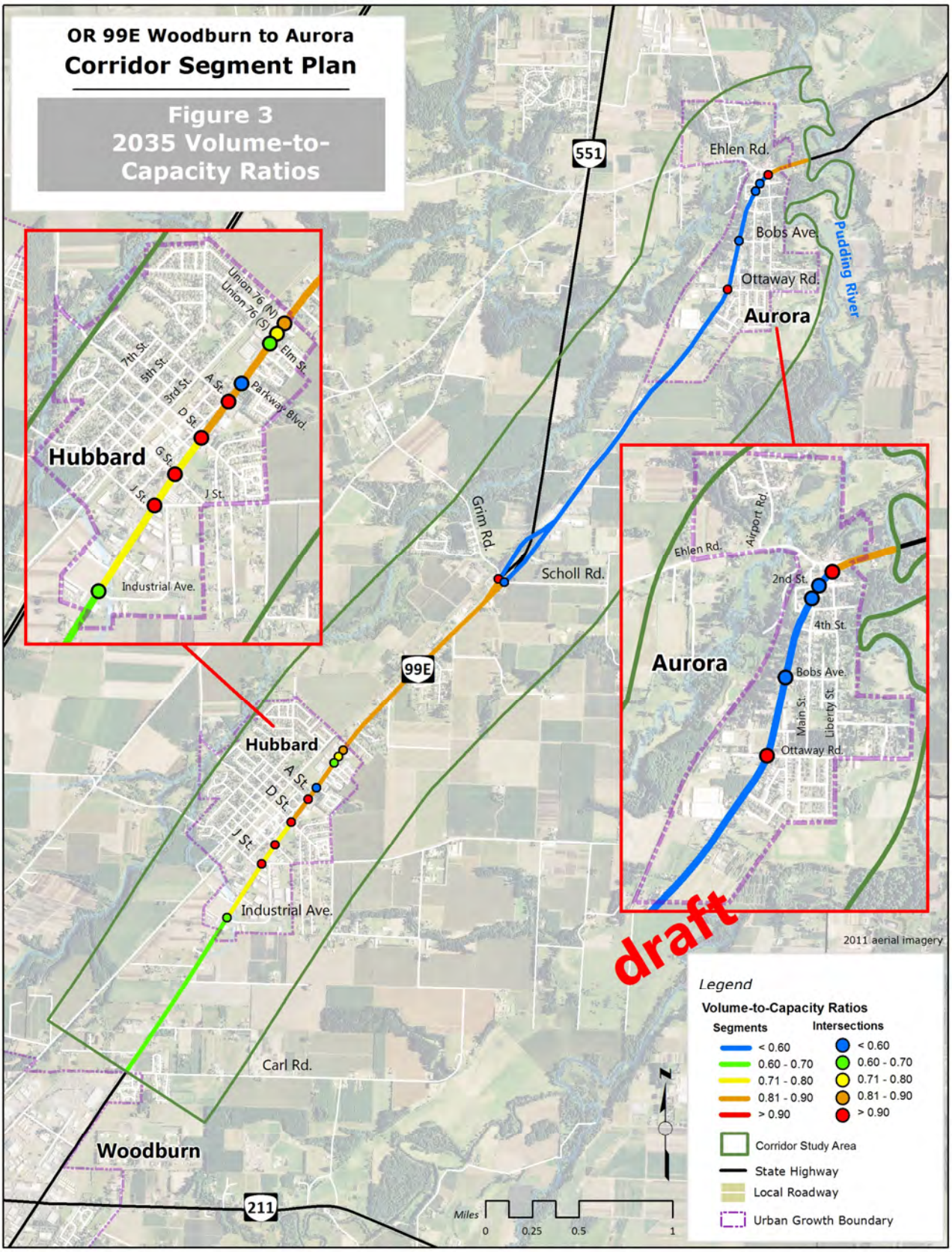

OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 3
2035 Volume-to-Capacity Ratios
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
Union 76 (N)
Union 76 (S)
Elm St.
7th St.
5th St.
3rd St.
A St.
Parkway Blvd.
D St.
Hubbard
G St.
J St.
Industrial Ave.
Grim Rd.
Scholl Rd.
99E
Airport Rd.
2nd St.
4th St.
Main St.
Liberty St.
Carl Rd.
Woodburn
211
draft
2011 aerial imagery
Legend
Volume-to-Capacity Ratios
Segments
Intersections
< 0.60
0.60 - 0.70
0.71 - 0.80
0.81 - 0.90
> 0.90
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1
N

Table 3
2035 V/C Ratio – Roadway Segments

Analysis Segment	From/To	Milepost	V/C Ratio	MobilityTarget (V/C Ratio)	Mobility Target Met?
1	Pudding River - Liberty St.	24.55-24.88	0.84	0.80	N
2	Liberty St. - Orchard Ave.	24.88-25.70	0.59	0.95	Y
3	Orchard Ave. – OR 551	25.70-27.54	0.58	0.85	Y
4	OR 551 - Union 76 Dwys.	27.54-28.81	0.89	0.85	N
5	Union 76 Driveways – D St.	28.81-29.26	0.86	0.90	Y
6	D St. – Industrial Ave.	29.26-29.96	0.76	0.90	Y
7	Industrial Ave. - Carl Rd.	29.96-30.86	0.66	0.80	Y

Intersection Capacity

V/C ratio estimates were also developed for the intersections shown in Figure 3 using the HCM2000 methodologies for signalized and unsignalized intersections. These methodologies provide a basis for grading the operational performance of intersections based upon the relationship of the critical volume of the intersection to the intersection capacity.

The results of the intersection capacity analysis are shown in Table 4 and Figure 3. For 2035, the mobility targets are exceeded at roughly half of the intersections. Two of these intersections are located in Aurora and four are in Hubbard.

Table 4
2035 V/C Ratio – Intersections

Intersection	V/C Ratio	Mobility Target (V/C Ratio)	Mobility Target Met?
OR 99E/Liberty St.	> 1.0	1.0	N
OR 99E/2nd St.	0.59	1.0	Y
OR 99E/Main St.	0.53	1.0	Y
OR 99E/Bobs Ave.	0.15	0.90	Y
OR 99E/Ottaway Rd.	> 1.0	0.90	N
OR 99E/OR 551/Grim Rd.	0.94	0.70	N
OR 99E/Scholl Rd.	0.53	0.70	Y
OR 99E/Union 76 N. Dwy.	0.81	0.85	Y
OR 99E/Union 76 S. Dwy.	0.79	0.85	Y
OR 99E/Elm St.	0.63	0.90	Y
OR 99E/Parkway Blvd.	0.60	0.90	Y
OR 99E/A St.	> 1.0	0.90	N

Table 4 (cont.)
2035 V/C Ratio – Intersections

Intersection	V/C Ratio	Mobility Target (V/C Ratio)	Mobility Target Met?
OR 99E/D St.	> 1.0	0.90	N
OR 99E/G St.	> 1.0	0.90	N
OR 99E/J St.	1.0	0.90	N
OR 99E/Industrial Ave.	0.61	0.90	Y

Traffic Operations

Future traffic operations needs were identified for unsignalized intersections where left-turn lanes or right-turn lanes may be needed.[4] Left-turn lanes may be needed to reduce the possibility of rear-end collisions or improve traffic flow by preventing left-turning vehicles from blocking the flow of through traffic. Right-turn lanes may be needed to reduce the delay of through vehicles behind right-turning traffic and to ease right-turns for drivers from the higher-speed through traffic stream.

Turn lane needs were determined using the turn lane criteria contained in the APM.[5] The volume criterion for left-turn lanes is based on the hourly opposing plus advancing volume per lane, hourly turning volume, and posted speed limit at an intersection. Thus, as the opposing plus advancing volume and/or turning volume increases, or as the speed limit increases, the volume threshold at which a turn lane should be considered decreases. The volume criterion for right turn lanes is based on the hourly approaching volume in the outside lane (through plus right-turn volume), hourly turning volume, and speed limit. As any of these factors increases, the volume threshold for a right-turn lane decreases.

The results of the analysis are shown in Figure 4 and Table 5. Additional turn lane needs compared to existing conditions were identified at OR 99E/Ottaway Rd. in Aurora and at OR 99E/Elm St., OR 99E/Parkway Blvd., OR 99E/J St., and OR 99E/Industrial Ave. in Hubbard (shown in bold check marks in Table 5).

[4] The need for turn lanes at signalized intersections are typically determined based on capacity requirements.
[5] Oregon Department of Transportation, ~~Analysis Procedures Manual~~, (2011).

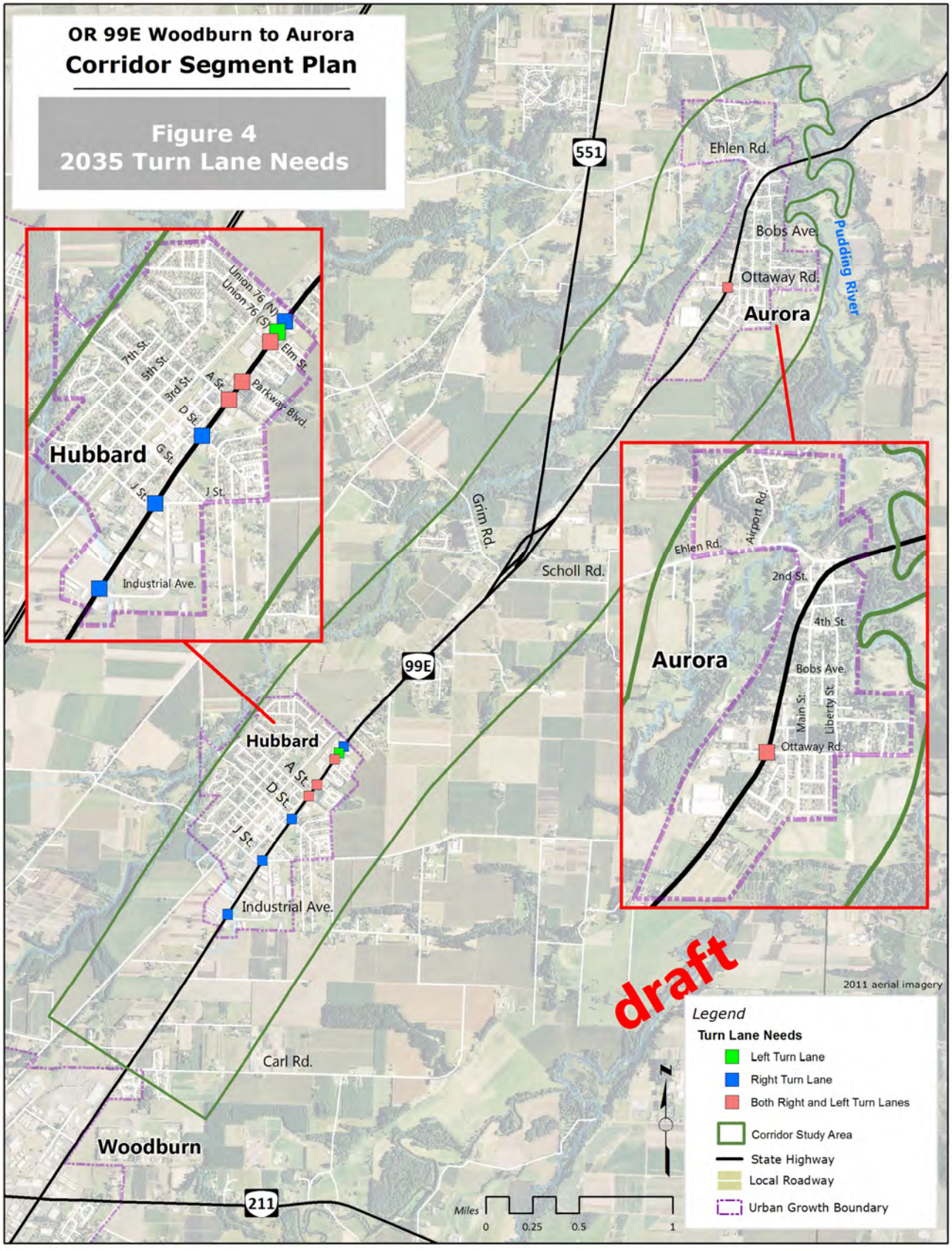

OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 4
2035 Turn Lane Needs
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
Union 76 (N)
Union 76 (S)
7th St.
5th St.
3rd St.
A St.
Elm St.
Parkway Blvd.
D St.
G St.
J St.
Hubbard
Industrial Ave.
Grim Rd.
Scholl Rd.
99E
Airport Rd.
2nd St.
4th St.
Main St.
Liberty St.
Carl Rd.
Woodburn
211
draft
2011 aerial imagery
Legend
Turn Lane Needs
Left Turn Lane
Right Turn Lane
Both Right and Left Turn Lanes
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
N
Miles
0
0.25
0.5
1

Table 5
2035 Turn Lane Needs

Intersection	Northbound*		Southbound*	
	LT	RT	LT	RT
OR 99E/Ottaway Rd.	**√**	**√**	√	√
OR 99E/Union 76 N. Dwy.				√
OR 99E/Union 76 S. Dwy.	√			
OR 99E/Elm St.		**√**	√	
OR 99E/Parkway Blvd.		**√**	√	
OR 99E/A St.	√			√
OR 99E/J St.		√		**√**
OR 99E/Industrial Ave.		**√**		

* Additional future turn lane needs shown in bold.

Safety

The Highway Safety Manual (HSM)[6] contains Crash Modification Factors (CMFs) which can be used to estimate future crash rates. The CMFs are used to adjust estimates of average crash frequency for the effects of specific geometric design and traffic control features for local sites. Some of the CMFs are based on traffic volume. Therefore, to estimate the effect of higher future traffic volumes on crash rates, the CMFs can be applied using the following procedure:

- Calculate CMF values for the base year and future year, using existing and future traffic volumes for the CMFs that are volume-based.
- Calculate composite CMF values for the base and future years by multiplying the individual CMF values.
- Estimate future crash rates by multiplying the ratio of the future year composite CMF to the base year composite CMF by the base year crash rate. Any resulting differences between the base year and future year crash rates are due to the volume differences.

For roadway segments, the volume-based CMFs for which data were available were the lane width CMF and shoulder width CMF. The CMF values for both of these geometric features do not vary above the 2,000 vpd level. Because the existing and future volumes for all segments are above this level, there would be no difference between the base year and future year composite CMFs. Therefore, the ratio of the composite CMFs would be 1.0, resulting in no change in the estimated future year crash rate compared to the base year rate based on these factors.

[6] American Association of State Highway and Transportation Officials, Highway Safety Manual, (2010).

For intersections, there were no volume-based CMFs for which data were available. Therefore, the future crash rate estimation procedure could not be applied for intersections.

Geometrics

Future geometric needs may differ from existing needs depending on the level of future traffic volumes. Such a difference may occur where an existing geometric feature is adequate for lower volumes, but falls below the standard for higher future volumes.

Potential volume-based differences for geometrics were investigated for lane and shoulder widths. Based on the standards in the Highway Design Manual,[7] it was found that there would be no differences between the existing and the future lane and shoulder width needs. This is because the existing and future volumes for all of the segments are greater than 4,000 vpd, and above this level, the standards do not vary (11' for lane width and 6' for shoulder width).

Access

Similar to geometric needs, future access needs may vary compared to existing needs due to future volume increases. There would be no difference in needs based upon ODOT's access spacing standards,[8] however, because the existing and future volumes for all of the segments are greater than 5,000 vpd. Above this volume level, the standards do not vary.

Bicycle and Pedestrian

Future bicycle and pedestrian needs were assumed to be the same as existing needs because, by definition for the No-Build case, there would be no construction of additional bicycle or pedestrian facilities.

CORRIDOR HEALTH

The Corridor Health Tool was used to calculate a future composite corridor health score for each segment by applying the same set of of factors, weights, and formulas used for the existing conditions analysis. The factors correspond to the same areas of need described in the previous sections, i.e., capacity, traffic operations, safety, geometrics, access, and bicycle and pedestrian facilities.

For each factor, the sum of the weights is equal to 100. The formulas were set up to produce scores for each factor ranging from zero to one, with a score of 1 representing "perfect" health

[7] Oregon Department of Transportation, Highway Design Manual, (2003).
[8] Standards contained in SB 264 that went into effect on January 1, 2012.

and a score of zero indicating very poor conditions or performance. The weights and formulas for each factor are shown in Table 6.

