City of Aurora
Transportation System Plan

Prepared for

City of Aurora
21420 Main Street
Aurora, OR 97002

August 2009

CITATION

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The contents of this document do not necessarily reflect views or policies of the State of Oregon.

Parametrix. 2009. City of Aurora Transportation System Plan. Prepared by Parametrix, Portland, Oregon. August 2009.

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ACRONYMS

ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
CAC	Citizen Advisory Committee
CARTS	Chemeketa Area Regional Transportation System
HDM	Highway Design Manual
HRB	Historic Review Board
IGA	Intergovernmental Agreement
LID	Local Improvement District
LOS	Level of Service
MAX	Metropolitan Area eXpress
MIRLs	Medium Intensity Runway Lights
MPO	Metropolitan Planning Organization
OAR	Oregon Administrative Rules
OBPP	Oregon Bike and Pedestrian Plan
ODA	Oregon Department of Aviation
ODOT	Oregon Department of Transportation
OECDD	Oregon Economic and Community Development Department
OHAS	Oregon Housing and Associated Services
OHP	Oregon Highway Plan
ORS	Oregon Revised Statute
OTC	Oregon Transportation Commission
OTIB	Oregon Transportation Infrastructure Bank
OTP	Oregon Transportation Plan
RTSP	Rural Transportation System Plan
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SCA	Special Small City Allotment
SCTD	South Clackamas Transportation District
SDC	System Development Charge
SMART	South Metro Area Regional Transit
STA	Special Transportation Area
STIP	Statewide Transportation Improvement Program
TAC	Technical Advisory Committee
TGM	Transportation and Growth Management
TPR	Transportation Planning Rule
TSP	Transportation System Plan
UGB	Urban Growth Boundary
V/C	Volume-to-Capacity (ratio)
VASIs	Visual Approach Slope Indicators

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1. INTRODUCTION

1.1 PURPOSE OF THE TRANSPORTATION SYSTEM PLAN

The City of Aurora Transportation System Plan (TSP) establishes the City's goals, policies, and action strategies for developing and improving the transportation system within the Aurora Urban Growth Boundary (UGB). The primary objective of the TSP is to enhance general mobility throughout this city of approximately 1,000 residents and to offer guidance on multi-modal transportation decisions over the coming decades.

1.2 DEVELOPMENT OF THE TRANSPORTATION SYSTEM PLAN

The 2009 update of the Aurora TSP began with an assessment of existing land uses and elements of the transportation system, and included a review of the relevant City, County, state, and federal plans and policies. An inventory of the existing transportation system was conducted to develop an understanding of the physical, operational, traffic safety, and travel characteristics of all of the major roadways in the UGB. The inventory also addressed characteristics of the existing bicycle, pedestrian, and public transportation systems in the study area. Transportation issues and community concerns were identified by the Technical Advisory Committee (TAC) and Citizen Advisory Committee (CAC). A public meeting was conducted to provide Aurora citizens an opportunity to comment on proposed transportation elements, regulations, and projects necessary to address future transportation needs.

1.3 COMMUNITY DESCRIPTION AND HISTORICAL OVERVIEW

Land development and the transportation system in the Aurora urban area has been heavily influenced by the location of State Highway Oregon 99 East (Oregon 99E), the Union Pacific Railroad, and the Pudding River. Oregon 99E runs north/south through the community and forms the backbone of much of the local transportation system. Oregon 99E, along with Marion County's Ehlen Road, provides regional connectivity for Aurora, linking it to other nearby communities and the remainder of the State.

The City of Aurora street layout consists of a discontinuous grid pattern. There are only a few north-south and east-west streets that are continuous and provide significant community accessibility. Oregon 99E, Main Street. Airport Road, and Liberty Street are the major north-south travel corridors that serve the City. Ehlen Road, 1st Street, 2nd Street, 3rd Street, 4th Street, Bob's Avenue, and Ottaway Road are the primary east-west roads in Aurora.

The commercial downtown area of the City is primarily centered along Main Street. Other areas with commercial development are located along Oregon 99E. The remaining City streets generally provide for local traffic circulation in the residential portions of the community. Oregon 99E bisects Aurora, and separates the primary residential area from the commercial area along Main Street. Because Oregon 99E bisects Aurora by a diagonal alignment, it creates two large triangles of development that include five closely spaced intersections.

1.4 TSP CONTENT AND ORGANIZATION

This TSP is divided into four sections, with Section 1 being this introduction. Section 2 provides the TSP goals and objectives, which were developed from information contained in the City's Comprehensive Plan. Section 3 includes the transportation system elements that will improve the transportation system and meet the transportation needs of the Aurora community for the next twenty two years. Section 4 provides information on the projects included in the TSP's transportation system alternatives, including ideas on project funding.

The TSP appendices include a significant amount of detailed and technical information that forms the foundation of this TSP.

2. GOALS OF THE TRANSPORTATION SYSTEM PLAN

The purpose of the TSP is to provide a guide for the City of Aurora to meet its transportation goals and objectives. The following goals and objectives were developed from information contained in the City's Comprehensive Plan, public input from the public involvement process, and to meet the requirements of the Transportation Planning Rule (TPR). An overall goal was drawn from the plan, along with more specific goals and objectives.

2.1 OVERALL TRANSPORTATION GOAL

To provide and encourage a safe, convenient, and economic transportation system.

Goal 1

Preserve the function, capacity, level of service, and safety of the state highway.

Objectives

A. Maintain and implement access management standards that meet the requirements of the TPR and also consider the needs of the affected community.

B. Provide a greater degree of safety for pedestrians walking along Oregon 99E and encourage a "main street" feel, especially between the downtown area and the post office at the southwest corner of Oregon 99E and Ottaway Road.

C. Promote alternative modes of transportation.

D. Promote transportation demand management programs (i.e. ridesharing and park and ride).

E. Promote transportation system management.

F. Develop procedures to minimize impacts to and protect transportation facilities, corridors, or sites during the development review process.

G. Utilize traffic calming techniques on Oregon 99E and other streets to promote safety.

Policies

A. The City shall coordinate all transportation-related activities impacting Oregon 99E with the Oregon Department of Transportation (ODOT). The ODOT will also coordinate all transportation-related activities impacting Oregon 99E with the City of Aurora.

B. The City shall conform to ODOT standards and practices with transportation issues concerning Oregon 99E. The ODOT will also consider standards and practices of Aurora with transportation issues concerning Oregon 99E especially as it impacts the historic district.

C. The City shall coordinate with the ODOT on all land use decisions impacting Oregon 99E. The ODOT will also coordinate with the City of Aurora on any decisions it makes that impact Oregon 99E.

D. The City shall work with the ODOT to further refine and implement the Oregon 99E transportation improvement alternatives identified in the TSP or another alternative yet to be defined.

Goal 2

Improve and enhance safety and traffic circulation and preserve the level of service on the local street systems.

Objectives

A. Develop an efficient road network consistent with local operations standards.

B. Improve and maintain existing roadways.

C. Ensure planning coordination between Aurora, Marion County, and the State.

D. Examine the need for speed reduction in specific areas.

E. Identify local traffic problems and recommend solutions.

F. Develop a more pedestrian-friendly Aurora consistent with historical preservation goals.

Policies

A. Approval Processes for Transportation Facilities

The following policies relate to the approval processes for transportation facilities:

1. The TSP is an element of the City's Comprehensive Plan. It identifies the general location of transportation improvements. When a specific alignment is selected for proposed public road and highway projects it shall be permitted without a plan amendment if the new alignment falls within a transportation corridor identified in the TSP.
2. Except where specifically regulated, the operation, maintenance, repair, and preservation of existing transportation facilities shall be allowed without land use review when, under ordinary circumstances they do not have a significant impact on land use.
3. Except where specifically regulated, the dedication of right of way, authorization of construction and the construction of facilities and improvements, for improvements designated in the TSP, and for improvements that are consistent with clear and objective dimensional standards, shall be allowed without land use review. The classification of the roadway and approval of road standards shall be in accordance with appropriate procedures.
4. Changes in the frequency of transit services that are consistent with the TSP and that under ordinary circumstances do not have a significant impact on land use shall be allowed without land use review.
5. For State projects that require an Environmental Impact Statement (EIS) or Environmental Assessment (EA), the draft EIS or EA shall serve as the documentation for local land use review, if local review is required. Where the project is not consistent with the TSP, formal review of the draft EIS or EA and concurrent completion of necessary goal exceptions or plan amendments shall occur prior to project commencement.

B. Protection of Transportation Facilities

The following policies relate to the protection of existing and planned transportation facilities:

1. The City shall protect the function of existing and planned roadways as identified in the TSP.
2. The City shall include a consideration of the impact of proposed development on existing and planned transportation facilities in all land use decisions.
3. The City shall protect the function of existing and planned roadways or roadway corridors through the application of appropriate land use regulations.

4. The City shall consider the potential to establish or maintain accessways, sidewalks, walkways, paths, and trails prior to the vacation of any public easement or right of way.
5. The City shall preserve right of way for existing and planned transportation facilities through exactions, dedication, and setbacks.
6. The City shall coordinate with and support Marion County and the City of Woodburn to plan for and develop a bicycle and pedestrian trail along Mill Creek.
7. The review of development applications and associated conditions of approval for right-of-way dedications and street improvements shall consider the impact of the development and rough proportionality through an individual determination.

C. The local street plan in the TSP shall be implemented by local developments. The local street plan identifies general alignments of future local streets and maintains a grid system whenever possible. Developers shall be required to follow the local street plan. Flexibility is allowed only as the proposed modifications still meet the integrity of the overall local street plan and circulation objectives.

Any modifications to the local street plan shall be in accordance with the appropriate land use application for the modification proposed. The decision for modification shall be based on the criteria for the appropriate land use application and whether the integrity of the overall local street plan is still met and circulation objectives can still be achieved.

Goal 3

Identify the 20-year roadway system needs to accommodate developing or undeveloped areas without undermining the current nature of the City of Aurora.

Objectives

A. Maintain and implement policies and standards that address street connectivity, spacing, and access management.

B. Integrate new arterial and collector routes into a grid system with an emphasis on reducing pressure on traditionally heavy traffic routes. The grid system is in nature with the historic character of Aurora and cul de sacs should be discouraged.

C. Improve access into and out of the City for goods and services.

D. Improve the access onto and off of arterial roadways.

Goal 4

Increase the use of alternative modes of transportation (walking, bicycling, rideshare/carpooling, and transit) through improved access, safety, and service. This shall be done in a manner consistent with the historic nature of Aurora. Increasing the use of alternative transportation modes includes maximizing the level of access to all social, work, and welfare resources for the transportation disadvantaged. The City of Aurora seeks for its transportation disadvantaged citizens the creation of a customer-oriented regionally coordinated public transit system that is efficient, effective, and founded on present and future needs.

Objectives

A. Provide sidewalks, bikeways, and safe crossings on arterial and collector streets demonstrating those needs and in a manner consistent with the historic nature of Aurora.

B. Develop and implement a city-wide pedestrian and bicycle plan and prioritize the completion of the plan to create safe, convenient, and attractive bicycle and pedestrian routes providing for connections throughout the community.

C. Promote alternative modes and rideshare/carpool programs through community awareness and education.

D. Plan for expanded transit service by coordinating with regional transit service efforts.

E. Seek Transportation and Growth Management (TGM) and other funding for projects evaluating and improving the environment for alternative modes of transportation.

F. Periodically assess pedestrian and bicycle modes of transportation within the City and develop programs to meet demonstrated needs.

G. The City will continue to support its transportation disadvantaged citizens by supporting a customer-oriented regionally coordinated public transit system that is efficient, effective, and founded on present and future needs.

Policies

A. Pedestrian and Bicycle Circulation

1. The City shall maintain and implement the TSP's network of streets, access ways, and other improvements, including bikeways, sidewalks, and safe street crossings to promote safe and convenient bicycle and pedestrian circulation within the community. Any alternative mode improvements within the historic area of Aurora must have prior approval from the historic review board (HRB). HRB shall be included in the planning of any alternative mode improvement within the historic district.
2. The City shall require streets and accessways where appropriate to provide direct and convenient access to major activity centers, including downtown, schools, shopping areas, and community centers.
3. The City shall maintain and implement the TSP's sidewalk improvement plan to develop the pedestrian system. Included within the pedestrian plan is a priority system that shall be followed.
4. Bicycle facilities on local streets shall be shared facilities with general traffic since local street traffic volumes are low and narrow local roads create a hardship in the development of exclusive bike lanes.
5. Retrofitting designated arterials and collectors in the TSP within the UGB with bike lanes shall be considered only when deemed appropriate and practical by the City Council.
6. The development of bike lanes shall be considered for all designated arterials and collectors in the TSP within the UGB. Consideration of the development of bike lanes shall be based on availability of right-of-way and financial ability.
7. Where practicable, bikeways and pedestrian accessways shall connect to local and regional travel routes.
8. Bikeways and pedestrian accessways shall be designed and constructed to minimize potential conflicts between transportation modes. Design and construction of such facilities shall follow the guidelines established by the Oregon Bicycle and Pedestrian Plan.