Table 6
Corridor Health Score Weights and Formulas

Factor	Weight	Scoring Formula
Safety	33.33	=0.5/X if X ≥ 0.5; else 1 Where: X = 0.7*(Fatal +Injury Crash Rate for Segment/ Average for Facility Category) + 0.3*(Total Crash Rate for Segment/ Average for Facility Category)
Traffic Operations	18.33	=1-min(Turn Lane Need Density, Max. Turn Lane Need Density)/Max. Turn Lane Need Density*
Access	10.00	=min(Avg. Spacing/Spacing Standard, 1)
Geometrics	10.00	=0.2*min(Lane Width/Lane Width Standard,1)+0.8*min(Shoulder Width/Shoulder Width Standard,1)
Bicycle/Pedestrian Facilities	15.00	=(0.5*% of Segment with Adequate Sidewalks+0.5*% of Segment with Adequate Bike Facilities)/100**
Capacity	13.33	=min((1-VC)/(1-VC Standard),1)

* Turn lane need density is the number of turn lanes (left turn+right turn) needed per mile. Maximum turn lane need density represents the worst need condition, for which a value of 16 was assumed.

** In the rural segments, sidewalks were excluded, so the formula was: % of Segment with Adequate Bike Facilities/100.

The factor scores were multiplied by the weights to produce an overall corridor health score for each segment ranging between 0 and 100, with 100 representing the best score attainable and 0 being the worst score.

Results

The future corridor health scores are shown in Table 7 and Figure 5. The segments were assigned to good, fair, and poor categories of corridor health based on the scores. The scores corresponding to each category are the following:

- Good – 75 – 100
- Fair – 50 – 74
- Poor - < 50

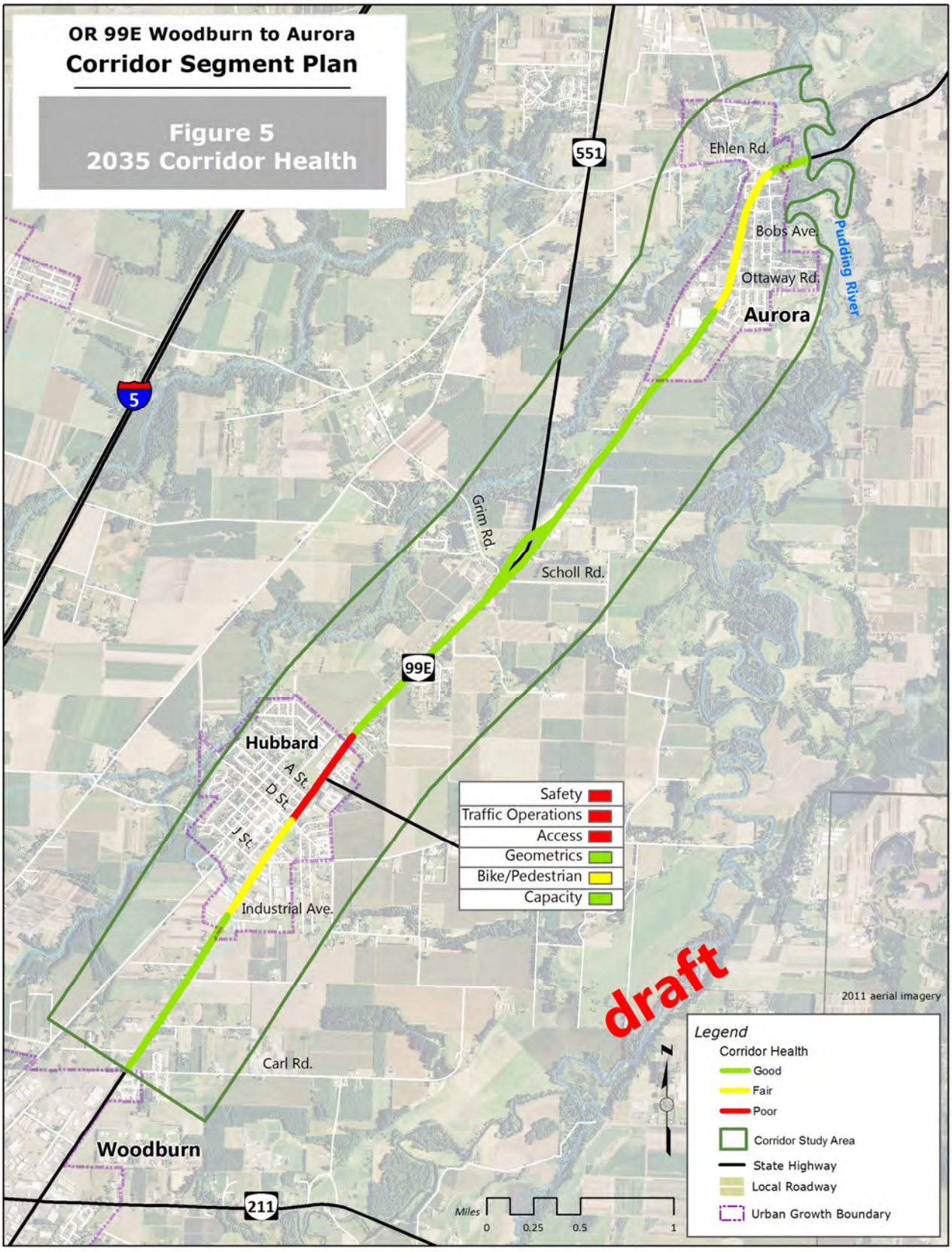

OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 5
2035 Corridor Health
551
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Aurora
Pudding River
5
Grim Rd.
Scholl Rd.
99E
Hubbard
A St.
D St.
J St.
Industrial Ave.
Carl Rd.
Woodburn
211
Safety
Traffic Operations
Access
Geometrics
Bike/Pedestrian
Capacity
draft
2011 aerial imagery
Legend
Corridor Health
Good
Fair
Poor
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

Table 7
2035 Corridor Health Scores

Analysis Segment	From/To	Milepost	Health Score						
			Safety	Traffic Ops.	Access	Geom.	Bike/ Ped.	Cap.	Total Score
1	Pudding River - Liberty St.	24.55-24.88	1.00	1.00	0.68	0.79	0.51	0.78	84.40
2	Liberty St. - Orchard Ave.	24.88-25.70	0.43	0.70	0.26	0.92	0.65	1.00	62.03
3	Orchard Ave. – OR 551	25.70-27.54	1.00	1.00	0.53	0.88	1.00	1.00	94.07
4	OR 551 - Union 76 Dwys.	27.54-28.81	1.00	1.00	0.29	0.83	0.43	0.74	79.11
5	Union 76 Dwys. - D St.	28.81-29.26	0.14	0.00	0.33	0.92	0.69	1.00	40.92
6	D St. – Industrial Ave.	29.26-29.96	0.65	0.64	0.26	0.83	0.29	1.00	62.09
7	Industrial Ave. - Carl Rd.	29.96-30.86	1.00	1.00	0.64	0.96	0.78	1.00	92.59

There would be no change in the good/fair/poor category ratings for any of the segments for future conditions. As shown in Table 8, the total scores for several of the segments would be slightly lower compared to existing conditions due to the greater traffic operations and capacity needs identified for the future.

Table 8
Comparison of Existing and Future
Corridor Health Scores

Analysis Segment	From/To	Milepost	Total Score	
			Existing	2035
1	Pudding River - Liberty St.	24.55-24.88	87.38	84.40
2	Liberty St. - Orchard Ave.	24.88-25.70	64.82	62.03
3	Orchard Ave. – OR 551	25.70-27.54	94.07	94.07
4	OR 551 - Union 76 Dwys.	27.54-28.81	82.64	79.11
5	Union 76 Dwys. - D St.	28.81-29.26	43.98	40.92
6	D St. – Industrial Ave.	29.26-29.96	67.00	62.09
7	Industrial Ave. - Carl Rd.	29.96-30.86	92.59	92.59

Appendix E

Problem Statement, Goals, Objectives, Evaluation Criteria, and Screening Procedure

DKS Associates
TRANSPORTATION SOLUTIONS

MEMORANDUM

TO: Dan Fricke, ODOT Region 2

FROM: Bob Schulte

DATE: March 5, 2011

SUBJECT: **OR 99E WOODBURN TO AURORA CORRIDOR SEGMENT PLAN** **P# 09042-022**
Technical Memorandum #7 – Problem Statement and Evaluation Criteria

INTRODUCTION

This memorandum describes the development of a proposed problem statement (Statement of Purpose and Need) and set of goals, objectives, and evaluation criteria that will guide the development of improvement alternatives for the corridor. A proposed screening procedure is also defined for the evaluation of the preliminary improvement alternatives. The hierarchy and internal consistency of these study components will help ensure that the recommended alternatives to be identified will satisfy the Statement of Purpose and Need.

PROBLEM STATEMENT

A problem statement, in the form of a Statement of Purpose and Need, describes the purpose of future improvements in terms of the overall objective to be achieved, and the need, which is a more detailed explanation of the specific transportation problems that exist or are expected to occur in the future. The Statement of Purpose and Need can be carried forward into the environmental phase of the project development process.

To provide a basis for development of the problem statement, a summary was prepared of the corridor needs identified in the existing and future conditions analysis and by stakeholders, PMT members, and agency staff.

Table 1
OR 99E Corridor Needs

Safety
Existing Needs: Crash rates for three of the seven corridor segments are higher than the statewide average. The majority of the crashes between 2006 and 2010 were rear-end-type

Table 1 (cont.)
OR 99E Corridor Needs

Safety
crashes (56%). The next most common crash types were turn (21%) and angle (11%) crashes. None of the study area intersections analyzed had a crash rate of more than 1.0 per million entering vehicles. A SPIS site was identified to the north of D St. in Hubbard that is within the top 5% of SPIS sites statewide. Identified safety needs included concerns about unprotected left turns onto and off of OR 99E due to the lack of two-way left-turn lanes, intersection turn lanes, and sufficient shoulders at most locations. This is a particular problem when trucks and schools buses block the entire travel lane while waiting to make a turn. Compounding this problem is the high number of accesses along the highway. *Future Needs:* Based upon the application of the Highway Safety Manual (HSM)[1] procedures, there would be no difference between existing and future crash rates for the corridor segments. The HSM procedures could not be applied for intersections.
Traffic Operations
Existing Needs: Turn lane needs were identified at seven of the study area intersections analyzed, where either left-turn and/or right-turn lanes are needed. Six of these are in Hubbard and one is in Aurora. There were numerous identified traffic operations needs. Many of the comments were related to problems with turning vehicles and the need for two-way center lanes and turn lanes at intersections, particularly at locations within and near Aurora and Hubbard where these facilities do not exist. *Future Needs:* In addition to the intersections with existing turn lane needs, there will be a future turn lane need at the OR 99E/Industrial Ave. intersection in Hubbard. Additional turn lanes will also be needed at several of the intersections where there are existing turn lane needs.
Capacity
Existing Needs: The analysis indicated that there are no existing capacity needs. Oregon Highway Plan (OHP) Mobility targets are met for all corridor segments and intersections. Stakeholders identified a general need for additional capacity along the corridor, as well as at specific locations. It was noted that the corridor becomes congested during commute times, particularly in the southbound direction north of Hubbard. Congestion was also reported when there are traffic incidents on I-5 and OR 99E is used as an alternate route and during special events.

[1] American Association of State Highway and Transportation Officials, Highway Safety Manual, (2010).

Table 1 (cont.)
OR 99E Corridor Needs

Future Needs: Capacity needs were identified for two segments in the analysis. The OHP mobility targets would be exceeded at roughly half of the intersections.
Geometrics
Existing Needs: Lane width is at least 11-12 feet for all of the segments, which meets or exceeds the ODOT Highway Design Manual (HDM) standards. The shoulder widths vary, with many locations not meeting the 6-foot HDM standard. Most of these locations are between OR 551 and Hubbard and within Hubbard. Four intersections have a skewed alignment, and sight distance requirements are not met at three intersections. Comments regarding geometric needs were focused on inadequate shoulder widths and skewed intersections. Stakeholders suggested that wider shoulders are needed throughout the corridor to provide an adequate area for emergency and school bus stops as well as bicycle and pedestrian use. Skewed intersections were identified at several locations. *Future Needs*: Based on the standards and estimated future year volumes, there would be no additional future lane or shoulder width needs.
Access Management
Existing Needs: ODOT's access spacing standards are exceeded at all locations except for one segment on one side of the highway. The largest differences between the existing spacing and the standards are for segments in Aurora and Hubbard. *Future Needs:* Based on the standards, there would be no differences between existing and future needs.
Bicycle and Pedestrian Facilities
Existing Needs: Bicycle facility needs exist where ODOT's bike lane or bikeway width standards are not met. These occur throughout the corridor, except for the segment between Aurora and OR 551. The standards for pedestrian facilities (sidewalks) are not met in most areas of Aurora and Hubbard along both sides of the highway. There were numerous comments that conditions for bicycle travel are unsafe throughout the corridor, particularly in the rural areas. A need was identified for wider shoulders in these areas to accommodate bicyclists. The lack of continuous sidewalks along OR 99E within Hubbard was identified as a pedestrian need, as well as the need for safe crossing areas. Pedestrians walking along the highway in the rural areas also need to be accommodated. *Future Needs:* Based upon the standards, future bicycle and pedestrian needs will be the same as the existing needs.

Based on these needs, the following Statement of Purpose and Need is proposed for the corridor:

> To improve transportation safety and traffic operations while minimizing environmental and land use impacts and maintaining the character of the corridor. Existing and future problems are based on identified needs in the areas of safety, traffic operations, capacity, geometrics, access management, and bicycle and pedestrian facilities.

GOALS, OBJECTIVES, AND EVALUATION CRITERIA

A proposed set of goals, objectives, and evaluation criteria was defined, consistent with the problem statement. The goals describe the desired outcomes of future improvements to the corridor. The objectives identify actions to be taken to accomplish the goals. The evaluation criteria are measurable factors used in determining the extent to which the improvement alternatives will meet the goals and objectives.

Goal I: Improve Transportation Safety

Objective 1: Reduce crashes

Evaluation Criteria:

- Potential reduction in crash rate/severity

Objective 2: Improve roadway geometrics

Evaluation Criteria:

- Type/level of improvement[2]

Objective 3: Provide adequate bicycle and pedestrian facilities

Evaluation Criteria:

- Type/level of improvement

Goal II Maintain Traffic Operations

Objective 1: Reduce traffic conflicts

Evaluation Criteria:

- Potential reduction in traffic conflicts

Objective 2: Maintain mobility

---

[2] Type of improvement reflects the effectiveness of one improvement type compared to another. Level of improvement represents the extent of the improvement and degree of improvement, compared to standards.

Evaluation Criteria:

- Potential reduction in congestion and delay[3]

Objective 3: Improve access density/spacing

Evaluation Criteria:

- Reduction in number of access points[4]
- Improvement in access design

Goal III: Maximize Constructability of Transportation Improvements

Objective 1: Minimize environmental impacts

Evaluation Criteria:

- Impacts to environmentally sensitive areas by level of significance (low/medium/high) including biological, historic, cultural, and archeological resources

Objective 2: Minimize land use impacts

Evaluation Criteria:

- Impacts to EFU-zoned parcels (rural areas) or developed parcels (urban areas)

Objective 3: Minimize cost

Evaluation Criteria:

- Construction cost
- Right-of-way requirement

Objective 4: Recognize related plans and policies

Evaluation Criteria:

- Consistency with ODOT standards (including practical design principles) and local plans and policies

SCREENING PROCEDURE

For locations along the corridor where more than one improvement alternative is identified, it will be necessary to have a method to compare the alternatives. Therefore, the following screening procedure is proposed, incorporating the evaluation criteria listed above.

---

[3] Will be measured by v/c ratio, where applicable.

[4] In areas not meeting spacing standards.

The improvement alternatives will be evaluated by developing scores for the evaluation criteria. For each alternative, point scores of between zero and ten will be assigned to each of the criteria. The point scores will reflect the assessment, based on professional judgment, of the degree to which the improvement alternative satisfies the criteria. The construction cost criterion will be scored based on planning level cost estimates for the alternatives.

Not all of the criteria will apply to each alternative. For example, the criterion for improved roadway geometrics would not apply to an alternative that does not affect the existing geometrics.

The score for each criterion will be multiplied by an associated weight. The proposed weights shown below were based on an assessment of the relative importance of corridor needs expressed by the stakeholders. The weighted scores will be summed to produce a total weighted score for each alternative.

Table 2
Proposed Weights for Evaluation Criteria

Criterion	Weight
1. Potential reduction in crash rate/severity	15
2. Type/level of geometric improvement	11
3. Type/level of bicycle/pedestrian facility improvement	10
4. Potential reduction in traffic conflicts	13
5. Potential reduction in congestion and delay	9
6. Reduction in number of access points	10
7. Improvement in access design	8
8. Minimization of impacts to environmentally sensitive areas	6
9. Minimization of impacts to EFU-zoned or developed parcels	5
10. Minimization of construction cost	7
11. Minimization of required right-of-way	4
12. Consistency with ODOT standards and local plans, policies	2
Total	100

Appendix F

Summary of Public Involvement Activities

320 WOODLARK BUILDING
813 SW ALDER STREET
PORTLAND, OREGON 97205-3111
503.225.0192 • FAX: 503.225.0224
www.coganowens.com

COGAN
OWENS
COGAN

Integrated Services in
Planning, Sustainability
and Community Engagement

OREGON HIGHWAY 99E WOODBURN-AURORA CORRIDOR SEGMENT PLAN
TECHNICAL MEMORANDUM
PUBLIC MEETING #2

PURPOSE OF TECHNICAL MEMORANDUM

The purpose of this technical amendment is to document the results of the second community open house for the Oregon Highway 99E Woodburn-Aurora Corridor Segment Plan. Included are:

A. Summary of Community Open Houses #1 and #2
B. Compilation of Community Feedback

A. SUMMARY OF OPEN HOUSES

Summary Open House #1

As part of the community outreach process for the OR 99E Corridor Segment Plan, a Community Open House was held on Wednesday, April 25, 2012 at Hubbard City Hall. Approximately 32 persons attended (26 attendees signed in, with several additional attendees neglecting to do so). The open house was co-sponsored by the Oregon Department of Transportation (ODOT), Marion County and the cities of Woodburn, Hubbard and Aurora.

The purpose of the open house was to provide interested parties an opportunity to review information on the project purpose and scope, planning process and existing and future projected conditions in the corridor. It was also intended to obtain comment on draft goals and objectives for the Plan; the most important operational and safety issues within the corridor; short-range, lower-cost solutions to address operational and safety issues; and, given financial constraints, the highest priority solutions to evaluate.

Summary Open House #2

As part of the community outreach process for the OR 99E Corridor Segment Plan, a Community Open House was held on Thursday, November 15, 2012 at Hubbard City Hall. 23 people participated in the open house which was co-sponsored by the Oregon Department of Transportation (ODOT), Marion County and the cities of Woodburn, Hubbard and Aurora.

The purpose of the open house was to provide interested parties an opportunity to review and comment on improvement options for safety and operational improvements along the

OR 99E corridor from the northern bounds of Woodburn to the Pudding River just north of Aurora, Oregon.

Notification Efforts Open House #1

Notification was provided by email and direct mail to 318 property and business owners within 250 feet of the 99E Corridor. Meeting flyers were distributed by project staff in the week prior to the open house to approximately 20 businesses in the corridor. Notification was also posted in English and Spanish on the project web site.

Notification Efforts Open House #2

Notification was provided with bilingual flyers via direct mail to 318 property and business owners within 250 feet of the 99E Corridor. Bilingual meeting flyers were distributed by project staff the week prior to the open house to approximately 20 businesses in the corridor. Notification was also posted in English and Spanish on the project web site.

Format Open House #1

An open house format with a scheduled presentation was utilized. Dan Fricke, ODOT Region 2, explained the project purpose and scope. Bob Shulte, DKS, summarized the planning process and Problem Statement (aka purpose and need) for the project. A facilitated question/answer session followed, after which attendees were encouraged to view plan materials at four stations:

- Planning Process
- Goals and Objectives
- Existing and Future Conditions
- Safety and Operational Issues and Solutions (This station consisted of large maps of corridor segments on which participants were encouraged to write comments.)

A comment form was also provided; one completed forms was received. Input on that comment form was limited to a response that the commenter learned about the open house from the flyer received in the mail.

Format Open House #2

People arrived between 5:45 and 6:15 pm. At 6:15 pm Dan Fricke, ODOT Region 2, introduced the open house and reviewed the improvement options. A question/answer session followed, after which participants were encouraged to view and comment on improvement options at 10 intersections along the OR 99E corridor as well as a board presenting low-cost improvement alternatives. Participants were given comment forms as well as the opportunity to place post-it notes with their comments on the boards of each improvement option.

In total 10 comment forms were returned and 35 comments were provided via post-it notes on the boards. A total of 60 unique comments were received from the 23 participants. A summary of comments follows below and the appendices A-C include the open house participant list, comment form feedback and consolidated post-it note comments from the boards.

The summary indicates whether or not people were in favor of or against the proposed recommendation options. Some comments were neutral and/or provided context for alternative ideas and those are summarized below as well.

B. COMPILATION OF COMMUNITY FEEDBACK

Comments Open House #1

Please see Appendix A for the compilation of open house comments and interview comments for intersections along the OR 99E corridor.

Comments Open House #2

Please see Appendix B for the compilation of open house comments for intersection improvement recommendations along the OR 99E corridor.

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Appendix A:
Interviews Summary
And
Open House #1
Summary

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October 13, 2011

OREGON HIGHWAY 99E WOODBURN-AURORA CORRIDOR SEGMENT PLAN
Summary of Stakeholder Interviews

Interviewees

To obtain input on critical issues as early as possible in the project, interviews with 15 key stakeholders were conducted in-person or by telephone between October 4 and October 13, 2011. Interviewees included:

- Dan Fricke – ODOT Region 2 Project Manager
- Dave Dryden – Hubbard Police Chief
- Dan Brown – City of Woodburn Public Works Director
- Bruce Warner – Hubbard Council Member
- Karen Odenthall – Marion County Public Works
- Zach Elliot – Director of Security, North Marion County School District
- Bill Hansen – Hubbard Fire Chief
- Walt (no last name) – Co-owner Imperial Gardens Nursery
- Jaime Estrada - Hubbard Public Works Director
- Terri Gonzalez – General Manager at Hubbard Chevrolet, past President of Hubbard Business and Economic Development
- Brent Earhart – Aurora Police Chief
- Deedee Jenkins – Location Safety Manager at First Student (school bus services)
- Rod Yoder – Aurora Fire Chief
- Jason Inman – Manager of Mini-Storage/U-Haul on 99E between Hubbard and Aurora
- Jason Myers – Marion County Sherriff

General Perceptions

Interviewees describe the current overall condition of the highway corridor in terms of meeting transportation needs as good to fair. Overall, the facility is seen to be in good physical repair but improvements are needed including better lighting, left turn lanes, wider shoulders, lower speeds, facilities for cyclists and pedestrians and intersection improvements at certain key locations.

Key Current and Future Safety and Operation Issues

Key current safety and operation issues identified include

- Left turn lanes onto and off of OR 99E. Specific locations include north from A Street in Hubbard to Grim Road and north of Woodburn to Hubbard for the businesses on the east side of the highway. Because these sections of road have only two lanes northbound, traffic slows or stops when one vehicle needs to turn left onto a business driveway. There is no passing lane or safe shoulder space for through vehicles to pass.

- Grim Road/551/99E intersection is identified as being particularly dangerous. There are two sets of stop-lights within 50 feet at this intersection and it was explained that people "create" two lanes out of one depending on which direction they are headed. Locals understand this de-facto lane creation but out-of-town traffic gets confused and it is unclear where a vehicle needs to be to head to either I-5 or continue to Oregon City.
- Traffic congestion caused by school buses stopping through traffic at peak travel times along the corridor.
- Lack of pedestrian facilities (sidewalks).
- Unsafe conditions associated with people disobeying traffic signals (including school bus stop signs) and passing on the right on shoulders.
- Driver confusion at the Grim Road intersection as well as at the G Street intersection in Hubbard.
- Dangerous intersection angles at Dimmock Lane and Goudy Gardens, including mergeg safety associated with insufficient length of pavement before it transitions to gravel and limited visibility because of road angle.
- Merging safely onto 99E from gravel roads generally.
- Poor lighting and visibility along the corridor at night and in the rain.

Interviewee opinions varied in terms of bicycle and pedestrian usage of the corridor. Opinions varied from there being "no problem" with bikes and pedestrians along the corridor because people don't use it that way or because pedestrians and bikes shouldn't be on the highway. Others feel that there should be bicycle and pedestrian facilities along the entire corridor to encourage different commute preferences and to improve safety for current cyclists and pedestrians. Safe and secure crosswalks and proper lighting are identified as being needed at key segments along the corridor where residential areas on one side of the highway access access businesses on the other side.

In terms of future planning issues, respondents state that increases in traffic volume and growth should be planned for. Specific improvements identified as likely being need in the future include:

- Left turn lanes at various locations in the corridor.
- Expansion to a four or five-lane highway through the entire corridor.
- Above or below grade rail road crossings along the corridor to reduce back-up when a train is moving through (train traffic has been increasing).
- Lower speeds along the corridor to better accommodate businesses and residences.
- Crosswalks at key locations for increased pedestrian safety.

Potential Solutions

Nearly all interviewees stated that left-turn lanes would solve many of the congestion problems along the corridor. Other solutions:

- Installation of a traffic signal at G Street in Hubbard
- Extending four lanes of traffic further out than they currently extend between Woodburn and Hubbard and Hubbard and Aurora.
- Widening of the shoulders as a solution for buses to have refuge for pulling over to drop passengers off as well as a safer space for bicycles and pedestrians and vehicles pulled over in an emergency.

- To help with night and rain visibility, rumble strips and reflectors be replaced on the highway (they were removed in the last re-paving).
- Correcting the geometry of the intersection at Dimmock Lane and Goudy Gardens.

Recommended Outreach Strategies

A variety of methods for outreach are identified as necessary to inform/involve property owners, businesses and residents in the corridor, including:

- Project website with a link on each city's webpage
- Newsletter mail-out with the utility bill
- Information posted in the Woodburn Independent.
- To reach Spanish speaking members of the area it was suggested to contact La Pantera, a local Spanish-language radio station.

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OR 99E – WOODBURN TO AURORA CORRIDOR SEGMENT PLAN COMMUNITY OPEN HOUSE
Wednesday, April 25, 2012; 6:00 – 8:00 pm
Hubbard City Hall; 3720 Second Street, Hubbard

Summary
As part of the community outreach process for the OR 99E Corridor Segment Plan, a Community Open House was held on Wednesday, April 25, 2012 at Hubbard City Hall. Approximately 32 persons attended (26 attendees signed in, with several additional attendees neglecting to do so). The open house was co-sponsored by the Oregon Department of Transportation (ODOT), Marion County and the cities of Woodburn, Hubbard and Aurora.
The purpose of the open house was to provide interested parties an opportunity to review information on the project purpose and scope, planning process and existing and future projected conditions in the corridor. It was also intended to obtain comment on draft goals and objectives for the Plan; the most important operational and safety issues within the corridor; short-range, lower-cost solutions to address operational and safety issues; and, given financial constraints, the highest priority solutions to evaluate.

Notification Efforts
Notification was provided by email and direct mail to 318 property and business owners within 250 feet of the 99E Corridor. Meeting flyers were distributed by project staff in the week prior to the open house to approximately 20 businesses in the corridor. Notification was also posted in English and Spanish on the project web site.

Format
An open house format with a scheduled presentation was utilized. Dan Fricke, ODOT Region 2, explained the project purpose and scope. Bob Shulte, DKS, summarized the planning process and Problem Statement (aka purpose and need) for the project. A facilitated question/answer session followed, after which attendees were encouraged to view plan materials at four stations:

- Planning Process
- Goals and Objectives
- Existing and Future Conditions
- Safety and Operational Issues and Solutions (This station consisted of large maps of corridor segments on which participants were encouraged to write comments.)

A comment form was also provided; one completed forms was received. Input on that comment form was limited to a response that the commenter learned about the open house from the flyer received in the mail.

Comments
Comments are organized by location and indicated in tracked changes in the attached table.

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Appendix B:
Comments from Open House #2

Open House Post-It Note Comments from Boards
November 15, 2012

Low Cost Improvement Options	Reduction of Speed limit	Rumble Strips	Lighting Improvements	Bus Pull-Outs	Crosswalks	Regular Maintenance of Pavement Markings	Bike Lanes and Sidewalks
	Yes	All you want	Great		Not needed in Aurora; What about D Street? G street?		Ok

Aurora 2nd Street	Improvement Option #1	General comments
	Cost seems low, lose too much parking, no accidents are here!; If you wanted to control traffic on 99E and 2nd can you have a one-way ingress?; It's okay the way it is (sad face)	How much money will ODOT pay businesses and owners for damages?; (smiley face); Don't take away parking!; Oppose option 1; support one way ingress onto 2nd and feed out to Liberty to leave town, low shrubs only at corner of Pythian Bldg; don't mess any more with the historic district - options are bad for Aurora businesses and tourism

Note: Unique comments are separated by a semi-colon ";".

Aurora Main Street - 3rd Street	Improvement Option #1	Improvement Option #2
	Don't land lock EDY Property! How would he access it?; Bad! No business access; Oppose option 1 and option 2, Support low cost options and a one-way on Main up to 3rd; No, it's okay as it is	VFW Main and 3rd have meetings all the time you would take their parking; One way in and out to Dirt Street?; No, it's okay as it is

Aurora Ottoway Ave	Improvement Option #1
	Good!; Yes; Good

Dimmick Lane	No comments

Goudy Gardens	No comments

Hubbard A Street	Improvement Option #1	Improvement Option #2
	Good, don't kill the park, make a cul-de-sac part of the park	No.

Hubbard D Street	Improvement Option #1
	G street lighted crosswalk very much needed!

Hubbard J Street	Improvement Option #1
	Ok, but a lot of truck traffic here. Make sure there's room for them; Make sure there is room for Truck right turn from westbound J street to OR 99E; Needed!

OR 551	Improvement Option #1	Improvement Option #2
	Good, clear up the existing condition so people don't criss cross their through as they do currently; Too expensive	I hate this idea!; NO! - will cause even more confusion, you will get grid lock when the train is going by; Too expensive

Union 76 to D Street, Hubbard	Improvement Option #1	Improvement Option #2
	Good, definitely need pedestrian crossing here	

Appendix B

Open House Comments Form Responses
November 15, 2012

#	Contact info	How did you learn about this evening's open house?	Did you find the open house to be useful?	Aurora 2nd Street	Aurora Main Street	Aurora Ottoway Ave	Dimmick Lane	Goudy Gardens
1								
2								
3		ODOT e-mail announcement		good	good	OK	good	good
4		newspaper						
5	Rodger Eddy, 2582 NW Lovejoy Street, Portland, Oregon, 97210; 503-223-3606	Direct mail to property owner	Yes… state representatives cordial and helpful. Comment sheet is appreciated.		My lot with parial construction would be greatly affected. I prefer existing street arrangement. (99E and Main Street). My property would lose access and value. I lost partial access with no notice with the earlier round of work about 5 years ago when my driveway was blocked with the sidewalk extension. Also... don't like the potential loss of downtown parking space and access.			
6	The Colony Pub, 21568 Hwy 99E, Aurora, OR	Mailer		Engineer access, ingress, restrict egress on 2nd street - delivery trucks need access from 99E. Business will be hurt.	Plan will land lock properties on Main Street - will lose too much parking - will hurt the historic business parking and the Legion Armory needs the parking.			
7		Mailer		Engineer access for ingress on 2nd. Close 2nd on the west side of 99E so geometrics are FAIR. Closing street is not necessary, local business will suffer. Traffic will be diverted to residential area.	Will lose too much parking.	Good, Historic.		
8								
9		Flyer in the mail	**Yes**					
10	Charles Huilsten, 19008 Hwy 99E, olof4106@hotmail.com	Woodburn newspaper	Yes, shows us where the construction affects us at 19008 Hwy 99E					

Open House Comments Form Responses
November 15, 2012

Hubbard A Street	Hubbard D Street	Hubbard J Street	OR 551	Union 76 to D Street, Hubbard	Low Cost Improvement Options	Additional Suggestions
						At G street, need a lighted and marked pedestrian crosswalk, ideally a traffic light.
Headed south on 99E, make a turning lane for a right turn onto A street. Create a "No left turn" from A street to 99E and force people to go to the light at D street (to make a turn).						
I like #1, like the dedicated right turn lane	Is there really enough bike traffic to warrant this?	Is there really that much traffic now and/or projected?	Current signage is good. Current signal timing and control are bad. Traffic circle here would make it worse. Some traffic circles work; this one would not because there are too many angles to consider.	#2 is better - two-way left turn lanes are better		
					2nd and 99E Aurora, allow turn in onto 2nd but not exit!	
How about doing away with the bike lanes?						
			Prefer roundabout		**All**	
			Like the roundabout, Grim and Scholl option #2		Noise abatement on 99E at 19008 address?	

Appendix G

Review of Land Use and Transportation Policies

MEMORANDUM

DATE: September 21, 2011

TO: Dan Fricke, Senior Transportation Planner, ODOT

FROM: Bob Schulte, DKS Associates
Michael Tomasini, P.E. P.T.O.E., DKS Associates

SUBJECT: **Oregon 99E Woodburn-Aurora Corridor Segment Plan**
Task 3 – Review Land Use and Transportation Plans and Policies P09042-022

The purpose of this memorandum is to summarize a review of planning documents, policies, and regulations applicable to the Oregon 99E Woodburn-Aurora Corridor Segment Plan (CSP). As new strategies for addressing transportation needs are proposed, compliance and coordination with the plans, policies, and regulations described herein will be required.

Highway 99E Corridor Safety Report

The *Highway 99E Corridor Safety Report* was prepared by ODOT Region 2 staff in July 2001. The study was initiated at the request of the Mid-Willamette Valley Area Commission on Transportation and in response to concerns about high accident and fatality rates along the OR 99E corridor. The study investigated motor vehicle, pedestrian and bicycle collisions along the corridor between the northern city limits of Salem and Canby.