B. Transit

1. Supporting the continued operation of existing public transit services is a priority.
2. The City shall support efforts to coordinate with governmental and private agencies in the planning and provision of public transportation services and support a regional program to improve services, particularly for the transportation disadvantaged.
3. The City will cooperate with Marion County and other agencies in investigating public transit possibilities, including bus and rail.
4. The City will coordinate with other jurisdictions when the need for park-and-ride facilities is studied. The City shall support the creation of or partnership with a dial-a-ride service for all residents needing door to door service within and outside of the City.

Goal 5

Provide and encourage a safe, convenient, and economic transportation system.

Objectives

A. Continue to develop the road system as the principal mode of transportation.

B. Seek further improvement of mass transit systems to the City of Aurora by encouraging more frequent scheduling of commercial carriers and by continued support of those systems presently developed for mass transit in the region.

C. Continue to support programs for the transportation disadvantaged where such programs are needed and are economically feasible.

D. Encourage the development to occur near existing community centers where services are presently available so as to reduce the dependence on automotive transportation.

E. Continue to monitor the needs of the transportation disadvantaged and provide support as required.

F. Cooperate with the ODOT Highway Division in the implementation of the ODOT Statewide Transportation Improvement Program (STIP) as it meets the needs of Aurora and its historic district.

Goal 6

Ensure that the road system within the City is adequate to meet public needs.

Objectives

A. Maintain and implement the city-wide transportation system plan.

B. Meet identified maintenance and level of service standards on the City and state highway system.

C. Direct commercial development and use access onto major arterials by means of improved City roads.

D. Ensure that roads created in land division and development be designed to tie into existing and anticipated road circulation patterns as identified in the TSP.

E. Review and revise, if necessary, street cross-section standards for local, collector, and arterial streets to enhance safety and mobility.

F. Maintain and implement the access management strategy for Oregon 99E.

G. Evaluate the need for traffic control devices, particularly along Oregon 99E.

H. Analyze the safety of traveling speeds and consider modifying posted speeds as necessary.

I. As funding becomes available, implement the improvements identified in the TSP.

Goal 7

Improve coordination among the City of Aurora, Marion County, the Aurora State Airport, and ODOT.

Objectives

A. Cooperate with ODOT in the implementation of the STIP. ODOT shall also coordinate with the City of Aurora in keeping it informed regarding the implementation and update efforts of the STIP.

B. Encourage improvement of state highways that protects the historical nature of Aurora, especially Oregon 99E.

C. Work with Marion County and ODOT in establishing cooperative road improvement programs and schedules. Marion County and ODOT shall also coordinate their road improvement programs and schedules with the City of Aurora.

D. Work to obtain the right-of-way needed for roads identified in the TSP.

E. Take advantage of federal and state highway funding programs.

Policies

A. The City shall coordinate with the ODOT to implement the highway improvements listed in the STIP that are consistent with the TSP and Comprehensive Plan.

B. The City shall consider the findings of ODOT's Draft Environmental Impact Statements and Environmental Assessments as an integral part of the land use decision making procedures. Other actions required, such as a goal exception or plan amendment, will be combined with review of the draft EA or EIS and land use approval process. ODOT shall provide the City of Aurora with a minimum time frame of 45 days for review and comment.

C. Multi-jurisdictional issues impacting Aurora's historic district shall be coordinated with Aurora's HRB and shall preserve and protect the historic natural of Aurora.

3. TRANSPORTATION ELEMENTS

This section includes the transportation system elements that will improve the transportation system and meet the transportation needs of the Aurora community for the next twenty two years. The elements included in this chapter reflect each mode of transportation and include:

- Roadway Element
- Public Transportation Element
- Pedestrian Element
- Bicycle Element
- Air, Rail, Water, and Pipeline Elements

Each element describes its relevant issues and deficiencies and how they are met by identified projects, plans, and regulations. A policy discussion relevant to each modal element is also included. More detailed analysis of existing conditions and plans affecting the modal elements is included in Appendix A: *Existing Transportation System Inventory*, Appendix B: *Relevant Plans and Policies*, and Appendix C: *Existing Conditions*. A more detailed analysis of future conditions for the elements is included in Appendix D: *Future Conditions*.

3.1 ROADWAY ELEMENT

This section documents an assessment of the needs, deficiencies, policies, and improvements affecting Aurora's roadway system.

Needs and Deficiencies

Aurora's existing street grid is fairly well developed. Oregon 99E divides the City east and west and Ehlen Road and Ottaway Road divide the City north and south. The existing grid system has many east-west discontinuities due to the presence of the Union Pacific Railroad right-of-way that runs north and south to the west of Oregon 99E, and the Pudding River that runs along the east side of the City. Accesses exist at almost every block interval along arterial roadways. The remaining City streets generally serve as local access streets for the residential areas.

The TSP's roadway element primarily focused on key intersections along Oregon 99E and included an evaluation of existing and future traffic volumes, intersection operations, and safety. These intersections included:

- Oregon 99E at Liberty Street/1st Street (signalized)
- Oregon 99E at 2nd Street (unsignalized)
- Oregon 99E at Main Street (unsignalized)
- Oregon 99E at Bob's Avenue (unsignalized)
- Oregon 99E at Ottaway Road (unsignalized)

Existing transportation system volumes and operations were also analyzed at:

- Ehlen Road at Airport Road (unsignalized)

Each of the unsignalized intersections is stop-controlled on the minor street approach. Only the Oregon 99E/Liberty Street intersection currently operates with a traffic signal.

Existing Traffic Operations

The Oregon Highway Plan (OHP) volume-to-capacity (V/C) mobility standards apply to Oregon 99E within the City of Aurora. Within the City, Oregon 99E is classified as a Regional Highway for the segment southwest of 4th Avenue and northeast of Liberty Street.

Oregon 99E is classified as a Regional Highway with a Special Transportation Area (STA) designation from Liberty Street to 4th Avenue. The V/C standard represents the maximum ratio for "acceptable" traffic operations. A V/C ratio of 0.85 means that 85 percent of the capacity of the roadway is utilized based on an established planning level capacity and measured traffic volume. The peak hour, maximum V/C standards for Oregon 99E are:

- Inside the UGB and outside the STA boundary:
  - With speeds less than or equal to 35 mph the mobility standard is 0.85
  - With speeds greater than 35 mph the standard is 0.80.
- Inside the UGB and inside the STA boundary:
  - The operations standard V/C ratio is 0.95.

An STA designation also provides for modified access management, signal, travel time, and street improvement standards. These standards emphasize local accessibility and community function over capacity and through traffic needs. Airport Road and Ehlen Road are Marion County facilities, with a volume/capacity standard of 0.90 and a Level of Service (LOS) standard of E. Currently, the study area intersections generally experience minimal delays and operate within their respective V/C or LOS standards. The exception is the southbound movement at Airport Road and Ehlen Road, a county intersection that has a failing LOS F.

Traffic queuing analysis measures the length of vehicles stopped at intersections during peak periods and is another measure of how well the roadway system is performing. Analysis conducted at the intersection of Oregon 99E and Liberty/1st Street indicates that both the eastbound left turn lane and the southbound right turn lane currently exceed the available vehicle storage for these movements. During peak periods traffic will occasionally spill back into the through travel lanes blocking traffic that does not desire to turn.

Existing Roadway Safety

Using 5-year crash data (2003 through 2007), analysis indicates that crash rates along the segment of Oregon 99E through Aurora do not exceed the average crash rate of 0.71 for all rural principal arterial highways in Oregon for the same time period. A review of data for Oregon 99E through the study area indicates that many of the crashes involve rear end collisions or turning movements at public and private access points.

Existing Access Management

On the approximate 1 mile segment of Oregon 99E in the city limits, there are 25 access points, equaling roughly one access per 211 feet. The excessive number of access points has the potential to degrade traffic operations and affect safety along Oregon 99E. There are an additional 15 access points along Ehlen Road.

Future Traffic Operations

An analysis of future (2030) peak hour intersection operations was conducted based on the level of community development anticipated in the City's Comprehensive Land Use Plan, and on growth in through traffic volumes on arterial roads. This analysis assumes that no improvements would be made to the existing street system over the life of the plan (2030). The analysis indicated that by 2030, without any improvements to the existing roadway system, the signalized intersection of Liberty and Oregon 99E and the unsignalized intersections at Oregon 99E/Ottaway Road and Airport Road/Ehlen Road would fail to meet their relevant mobility standards.

In addition to the impacts of community growth on the existing roadway system, the TSP also recognizes that there are several large areas within Aurora that are expected to develop and/or redevelop over the life of the plan (2030). These areas will need new and/or improved

roadways to provide for safe and convenient access between the new uses and the larger community. For more information on expected development trends, see Appendix C: *Existing Conditions*.

Policies

Functional Classification and Future Street Plan

Functional classification provides a systematic basis for determining future right-of-way and improvement needs, and can also be used to provide general guidance on appropriate or desired vehicular street design characteristics. The functional classification of a street is typically based on the relative priority of traffic mobility and access functions that are served by the street. At one end of the spectrum of mobility and access are freeways, which emphasize moving high volumes of traffic, allowing only highly controlled access points. At the other end of the spectrum are residential cul-de-sac streets, which provide access only to parcels with direct frontage and allow no through traffic.

Identification of the roadway functions is the basis for planning roadway improvements and the appropriate standards (right-of-way, roadway width, design speed) that would apply to each roadway facility. The following definitions serve as a general guide in determining City street classifications:

- Principal and Minor Arterials. Intra- and inter-community roadways connecting community centers with major facilities. In general, arterials serve both through traffic and local traffic. Access should be partially controlled with infrequent access to abutting properties.
- Collectors - Streets connecting residential neighborhoods with smaller community centers and facilities as well as access to the arterial system. Property access is generally a higher priority for collector arterials; through-traffic movements are served as a lower priority.
- Local Residential - Streets within residential neighborhoods connecting housing (also can be commercial, industrial, etc.) with the collector and/or arterial system. Property access is the main priority; through traffic movement is not encouraged.

Figure 3-1 presents a street plan for the Aurora UGB that shows the functional classification system for public roads. It should be noted that Oregon and Marion County's designation of functional classifications is different than the City's primarily due to the difference between state, county and local travel functions. The State of Oregon's functional classification map displays Oregon 99E as a minor arterial through the city limits. While Ehlen Road is identified as an arterial by Marion County, the County identifies Airport Road as a major collector. Figure 3-1 defines Airport Road as an arterial consistent with the functions it serves locally, rather than the lower classification of collector as identified by Marion County.

In addition to identifying the functional classifications of Aurora's existing roadways, the Future Street Plan in Figure 3-1 identifies the conceptual locations of new collectors streets to support future development. The locations of new collector streets are conceptual only, as the precise alignment of these roadways will be subject to site and engineering constraints (for example, slopes), development needs and proposals, and will require negotiations with ODOT and Marion County, those with jurisdiction over Ehlen Road and Oregon 99E. It is assumed local roadways (not pictured in the figure) would also connect to the collector roads identified in the Future Street Plan, but that only the collector roads would connect to Ehlen Road and Oregon 99E.

Marion County and ODOT have their own spacing standards for street connections to roadways they manage, and the new collector roadway connections proposed for Ehlen Road and Oregon 99E will be subject to approval by Marion County and ODOT, respectively. In

the case of Marion County, a new collector street is proposed to connect Ehlen Road via Williams Court to Cole Lane in northwestern Aurora. This facility would provide access and circulation to existing and future residential properties in the area and would be constructed as development occurs. New and existing local residential streets in this area would connect to this new collector street rather than connecting directly to Ehlen Road or Cole Lane. As this collector connection would replace Williams Court's existing Ehlen Road connection, no new Ehlen Road access is required.

A large number of driveways and private drives currently exist on Oregon 99E between Ottaway Road and Bob's Avenue, and as a result, the proposed new collector connections in this area will either have to include the closure or consolidation of existing Oregon 99E accesses or require a spacing deviation. The proposed new collector connections to Oregon 99E to the south of Ottaway Road should be able to meet ODOT's spacing standards, as this rural stretch of Oregon 99E has relatively few existing driveways and private drives.

Street Design Standards

Street design standards dictate how new roads should be constructed and how existing roads should be modified over time. Three jurisdictions - the City of Aurora, Marion County, and the State of Oregon - own, manage, and maintain roads within Aurora's UGB. Though the City does not have authority over County and state roadways, adopting local street design standards for these roadways will help the City influence decisions regarding future roadway improvements on the County's Airport and Ehlen Roads and the State of Oregon's 99E. Aurora's street design standards apply based on the functional classification of a roadway segment, and are described in Table 3-1 and Figure 3-2.