Crash rates along the corridor between Woodburn and Aurora were found to be higher than the statewide averages for rural highways. Several short term and long term improvements for this area were recommended as a result of this study (see Table 1).

Table 1: Highway 99E Corridor Safety Report Improvement Recommendations

Location	Recommended Improvement	Completed?
City of Hubbard	Sidewalks and shoulder bikeways	No*
City of Hubbard northern city limit	Left turn refuge at Chevron Station	No

Table 1: Highway 99E Corridor Safety Report Improvement Recommendations (cont.)

Location	Recommended Improvement	Completed?
"D" Street in the City of Hubbard	Short term: Install pavement "dots" across the intersection to direct cross traffic to the proper lane. Long term: Widen the east leg of "D" Street to accommodate a westbound through and right turn lane, a left turn lane, and an eastbound lane.	Yes
"A", "D", "G" and "J" Street Intersections with OR 99E	Conduct additional study in the City of Hubbard Transportation System Plan (TSP).	Yes
Hubbard northern city limit to Aurora southern city limit	Short term: As volumes continue to grow; this area would be a candidate for centerline rumble treatment and more enforcement. Short term: Coordinate and promote, potentially through the Hubbard local traffic safety committee, transportation safety public information and education programs, focusing on drowsy driving, speed and DUII.	No

Source: *Highway 99E Corridor Safety Report*
* Sidewalk currently under construction north of "D" Street on east side of highway.

Local Plans, Policies, and Regulations

The following sections summarize local plans, policies, and regulations for the Cities of Woodburn, Hubbard and Aurora and Marion County.

City of Woodburn Transportation System Plan

The *City of Woodburn Transportation System Plan*[1] provides a comprehensive overview of the city's transportation needs over a 20-year horizon. It was adopted in 2005. OR 99E is classified as a major arterial within the city's Urban Growth Boundary (UGB) and serves as an important north-south route through the city. The document cites pedestrian and bicycle needs for the OR 99E corridor and suggests that the corridor should be upgraded to major arterial standards as forecasted growth and redevelopment occur.

City of Woodburn Comprehensive Plan

The *City of Woodburn Comprehensive Plan*[2] is a blueprint for city growth over a 20-year planning horizon. The plan was adopted by the city council in 2005 and includes the TSP as a component. The recommendations from the TSP are contained in this document.

[1] City of Woodburn and the Oregon Department of Transportation, Woodburn Transportation System Plan (2005).
[2] City of Woodburn, Comprehensive Plan, Volume 1 Goals and Policies, (2005).

The plan has a policy in place to develop a strategy for improving safety and mobility on state highways, including OR 99E, through the addition of travel lanes, signalization, access management, and new parallel facilities.

The plan identifies 126 acres of vacant, partially vacant and potentially redevelopable industrial land within the UGB. Much of this land is located between OR 99E and the Union Pacific railroad tracks.

Commercial strip development along OR 99E is cited as being problematic for the city. The comprehensive plan encourages redevelopment of commercial properties along OR 99E through limiting the supply of vacant "green field" commercial land within the UGB.

The plan includes details about the 2005 expansion of the Woodburn UGB. Eight areas around the city were proposed for inclusion in the UGB, including an area adjacent to OR 99E in the northeast area of the city. The proposed expansion would add 13 acres of low density residential land to the UGB.

City of Hubbard Transportation System Plan

The *City of Hubbard's Transportation System Plan*[3] is currently being updated and will provide a comprehensive overview of the city's transportation needs over a 20 year horizon. OR 99E is the primary roadway through Hubbard and runs parallel (northeast to southwest) to the Union Pacific railroad tracks. OR 99E is classified by the City of Hubbard as a major arterial. Within the city, the TSP identifies the following characteristics for OR 99E:

- Does not meet current design or access spacing standards.
- Has several gaps in the sidewalk network.
- Does not have bike lanes.
- Contains a Safety Investment Program (SIP) Category 3 segment[4].
- The intersection of OR 99E/"D" Street is in the top 5 percent of ODOT's Safety Priority Index System (SPIS) locations.
- Wide shoulders and "open frontage" contribute to a perceived access control problem.
- The higher-than-average crash rate along OR 99E can be attributed, in part, to the high traffic volumes.

[3] City of Hubbard, Transportation System Plan Update, Technical Memorandum #2, Existing and Future Conditions, (2011).

[4] The SIP uses five categories (1 to 5) to selectively identify five-mile segments of highway for safety improvements. A Category 3 segment contains three to five fatal or injury "A" crashes over a three-year period.

The TSP recommends that the city, Marion County, and ODOT work together to improve pedestrian and bicycle facilities on or parallel to OR 99E. Potential pedestrian and bicycle projects identified by the TSP for improvements along OR 99E include:

Construct Sidewalks

- West side of road between the northern UGB and Schmidt Lane
- East side of road between "D" Street and the southern UGB

Pedestrian Crossing Improvements

- OR 99E/"G" Street
- OR 99E/"A" Street

Bicycle Lanes

- Between "D" Street and "J" Street

City of Hubbard Comprehensive Plan

The City of *Hubbard Comprehensive Plan*[5] was updated in 2010. This document contains the planning and policy information to be used as guidance in the urbanization and development of the city. The plan does not contain a transportation section. Instead, it references the city's TSP. The comprehensive plan identifies OR 99E as an important connection for commerce to the markets of Portland and Salem.

The comprehensive plan recommends clustering commercial-type development at major intersections and at a commercial center between "A" and "G" Streets and OR 99E and 3rd Street. The city would like these centers to be pedestrian-oriented and coordinated in their development to reflect the character of the community. The plan encourages a mix of residential and commercial uses within this area. Additionally, the plan encourages commercial land uses along OR 99E.

The City of Hubbard has identified 12.3 acres north of the existing UGB for inclusion and use by the year 2027. This land would be used for commercial and industrial development.

City of Aurora Transportation System Plan

The *City of Aurora Transportation System Plan*[6] was updated in 2009 and provides a comprehensive overview of the city's transportation needs over a 20 year horizon. OR 99E is the main road through Aurora and connects the community to the Portland metro area to the north and Woodburn and Salem to the south. The city classifies OR 99E as a principal arterial. The TSP investigated future year (2030) motor vehicle operations along OR 99E and found that improvements would be needed at four intersections to meet ODOT's mobility standards:

[5] City of Hubbard, Hubbard Comprehensive Plan, (2010).
[6] City of Aurora, Transportation System Plan, (2009).

- OR 99E/Liberty St.: Add second eastbound left turn lane and corresponding receiving lane and channelize the southbound right turn lane.

- OR 99E/Bobs Avenue: Add southbound left turn lane.

- OR 99E/Ottaway Road: Install turn lanes and intersection improvements including sidewalks, ADA ramps, crosswalks, and a pedestrian crossing warning device.

- OR 99E/Ottaway Road: Install signal when warranted.

Bicycle facilities (bike lanes or shoulder bikeways) are provided along most of OR 99E within Aurora. Sidewalks are provided on both sides of the roadway between Liberty St. and 4th Street. Outside of this area, sidewalks are provided mostly on one side of the street, with gaps in continuous coverage. To address these gaps, the TSP identifies three projects to provide sidewalks and upgrade the shoulder to a bike lane along OR 99E.

- Main Street to Bobs Avenue: Add sidewalks, bike lanes and parking.

- Bobs Avenue to Ottaway Road: Provide bike lanes and sidewalks.

- Ottaway Road to south UGB: Provide bike lanes and sidewalks.

City of Aurora Comprehensive Plan

The *City of Aurora Comprehensive Plan*[7] was updated in 2009 and provides a coordinated policy framework for managing urban growth. OR 99E passes through Aurora from the south to the northeast and is the most important thoroughfare in the city. Various commercial, retail, and manufacturing, and residential land uses are located adjacent to OR 99E.

The city also has several five-acre or smaller vacant industrial and commercial parcels dispersed throughout the city, including some near to or adjacent to OR 99E. In total the city has 30.88 acres of vacant or infill commercial and industrial land available.

Marion County Rural Transportation System Plan

The *Marion County Rural Transportation System Plan*[8] was updated in 2005 and covers the rural areas of Marion County outside of the cities' UGBs. Based on future land use projections, the TSP forecasts average daily traffic volumes on OR 99E between Woodburn and Aurora for the Year 2025. The forecasts were broken into three segments:

- Liberty St. (Aurora) to Wilsonville-Hubbard Highway: 16,000 ADT

- Wilsonville-Hubbard Highway to Hubbard: 32,000 ADT

[7] City of Aurora, Comprehensive Plan Update 2009 to 2029, (2009).
[8] Marion County, Marion County Rural Transportation System Plan, (2005).

- Hubbard to Woodburn: 30,000 ADT

Due to the projected growth along the corridor, the TSP identifies a need for an additional travel lane in each direction with a center turn lane or median between Woodburn and the Wilsonville-Hubbard Highway. The projected need for this improvement is forecast to occur within the next twenty years.

Marion County Comprehensive Plan

The *Marion County Comprehensive Plan*[9] was developed to provide guidance in the development and conservation of Marion County's land resources. The plan was originally adopted in 1981 and revised in 2010. It sets broad goals for rural and urban land use and development.

The transportation element of the comprehensive plan summarizes the Marion County Rural Transportation System Plan. It does not identify specific improvements for the state highways such as OR 99E. Instead, the plan has policies in place to support these facilities, including safety improvements, highway modernization, roadway maintenance, and regional planning studies.

State Plans, Policies, and Regulations

The following sections summarize state plans, policies, and regulations.

Oregon Transportation Plan

An update of the *Oregon Transportation Plan (OTP)*[10] was adopted by the Oregon Transportation Commission (OTC) in 2006. The OTP is a comprehensive plan that addresses the future transportation needs of the State of Oregon through the year 2030. It considers all modes of transportation, including airports, bicycle and pedestrian facilities, highways and roadways, pipelines, ports and waterway facilities, public transportation, and railroads.

The following seven goals with associated policies and strategies are provided in the plan to address the core challenges and opportunities facing transportation in Oregon:

- Goal 1 – Mobility and Accessibility
- Goal 2 – Management of the System
- Goal 3 – Economic Vitality
- Goal 4 – Sustainability
- Goal 5 – Safety and Security
- Goal 6 – Funding the Transportation System
- Goal 7 – Coordination, Communication and Cooperation

[9] Marion County Planning Division, Marion County Comprehensive Land Use Plan, (2010).
[10] Oregon Department of Transportation, Oregon Transportation Plan, (2006).

Six key initiatives are also identified reflecting the desired direction of the plan and framing the plan implementation. These initiatives are:

1. Maintain the existing transportation system to maximize the value of the assets. If funds are not available to maintain the system, develop a triage method for investing available funds.
2. Optimize system capacity and safety through information technology and other methods.
3. Integrate transportation, land use, economic development and the environment.
4. Integrate the transportation system across jurisdictions, ownerships and modes.
5. Create a sustainable funding plan for Oregon transportation.
6. Invest strategically in capacity enhancements.

This CSP will be developed to be consistent with the goals and policies of the OTP. It will emphasize maintaining and building upon existing investments and using system management, technology, and transportation options to maximize the existing state highway system.

Oregon Highway Plan

The *Oregon Highway Plan (OHP)*[11] was originally adopted in 1991 and a major update was completed in 1999. It is as a modal element of the 2006 OTP. The OHP defines policies and investment strategies for Oregon's state highway system. The plan contains three elements: a vision element that describes the broad goal for how the highway system should look in 20 years; a policy element that contains goals, policies, and actions to be followed by state, regional, and local jurisdictions; and a system element that includes an analysis of needs, revenues, and performance measures.

The OHP addresses the following issues:

- Efficient management of the system to increase safety, preserve the system, and extend its capacity.
- Increased partnerships, particularly with regional and local governments.
- Links between land use and transportation.
- Access management.
- Links with other transportation modes.
- Environmental and scenic resources.

The policy element contains several policies and actions that are particularly relevant to the CSP, as described in the following subsections.

Policy 1A (State Highway Classification System)

Action 1A.1 categorizes state highways for planning and management decisions. OR 99E (Highway No. 81) is classified as a regional highway and a truck route between Woodburn and Aurora.

[11] Oregon Department of Transportation, Oregon Highway Plan, (1999).

According to OHP policy, regional highways are intended to provide connections and links to regional centers, statewide and interstate highways, and economic and activity centers of regional significance. The management objective for this type of highway is safe, efficient, high-speed, and continuous flow operation in rural areas and moderate to high-speed operation in urban and urbanizing areas. Access to surrounding land uses from regional highways is a secondary function, except within Special Transportation Areas (STAs) or Urban Business Areas (UBAs), where access becomes more important. Any improvements or modifications identified in the CSP will be consistent with the existing highway classification and will maintain or enhance the ability of the highway to serve its defined function.

Special Transportation Areas

An STA is a specially designated district with compact development located on a state highway within a UGB where the need for appropriate local access outweighs the considerations of highway mobility. Pedestrian, bicycle, and transit modes are the primary focus of transportation within an STA and motor vehicle traffic is typically a balance of local traffic and through movements. There is one STA within the study area in the City of Aurora that was approved by the Oregon Transportation Commission in April of 2009. This STA is located between Liberty St. and 4th Avenue (MP 24.88 to 25.10).

Policy 1B (Land Use and Transportation)

Policy 1B recognizes the need for coordination between state and local jurisdictions. Action 1B.7 gives special highway segment designations for specific types of land use patterns to foster compact development. The three segment designations available are STA, Commercial Center, and UBA.

Policy 1C (State Highway Freight System)

Policy 1C addresses the need to balance the movement of goods and services with other uses. In addition, Action 1C.4 states that the timeliness of freight movements should be considered when developing and implementing plans and projects on freight routes. OR 99E is not a freight route between Woodburn and Aurora.

Policy 1F (Highway Mobility Standards)

Policy 1F sets mobility standards for ensuring a reliable and acceptable level of mobility on the highway system.[12] Pursuant to Policy 1F, Table 6 for regional highways in the Oregon Highway Plan is shown below.

[12] This policy is currently being updated. Adoption of the amendments will occur in December 2011.

Table 2: Applicable Mobility Standards for Regional Highways

Criteria	Signalized Intersection (v/c ratio)	Unsignalized Intersection (v/c ratio)*
Inside UGB		
Non-MPO outside of STAs where non-freeway posted speed <= 35 mph, or a designated UBA	0.85	0.90
Non-MPO outside of STAs where non-freeway speed > 35 mph	0.80	0.85
Within STA	0.95	0.95
Outside UGB		
Unincorporated communities	0.75	0.80
Rural lands	0.70	0.80

Source: *Oregon Highway Plan*

* Note: v/c ratio is for the uncontrolled approach at unsignalized intersections.

Policy 1G (Major Improvements)

Policy 1G requires maintaining performance and improving safety by improving efficiency and management before adding capacity. The intent of Policy 1G and Action 1G.2 is to ensure that major improvement projects to state highway facilities have been through a planning process that involves coordination between state, regional, and local stakeholders and the public, and that there is substantial support for the proposed improvement.

Policy 2B (Off–System Improvements)

Policy 2B establishes ODOT's interest in improvements on local roads that maintain or improve safety and mobility performance on state roadways and supports local jurisdictions in adopting land use and access management policies. The CSP will describe existing and future land use patterns, access management, and implementation measures within the study area.

Policy 2D (Public Involvement)

Public involvement in transportation and planning and project development will be a critical part of the CSP. This policy calls for input from citizen, business, regional and local government, state agencies and tribal governments regarding proposed policies, plans, programs and improvement projects that affect the state highway system.

Policy 2E (Intelligent Transportation Systems)

Policy 2E allows for a broad range of intelligent transportation systems (ITSs) to be implemented to improve system efficiency and safety in a cost-effective manner. Action 2E.8 creates a toolbox of standardized ITS applications for application in small cities and rural areas. The emphasis of this toolbox is to enhance safety, traveler information, incident response and congestion relief.

Policy 2F (Traffic Safety)

Policy 2F identifies the need for projects to improve safety for all users of the state highway system through engineering, education, enforcement, and emergency services. One component of the CSP will identify existing crash patterns and rates and develop strategies to address safety issues. Proposed improvements will aim to reduce the vehicle crash potential and/or improve bicycle and

pedestrian safety by providing upgraded facilities that are context sensitive.

Policy 3A (Classification and Spacing Standards)

Policy 3A sets access spacing standards for driveways and approaches to the state highway system. The CSP will catalog existing driveways and approaches along the corridor.

Policy 3B (Medians)

Policy 3B describes the State of Oregon's policy for the planning and placement of medians on state highways to enhance the efficiency and safety of the highways.

Policy 4B (Alternative Passenger Modes)

Policy 4B promotes alternative passenger transportation services in highway corridors to help maintain or meet established performance standards and to reduce local trips on the highway. The CSP will investigate ways to support and increase the use of alternative passenger modes, including improvements to bicycle and pedestrian facilities.

Oregon Bike and Pedestrian Plan

The provision of safe and accessible bicycling and walking facilities in an effort to encourage increased levels of bicycling and walking is the goal of the *Oregon Bicycle and Pedestrian Plan*[13], which was adopted as an element of the OTP in September 2006. The plan identifies actions that will assist local jurisdictions in understanding the principles and policies that ODOT follows in providing bike and walkways along state highways. In order to achieve the plan's objectives, the strategies for system design are outlined, including:

- Providing bikeway and walkway systems and integrating these with other transportation systems
- Providing a safe and accessible biking and walking environment
- Developing educational programs that improve bicycle and pedestrian safety

The document includes the Policy & Action Plan and the Bikeway & Walkway Planning Design, Maintenance & Safety section. The Policy & Action section contains background information, legal mandates and the current conditions, goals, actions and implementation strategies ODOT proposes to improve bicycle and pedestrian transportation. The Bikeway & Walkway Planning Design, Maintenance & Safety section assists ODOT, cities and counties in designing, constructing and maintaining pedestrian and bicycle facilities. Design standards are recommended and information on safety is provided.

Oregon Freight Plan

The *Oregon Freight Plan* (OFP) [14] expresses a 25-year vision focused on improving freight connections to local, state, regional and global markets in an effort to increase trade-related jobs and income for

[13] Oregon Department of Transportation, Oregon Bicycle and Pedestrian Plan, (1995).
[14] Oregon Department of Transportation, Oregon Freight Plan, (2011).

Oregon workers and businesses. The OFP further defines and implements the OTP's goals, policies, strategies and investment scenarios. It covers freight movement along Oregon's highways, waterways and airways. OR 99E serves local and regional freight movement. It also runs parallel to I-5, a vital freight link in the state and national freight network.

ODOT Access Management Manual

The ODOT *Access Management Manual* (AMM) [15] provides documentation regarding access management, including a legal and policy overview, project directives regarding access management in ODOT projects, approach permitting, and development review guidelines.

ODOT Highway Design Manual

The *Highway Design Manual*[16] (HDM) was developed in 2003 by ODOT and sections of this manual have been updated several times. This document sets the design standards for the construction of roadway, bicycle and pedestrian facilities within ODOT's right-of-way. Functional classification is used in the HDM for the purpose of determining design standards. OR 99E is classified as a rural minor arterial within the study area. Table 3 shows some of the design criteria relevant to OR 99E.

Table 3: Rural Arterial Design Criteria

Functional Design Classification	# of Lanes	Design Speed	Width of Traveled Way (ft)	Shoulder Width (ft)	Maximum Grade (%)	Maximum Curvature	Stopping Sight Distance (ft)
Rural Arterial	2	70 mph	24	8	3	3°15'	730

Source: *ODOT Highway Design Manual*

To ensure a minimum of a 20 year lifespan for new highway capital investments, the HDM stipulates that new projects must meet the HDM mobility standards instead of the less stringent OHP mobility standards. The mobility standards for regional highways are shown in Table 4.

Table 4: Regional Highway 20-Year Design Mobility Standards

Criteria	Mobility Standard (v/c ratio)
Inside UGB	
Non-MPO outside of STAs where non-freeway posted speed < 45 mph	0.75
Non-MPO outside of STAs where non-freeway speed ≥ 45 mph	0.75
Outside UGB	
Unincorporated Communities	0.70
Rural Lands	0.65

Source: Table 10-1, *ODOT Highway Design Manual*

[15] Oregon Department of Transportation, Access Management Manual, (2000).
[16] Oregon Department of Transportation, Highway Design Manual, (2010).

Oregon Department of Transportation Traffic Manual

The 2009 edition of ODOT's *Traffic Manual*[17] was updated in September 2010. The manual focuses on ODOT's traffic engineering policies and practices. The intent of the manual is to clarify roles and responsibilities and provide information needed when considering traffic control changes. It includes or references policies, procedures, warrants and design consideration for traffic related items.

Transportation Planning Rule (OAR 660.012)

The *Transportation Planning Rule (TPR)*[18,19] implements Oregon Statewide Planning Goal 12, which supports transportation facilities and systems that are safe, efficient, and cost-effective and are designed to reduce reliance on single-occupancy vehicles. The objective of the TPR is to reduce air pollution, congestion, and other livability problems, and to maximize investments made in the transportation system. The following subsections of the TPR are relevant to the CSP.

660-012-0050 – Transportation Project Development

Section 0050 requires that transportation projects be reviewed for compliance with local and regional plans and, when applicable, undergo a NEPA environmental review process.

660-012-0065 – Transportation Improvements on Rural Lands

Section 0065 identifies transportation facilities, services and improvements which may be permitted on rural lands consistent with Statewide Planning Goals 3, 4, 11, and 14 without a goal exception. Examples of transportation improvements consistent with these goals include roadway realignment, construction of continuous median turn lanes, and construction of bikeways, footpaths, recreation paths, and park and ride lots.

660-012-0070 – Exceptions for Transportation Improvements on Rural Lands

Section 0070 states that transportation facilities, services and improvements which do not meet the requirements of OAR 660-012-0065 require an exception to be sited on rural lands. It describes the process to apply for an exception and the modifications that must be met for the exception petition to be accepted.

Oregon Access Management Rule (OAR 734-051)

The purpose of Oregon's *Access Management Rule*[20,21]is to control the issuing of permits for access to state highways, state highway rights-of-way and other properties under the state's jurisdiction. In addition, the ability to close existing approaches, set spacing standards and establish a formal appeals process in relation to access issues is also identified.

These rules enable the state to set policy and direct the location and spacing of intersections and

[17] Oregon Department of Transportation, Traffic Manual, (2010).
[18] State of Oregon, Transportation Planning Rule, Oregon Administrative Rule 660.012, (2006).
[19] OAR 660-012-0060 is being revised along with the amendments to the OHP Mobility Policy.
[20] State of Oregon, Division 51 Highway Approaches, Access Control, Spacing Standards and Medians, Oregon Administrative Rule 734-051, (2004).
[21] OAR 734-051 is currently being amended.

approaches on state highways, ensuring the integrity of the functional classification system and preserving the efficient operation of state routes. Regulating access can:

- Protect resource lands
- Preserve highway capacity
- Ensure safety along segments of state routes with sharp curves, steep grades or obstructed sight distance.

The access management standards defined in OAR 734-051-0115 for regional highways are summarized below in Table 5.

Table 5: Access Management Spacing Standards for Public and Private Approaches on Regional Highways

Posted Speed	Rural (ft)	Urban (ft)	STA (ft)
≥55	990	990	
50	830	830	
40 & 45	750	750	
30 & 35	600	425	175*
≤25	450	350	175*

Source: ODOT *Access Management Manual*

Note: Measurement of the approach road spacing is from center to center on the same side of the roadway.

* 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 STAs, driveways are discouraged. However, where driveways are allowed and where land use patterns permit, the minimum access management spacing standard for driveways is 175 feet (55 meters) or mid-block if the current city block spacing is less than 350 feet (110 meters).

Appendix H

Draft Recommended Improvements

MEMORANDUM

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TO: Dan Fricke, ODOT Region 2

FROM: Bob Schulte, PTP

DATE: October 10, 2013

SUBJECT: **OR 99E Woodburn to Aurora Corridor Segment Plan** **P# 09042-022**
Technical Memorandum #8/9 – Draft Recommended Improvements

INTRODUCTION

This memo documents the development of draft recommended improvements within the OR 99E Woodburn to Aurora Corridor Segment Plan study area. The draft improvements will serve as the basis for the development of the corridor plan. The process included the following steps:

- Development of preliminary improvement options
- Analysis of preliminary improvement options
- Identification of draft recommended improvements

DEVELOPMENT OF PRELIMINARY IMPROVEMENT OPTIONS

Identification of Top 10 Improvement Locations

The development of preliminary improvement options began with the identification of a Top 10 list of improvement locations. These were the locations along the corridor that were determined to have the highest need for some type of improvement.

An initial list of 16 potential improvement locations was identified based on the existing and future corridor needs information generated in Task 4 – Assess Existing Conditions and Task 6 – Assess Future Transportation System Performance. Information on the type of need, general improvement options, and the potential benefits of the options was shared with the Project Management Team (PMT) at a March 29, 2012 meeting. The main comments received from the PMT were that:

- There should be some type of reasonable distribution of the recommended improvements throughout the corridor, so that they are not all concentrated in one or two areas, particularly because the plan will be an ODOT facility plan that will need to be incorporated in the local TSPs before the OTC will adopt it.
- The recommended improvements from the Hubbard TSP Update should be directly incorporated into the plan. To the extent possible, this should also be done for the recommended improvements in the Aurora TSP, although this study was done longer ago.

Additional comments on the specific improvement locations and improvement options were received from the individual PMT members following the meeting. The comments were reflected in a revised improvement location list that was distributed to the members.

To reduce the number of locations to a Top 10 list, the existing and future needs information was further reviewed. The primary factors considered were the relative severity of need for a particular location identified in Tasks 4 and 6 and the frequency of comments received from the stakeholders, agency staff, and public regarding the need for improvement at a particular location.

Based on this review and the input from the PMT, the locations shown in Table 1 and Figure 1 were included in the Top 10 list.

Table 1
Top 10 Improvement Locations

Location		Milepost(s)
No.	**Description**	
1	OR 99E/2nd St./Main St. (north leg) (Aurora)	24.95
2	OR 99E/3rd St./Main St. (south leg) (Aurora)	25.01
3	OR 99E/Ottaway Ave. (Aurora)	25.56
4	OR 99E/OR 551	27.54
5	Union 76 Station to D St. (Hubbard)	28.82 – 29.26
6	OR 99E/A St. (Hubbard)	29.11
7	D St. to South City Limit (Hubbard)	29.26 – 30.02

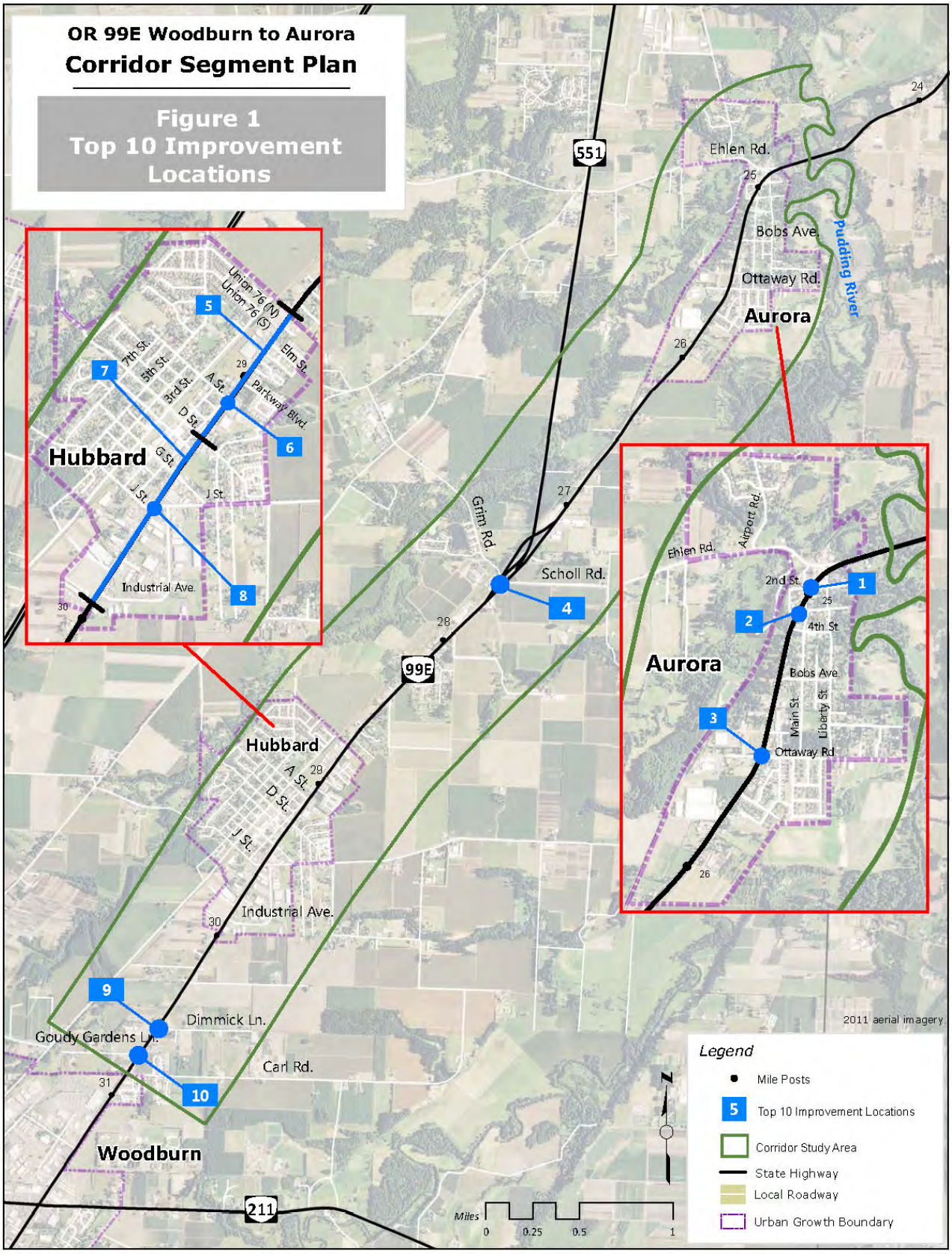

OR 99E Woodburn to Aurora
Corridor Segment Plan
Figure 1
Top 10 Improvement Locations
Hubbard
Aurora
Woodburn
Scholl Rd.
Grim Rd.
Ehlen Rd.
Bobs Ave.
Ottaway Rd.
Pudding River
Airport Rd.
2nd St.
4th St
Main St.
Liberty St.
Elm St.
Parkway Blvd.
7th St.
5th St.
3rd St.
A St.
D St.
G St.
J St.
Industrial Ave.
Union 76 (N)
Union 76 (S)
Dimmick Ln.
Goudy Gardens Ln.
Carl Rd.
551
99E
211
24
25
26
27
28
29
30
31
2011 aerial imagery
Legend
Mile Posts
Top 10 Improvement Locations
Corridor Study Area
State Highway
Local Roadway
Urban Growth Boundary
Miles
0
0.25
0.5
1

Table 1 (cont.)
Top 10 Improvement Locations

Location		Milepost(s)
No.	Description	
8	OR 99E/J St. (Hubbard)	29.54
9	OR 99E/Dimmick Ln.	30.57
10	OR 99E/Goudy Gardens Ln.	30.74

The list was distributed to the PMT members and there was agreement on the locations. Several members also provided comments on additional needs and potential improvements at specific locations. These were incorporated in a revised Top 10 list.

Development of Preliminary Improvement Options

Once the Top 10 list had been established, preliminary improvement options were identified for each location to address the identified needs. The goals, objectives, and evaluation criteria defined in Task 7 – Develop Problem Statement and Evaluation Criteria were used as a guide in the development of the options. Thus, the focus of the process was to identify lower-cost options that would improve safety and maintain traffic operations and minimize environmental and land use impacts. Another objective was to develop improvement packages for each location that would address not only the primary need, but secondary needs within the vicinity. This approach enhances the cost-effectiveness of improvement projects by increasing the total benefit while reducing the total cost, compared to undertaking separate projects for each improvement.

In some cases, due to the type of need or specific characteristics of the location, only one improvement option was available. An example of this would be a location where there are conflicts between turning vehicles and through traffic. Here, the only option would be to provide a turn lane.

A summary of the needs and improvement options for each of the Top 10 locations is provided in Table 2. Information on the specific features of the options is presented in the next section.

Table 2
Top 10 Improvement Locations
Summary of Needs and Preliminary Improvement Options

Location		Needs	Improvement Options
No.	**Description**		
1	OR 99E/2nd St./ Main St. (north leg) - Aurora	• Skewed intersections • Substandard sight distance	1. Consolidate OR 99E/2nd St. and OR 99E/Main St. (north leg).
2	OR 99E/3rd St./Main St. (south leg) - Aurora	• Skewed intersection at OR 99E/Main St.	1. Close south leg of intersection 2. Consolidate OR 99E/Main St. (south leg) and OR 99E/3rd St.
3	OR 99E/Ottaway Ave. - Aurora	• Turn lanes • Capacity (future) • Improved pedestrian safety	1. Combination of turn lane, capacity, and bike/pedestrian improvements.
4	OR 99E/OR 551	• Poor intersection configuration • Capacity (future)	1. Reconstruct OR 99E/Grim Rd. and OR 99E/Scholl Rd. intersections as single, signal-controlled intersection. 2. Reconstruct intersections as roundabout.
5	Union 76 Station to D St. - Hubbard	• Improved safety • Turn lanes • Access control • Sidewalks	1. Combination of turn lane and bike/pedestrian improvements. 2. Combination of two-way center turn lane and bike/pedestrian improvements.
6	OR 99E/A St. - Hubbard	• Turn lanes • Capacity (future)	1. Combination of turn lane, capacity, and bike/pedestrian improvements. 2. Combination of turn lane, capacity, and bike/pedestrian improvements.
7	D St. to South City Limit - Hubbard	• Bicycle facilities • Sidewalks	1. Combination of bike/pedestrian and capacity improvements.