Table 3-1. Street Design Standards(1)

Classification	Pavement Width (ft)	Sidewalks Width (ft)	Planting Strips (ft)	Bikeway Width (ft)	Parking	ROW (ft) (2)
Local Residential(3)	32	5	5	None	2 sides	54
Collector(3)	36	6	7.5	None(4)	2 sides(4)	65
Minor Arterial(3)(5)(6) (County)	36	6	8	6	None	68
Principal Arterial (County)(6)(7)	50	6	9.5	6	None	84
Principal Arterial (State) (8)	48-50	8	6	6	None	84
Alleys	16	None	None	None	None	16

Notes:

(1) Street Design Standards for roadways within the National Historic District are subject to historic review board approval on a case-by-case basis.

(2) Additional right-of-way and roadway improvements may be required at major intersections to provide for turn lanes and for corner radii.

(3) Planter strips are required unless approved otherwise by the City. Planting strips should be at least 4 feet wide to accommodate tree plantings. In commercially zoned areas, the City may require wider sidewalks which encroach into the planting strip area.

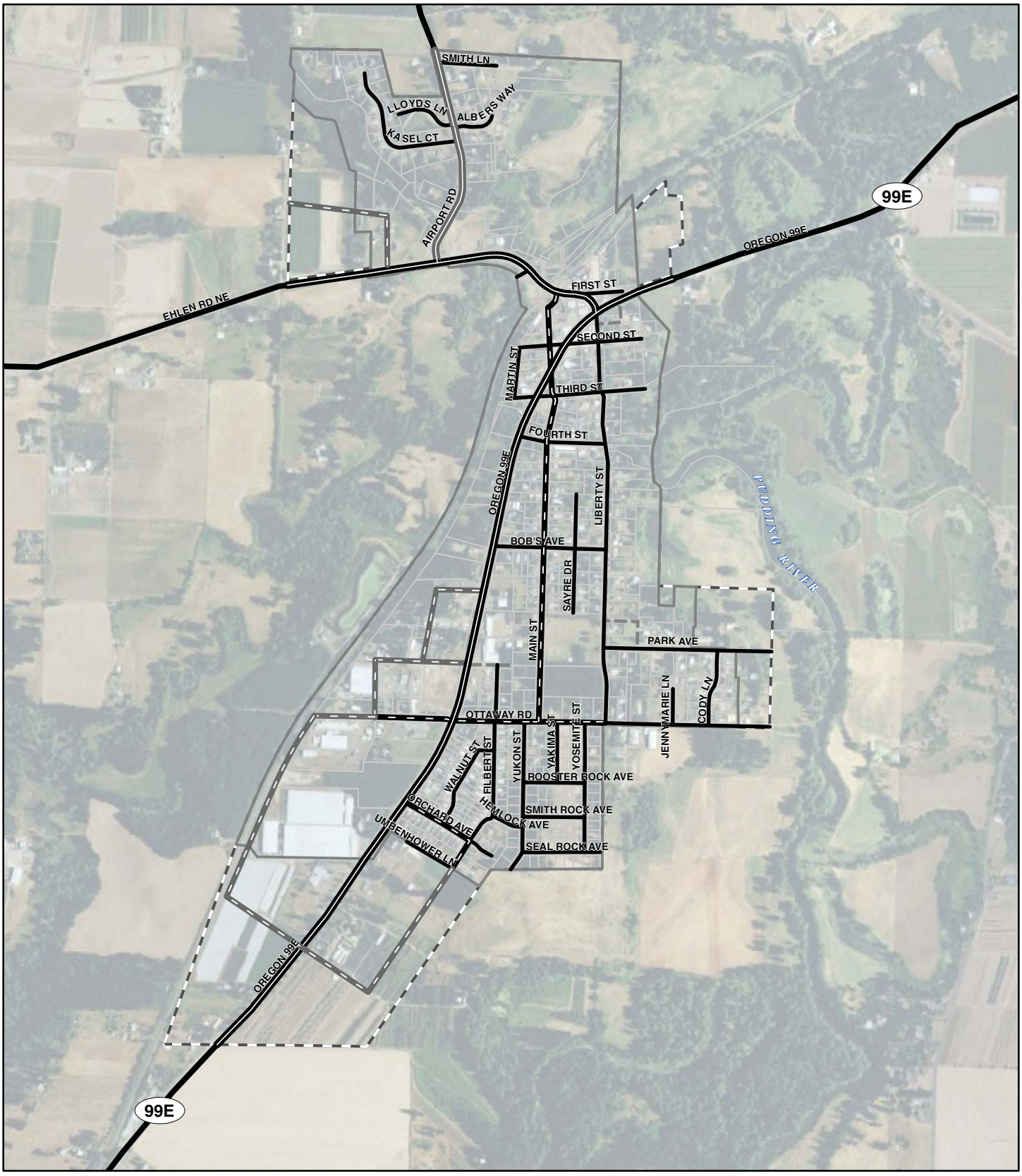
(4) Collectors serving residential areas and historic commercial areas can accommodate on-street parking and shared use of road space by bicyclists and motor vehicles. These shared roadways will be designated with "sharrows." "Sharrows" are markings painted directly onto the road to promote the awareness that the road is a shared traffic lane to be used by both motorists and bicyclists. Collector Streets which serve primarily a mix of commercial and industrial properties will have bike lanes in lieu of on-street parking.

(5) On an interim basis, two 6-8 foot protected shoulders may be installed adjacent to two 12 foot travel lanes, on a case-by-case basis as approved by the County.

(6) City standards are advisory to Marion County on Marion County-owned roadways.

(7) On an interim basis, a multi-use path, separated from the roadway, and on-street bike lanes may be allowed instead of sidewalks and planting strips on a case-by-case basis as approved by the County.

(8) City standards are advisory on ODOT managed roadways.



Principal Arterial
Minor Arterial
Collector
Collector (New Roadway)
Local Residential
Right-of-Way

Taxlot
City Limits
Urban Growth Boundary

0 500 1,000
Scale in Feet

NOTE: Identified new roadway alignments are conceptual only.

Figure 3-1
Future Street Plan
City of Aurora, Oregon

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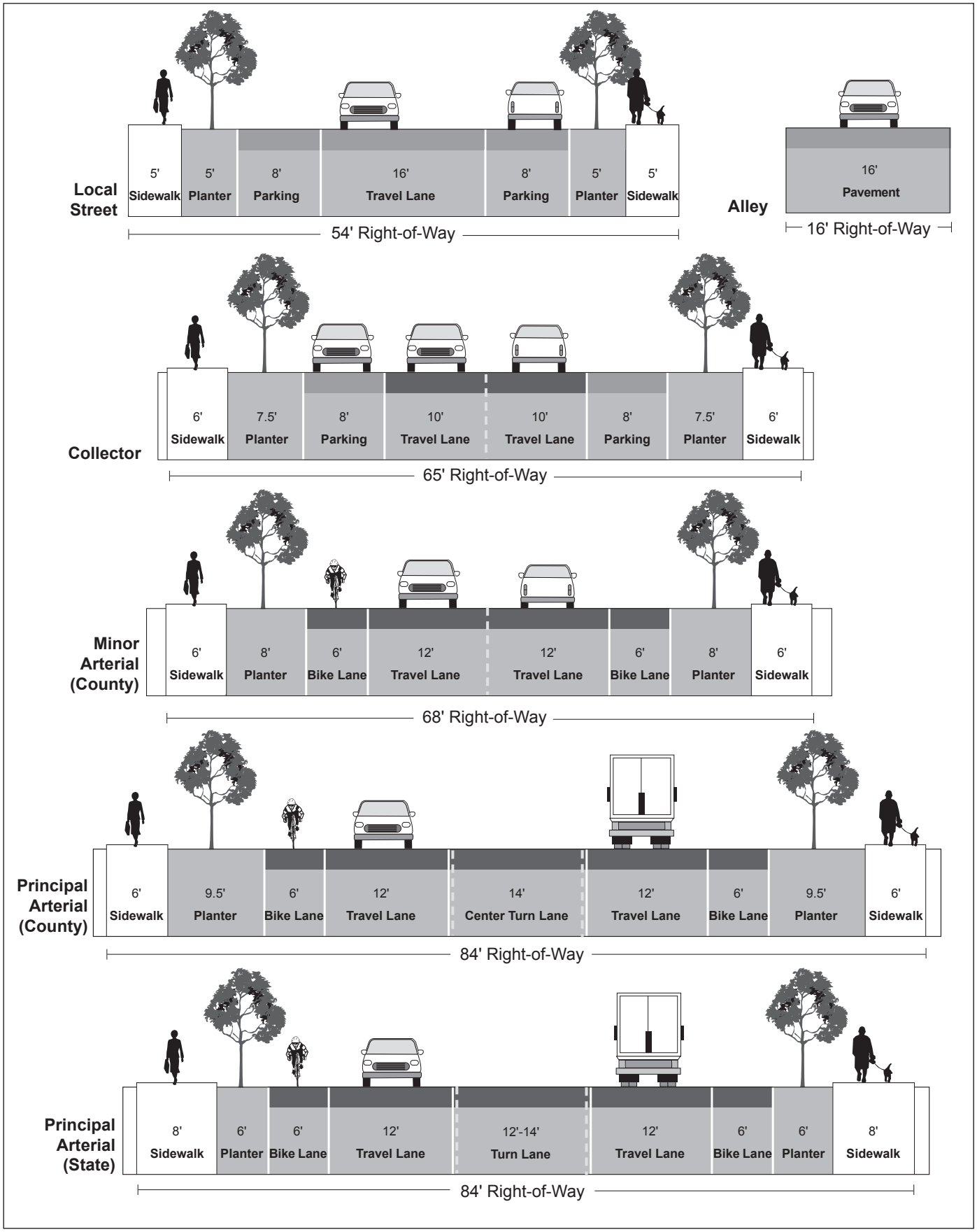

Figure 3-2
Street Designs Standards
City of Aurora, Oregon

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Traffic Mobility Standards

The TPR [660-12-045(2)(b)] requires local governments to adopt standards to protect future operation of roads, transit ways, and major transit corridors. The OHP similarly calls for the creation of performance standards to protect the mobility of state owned transportation facilities. Within the State of Oregon, traffic operations are evaluated based on two sets of criteria or standards. The mobility standard used by ODOT for state highways is the V/C ratio, and is expressed in terms of the relationship between traffic volumes and the roadway or intersection's capacity. Many local communities assess the quality of traffic performance in terms of intersection or roadway LOS.

Within Aurora, city-owned roads use LOS D as the mobility standard for signalized intersections and LOS E for unsignalized intersections. This standard is based on the understanding that delay is more acceptable and causes fewer impacts to motorists on lower volume roads (local residential and collector roads) and the City does not control the higher volume roads within its UGB (Ehlen Road, Airport Road, and Oregon 99E). This recommendation also results in the need to widen fewer City intersections to accommodate added turn lanes. This results in a shorter walking distance for pedestrians crossing streets and a more pedestrian-friendly environment. Aurora has also incorporated Marion County's and ODOT's V/C and LOS standards for county and state roadways, respectively. Traffic mobility standards for the Aurora UGB are included in the Table 3-2.

Table 3-2. Traffic Operations Standards

Roadway Functional Classification[1,2]	Intersection Type	Operations Standard
Local Residential	Signalized, All-way Stop and Roundabout	LOS D
	Unsignalized	LOS E
Collector	Signalized, All-way Stop and Roundabout	LOS D
	Unsignalized	LOS E
Minor Arterial (County)[3]	Signalized, All-way Stop and Roundabout	LOS D .85 V/C
	Unsignalized[4]	LOS E .90 V/C
Principal Arterial (County)[3]	Signalized, All-way Stop and Roundabout	LOS D .85 V/C
	Unsignalized[4]	LOS E 90 V/C
Principal Arterial (State)[5]	Regional Highway	[5]
	Regional Highway (STA)	[5]

Notes:

(1) For intersections where state owned roadways cross City or County-owned roadways, state traffic operations standards are used in place of City and/or County standards. Where County owned roadways cross local roadways, County operations standards are used in place of City standards.

(2) For intersections where two roadways owned by the same jurisdiction cross, the traffic operations standards of the street with the higher functional classification are used (Collector is higher than Local Residential and Principal Arterial is higher than Minor Arterial).

(3) Source: Marion County Regional TSP.

(4) LOS F may be allowed at County-owned unsignalized intersections if the movement has relatively low volume (as determined by County staff) and there is no indication that a safety problem will be created.

(5) ODOT operations standards apply to Oregon 99E within the City of Aurora. Within the City, Oregon 99E has two designations, each with its own operations standard. The portion of Oregon 99E from Liberty Street to 4th Avenue is a Regional Highway with STA designation. The remaining portion of Oregon 99E is a Regional Highway.

Access Spacing Standards

Three separate jurisdictions own the public roadways within the City of Aurora – the City of Aurora, Marion County, and the State of Oregon. Each jurisdiction establishes its own standards for regulating the spacing of the streets and driveways which intersect with their roadways. Table 3-3 below includes the spacing standards for City roadways (Collector and Local Residential roadways), as well as reflect Marion County's access spacing standards for their Arterial roadways. Pursuant to a request by ODOT, access spacing standards for their facility (Oregon 99E) have not been included in Table 3-3, but can be found in Oregon Administrative Rules 734-051.

The excessive number of access points on Oregon 99E and Ehlen Road has the potential to degrade traffic operations and affect safety along these roadways. Frequent driveway and cross-street access can significantly degrade traffic operations along major streets, as motorists must contend with people slowing to turn into adjacent property or attempting to get back onto the major street from a side access location. Not only do frequent driveways adversely affect the operational capacity of a road, they also affect safety since each driveway or intersecting street represents a potential conflict point for through-moving vehicles. The strip development that often occurs as a result of the lack of access control is often inhospitable to pedestrians and bicyclists, and its dispersed uses make efficient transit service difficult.

Although the State of Oregon and Marion County, respectively, have jurisdiction over these roadways, the City has control over land adjacent to the roadways, and thus, has significant influence over access demands. Because of the overlapping jurisdictions, all development proposals that impact Oregon 99E, Airport Road, and Ehlen Road will be submitted to ODOT and Marion County for review, respectively. In addition, when pre-existing patterns of land ownership preclude the application of spacing standards on Oregon 99E and Ehlen Road, the City will encourage property owners to share private drives or to obtain access via the local and/or collector street system wherever feasible.

Table 3-3. Spacing Requirements for Accesses on City and County Roadways

Functional Classification	Distance[1]
Principal Arterial (State)	[2]
Principal Arterial (County)	400 feet from any intersection with Oregon 99E or Airport Road
	300 feet from any other intersection of public or private access
Minor Arterial (County)	400 feet from the intersection with Ehlen Road
	300 feet from any other intersection of public or private access
Collector	75 feet
Local Residential	16 feet

Notes:
(1) Distances are measured from inside edge to inside edge of roadways and driveways, excluding driveway aprons.
(2) For access spacing requirements on Oregon 99E, consult Oregon Administrative Rules 734-051.

Improvements

As discussed in the Needs and Deficiencies section above, currently only the intersection of Airport Road/Ehlen Road fails to meet its applicable intersection mobility standard. Analysis of future conditions indicates that by 2030, without any improvements to the existing roadway system, the intersections of Oregon 99E/Liberty Street, Oregon 99E/Ottaway Road

and Airport Road/Ehlen Road will all fail to meet mobility standards for both V/C and LOS. In addition, by 2030, the intersection of Oregon 99E/Bob's Avenue will fail to meet LOS standards. In addition to addressing increased levels of congestion, the TSP also recognizes that new roadways will be needed to serve areas of anticipated development/redevelopment.

This TSP includes two transportation system alternatives to address the existing and future roadway system deficiencies, a Preferred Plan Alternative and a Revenue Forecast Alternative.

The first alternative (Preferred Plan Alternative) includes improvements to help the City of Aurora comply with the requirements of the TPR, even as the costs of the alternative exceed the forecast of future transportation revenues in the City.

The second alternative (Revenue Forecast Alternative) includes improvements to optimize transportation system operations while constrained by forecasted funding levels. The difference between the two alternatives rests in the fact that, in the Revenue Forecast Alternative, several projects will not be built unless they are funded privately as a part of a land development project. In addition, the Revenue Forecast Alternative includes a multi-use path on the north side of Ehlen Road (between Airport Road and Oregon 99E) and widened protected shoulders on Airport Road (between Ehlen Road and the northern city limits) which are not included in the Preferred Plan Alternative.

Table 3-4 below lists the transportation projects which are included in both the Preferred Plan and Revenue Forecast Alternatives. These projects are primarily intended to address the existing and anticipated needs and deficiencies of the Aurora roadway system. Project descriptions follow the table.

Table 3-4. Roadway System Improvements

Map Key[(1)]	Project Location	Project Description	Cost Estimates[(2)]	Priority
2	Ehlen Road and Airport Road Intersection	Add southbound left turn lane and westbound right turn lane	$150,000[(3)]	High
3	Ehlen Road and Airport Road Intersection	Install signal when warranted and eastbound left turn lane	$379,000	Low
5	OR 99E and Liberty Street Intersection	Add 2nd eastbound left turn lane and corresponding receiving lane and channelize the southbound right turn lane	$611,000	Low
8	OR 99E and Bob's Avenue Intersection	Add southbound left turn lane	$142,000	Low
9	OR 99E and Ottaway Road Intersection	Install turn lanes and intersection improvements including sidewalks, ADA ramps, crosswalks, and pedestrian crossing warning device	$311,000	High
10	OR 99E and Ottaway Road Intersection	Install signal when warranted	$326,000	Low
11	Ottaway Road and Liberty Street Intersection	Improve intersection to provide better sight distance	$46,000	High
17	New Collector Roadway: West Ottaway Road extension south to OR 99E	New Collector Roadway	$2,045,000	Low

Map[1] Key	Project Location	Project Description	Cost Estimates[2]	Priority
18	New Collector Roadway: Filbert Street extension to OR 99E	New Collector Roadway	$1,252,000	Low
21	New Collector Roadway: Ehlen Road via Williams Court to Cole Lane	New Collector Roadway	$754,000	Low
22	New Collector Roadway: West Ottaway Road north	New Collector Roadway	$1,639,000	Low
		Total Cost	**$7,655,000**	

Notes:

(1) Map Key corresponds with project numbers included in the Preferred Plan and Revenue Forecast Alternatives.

(2) These cost estimates are for planning purposes only and do no include right-of-way costs and stormwater quality control or detention structures. Cost estimates were based on 2008 bid tab data. As costs for materials and labor are expected to generally increase over time, these estimates should be updated periodically.

(3) Project cost estimate provided by Marion County.

Oregon 99E (#8)

Along Oregon 99E, a southbound left turn is recommended at Bob's Avenue to address forecasted traffic deficiencies (Project #8). This project is a low priority, as it is not needed to address near-term traffic issues.

Ehlen Road and Airport Road Intersection (#2 and #3)

This intersection is currently failing, and additional turn lanes will be needed to accommodate future traffic growth. The turn lane improvements include a westbound right turn lane and a southbound left turn lane (Project #2). The intersection should be monitored for signal warrants, as future traffic to and from the airport is expected to increase (Project #3).

Oregon 99E and Liberty Street Intersection (#5)

Analysis of future traffic operations indicates that the V/C ratio for the intersection would grow to 1.19 by 2030 if mitigation does not occur. This indicates that an improvement project is warranted in the longer-term. The proposed improvement would add turn lanes and modify the traffic signal to achieve V/C standards acceptable for a STA. The recommended improvements include providing a channelized southbound right turn lane, a second eastbound left turn lane and corresponding receiving lane on Oregon 99E and signal modification. The receiving lane should be continued for several hundred feet east of the intersection to achieve optimal turning lane balance.

Oregon 99E and Ottaway Road Intersection (#9 and #10)

Additional turn lanes will be needed to accommodate future traffic growth at this intersection. The turn lane improvements include a southbound left turn lane and should include pedestrian accommodations and Americans with Disabilities Act (ADA) ramps (Project #9). Though not needed as soon as the turn lane improvements, analysis indicates that future development will also likely necessitate signal installation at this intersection to allow traffic to access Oregon 99E (Project #10). A pedestrian activated illuminated crosswalk warning device is included as an interim treatment with Project #9 to facilitate safe pedestrian crossing of Oregon 99E between key community destinations.

Liberty Street and Ottaway Road Intersection (#11)

Poor sight distance at the intersection should be remedied. This will likely include removing vegetation and earthwork to increase sight distance for southbound vehicles at the intersection—a relatively low cost project.

New Collector (#17)

A new collector street is proposed from Ottaway Road west (toward the railroad tracks) and then turning south for approximately 1500 feet before looping back to Oregon 99E. The facility would provide access and circulation to industrial and commercial properties, when developed, and would likely include a potential future signal at the Ottaway Road/Oregon 99E intersection (project #10). The roadway would provide existing and new development indirect access to Oregon 99E, supporting ODOT access management policies. Though conceptual in nature, the location of this collector street would meet ODOT access management standards for spacing public and private accesses.

New Collector (#18)

A new collector street is proposed as an extension of Filbert Street south, looping back to Oregon 99E. The facility would provide access and circulation to residential properties, when developed, and align with another proposed new collector's (see project #17) southern connection point with Oregon 99E. The roadway would provide an alternative to direct access to Oregon 99E, supporting ODOT access management policies. Though conceptual in nature, the location of this collector street would meet ODOT access management standards for spacing public and private accesses.

New Collector (#21)

A new collector street is proposed to connect Ehlen Road via Williams Court to Cole Lane in northwestern Aurora. This facility would provide access and circulation to existing and future residential properties in the area, and would be constructed as development occurs. Local residential streets in this area would connect to this new collector street rather than connecting directly to Ehlen Road or Cole Lane, supporting Marion County access standards.

New Collector (#22)

A new collector street is proposed to connect existing and future industrial and commercial uses with Ottaway Road and Oregon 99E. Though conceptual in nature, this alignment may achieve ODOT goals of improved management of public and private accesses to state highways, if the project included consolidations and/or closures of existing driveways and private drives on the east and west sides of Oregon 99E. Without such consolidations and/or closures, the project would require an ODOT approved spacing deviation.

3.2 PUBLIC TRANSPORTATION ELEMENT

This section documents an assessment of the needs, deficiencies, policies, and improvements affecting Aurora's public transportation system.

Needs and Deficiencies

Canby Area Transit (CAT) currently provides fixed route service from Aurora south to Woodburn, and north to Canby, along Oregon 99E. From Woodburn, riders can connect to the Chemeketa Area Regional Transportation System (CARTS) in Woodburn or the South Clackamas Transportation District (SCTD) in Molalla. From Canby, riders can connect to the Wilsonville South Metro Area Regional Transit (SMART) or via another CAT connection to Oregon City in order to connect to Portland TriMet.

The CAT provides seven daily round trips, Monday through Friday. Currently, no service is provided on Saturdays, Sundays, or holidays. There are two bus stop locations along Oregon 99E, one on both sides of Liberty Street and one on both sides of Ottaway Road. The stops are marked by CAT signage.

An assessment of transit needs in Aurora was conducted as a part of TSP development and focused primarily on identifying the extent of transit-dependence within the community. According to the 2000 Census, people living in Aurora characterized as transportation dependent or disadvantaged included:

- 42 people aged 12 to 16 years.
- 105 people greater than 60 years old.
- 17 non-institutionalized people with a go-outside-the-home disability between the ages of 16 and 64.
- 10 individuals with poverty status who generally may have no personal auto access.

The transportation disadvantaged population includes overlap in the disability status and poverty status as those persons may also be included in the 12-60+ years age categories. If the City were to include all families with low to moderate incomes as defined by the Marion and Polk County Regional Transportation Enhancement Plan, an additional 130 persons could be considered in the transportation disadvantaged portion of Aurora's population.

In addition to transportation disadvantaged, an assessment was also conducted of the potential demand for transit service to the City's existing work force. Census data showed that in 2000 the workforce in Aurora was 292 people, or about 45 percent of the population (2000 U.S. Census of 655 persons). Driving alone was the most common way to get to work. A few individuals walked or bicycled to work while 8 percent worked at home. About 53 percent of the workforce was at their place of employment within 29 minutes of travel, 35 percent had travel times between 30 and 59 minutes, and 2 percent traveled more than one hour. The mean travel time to work was 24 minutes.

In addition to the public transportation service provided by CAT, Amtrak utilizes the Union Pacific Railroad line through Aurora but does not have a local stop. Residents wanting to travel south on Amtrak must utilize service from Salem, approximately 27 miles to the south. Residents wishing to travel north must utilize service from Oregon City or Portland, approximately 25 miles to the north.

The City of Aurora currently has no school facilities located within its UGB. Students living in Aurora are served by the North Marion School District, which contracts with a private school transportation provider in the area. The transportation provider determines school bus routes each year based upon the addresses of students. Typical pick-up/drop-off locations include informal bus stops at the intersection of Airport Road/Kasel Court and Airport Road/Albers Way serving students in northern Aurora, and at the intersection of Oregon 99E/Orchards Avenue serving students in southern Aurora. Additional pick-up/drop-off locations include points along Liberty Street, Main Street, and Ottaway Road.