Table 2 (cont.)
Top 10 Improvement Locations
Summary of Needs and Preliminary Improvement Options

Location		Needs	Improvement Options
No.	Description		
8	OR 99E/J St. - Hubbard	• Turn lane • Skewed intersection • Substandard sight distance • Capacity (future)	1. Combination of turn lane, sight distance, capacity, and pedestrian improvements.
9	OR 99E/Dimmick Ln.	• Turn lane • Skewed intersection	1. Combination of turn lane and geometric improvements.
10	OR 99E/Goudy Gardens Ln.	Skewed intersection	1. Combination of geometric improvements.

ANALYSIS OF PRELIMINARY IMPROVEMENT OPTIONS

The preliminary improvement options were analyzed to develop information to support the evaluation of the options. For locations with more than one option, this information was used with the screening process developed in Task 7 – Develop Problem Statement and Evaluation Criteria to assess the relative effectiveness of the options.

Development of Evaluation Data

For convenience, the evaluation data was organized within cut sheets for each of the options. This information included:

- Improvement location
- Description of needs
- Description of improvement
- Concept design drawing
- Preliminary cost estimate
- Benefits
- Key considerations/notes

The cut sheets are included in Appendix A.

The improvement descriptions and concept design drawings define the basic features of the improvement and illustrate how it would be configured within the existing corridor. The drawings are not to scale, but provide a general indication of the project limits.

The cost estimates are planning level estimates that indicate the order-of-magnitude costs of the improvements. They include all major cost categories except right-of-way acquisition. Right-of-way was not included because of the difficulty of obtaining accurate cost information and because it would not be a significant cost component for any of the options. They are based on estimates of the required quantities of the individual cost items (e.g., units of backfill), which is generally more accurate than using aggregate unit costs (e.g., total cost per mile of lane widening).

The list of benefits includes all of the significant benefits of the improvement, described in either quantitative or qualitative terms. In the key considerations/notes section, special considerations for the improvement are identified, such as operational characteristics, environmental review requirements, impacts to specific parcels, and consistency with local plans.

Screening of Options

The results of the screening process for locations with more than one option are included in the last section of the cut sheets.

As defined in Task 7, the improvement options were evaluated by assigning point scores of between zero and ten for each criterion. The point scores reflect the assessment, based on professional judgment, of the degree to which an option satisfied the criteria. Not all of the criteria applied to each option. For example, the criterion for improved roadway geometrics would not apply to an option that does not change the existing geometrics.

The score for each criterion was multiplied by an associated weight. The weights were developed based on an assessment of the relative importance of corridor needs by the stakeholders. The weighted scores were summed to produce a total weighted score for each alternative.

PMT Review

The initial versions of the cut sheets were submitted to ODOT staff for review and comment. Following modifications to reflect the ODOT comments, they were reviewed with the PMT at an August 30th, 2012 meeting. There was general agreement about the improvement concepts and the results of the evaluation. Most of the comments were related to specific features of the options, such as the location of crosswalks, and the need for additional information in certain areas. Another comment was that there should be an additional cut sheet to summarize the generic, low-cost improvements types suggested by the stakeholders and public that could be implemented in the near-term. This cut sheet is also shown in Appendix A.

Revised versions of the cut sheets were developed based on the comments and distributed to the PMT members.

IDENTIFICATION OF DRAFT RECOMMENDED IMPROVEMENTS

A set of draft recommended improvements was identified based on the evaluation results, input from the PMT, and comments received from the public at an open house meeting.

Public Open House Comments

Public comments on the improvement options were obtained at an open house meeting held on November 15th, 2012. The meeting was attended by 23 people. A total of 60 comments were received, some in favor of or opposing the options and others identifying alternative improvement concepts.

Within Aurora, a strong majority of the comments were opposed to the improvement options for OR 99E/2nd St./Main St. and OR 99E/Main St./3rd St. At both locations, it was believed that the improvements would hurt businesses and restrict parking. The existing configuration was preferred to both of the options for OR 99E/Main St./3rd St. There was, however, strong support for the improvement option at OR 99E/Ottaway Ave.

At OR 99E/OR 551, there was mixed support for Option 1 (single, signalized intersection), while a majority of the comments were opposed to Option 2 (roundabout). Comments were made that both options were too expensive and that the roundabout would be even more confusing than the existing intersections.

In the Hubbard area, there were positive responses to both of the options for the segment between the Union 76 station and D St. The crosswalk was noted as a desirable feature of both options, as well as the two-way center turn lane for Option 2. For the OR 99E/A St. intersection, there was more support for Option 1 than Option 2. This was due, in part, to the southbound right-turn lane included in Option 1, but not in Option 2.

There were no comments for or against the additional lane and bicycle/pedestrian improvements for the segment between D St. and the Hubbard south city limit. One commenter questioned whether there was enough traffic to warrant the additional lane improvement, while two others indicated that what was actually needed within this segment was a lighted crosswalk at the G St. intersection. There was support for the OR 99E/J St. improvement options, with the comment that there must be adequate room for truck turns, particularly from westbound J St. onto OR 99E.

The improvement options for both OR 99E/Dimmick Lane and OR 99E/Goudy Gardens Lane were supported.

The highest level of support was received for a set of low-cost improvement options. Specific comments were that a crosswalk was needed at G St. in Hubbard, bicycle lane and sidewalk improvements would be acceptable, lighting improvements would have a significant benefit, and a reduction in the speed limits was needed.

A tally of the for/against comments by improvement location is presented in Table 3.

Table 3
Public Input On Improvement Options

Location		Option 1		Option 2	
No.	**Description**	**For**	**Against**	**For**	**Against**
1	OR 99E/2nd St./Main St. (north leg) (Aurora)	1	4	N/A	
2	OR 99E/3rd St./Main St. (south leg) (Aurora)	1	5	0	3
3	OR 99E/Ottaway Ave. (Aurora)	5	0	N/A	
4	OR 99E/OR 551	1	1	2	4
5	Union 76 Station to D St. (Hubbard)	1	0	1	0
6	OR 99E/A St. (Hubbard)	2	0	0	1
7	D St. to South City Limit (Hubbard)	0	0	N/A	

Table 3 (cont.)
Public Input On Improvement Options

Location		Option 1		Option 2	
No.	**Description**	**For**	**Against**	**For**	**Against**
8	OR 99E/J St. (Hubbard)	2	0	N/A	
9	OR 99E/Dimmick Ln.	1	0	N/A	
10	OR 99E/Goudy Gardens Ln.	1	0	N/A	

Draft Recommended Improvements

The improvement options presented below are recommended for further investigation. No improvement options are recommended for OR 99E/2nd St./Main St. (north leg) and OR 99E/2nd St./Main St. (south leg) in Aurora because the City of Aurora Planning Commission was not in favor of improvements at these locations.[1] It was felt that these would have negative impacts on business access and overall accessibility within the area, and that these locations should be left "as is". Similar comments were made at the open house. While geometric deficiencies exist at these intersections, the proposed modifications are not recommended due to the opposition of the city and the fact that there are no identified safety or operational issues that would dictate improvements.

OR 99E/Ottaway Ave. (Aurora)

Option 1 (see appendix) was the only option investigated for this location. It comprises turn lane, capacity, and bike/pedestrian improvements. This option would result in the following benefits:

- Reduced traffic conflicts along OR 99E due to turn lanes.
- Improved pedestrian environment with additional sidewalks and crosswalks (crosswalks would be

Improvement Option 1

[1] February 26th, 2013 email from Renata Wakeley, Mid-Willamette Valley COG, to Dan Fricke, ODOT Region 2.

signalized and illuminated in the future).

- Improved bicycle environment with addition of bicycle lanes.
- Future intersection v/c ratio of 0.73 (with signal) that would meet both Oregon Highway Plan (OHP) and ODOT Highway Design Manual (HDM) mobility targets for the Year 2035.

In addition, this option received strong public support and is consistent with the City of Aurora TSP.

OR 99E/OR 551

Both Option #1 and Option #2 for OR 99E/OR 551 are recommended for further investigation. Option 1 would reconstruct the existing OR 99E/Grim Rd. and OR 99E/Scholl Rd. intersections as a single, signal-controlled intersection. Option 2 would reconstruct these intersections as a roundabout. The total evaluation scores for the options were similar; however, there are several specific differences in the benefits and costs of each option.

Improvement Option 1

Improvement Option 2

Option #1 could be constructed entirely within the existing right-of-way and would be more consistent with current ODOT design policy, which is oriented toward conventional intersection design rather than roundabouts. Drivers would also have more familiarity with signalized intersection operations than they initially would with roundabouts. There would be fewer special considerations required for truck movements with a standard intersection configuration compared to a roundabout. The single intersection would also be located further away from the access to a trucking business in the southwest quardrant of the intersection and the Union Pacific rail line to the west.

An important benefit of Option #2 compared to Option #1 is that it would have greater long-term safety benefits for both traffic and pedestrians. The roundabout configuration would also have a greater potential for reducing traffic conflicts. In addition, the total cost of Option #1 would be slightly less than that of Option #2.

Union 76 Station to D St. - Hubbard

Both of the improvement options investigated for this location feature the same bicycle and pedestrian improvements in the vicinity of the Union 76 station, as well as a southbound left-turn lane at the north driveway of the station. The difference is the extent of the improvements to the south of the station. Option 1 includes only a northbound left-turn lane at the south driveway of the station, while Option 2 includes a two-way center turn lane extending south from the station to D St., together with bicycle lanes and sidewalks. While this results in a significant cost difference (see appendix), Option 2 is preferred because it:

Improvement Option 2

- Received a higher total evaluation score.
- Addresses a significant need for a northbound/southbound turn refuge between the Union 76 station and D St.
- Provides continuous bike lanes and sidewalks between the Union 76 and D St.

This option was also favored by the PMT and supported by the public.

OR 99E/A St. - Hubbard

Options 1 and 2 for OR 99E/A St. both include bicycle and pedestrian improvements within the intersection area, as well as a two-way center turn lane between Parkway Blvd. and D St., a southbound through/right-turn lane south of the intersection (as recommended in the Hubbard TSP), closure of 1st St. at A St., and a future traffic signal. The only difference between the

options is that Option 1 features a southbound right-turn lane at A St., while Option 2 includes a southbound through/right-turn lane. Option 2 is preferred because:

- It received a slightly higher total evaluation score.
- The future v/c ratio (0.71) would meet both the OHP and HDM mobility targets compared to the v/c ratio for Option 2 (0.91), which would meet neither of the targets.
- The southbound through/right-turn lane improvement is consistent with the adopted Hubbard TSP, whereas the southbound right-turn only lane in Option 1 is not.

Improvement Option 2

Signalization of the intersection would be required to meet future mobility targets. Prior to implementation, a signal study would be needed, which would include signal warrant analysis, determination of intersection geometrics, and signal operations analysis. The proposed signal would then have to be approved by the State Traffic Engineer.

D St. to South City Limit - Hubbard

Only one option was considered for this segment, in which a southbound through/right-turn lane would be constructed together with bicycle lanes and sidewalks where they are not currently available. This option is consistent with the Hubbard TSP and would provide increased capacity for southbound vehicles as well as an enhanced bicycle/pedestrian environment within Hubbard.

Improvement Option 1

OR 99E/J St. - Hubbard

The improvement option for OR 99E/J St. includes a southbound through/right-turn lane (part of the D St. to South City Limit option above), as well as minor sight distance, striping, and pedestrian improvements. These would improve safety and provide additional intersection capacity. This option was supported by the public.

Improvement Option 1

OR 99E/Dimmick Lane

The OR 99E/Dimmick Lane improvement option would address turn lane and intersection angle needs identified by the PMT and public with the construction of a southbound left-turn lane and a minor intersection realignment. In addition, the Dimmick Lane approach would be widened to allow access/egress by WB-67 trucks or another appropriate design vehicle.

Improvement Option 1

OR 99E/Goudy Gardens Lane

Similar to the OR 99E/Dimmick Lane improvement, this improvement option would realign the OR 99E/Goudy Gardens Lane intersection to reduce the skew angle and widen the Goudy Gardens approach to accommodate large truck turning movements.

Improvement Option 1

Low-Cost Improvements

In addition to the improvements for the specific locations described above, a set of low-cost improvements is recommended for further investigation at the appropriate locations along the corridor. These are summarized in Table 4 below.

Table 4
Low Cost Improvements

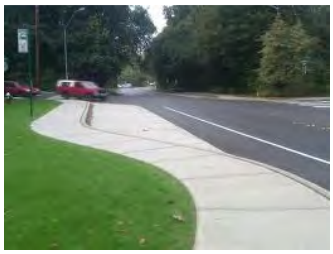
Improvement		Potential Improvement Locations
Reduction of Speed Limit		South of Aurora City limit
Rumble Strips		Along OR 99E shoulders within study area
Lighting Improvements		Provide lighting at crosswalks and intersections: • OR 99E/Main St. (crosswalk) • OR 99E/A St. (crosswalk) • OR 99E/Ottaway Ave. (intersection) • OR 99E/Union 76 Station (crosswalk) • OR 99E/ D St. (intersection)
Bus Pull-Outs		Bus stop locations along OR 99E within study area
Regular Maintenance of Pavement Markings		Locations with worn pavement markings

Table 4 (cont.)
Low Cost Improvements

Improvement		Potential Improvement Locations
Crosswalks		Provide crosswalks complete with signing, striping, and lighting: • OR 99E/Main St. - Aurora • OR 99E/3rd St. - Aurora • OR 99E/Ottaway Ave. - Aurora • OR 99E/Union 76 Station - Hubbard • OR 99E/A St. - Hubbard • OR 99E/D St. - Hubbard • OR 99E/J St. - Hubbard
Bike Lanes and Sidewalks		Provide bike lanes and sidewalks along OR 99E within study area: • 1st St. to Bobs Ave. - Aurora • OR 99E/Ottaway Ave. - Aurora • Union 76 station to Hubbard south city limit

Appendix A

CUT SHEETS

OR 99E/2nd St./Main St. (North Leg) - Aurora

Location: OR 99E/2nd St./Main St. (north leg) - Aurora

Milepost: 24.95

Needs:

- Skewed intersections.
- Substandard sight distance from westbound approach of 2nd St.

Improvement Option #1

Description: Consolidate OR 99E/2nd St. and OR 99E/Main St. (north leg):

1. Close east leg of OR 99E/2nd St. intersection.
2. Close west leg of OR 99E/2nd St. intersection.
3. Close north leg of OR 99E/Main St. intersection.
4. Realign Main St. to "T" into OR 99E.

Preliminary Cost Estimate:

Preliminary Engineering	$75,000
Construction	$210,000
Construction Engineering	$30,000
Contingency	$85,000
Total	$400,000

* Crosswalk desired between realigned Main St. and 3rd St. However, full crosswalk investigation will be required to determine safest location, in addition to approval of crosswalk by State Traffic Engineer.

Benefits:

- Elimination of skewed intersection approaches at OR 99E/2nd St. and OR 99E/Main St.
- Elimination of sight distance deficiency at OR 99E/2nd St.
- Reduced number of traffic conflict points.
- Creation of two small parcels that could be used for open space or redevelopment.
- Improved pedestrian environment along OR 99E due to fewer intersections.

Key Considerations/Notes:

- No additional right of way would be needed for this improvement.

- This improvement is not included in Aurora TSP.
- This improvement would vacate parts of 2nd St. and Main St., creating two small parcels.
- Ten-foot sidewalks assumed.
- Lost parking from vacation of Main St. could be provided along 2nd St., west of Main St.
- This improvement would result in the diversion of approximately 20 vehicles per hour from westbound 2nd St. to Liberty St. to the north and 3rd St. to the south.

OR 99E/3rd St./Main St. (South Leg) - Aurora

Location: OR 99E/3rd St./Main St. (south leg) - Aurora

Milepost: 25.01

Need: Skewed intersection at OR 99E/Main St.