There are no consistent networks of sidewalks linking residential areas with the bus pick-up/drop-off locations referenced above, leading to poor walking conditions for the students utilizing the school bus system. In addition, there is only one bus shelter provided, at Oregon 99E/Orchards Avenue, and therefore, for most students, waiting for transit in inclement weather is not a comfortable experience.

Policies

Aurora's relative distance from the major urban centers of Salem and Portland and small population base make it difficult for transit agencies to provide a high level of service to the

City's residents. However, Census data shows that a relatively large number of the transportation disadvantaged live in Aurora, and anecdotal evidence suggests that many of Aurora's residents commute to Salem and Portland, increasing the importance and opportunities to create an improved transit system in the future.

In recognition of these needs, the City will support efforts to coordinate with governmental and private agencies in the planning and provision of public transportation services and support a regional program to improve service, particularly for the transportation disadvantaged. The City will cooperate with Marion County and other agencies in investigating public transit possibilities, including improved transit access to Salem and Portland by bus and rail.

The City will also coordinate with other jurisdictions when the need for park-and-ride facilities is studied. The City should support the creation of or partnership with a dial-a-ride service for all residents needing door to door service within and outside of the City.

The City will seek further improvement in local public transportation services by encouraging more frequent scheduling of commercial carriers and by continued support of those systems presently developed for public transportation in the region.

The City will coordinate with CAT and the North Marion School District to make improvements to existing transit and school bus stops, respectively.

Improved pedestrian and bicycling infrastructure in Aurora is also a part of its transit strategy, making it easier to safely and efficiently access transit stops without the use of a motor vehicle. Pedestrian system needs and improvements are discussed later in this chapter.

Improvements

Table 3-5 below lists the transportation projects which are included in both the Preferred Plan and Revenue Forecast Alternatives and are designed to address transit needs and deficiencies. Project descriptions follow the table.

Table 3-5. Public Transit System Improvements

Map Key	Project Location	Project Description	Cost Estimates[(1)]	Priority
7	Airport Road and Kasel Court/Albers Way	Provide school bus stop with covered shelter and lighting	$6,000	High
13	OR 99E at Ottaway Road and OR 99E at Liberty Street	Improve transit bus stops with covered shelters, lighting and bike racks	$13,000	High
		Total Cost	**$19,000**	

Transit Facilities (#7 and #13)

An Airport Road location has been identified as an existing school bus stop and two Oregon 99E locations have been identified as existing public transit stops that could be improved at relatively low cost to provide a safer and more comfortable transit experience. Improvements include covered bus shelters, lighting, and bicycle racks at:

- Airport Road at Albers Way/Kasel Court (Project #7) (school bus stop)
- Oregon 99E at Ottaway Road (Project #13) (transit stop)
- Oregon 99E at Liberty Street (Project #13) (transit stop)

3.3 PEDESTRIAN ELEMENT

This section documents an assessment of the needs, deficiencies, policies, and improvements affecting Aurora's pedestrian system.

Needs and Deficiencies

There are a variety of local destinations within the Aurora UGB that attract pedestrian traffic to the state, county, and local street network. Several of these streets are within the Aurora National Historic District and include adjacent retail, service, and employment uses for those who live inside and outside the City. These streets are primarily:

- Main Street, from First Street to Third Street
- Ehlen Road, from the Union Pacific Railroad right-of-way to Oregon 99E
- Oregon 99E, from Liberty Street to Third Street

Outside the Aurora National Historic District, the following uses are also significant local pedestrian destinations:

- The City's only park lies in the southeast portion of the City and is accessed primarily via Main Street and Ottaway Road.
- The City has contracted with a consultant for design of a new city park located at the north end of town. The most likely access for the new park will be via Ehlen Road prior to the intersection with Oregon 99E.
- The post office located at the SE corner of Oregon 99E and Ottaway Road.

The relatively small size of Aurora indicates that walking could be employed regularly for short trips to reach a variety of destinations. Typically, a short trip that would be taken by a pedestrian would be about one-half mile in length. Encouraging pedestrian activities can decrease the use of a personal automobile and can also provide benefits for retail businesses. Where people find it safe, convenient, and pleasant to walk, they may linger and take notice of shops overlooked before.

Sidewalks generally exist along the pedestrian-oriented streets within the Aurora National Historic District, but are missing on Oregon 99E between Third Street and Main Street (see Figure 3-3, Sidewalk Facility Inventory). Sidewalks are also present in newer residential developments constructed after 1995. Other sidewalk locations exist sporadically in established residential areas, but are typically narrow, in poor condition, and discontinuous. Notably, poor pedestrian conditions exist in northern Aurora, as there are no sidewalks along Airport Road or along most of Ehlen Road. Undesirable pedestrian conditions also exist in southern Aurora, with large gaps in the sidewalk system on Oregon 99E, Main Street, and Liberty Street, the only continuous streets connecting the northern and southern ends of the City. Figure 3-3 also shows sidewalk widths. Based on street design standards, sidewalks with widths of less than 6 feet are considered deficient for all roadways except for those designated local residential. Sidewalks with widths of less than 6 feet are also considered deficient on Oregon 99E, according to the Oregon Highway Design Manual (HDM).

Policies

The TPR requires (OAR 660-12-020) requires development of a bicycle and pedestrian plan for a network of bicycle and pedestrian routes throughout the planning area as a part of the TSP. Aurora's Bicycle and Pedestrian Route System is shown in Figure 3-4. The TPR also requires that, when developing bicycle and pedestrian circulation plans, local governments shall identify improvements to facilitate bicycle and pedestrian trips to meet local travel needs in developed areas. Appropriate improvements will provide for more direct, convenient

and safer bicycle or pedestrian travel within and between residential areas and neighborhood activity centers (i.e., schools, shopping, transit stops).

Implementation of the street design standards included in the roadway element will, over time, increase the prevalence and widths of sidewalks throughout the City of Aurora. Additionally, on an interim basis, street improvements could also include multi-use paths in lieu of sidewalks along Ehlen Road and Airport Road until such time as full sidewalks improvements can be made. The improvements identified below include the construction of pedestrian and bicycling infrastructure on key segments of the non-motorized route system. Requirements for planter strips, street trees, and safe and convenient pedestrian internal circulation and connections to external pedestrian destinations will also improve the pedestrian experience.

Improvements

Table 3-6 below lists the transportation projects which are included in both the Preferred Plan and Revenue Forecast Alternatives and are designed primarily to address pedestrian needs and deficiencies. Many of these projects also address bicycling needs, as discussed in the bicycle element. Project descriptions follow the table.

Table 3-6. Pedestrian System Improvements

Map Key	Project Location	Project Description	Cost Estimates[(1)]	Priority
1	OR 99E: Main Street to Bob's Avenue	Add sidewalks, bike lanes and parking	$400,000[(2)]	High
4	Ehlen Road: Airport Road to OR 99E	Phase 1: Construct Multi-use path Phase 2: Improve to Principal Arterial standard	$116,000 $853,000	High
6	Airport Road: City Limits to Ehlen Road	Phase 1: Construct protected shoulders Phase 2: Improve to Minor Arterial standard	$292,000 $1,022,000	High
12	Ottaway Road: OR 99E to Liberty Street	Complete sidewalks and add "sharrows"	$263,000	Medium
14	Main Street: Bob's Avenue to Ottaway Road	Complete sidewalks and add "sharrows"	$425,000	High
15	Liberty Street	Install traffic calming measures	$137,000	Medium
16	OR 99E: Bob's Avenue to Ottaway Road	Provide bike lanes and sidewalks	$856,000	Low
19	OR 99E: Ottaway Road to south UGB	Provide bike lanes and sidewalks	$1,322,000	Low
20	Ehlen Road: UGB to Airport Road	Improve to Principal Arterial standard	$899,000	Low
		Total Cost	**$6,585,000**	

Oregon 99E (#1, #16 and #19)

As a state highway inside an UGB, Oregon 99E should be improved to provide for bicycles and pedestrians. An existing project is scheduled to provide these facilities from Main Street to Bob's Avenue (Project #1).

Additional projects should include extending sidewalks and bicycle lanes south to the UGB limits (Projects #16 and #19). Constructing these facilities will require addressing steep slopes, widening of the existing roadway and handling stormwater runoff, making them

prohibitively expensive. As an interim measure, bicycle lanes could be added to the existing highway, waiting to redo the entire streetscape south of Bob's Avenue when funds are available.

Ehlen Road (#4 and #20)

Ehlen Road is a rural arterial roadway, which provides the only connection between existing residential areas in northern Aurora with downtown Aurora, and is a part of a proposed primary north-south pedestrian and bicycle route. As such, Ehlen Road between Airport Road and Oregon 99E should be improved to provide for bicycles and pedestrians (Project #4). Phase 1 of Project #4 includes marking a bicycle lane on the existing roadway and providing a multi-use path on the north side of the street to serve pedestrians and bicyclists not comfortable using bicycle lanes. The multi-use path option is less expensive, preserves a more rural character, and provides more separation from traffic which is desirable to more vulnerable road users. Phase 2 of the project is more expensive and would occur at a later date and includes fully improving the road to Principal Arterial standards with sidewalks and bicycle lanes on both sides of the street.

Pedestrian and bicycling improvements on Ehlen Road between Airport Road and the city limits (Project #20) is less time sensitive, as it would serve primarily future residential development west of Airport Road.

Airport Road (#6)

Airport Road is a Minor Arterial roadway, which provides the only connection between existing residential areas in northern Aurora with downtown Aurora. This road is also a part of the proposed primary north-south pedestrian and bicycle route. As such, Airport Road should be improved to provide for safer travel for bicyclists and pedestrians. Because of existing right-of-way constraints and the high cost improving Airport Road to full Minor Arterial standards, project #6 includes two phases. Phase one includes the addition of a 6 foot to 8 foot wide protected shoulder on both sides of the street to be built within existing right of way, and phase two is full development to the Minor Arterial standard. Though the means of providing separation between pedestrians and vehicular traffic will be determined through project design, the design should allow for the continued use of Marion County street sweeping equipment on the protected shoulders. In addition to project #6, there is a desire to see improved bicycle and pedestrian facilities extending north on Airport Road beyond the Aurora UGB.

Ottaway Road (#12)

Project #12 proposes improvements to pedestrian connectivity from Liberty Street to Oregon 99E. Such improvements would connect the primary north-south pedestrian route at Main Street with the post office and commercial areas along Oregon 99E. These improvements would consist of the standard curb, gutter, and sidewalk configuration, appropriate for this urban area. The case for future signalization and crossing improvements at the Oregon 99E and Ottaway Road intersection (see project #9 and #10) is helped with Ottaway Road's functional classification as a collector street (from Main Street to Oregon 99E).

Main Street (#14)

Main Street is a collector road paralleling Oregon 99E and is a part of the proposed primary north-south pedestrian and bicycle route. Main Street should be improved to provide for bicycles and pedestrians. A shared street with bicycles is acceptable based on the volume of traffic on Main Street. The addition of "sharrows"—stencil bicycle graphics applied to the roadway—would reinforce Main Street as a bicycle route. Sidewalks exist on a portion of Main Street but should be completed from Bob's Avenue to Ottaway Road to provide north/south pedestrian connectivity.

Liberty Street (#15)

Traffic calming has been identified by the public as an improvement option for Liberty Street, classified as a Local Residential street. Though Liberty Street is not a part of the proposed primary north-south pedestrian and bicycle route, with traffic calming the street will provide a secondary north/south bicycle and pedestrian route. Though selection of specific traffic calming techniques for Liberty Street would take place during project design, members of the community have recommended accentuating the existing roadway's curves and fluctuations in width through the addition of chicanes. There is also an interest in exploring the addition of stop signs and painted crosswalks as a part of the Liberty Street project.

3.4 BIKEWAY ELEMENT

Needs and Deficiencies

The Oregon Bicycle and Pedestrian Plan categorizes bicycle facilities into the following four major classifications:

- Shared roadway – Bicycles and vehicles share the same roadway area under this classification. The shared roadway facility is best used where there is minimal vehicle traffic to conflict with bicycle traffic.
- Shoulder bikeways – This bicycle facility consists of roadways with paved shoulders to accommodate bicycle traffic.
- Bike lanes – Separate lane adjacent to the vehicle travel lane for the exclusive use of bicyclists are considered bike lanes.
- Bike paths – These bicycle facilities are exclusive bicycle lanes separated from the roadway.

Three kinds of bicycle facilities are located in the study area (see Figure 3-5, Bicycle Facility Inventory), shared roadways, shoulder bikeways, and bicycle lanes.

All existing local residential streets and collectors in the study area are shared roadways, a designation which is appropriate given the relatively low traffic volumes on streets with these designations. Main Street, in particular, provides good bicycle connectivity between downtown Aurora and southern Aurora.

Six foot shoulders exist along both sides of Ehlen Road, from the city limits to Airport Road, which provides bicyclists with shoulder bikeways. Airport Road also has approximately 300 feet of shoulder bikeways from its southern terminus at Ehlen Road to the north.

Bicycle lanes exist along Ehlen Road from Airport Road to Oregon 99E and along Oregon 99E from the northern city limits to Third Street. No other designated bicycle facilities currently exist within the Aurora UGB. Shoulder bikeways are sufficient to accommodate bicycle traffic in rural environments, however, bike lanes are the standard for urban arterials and highways within the UGB. Therefore the bicycle facilities along most of Airport Road, Ehlen Road and Oregon 99E are considered deficient. These deficiencies create a poor bicycling environment for those seeking to travel to northern Aurora (in particular to areas along Airport Road), and to those seeking to travel through Aurora along Oregon 99E.

Policies

Implementation of the street design standards included in the roadway element will, over time, increase the prevalence of bike lanes and/or multi-use paths along Ehlen Road, Airport Road, and Oregon 99E. In addition, the street design standards will bring bike lanes to the anticipated new collector streets serving primarily a mix of commercial and industrial

properties to the southwest and northwest of the Oregon 99E/Ottaway Road intersection (projects #17 and #22).

Bicycle parking is also required in any new commercial, industrial, institutional, multifamily, or park-and-ride development. Should transit transfer stations be developed in Aurora in the future, bicycle parking shall be required at those locations as well.

Improvements

All of the projects listed in Table 3-6, Pedestrian System Improvements also have components which improve bicycling safety and efficiency.

In addition, there is an effort to develop a trail along Mill Creek from Woodburn through Hubbard to Aurora, with possible connections to other destinations in northern Marion County. This trail would provide good scenery, community connectivity, and economic development potential. Though the trail would serve pedestrians as well as bicyclists, given the relatively long distances between the cities on its route, it would serve bicyclists particularly well. Though there is some property owner opposition to developing this trail, further analysis and planning of the trail is recommended. The City generally supports building this trail for the transportation, recreation, and economic development opportunities that come with it, provided that its impacts can be appropriately mitigated. As Mill Creek trail designs are finalized, the Preferred Plan and Revenue Forecast Alternatives' project lists should be updated to include the trail as well as other improvements that may be needed to better connect Aurora to the trail.

3.5 AIR, RAIL, WATER, AND PIPELINE ELEMENT

Needs and Deficiencies

Aviation

There are no airports within the Aurora study area. The Aurora State Airport is a publicly owned airport located approximately one-half mile northwest of the Aurora city limits. The airport is home to approximately 260 aircraft and has a 5,000 foot by 100 foot runway. The facility serves a wide-range of charter, corporate, and recreational users and is home to a number of businesses providing services such as fuel sales, maintenance, storage, charter, aircraft sales, and flight training. In 2005, there were a total of 83,824 operations at the Aurora Airport. An operation is a landing or take-off. The Oregon Department of Aviation (ODA) estimates that by 2025, the number could increase to approximately 124,978 operations. For regularly scheduled commercial flights, City residents utilize the Portland International Airport.

Due to its runway size and close proximity to Portland, the Aurora State Airport is becoming more and more popular for general aviation services including private plane owners and those who rely on corporate aviation. A number of community residents are concerned about the close proximity of the airport to the City of Aurora, and its impact on the community. For planning purposes, the City needs to continue to work with the Aurora State Airport and ODA to help maintain and improve roadway access to and from the airport, as well as understand and address the effects of increased traffic flow on Airport and Ehlen Roads caused by airport growth. The increased growth will likely impact operations at intersections under the jurisdiction of the City, County, and ODOT. Mitigation for these impacts may be required in the future to ensure safety and efficient traffic operations.

An updated Intergovernmental Agreement (IGA) was signed between the City of Aurora, Marion County, and ODA in April 2008 to ensure that appropriate opportunities are given to affected parties to review and address coordinated growth management and transportation

related development processes and decisions related to the Aurora State Airport. The ODA has plans to update the 2000 Airport Master Plan by 2010.

Rail

There is one rail right-of-way, the Union Pacific Railroad, through the City of Aurora. The rail line runs parallel to Oregon 99E on the west side. One protected railroad crossing in town exists on Ehlen Road just north of First Street. There are approximately 20 to 25 trains per day using these tracks.

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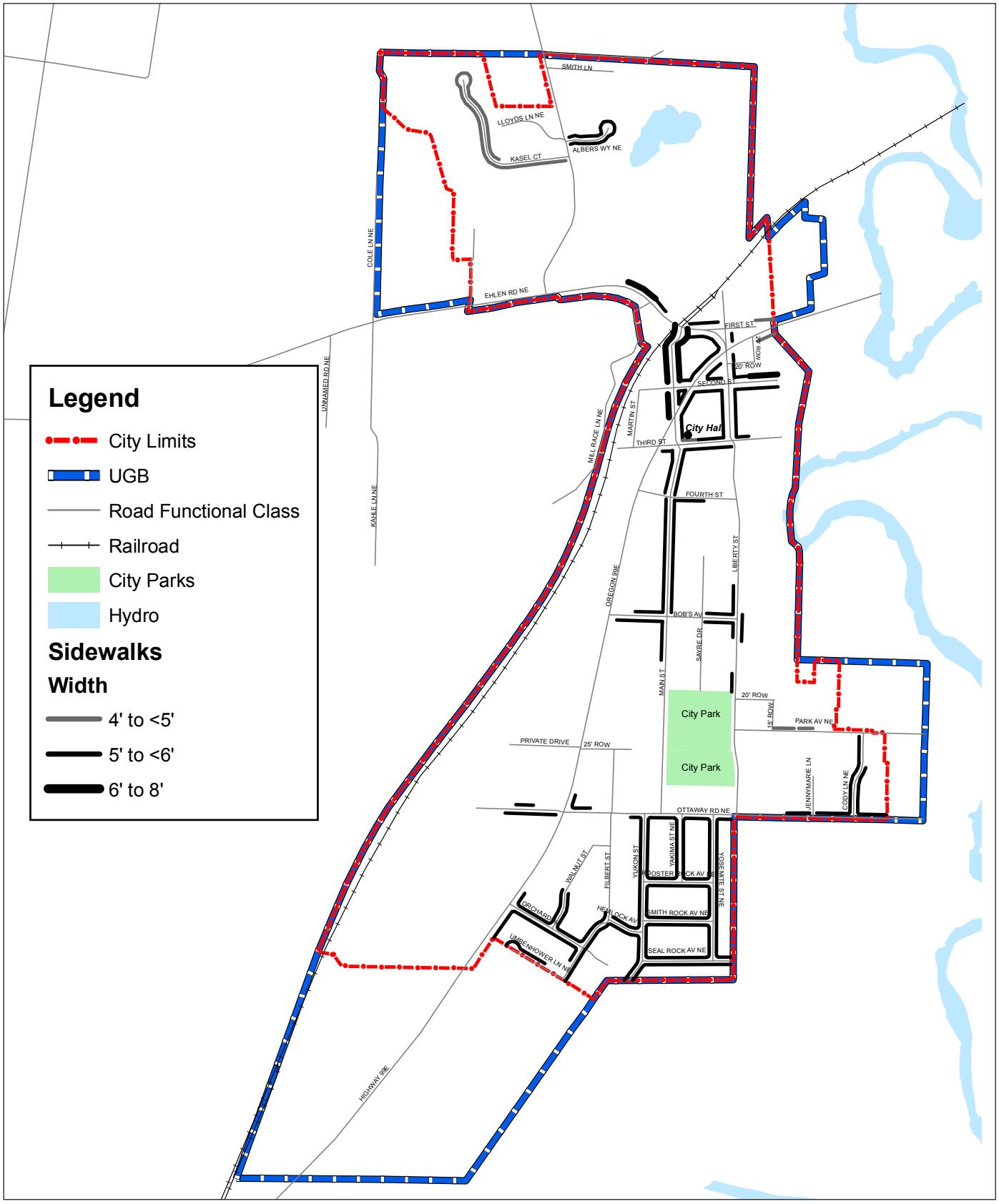

Source:

Mid-Willamette Valley Council of Governments
Getting things done together!

Figure 3-3
Sidewalk Inventory

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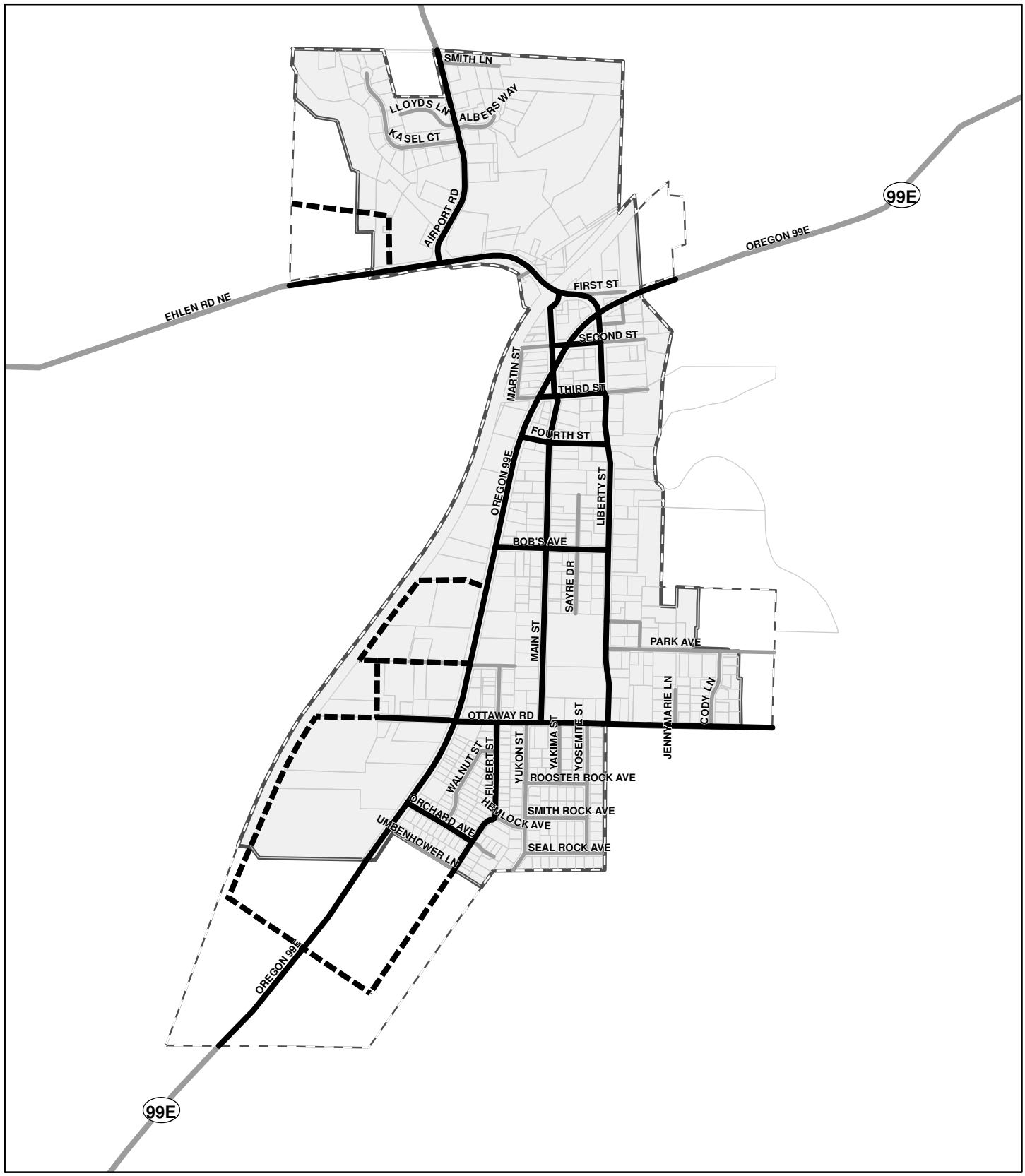

Date: 09/13/09 File: AuroraBikePed.mxd

N

0 500 1,000

Scale in Feet

- Existing Roadway
- Bicycle/Pedestrian System (Along Existing Roadway)
- Bicycle/Pedestrian System (Along Conceptual Roadway)
- Taxlot
- City Limits
- Urban Growth Boundary