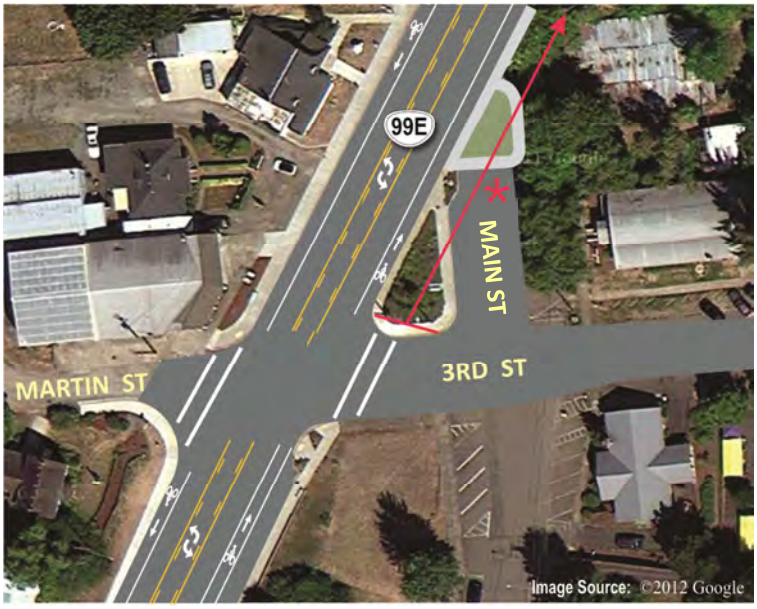
Improvement Option #1

Description: Eliminate skewed intersection:

1. Close north leg of OR 99E/Main St. intersection (see improvement option for OR 99E/2nd St. intersection).
2. Close south leg of OR 99E/Main St. intersection.

Preliminary Cost Estimate:

Preliminary Engineering	$2,000
Construction	$5,000
Construction Engineering	$1,000
Contingency	$2,000
Total	$10,000[1]



* Crosswalk desired between realigned Main St. and 3rd St. However, full crosswalk investigation will be required to determine safest location, in addition to approval of crosswalk by State Traffic Engineer.

Benefits:

- Elimination of skewed intersection.
- Reduced number of traffic conflict points.
- Creation of small parcel that could be used for open space or as part of redevelopment.
- Improved pedestrian environment along OR 99E due to fewer intersections.

Key Considerations/Notes:

- No additional right-of-way would be needed for this improvement.
- This improvement would result in the diversion of approximately 25 vehicles per hour from

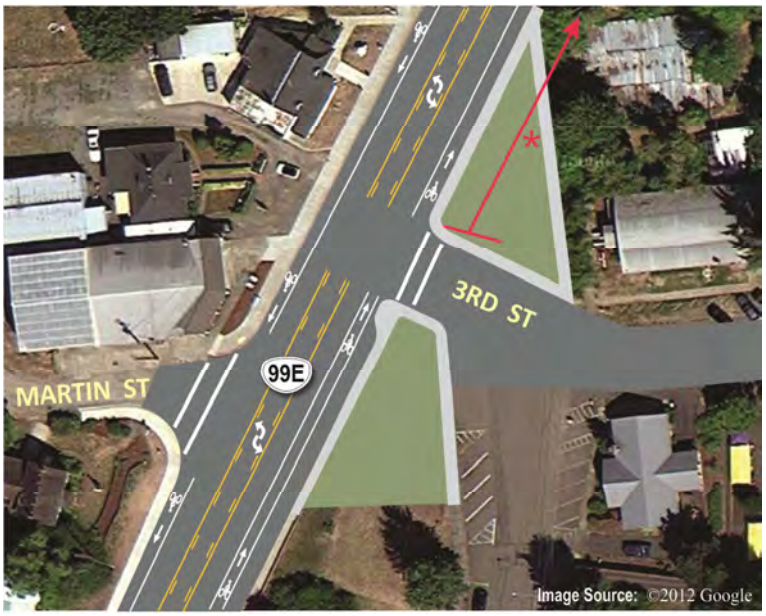
[1] Cost of vacating north leg of OR 99E/Main St. intersection included in cost of improvement option for OR 99E/2nd St. intersection.

northbound Main St. to 3rd St.
- Vacated portion of Main St. could be converted into landscaping.
- Ten-foot sidewalks assumed.
- This improvement is not included in Aurora TSP.

Improvement Option #2

Description: Eliminate skewed intersections at OR 99E/Main St. and OR 99E/3rd St.:

1. Close north leg of OR 99E/Main St. intersection (see improvement option for OR 99E/2nd St. intersection).
2. Close south leg of OR 99E/Main St. intersection.
3. Realign east leg of 3rd St. to "T" into OR 99E.



* Crosswalk desired between realigned Main St. and 3rd St. However, full crosswalk investigation will be required to determine safest location, in addition to approval of crosswalk by State Traffic Engineer.

Preliminary Cost Estimate:

Preliminary Engineering	$75,000
Construction	$210,000
Construction Engineering	$30,000
Contingency	$85,000
Total	$400,000[2]

Benefits:

- Elimination of skewed intersection approaches at OR 99E/3rd St. and OR 99E/Main St.
- Reduced number of traffic conflict points
- Creation of two parcels that could be used for open space or as part of redevelopment.
- Improved pedestrian environment along OR 99E due to fewer intersections.

Key Considerations/Notes:

- No additional right-of-way would be needed for this improvement.
- This improvement would consolidate two closely spaced intersections - OR 99E/Main St. (south leg) and OR 99E/3rd St.
- This improvement would result in the diversion of approximately 25 vehicles per hour from northbound Main St. to 3rd St.
- Vacated portions of Main St. and 3rd St. could be converted into landscaping.
- Vacation of Main St. between 3rd St. and OR 99E would eliminate 15 parking spaces.
- Ten-foot sidewalks assumed.
- This improvement is not included in Aurora TSP.

[2] Cost of vacating north leg of OR 99E/Main St. intersection included in cost of improvement option for OR 99E/2nd St. intersection.

Scoring			
Evaluation Criterion	**Weight**	**Raw Score**	
		Option 1	**Option 2**
1. Potential reduction in crash rate/severity	15	3	8
2. Type/level of geometric improvement	11	4	10
3. Type/level of bicycle/pedestrian facility improvement	10	2	4
4. Potential reduction in traffic conflicts	13	3	8
5. Potential reduction in congestion and delay	9	0	0
6. Reduction in number of access points	10	0	0
7. Improvement in access design	8	3	3
8. Minimization of impacts to environmentally sensitive areas	6	10	10
9. Minimization of impacts to EFU-zoned or developed parcels	5	10	10
10. Minimization of construction cost	7	9	1
11. Minimization of required right-of-way	4	10	10
12. Consistency with ODOT standards and local plans, policies	2	5	8
Total Weighted Score		395	571

OR 99E/Ottaway Ave. - Aurora

Location: OR 99E/Ottaway Ave. - Aurora

Milepost: 25.56

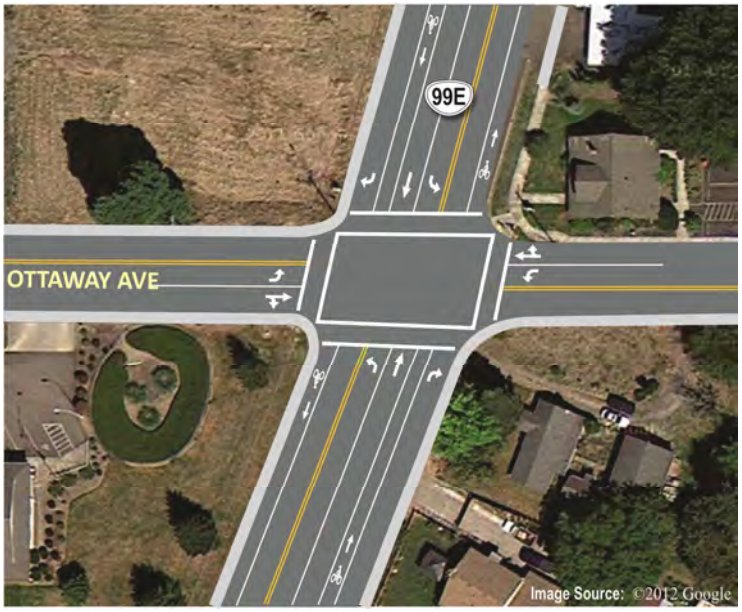
Needs:

- Turn lanes
- Capacity (future only)
- Improved pedestrian safety

Improvement Option #1

Description:

1. Construct NB and SB left- and right-turn lanes.
2. Add striping for EB and WB left-turn lanes.
3. Construct bicycle lanes along both sides of OR 99E.
4. Construct sidewalks on all intersection legs where currently not available.
5. Install crosswalks with ADA ramps and illumination on all intersection legs where currently not available.
6. Install traffic signal (future only).



Preliminary Cost Estimate:

Preliminary Engineering	$250,000
Construction	$900,000
Construction Engineering	$100,000
Contingency	$275,000
Total	$1,300,000

Benefits:

- Reduced traffic conflicts along OR 99E due to turn lanes.
- Improved pedestrian environment with additional sidewalks and crosswalks (crosswalks would be signalized and illuminated in future).

- Improved bicycle environment with addition of bicycle lanes.
- Future (signalized) intersection v/c ratio of 0.73 would meet both OHP and HDM mobility standards for Year 2035.

Key Considerations/Notes:

- All improvements are consistent with Aurora TSP.
- Right-of-way needs would be minimal.
- Bicycle lanes and sidewalk improvements along OR 99E would extend between beginning and end of NB, SB turn lane improvements.
- Bicycle lane improvements would connect to existing shoulder bikeways to north and south of intersection.
- Right-of-way cost not included in the preliminary cost estimate.
- Preliminary cost estimate assumes 6’ bicycle lanes and 6’ sidewalks.
- MUTCD traffic signal warrants would have to be met prior to installation of traffic signal.
- Future (unsignalized) intersection v/c ratio of >1.0 would not meet OHP or HDM mobility standards for Year 2035.

OR 99E/OR 551

Location: OR 99E/OR 551

Milepost: 27.54

Needs:

- Poor intersection configuration – driver confusion, potential safety problems, general congestion
- Capacity (future only)

Improvement Option #1

Description: Reconstruct OR 99E/Grim Rd. and OR 99E/Scholl Rd. intersections as a single, signal-controlled intersection:

1. Remove medians to north and south of existing intersections.
2. Merge SB OR 99E and SB OR 551 to north of Grim Rd. intersection.
3. Construct intersection with five lane cross section.
4. Provide 6'-wide shoulders along new alignment.

Preliminary Cost Estimate:

Preliminary Engineering	$1,950,000[1]
Construction	$1,805,000
Construction Engineering	$270,000
Contingency	$725,000
Total	$4,750,000

Benefits:

- New intersection configuration would be less confusing and would eliminate drivers being caught between intersections along Scholl Rd. and Grim Rd.

[1] Includes cost of Environmental Impact Study.

- Future intersection v/c ratio of 0.77 would meet the OHP mobility target for Year 2035.
- One intersection rather than two would provide improved pedestrian crossings.
- Widened shoulders would improve safety for bicyclists and pedestrians.
- Existing OR 99E NB alignment could be retained as a local access road.

Key Considerations/Notes:

- Addition of southbound right-turn lane would further reduce future v/c ratio to 0.70, which would meet OHP mobility target and nearly meet HDM mobility standard of 0.65.
- Entire project could be constructed within existing right-of-way.
- Merging of SB OR 99E and SB OR 551 would introduce weave area north of intersection.
- This improvement may require NEPA environmental review due to realignment of existing centerlines of OR 99E and OR 551. If this is not required, cost would be reduced by roughly $1.5 million.
- Coordination with ODOT Rail Division would be needed due to close proximity of intersection to existing railroad crossing.
- The distance from the gore of southbound OR 99E and OR 551 to the intersection stop bar would need to be approximately 745‘ to accommodate the estimated 95th percentile queue length of 250‘ and the required stopping sight distance of 495‘ at 55 mph. A reduced speed zone or alternative design may be needed if these distances cannot be achieved.

Improvement Option #2

Description:

Reconstruct OR 99E/Grim Rd. and OR 99E/Scholl Rd. intersections as a roundabout:

1. Remove medians to north and south of existing intersections.
2. Merge SB OR 99E and SB OR 551 to north of roundabout.
3. Add slip lane from SB OR 99E to WB Grim Rd.
4. Add second NB lane on OR 99E south and north of roundabout.
5. Provide 6’-wide shoulders along new alignment.

Preliminary Cost Estimate:

Preliminary Engineering	$1,890,000[2]
Construction	$1,600,000
Construction Engineering	$235,000
Contingency	$625,000
Total	$4,350,000

[2] Includes cost of Environmental Impact Study.

Benefits:

- Roundabout would be less confusing than two intersections and would eliminate drivers being caught between intersections along Scholl Rd. and Grim Rd.
- Future v/c ratio of 0.73 would meet the OHP mobility target for Year 2035.
- Widened shoulders would improve safety for bicyclists and pedestrians.
- Existing OR 99E NB alignment could be retained as a local access road.

Key Considerations/Notes:

- Merging of SB OR 99E and SB OR 551 would introduce weave area north of signal.
- This improvement may require NEPA environmental review due to realignment of existing centerlines of OR 99E and OR 551. If this is not required, cost would be reduced by roughly $1.5 million.
- Coordination with ODOT Rail Division would be needed due to close proximity of roundabout to existing railroad crossing.
- Small amount of additional right-of-way may be needed; this could be eliminated during the design process, however.
- The distance from the gore of southbound OR 99E and OR 551 to the intersection stop bar would need to be approximately 695‘ to accommodate the estimated 95th percentile queue length of 200‘ and the required stopping sight distance of 495‘ at 55-mph. A reduced speed zone or alternative design may be needed if these distances cannot be achieved.
- Existing access to trucking business on southwest corner of roundabout would be maintained. Grim Rd. driveway could be accessed via roundabout. OR 99E driveway would be unaffected.

Scoring

Evaluation Criterion	Weight	Raw Score	
		Option 1	Option 2
1. Potential reduction in crash rate/severity	15	4	7
2. Type/level of geometric improvement	11	5	5
3. Type/level of bicycle/pedestrian facility improvement	10	1	1
4. Potential reduction in traffic conflicts	13	5	9
5. Potential reduction in congestion and delay	9	8	8
6. Reduction in number of access points	10	0	0
7. Improvement in access design	8	0	0
8. Minimization of impacts to environmentally sensitive areas	6	9	9
9. Minimization of impacts to EFU-zoned or developed parcels	5	10	10
10. Minimization of construction cost	7	5	6
11. Minimization of required right-of-way	4	10	9
12. Consistency with ODOT targets and local plans, policies	2	8	6
Total Weighted Score		457	553

Union 76 Station to D St. - Hubbard

Location: Union 76 Station to D St. - Hubbard

Milepost: 28.82 – 29.26

Needs:

- Improved safety
- Turning lanes
- Access control
- Sidewalks

Improvement Option #1

Description:

1. Construct SB right-turn lane at OR 99E/Union 76 N. Dwy.
2. Construct NB left-turn lane at OR 99E/Union 76 S. Dwy.
3. Construct sidewalks on both sides of OR 99E.
4. Install enhanced pedestrian crossing (Rectangular Rapid Flashing Beacon with illumination) with ADA ramps at OR 99E/Union 76 S. Dwy.
5. Construct bike lanes on both sides of OR 99E.

Preliminary Cost Estimate:

Preliminary Engineering	$70,000
Construction	$195,000
Construction Engineering	$30,000
Contingency	$80,000
Total	$375,000

Benefits:

- Improved pedestrian and bicycle environment.
- Improved access to Union 76 station.
- Improved traffic operations and safety with removal of turning vehicles from traffic stream.

Key Considerations/Notes:

- Minimal or no right-of-way would be needed (no right-of-way cost included in preliminary cost estimate).
- Sidewalks and bike lanes would extend between the beginning and end of the turn lane improvements.

Improvement Option #2

Description:

1. Construct two-way center turn lane between Union 76 N. Dwy. and D St.
2. Construct SB right-turn lane at OR 99E/Union 76 N. Dwy.
3. Construct sidewalks on both sides of OR 99E where currently not available.
4. Install enhanced pedestrian crossing (Rectangular Rapid Flashing Beacon with illumination) with ADA ramps at OR 99E/Union 76 S. Dwy.
5. Construct bike lanes on both sides of OR 99E.

Preliminary Cost Estimate:

Preliminary Engineering	$230,000
Construction	$625,000
Construction Engineering	$95,000
Contingency	$250,000
Total	$1,200,000

Benefits:

- Improved pedestrian and bicycle environment.
- Improved access to Union 76 station.
- Improved traffic operations and safety with removal of turning vehicles from traffic stream.
- Compared to Improvement Option #1, separation of left-turning traffic would be continuous between Union 76 Station and D St. with two-way center turn lane.

Key Considerations/Notes:

- Minimal or no right-of-way would be needed (no right-of-way cost included in preliminary cost estimate).
- Sidewalks and bike lanes would extend between D St. and end of turn lane improvements at Union 76 station.
- Two-way center turn lane improvement is consistent with Hubbard TSP, which recommends the same improvement between D St. and Hubbard north UGB.
- A two-way center turn lane improvement between Parkway Blvd. and D St. will be added to ODOT's safety project scoping list for 2014 - 2017.

Scoring			
Evaluation Criterion	**Weight**	**Raw Score**	
		Option 1	**Option 2**
1. Potential reduction in crash rate/severity	15	3	8
2. Type/level of geometric improvement	11	2	7
3. Type/level of bicycle/pedestrian facility improvement	10	4	6
4. Potential reduction in traffic conflicts	13	3	8
5. Potential reduction in congestion and delay	9	2	5
6. Reduction in number of access points	10	0	0
7. Improvement in access design	8	0	0
8. Minimization of impacts to environmentally sensitive areas	6	10	10
9. Minimization of impacts to EFU-zoned or developed parcels	5	10	10
10. Minimization of construction cost	7	7	3
11. Minimization of required right-of-way	4	10	10
12. Consistency with ODOT standards and local plans, policies	2	10	10
Total Weighted Score		383	597

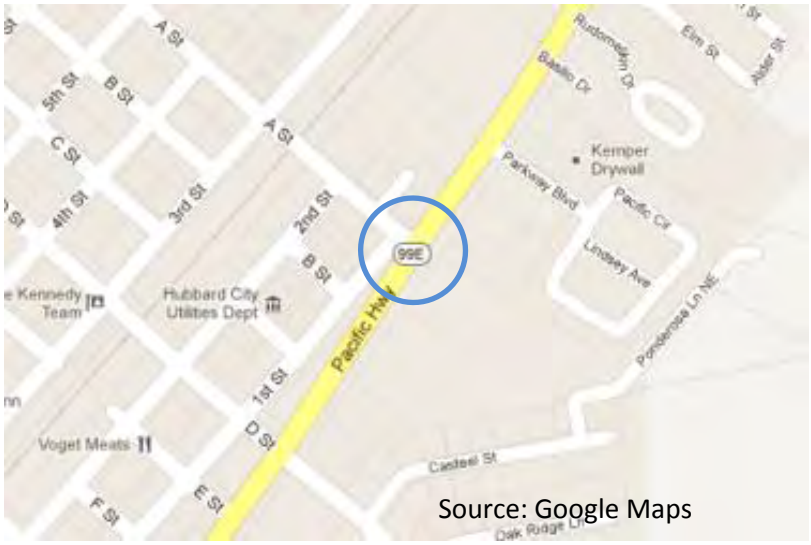
OR 99E/A St. – Hubbard

Location: OR 99E/A St. - Hubbard

Milepost: 29.11

Needs:

- Turn lanes
- Capacity (future only)



Source: Google Maps

Improvement Option #1

Description:

1. Consistent with Hubbard TSP, construct SB through/right-turn lane south of OR 99E/A St. intersection (see improvement option for D St. - Hubbard S.C.L. segment).
2. Construct SB right-turn at A St.
3. Closure of 1st St. at A St.
4. Construct two-way center turn lane from Parkway Blvd. to D St.
5. Construct sidewalks on west side of OR 99E.
6. Construct bike lanes on both sides of OR 99E.
7. Construct enhanced pedestrian crossing (Rectangular Rapid Flashing Beacon with illumination) on south side of intersection.
8. Construct traffic signal (future only).

Preliminary Cost Estimate:

Preliminary Engineering	$300,000
Construction	$915,000
Construction Engineering	$135,000
Contingency	$350,000
Total	$1,700,000

Benefits:

- Improved traffic operations and safety with removal of turning vehicles from traffic stream.
- Enhanced pedestrian crossings of OR 99E at A St.
- Reduction in conflict points near busy OR 99E/A St. intersection with elimination of access to 1st St.
- Future (signalized) intersection v/c ratio of 0.91 would exceed OHP mobility target of 0.90 for Year 2035.

Key Considerations/Notes:

- This option shows more widening of OR 99E on west side of highway than east side. This would preserve recent pedestrian enhancements on east side of highway. Alternatively, widening on both sides of highway would minimize need for additional right-of-way.
- Sidewalks and bike lanes would extend from Parkway Blvd. to D St.
- Pedestrian crossing improvements are consistent with Hubbard TSP; closure of 1st St. at A St. not included in Hubbard TSP.
- Improvement elements 4 – 6 are also part of Improvement Option #2 for Union 76 Station – D St. segment.
- Signalization of this intersection is not included in Hubbard TSP.
- MUTCD traffic signal warrants would need to be met prior to installation of traffic signal.
- Future (unsignalized) intersection v/c ratio of >1.0 would not meet OHP or HDM mobility targets for Year 2035.
- This intersection is a top 10th percentile location in ODOT's 2012 SPIS list.

Improvement Option #2

Description:

1. Consistent with Hubbard TSP, construct SB through/right-turn lane south of OR 99E/A St. intersection (see improvement option for D St. - Hubbard S.C.L. segment).
2. Construct SB through/right-turn lane at A St.
3. Closure of 1st St. at A St.
4. Construct two-way center turn lane from Parkway Blvd. to D St.
5. Construct sidewalks on west side of OR 99E.
6. Construct bike lanes on both sides of OR 99E.
7. Construct enhanced pedestrian crossing (Rectangular Rapid Flashing Beacon with illumination) on south side of intersection.
8. Construct traffic signal (future only).

Preliminary Cost Estimate:

Preliminary Engineering	$350,000
Construction	$955,000
Construction Engineering	$145,000
Contingency	$400,000
Total	$1,850,000

Benefits:

- Improved traffic operations and safety with removal of turning vehicles from traffic stream.
- Improved pedestrian crossings of OR 99E at A St.
- Reduction in conflict points near busy OR 99E/A St. intersection with elimination of access to 1st St.
- Compared to Improvement Option #1, future intersection v/c ratio of 0.71 would meet both OHP and HDM mobility targets for Year 2035.

Key Considerations/Notes:

- This option shows more widening of OR 99E on west side of highway than east side. This would preserve recent pedestrian enhancements on east side of highway. Alternatively, widening on both sides of highway would minimize need for additional right-of-way.
- Sidewalks and bike lanes would extend from Parkway Blvd. to D St.
- Southbound through/right turn lane and pedestrian crossing improvements are consistent with Hubbard TSP; vacation of 1st St. is not included in Hubbard TSP.
- Improvement elements 4 – 6 are also part of Improvement Option #2 for Union 76 Station – D St. segment.
- Signalization of this intersection not included in Hubbard TSP.
- MUTCD traffic signal warrants would need to be met prior to installation of traffic signal.
- Future (unsignalized) intersection v/c ratio of >1.0 would not meet OHP or HDM mobility targets for Year 2035.
- This intersection is a top 10th percentile location in ODOT's 2012 SPIS list.

Scoring

Evaluation Criterion	Weight	Raw Score	
		Option 1	Option 2
1. Potential reduction in crash rate/severity	15	6	5
2. Type/level of geometric improvement	11	6	6
3. Type/level of bicycle/pedestrian facility improvement	10	6	5
4. Potential reduction in traffic conflicts	13	6	5
5. Potential reduction in congestion and delay	9	5	10
6. Reduction in number of access points	10	0	0
7. Improvement in access design	8	0	0
8. Minimization of impacts to environmentally sensitive areas	6	10	10
9. Minimization of impacts to EFU-zoned or developed parcels	5	10	10
10. Minimization of construction cost	7	3	3
11. Minimization of required right-of-way	4	9	8
12. Consistency with ODOT standards and local plans, policies	2	6	10
Total Weighted Score		518	529

OR 99E/D St. to Hubbard South City Limit

Location: OR 99E/D St. to Hubbard South City Limit

Milepost: 29.26 – 30.02

Needs:

- Bicycle facilities
- Sidewalks

Improvement Option #1

Description:

1. Consistent with Hubbard TSP, construct SB through/right-turn lane.
2. Construct bike lanes on both sides of OR 99E.
3. Construct sidewalks where currently not available on both sides of OR 99E.

Preliminary Cost Estimate:

Preliminary Engineering	$225,000
Construction	$625,000
Construction Engineering	$100,000
Contingency	$250,000
Total	$1,200,000

Benefits:

- Increased capacity for southbound vehicles.
- Enhanced pedestrian environment.
- Enhanced bicycle environment.

Key Considerations/Notes:

- All improvement elements are consistent with Hubbard TSP.
- Interim pedestrian improvement could be to replace drainage ditches with storm sewer pipe/bioswales and level walking area.

OR 99E/J St. – Hubbard

Location: OR 99E/J St. – Hubbard

Milepost: 29.54

Needs:

- Turn lanes
- Skewed intersection
- Substandard sight distance from EB approach of J St.
- Capacity (future only)

Improvement Option #1

Description:

1. Consistent with Hubbard TSP, construct SB through/right-turn lane (see improvement option for D St. - Hubbard S.C.L. segment).
2. Trim/remove vegetation on EB approach of J St. to improve sight distance.
3. Add striping for WB left-turn lane.
4. Construct sidewalks and ADA ramps on all legs of intersection where currently not available.

Preliminary Cost Estimate:

Preliminary Engineering	$10,000
Construction	$26,500
Construction Engineering	$3,500
Contingency	$10,000
Total	$50,000[1]

[1] OR 99E widening is included in cost estimate for D St. to Hubbard S.C.L. improvement. Only costs included in this project are for westbound left turn lane striping on J St. and construction of sidewalks.

Benefits:

- Improved sight distance from J St.
- Increased intersection capacity for traffic on J St.
- Improved pedestrian environment.

Key Considerations/Notes:

- Some right-of-way may be needed to accommodate turn radius requirements for large trucks turning onto and off of east leg of J St.
- Intersection skew not addressed because skew angle is slight and property acquisition would be required.

OR 99E/Dimmick Ln.

Location: OR 99E/Dimmick Ln.

Milepost: 30.57

Needs:[1]

- Turn lanes
- Skewed intersection

Improvement Option #1

Description:

1. Construct SB left-turn lane.
2. Realign Dimmick Ln. approach to north to "T" into OR 99E.
3. Widen Dimmick Ln. approach to allow access/egress by WB-67 trucks or other appropriate design vehicle.

Preliminary Cost Estimate:

Preliminary Engineering	$125,000
Construction	$320,000
Construction Engineering	$40,000
Contingency	$115,000
Total	$600,000

Benefits:

- Removal of southbound left-turning vehicles from traffic stream.
- Improved access/egress for large vehicles into and out of Dimmick Ln.

Key Considerations/Notes:

- Realignment/widening of Dimmick Ln. approach would require minor property acquisition.
- Improvement does not include sidewalks.
- Improvement includes replacement of drainage ditches with drainage pipe along length of improvement.

[1] These needs were identified by the PMT and through the public involvement process. The operational and geometric needs analyses did not indicate a left turn lane need or skewed intersection condition at this location.

- Taper to south for SB left-turn lane would extend to approximately 300‘ north of Goudy Gardens Ln. intersection.
- Project could be constructed with or without the proposed improvements to Goudy Gardens Ln. intersection.

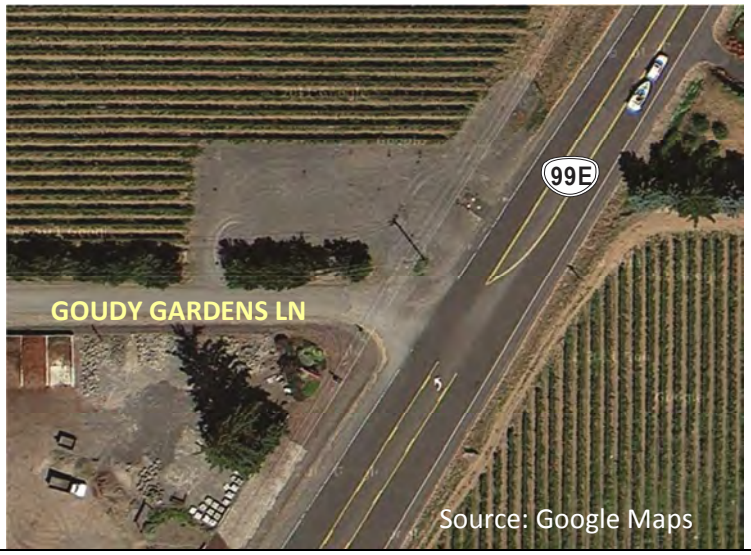
OR 99E/Goudy Gardens Ln.

Location: OR 99E/Goudy Gardens Ln.

Milepost: 30.74

Need:

- Skewed intersection[1]



Improvement Option #1

Description:

1. Realign Goudy Gardens Ln. approach to south to "T" into OR 99E.
2. Widen Goudy Gardens Ln. approach to allow access/egress by WB-67 trucks or other appropriate design vehicle.

Preliminary Cost Estimate:

Preliminary Engineering	$15,000
Construction	$40,000
Construction Engineering	$5,000
Contingency	$15,000
Total	$75,000

Benefits:

- Improved access/egress for large vehicles into and out of Goudy Gardens Ln.

Key Considerations/Notes:

- Realignment/widening of Goudy Gardens Ln. approach would require minor property acquisition.
- No widening on OR 99E would be needed for this improvement.
- Only minor restriping would be needed on OR 99E.

[1] This need was identified by the PMT and through the public involvement process. The geometric needs analysis did not indicate a skewed intersection condition at this location.

Appendix I

Local Consistency Letters

Marion County
OREGON

PUBLIC WORKS

February 4, 2014

Lisa Nell
Region 2 Planning and Development Manager
455 Airport Road SE, Building B
Salem, OR 97301-5395

RE: OR 99E Woodburn to Aurora Corridor Segment Plan

Dear Ms. Nell:

The purpose of this letter is to respond to your request that Marion County provide the Oregon Department of Transportation (ODOT) a letter of acknowledgement that the draft of the OR 99E Woodburn to Aurora Corridor Segment Plan is supported by the *2005 Marion County Rural Transportation System Plan (RTSP)*.

County staff was involved in developing, and has reviewed, the proposed corridor segment plan. The analyses produced in the corridor study demonstrate that the County facilities along the corridor will benefit from the potential mitigations detailed in the study. These potential mitigations aim to reduce delay, increase safety, add bicycle and pedestrian improvements, and provide an overall improved efficiency of the corridor as a whole and to Marion County facilities that intersect with the state highway.

I appreciate the effort that ODOT has put forth to analyze the future performance along this portion of the 99E corridor. County staff looks forward to working with the State as identified projects involving County roads are further developed.

Sincerely,

Cynthia J. Schmitt

Cynthia J. Schmitt, P.E., P.T.O.E.
County Engineer

DRS:aeh

c: Brandon Reich, Marion County Public Works – Planning

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CITY OF
HUBBARD

3720 2nd Street • P.O. Box 380 Hubbard, Oregon 97032

503-981-9633 Fax: 503-981-8743
www.cityofhubbard.org

June 17, 2014

Lisa Nell
Region 2 Planning and Development Manager
Oregon Department of Transportation
455 Airport Road SE, Building B
Salem, OR 97301-5395

RE: Draft OR 99E Woodburn to Aurora Corridor Segment Plan

Dear Ms. Nell:

The purpose of this letter is to respond to your request that the City of Hubbard provide ODOT with a letter confirming that the draft OR 99E Woodburn to Aurora Corridor Segment Plan is consistent with the *Hubbard Comprehensive Plan* and *Hubbard Transportation System Plan.*

City staff were involved with review of the draft plan and have reviewed the March 2014 edition. This letter confirms that the implementation measures described in the Plan are consistent with the City's current adopted and acknowledged comprehensive plan, transportation system plan, and implementing regulations.

We appreciate the effort that ODOT has put forth to analyze the future performance of this corridor and to identify needed improvements. The City will continue to work with ODOT to improve these facilities and safety of this important facility.

Sincerely,

Suzanne Dufner
City Planner

cc: Dan Fricke (by email)
Jaime Estrada, Hubbard Public Works Supervisor
Vickie Nogle, Director of Administration/City Recorder

City of Aurora

FOUNDED 1856

"National Historic Site"

May 7, 2014

Dan Fricke, Senior Transportation Planner
Oregon Department of Transportation, Region 2
455 Airport Road SE, Building B
Salem, OR 97301-5395

RE: Draft OR 99E Woodburn to Aurora Corridor Segment Plan

Dear Mr. Fricke:

The purpose of this letter is to respond to your request that the City of Aurora provide ODOT with a letter confirming that the draft OR 99E Woodburn to Aurora Corridor Segment Plan is consistent with the *Aurora Comprehensive Plan* and *Aurora Transportation System Plan*.

City staff and the Aurora Planning Commission were involved with review of the draft plan and have reviewed the March 2014 edition. This letter confirms that the implementation measures described in Section 6 are consistent with the City's current adopted and acknowledged comprehensive plan, transportation system plan, and implementing regulations.

We appreciate the effort that ODOT has put forth to analyze the future performance of this corridor and to identify needed improvements. (The City will continue to work with ODOT to improve these facilities and safety of this important facility.

Sincerely,

Joseph Schaefer, Planning Commission Chair

21420 Main Street • Aurora, OR 97002 • (503) 678-1283 • Fax (503) 678-2758