Figure 3-4
Bicycle/Pedestrian Route System

City of Aurora, Oregon

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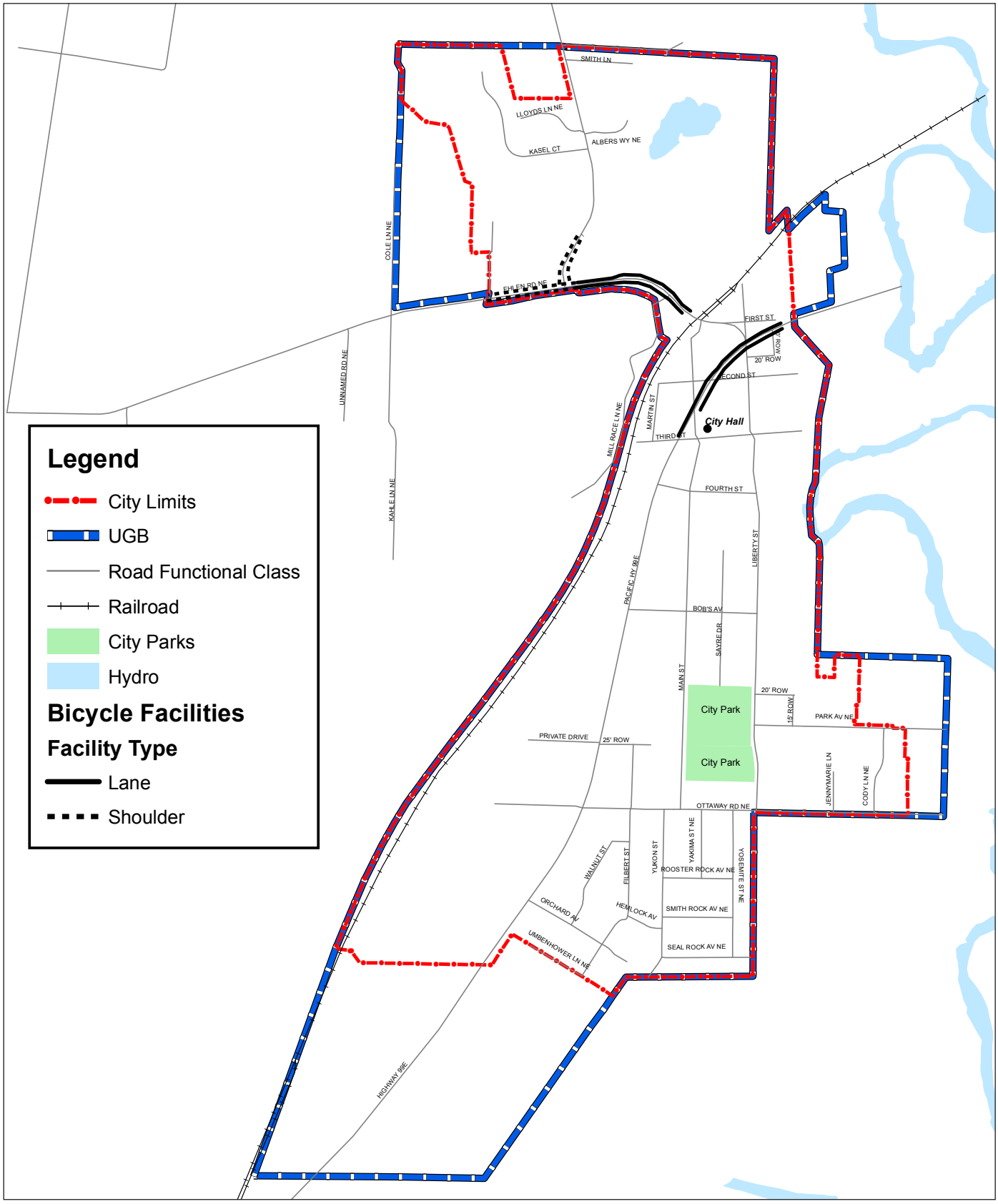

Source:

Mid-Willamette Valley Council of Governments
Getting things done together!

Figure 3-5
Bicycle Facility Inventory

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Pipelines

Although not often considered as transportation facilities, pipelines carry liquids and gases very efficiently. The use of pipelines can greatly reduce the number of trucks and rail cars carrying fluids such as natural gas, oil, and gasoline.

The Oregon Office of Energy defines jurisdictional gas pipelines as those that are 16-inches or larger in diameter and 5-miles or longer in length. There are no lines meeting this criterion in the immediate area of the City of Aurora. Northwest Natural has several 12-inch mains in and around the City of Aurora, but no facilities that are 16-inches or larger in diameter within the current Aurora UGB.

Water Transportation

There are no navigable waterways within the City of Aurora and therefore no possibility for water transportation services.

Policies

The City of Aurora has an airport overlay zone (A) to prevent the creation of potential air traffic hazards such as objects that would exceed the FAA-required height limitations around the airport. All land within the City was and is, subject to the provisions of the airport overlay zone.

It is City policy to safely and efficiently manage the interface between railroad infrastructure and the vehicular, bicycle, and pedestrian transportation system.

The City has no jurisdictional pipelines nor navigable waters nor policies regarding that infrastructure.

Improvements

The City has not identified any improvements related to the air, rail, water, or pipeline elements.

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4. PREFERRED PLAN AND REVENUE FORECAST ALTERNATIVES

The City of Aurora TSP includes two transportation system alternatives – the Preferred Plan Alternative and the Revenue Forecast Alternative. Though the two alternatives include the same list of transportation projects, the Revenue Forecast Alternative is constrained by forecasted funding levels and therefore requires a strategy for when and how its projects will be constructed. This report provides such a strategy by estimating future transportation revenue based on past experience in Aurora and identifying which projects should be funded in whole or in part by developers.

This section is divided into three subsections. Section 4.1 describes the Preferred Plan Alternative. Section 4.2 describes the estimated costs of the Revenue Forecast Alternative, broken into three time periods – short-term, medium-term, long-term – as well as the costs of "development dependent" projects. Section 4.3 provides an estimate of future public transportation funding that can be used to fund projects included in the transportation system alternative. Section 4.4 includes a comprehensive list of transportation revenue sources the City may adopt or compete for, many of which must be pursued in order to successfully implement the Revenue Forecast Alternative.

4.1 PREFERRED PLAN ALTERNATIVE

The Preferred Plan includes improvements for travel by a variety of modes, including auto and truck, bicycle, walking, and transit, which:

- Respond to the draft transportation goals of the TSP;
- Eliminate existing and future transportation deficiencies;
- Address identified needs and issues; and
- Assist the City of Aurora in complying with the requirements of the TPR.

The Preferred Plan Alternative significantly exceeds the forecast of future transportation revenue available from public sources.

Summary of the Preferred Plan

Priority designations, summary project descriptions, and cost estimates for projects within the Preferred Plan are included in Table 4-1 below, and are identified on Figure 4-1. More detailed narrative project descriptions are included in the modal elements, above. Additional project summaries and detailed breakdowns of the project cost estimates are included in Appendix E: *Project Descriptions and Cost Estimates*.

Table 4-1. Preferred Plan Transportation System Improvement

Map Key	Project Location	Project Description	Cost Estimates[(1)]	Priority
1	OR 99E: Main Street to Bob's Avenue	Add sidewalks, bike lanes and parking	$400,000[(2)]	High
2	Ehlen Road and Airport Road Intersection	Add southbound left turn lane and westbound right turn lane	$150,000[(3)]	High
3	Ehlen Road and Airport Road Intersection	Install signal when warranted and eastbound left turn lane	$379,000	Low
4	Ehlen Road: Airport Road to OR 99E	Phase 2: Improve to Principal Arterial standard	$853,000	High

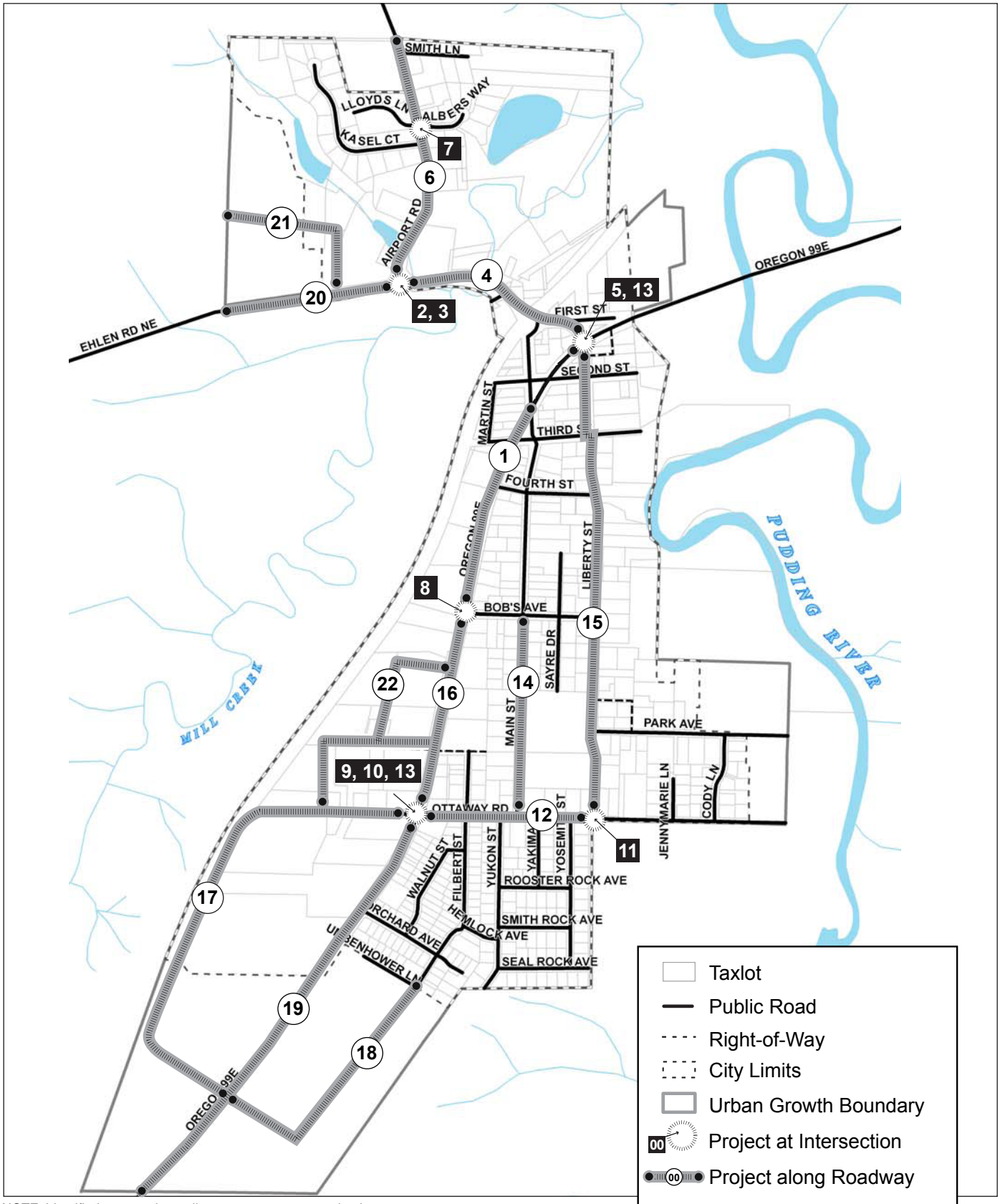
Map Key	Project Location	Project Description	Cost Estimates[(1)]	Priority
5	OR 99E and Liberty Street Intersection	Add 2nd eastbound left turn lane and corresponding receiving lane and channelize the southbound right turn lane	$611,000	Low
6	Airport Road: City Limits to Ehlen Road	Phase 2: Improve to Minor Arterial standard	$1,022,000	High
7	Airport Road and Kasel Court/Albers Way	Provide school bus stop with covered shelter and lighting	$6,000	High
8	OR 99E and Bob's Avenue Intersection	Add southbound left turn lane	$142,000	Low
9	OR 99E and Ottaway Road Intersection	Install turn lanes and intersection improvements including sidewalks, ADA ramps, crosswalks, and pedestrian crossing warning device	$311,000	High
10	OR 99E and Ottaway Road Intersection	Install signal when warranted	$326,000	Low
11	Ottaway Road and Liberty Street Intersection	Improve intersection to provide better sight distance	$46,000	High
12	Ottaway Road: OR 99E to Liberty Street	Complete sidewalks	$263,000	Medium
13	OR 99E at Ottaway Road and OR 99E at Liberty Street	Improve transit bus stops with covered shelters, lighting and bike racks	$13,000	High
14	Main Street: Bob's Avenue to Ottaway Road	Complete sidewalks and add "sharrows"	$425,000	High
15	Liberty Street	Install traffic calming measures per TSP measures	$137,000	Medium
16	OR 99E: Bob's Avenue to Ottaway Road	Provide bike lanes and sidewalks	$856,000	Low
17	New Collector Roadway: West Ottaway Road extension south to OR 99E	New Collector Roadway	$2,045,000	Low
18	New Collector Roadway: Filbert Street extension to OR 99E	New Collector Roadway	$1,252,000	Low
19	OR 99E: Ottaway Road to south UGB	Provide bike lanes and sidewalks	$1,322,000	Low
20	Ehlen Road: UGB to Airport Road	Improve to Principal Arterial standard	$899,000	Low
21	New Collector Roadway: Ehlen Road via Williams Court to Cole Lane	New Collector Roadway	$754,000	Low
22	New Collector Roadway: West Ottaway Road north	New Collector Roadway	$1,639,000	Low
		Total Cost	**$13,851,000**	

Notes:

(1) These cost estimates are for planning purposes only and do no include right-of-way costs and stormwater quality control or detention structures. Cost estimates were based on 2008 bid tab data. As costs for materials and labor are expected to generally increase over time, these estimates should be updated periodically.

(2) Existing funded project. Project budget figure provided by ODOT.

(3) Project cost estimate provided by Marion County.



NOTE: Identified new roadway alignments are conceptual only.

N

0 500 1,000 Feet

Figure 4-1
Transportation System Improvement Projects

City of Aurora, Oregon

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4.2 REVENUE FORECAST ALTERNATIVE

The Revenue Forecast Alternative includes improvements to optimize transportation system operations while attempting to constrain the improvement program to the estimated level of publicly available funding identified in the forecast of future transportation revenue. In addition to the publicly funded projects described in this alternative, a separate table of anticipated developer-funded projects is also identified. All project descriptions are the same as those found in Section 4.1.

Project Priorities

For a project list to be implementable, it is important to identify a logical order in which to build each project. Recommendations on when to build projects are included in Table 4-2 through Table 4-4 below, and are based roughly on the expected availability of public funds in the short-term (2009-2015), medium-term (2016-2020), and long-term (2021-2030), respectively. Project implementation recommendations also reflect the relative priority of each project as identified in the Preferred Plan Alternative. For example, all high-priority projects in the Preferred Plan are identified as short-term improvements in the Revenue Forecast Alternative, all medium-priority projects are identified as medium-term improvements, and all low-priority projects are identified as either long-term improvements or development dependent improvements.

Table 4-5 includes the list of potential developer dependent projects. These are projects that are expected to be paid for by developers, based on the significance of the impact that their developments will have on specific intersections and/or the projects are necessary to serve their property. Half the costs of two projects, Airport Road improvements from Ehlen Road to the UGB (Phase 2 of project #6) and Ehlen Road improvements from Airport Road to Oregon 99E (Phase 2 of project #4), are included in Table 4-5. It is assumed that the other half of the costs of these two projects warrant public contributions, as a sizable portion of the land adjacent to these roadways is already developed.

In addition to helping construct significant portions of the bicycle and pedestrian route system in the short-term, the projects included in Table 4-2 resolve the existing operational deficiency at the intersection of Ehlen and Airport Road.

Table 4-2. Short-Term (2009-2015) Transportation System Improvements

Map Key	Project Location	Project Description	Cost Estimates
1	OR 99E: Main Street to Bob's Avenue	Add sidewalks, bike lanes and parking	$400,000
2	Ehlen Road and Airport Road Intersection	Add southbound left turn lane and westbound right turn lane	$150,000
4	Ehlen Road: Airport Road to OR 99E	Phase 1: Construct Multi-use path	$116,000
6	Airport Road: City Limits to Ehlen Road	Phase 1: Construct protected shoulders	$292,000
7	Airport Road and Kasel Court/Albers Way	Provide bus stop with covered shelter and lighting	$6,000

Map Key	Project Location	Project Description	Cost Estimates
9	OR 99E and Ottaway Road Intersection	Install turn lanes and intersection improvements including sidewalks, ADA ramps, crosswalks, and pedestrian crossing warning device	$311,000
11	Ottaway Road and Liberty Street Intersection	Improve intersection to provide better sight distance	$46,000
13	OR 99E at Ottaway Road and OR 99E at Liberty Street	Improve bus stops with covered shelters, lighting and bike racks	$13,000
14	Main Street: Bob's Avenue to Ottaway Road	Complete sidewalks and add "sharrows"	$425,000
		Total	**$1,759,000**

Table 4-3. Medium-Term (2016-2020) Transportation System Improvements

Map Key	Project Location	Project Description	Cost Estimates
6	Airport Road: City Limits to Ehlen Road	Phase 2: Improve to Minor Arterial standard – 1/2 costs shared with developers (see Table 5-5)	$511,000
12	Ottaway Road: OR 99E to Liberty Street	Complete sidewalks	$263,000
15	Liberty Street	Install traffic calming measures per TSP measures	$137,000
		Total	**$911,000**

Table 4-4. Long-Term (2021-2030) Transportation System Improvements

Map Key	Project Location	Project Description	Cost Estimates
4	Ehlen Road: Airport Road to OR 99E	Phase 2: Improve to Principal Arterial standard. 1/2 costs shared with developers (see Table 5-5)	$426,500
5	OR 99E and Liberty Street Intersection	Add 2nd eastbound left turn lane and corresponding receiving lane and channelize the southbound right turn lane	$611,000
8	OR 99E and Bob's Avenue Intersection	Add southbound left turn lane	$142,000
16	OR 99E: Bob's Avenue to Ottaway Road	Provide bike lanes and sidewalks	$856,000
		Total	**$2,035,500**

Table 4-5. Development Dependent Transportation System Improvements

Map Key	Project Location	Project Description	Cost Estimates
3	Ehlen Road and Airport Road Intersection	Install signal when warranted and eastbound left turn lane	$379,000
4	Ehlen Road: Airport Road to OR 99E	Phase 2: Improve to Principal Arterial standard. 1/2 costs shared with public (see Table 5-4)	$426,500

Map Key	Project Location	Project Description	Cost Estimates
6	Airport Road: City Limits to Ehlen Road	Phase 2: Improve to Minor Arterial standard – 1/2 costs shared with developers (see Table 5-4)	$511,000
10	OR 99E and Ottaway Road Intersection	Install signal when warranted	$326,000
17	New Collector Roadway: West Ottaway Road extension south to OR 99E	New Collector Roadway	$2,045,000
18	New Collector Roadway: Filbert Street extension to OR 99E	New Collector Roadway	$1,252,000
19	OR 99E: Ottaway Road to south UGB	Provide bike lanes and sidewalks	$1,322,000
20	Ehlen Road: UGB to Airport Road	Improve to Principal Arterial standard	$899,000
21	New Collector Roadway: Ehlen Road via Williams Court to Cole Lane	New Collector Roadway	$754,000
22	New Collector Roadway: West Ottaway Road north	New Collector Roadway	$1,639,000
		Total	**$9,553,500**

4.3 TOTAL PROJECT COSTS

Transportation revenues come from many different sources and the amount a city receives can vary significantly from year to year. Because of this uncertainty, the Revenue Forecast Alternative's transportation projects were divided into three general time periods – short, medium, and long-term – which are intended to serve as general guidance on the timing of project implementation by indicating when the City should seek public funds to construct them. In addition to grouping projects into these time periods, Section 4.2 also included information on development-dependent projects. Development-dependent projects are those projects that are expected to be funded in whole or in part by developers based on the significance of traffic impacts associated with their developments and/or whether specific projects are necessary to serve their property.

The estimated costs of the Revenue Forecast Alternative, including the costs of the development-dependent projects, are included in Table 4-6 below.

Table 4-6. Revenue Forecast Alternative Cost Estimates

Costs of Public Projects	
Short-term (2009-2015)	$1,759,000
Medium-term (2016-2020)	$911,000
Long-term (2021-2030)	$2,035,500
Total	**$4,705,500**
Costs of Development Dependent Projects	**$9,553,500**
Total Estimated Project Costs	**$14,259,000**

Approximately $147,000 dollars of public funding per year will have been spent from 2002 through 2009 on transportation projects in Aurora (in 2007 dollars). In addition, the City estimated that approximately $43,000 of System Development Charge (SDC) revenues could be devoted to transportation projects each year.

Table 4-7 below estimates the availability of public transportation funding in future time periods, starting in 2009, based on past funding availability. The table presents funds available in the short- (2009-2015), medium- (2016-2020), and long-term (2021-2030), and compares them to the estimate of project costs from Table 4-7.

Table 4-7. Estimated Future Public Transportation Revenue (2007 Dollars)

Funding Sources	Short-Term (2009-2015)	Medium-Term (2016-2020)	Long-Term (2021-2030)	Total
ODOT/City/County/Other Public Sources	$1,026,214	$733,010	$1,466,020	$3,225,244
Future Transportation SDC Revenue	$302,258	$215,899	$431,797	$949,954
Total Funding	**$1,328,472**	**$948,909**	**$1,897,817**	**$4,175,198**
Total Costs	**$1,759,000**	**$911,000**	**$2,035,500**	**$4,705,500**

As can be seen in Table 4-7, the total estimated project costs in the medium time period are similar to estimated available funds in that time period. However, funding shortfalls of roughly $400,000 and $100,000 are anticipated in the short- and long-terms, respectively.

4.4 ESTIMATED FUTURE PUBLIC TRANSPORTATION REVENUE

As discussed in Section 4.3, approximately $147,000 dollars of public funding per year will have been spent from 2002 through 2009 on transportation projects in Aurora (in 2007 dollars) in addition to Transportation SDCs. While available documentation indicated which jurisdiction (e.g., City, County, or state) provided public funding, the specific programs associated with those funds were not identified. Included below is a discussion of the most readily available sources of transportation funding for cities in Oregon, many of which have already been used to fund transportation projects in Aurora in the past. The City of Aurora should seek to familiarize themselves with programs they haven't used in the past to ensure they are maximizing funds available to complete priority projects.

State and Federal Funding

Federal Surface Transportation Program/State Highway Funding

As the recipient and distributor of Federal Highway Administration funding, ODOT is the primary distributor of federal and state transportation funding. ODOT allocates funding through updates to the STIP. Aurora is included within Region 2 of the ODOT STIP. Projects selected for inclusion in the STIP must be consistent with the goals and objectives of the Oregon Transportation Plan (OTP), and its modal plans for highways, public transportation, freight and passenger rail, and bicycle and pedestrian facilities. Eligible projects are usually selected from a list of prioritized improvements, such as those included in the Aurora TSP and other related refinement plans or studies. Input and testimony from the general public, the local Area Commission on Transportation, and local government representatives play an important role in getting specific projects on the STIP.

STIP project costs will likely be subject to escalation to reflect rising material costs (such as oil and steel). The combined result of fixed federal/state funding allocations and annual

project cost escalation means fewer improvements can be implemented over time. It should be noted that the state has begun to require contributions from local jurisdictions for some projects when development has significant traffic impacts. An example of this are improvements on U.S. Highway 101 near Lincoln City, and Highway 18 near Valley Junction. Cost sharing may become more common if federal funds decrease in the future. It is expected that local contribution to or cost sharing for projects such as interchanges and bridges will continue.

The paragraphs below summarize some of the specific federal/state programs that could be useful in Aurora.

Special Small City Allotment

ODOT administers the Special Small City Allotment (SCA) program that provides funding of up to $25,000 to cities with populations under 5,000. The SCA funds are from the state gas tax, and may be used to fund improvements to a city's local transportation system.

State Motor Vehicle Fund

The State of Oregon collects gas taxes, vehicle registration fees, overweight/overheight fines and weight/mile taxes and distributes a portion of these revenues to counties and cities using an allocation formula. The State distributes a local share to cities based on a per capita rate. Revenues vary from year to year as the allocation formula can vary. Funds can be used for capital improvements or maintenance. While the gas tax provides needed transportation system revenue, it is unlikely to keep pace with future maintenance needs. Over time fuel efficiency and the appearance of hybrid or mixed-fuel vehicles offset the future purchasing power of the gas tax.

Special Public Works Fund and Immediate Opportunity Fund

The Special Public Works Fund (loans and grants) and Immediate Opportunity Fund (grants) provides funding for public works that encourage economic and community development, such as supporting private projects resulting in creation or retention of permanent jobs. Loans that are provided through the Special Public Works Fund are typically available at below market rates.

Oregon Transportation Infrastructure Bank (OTIB)

The Oregon Transportation Infrastructure Bank (OTIB) is a statewide revolving fund available to local governments to provide long-term (up to 30-years) low interest loans designed to promote innovative transportation funding solutions. Project must be Federal-Aid eligible. OTIB funds can be spent on engineering, environmental permitting, right-of-way, construction, and project management. Applications are accepted on an ongoing basis.

Oregon Immediate Opportunity Fund

The Immediate Opportunity Fund program, managed by ODOT and the Oregon Economic and Community Development Department (OECDD), provides a maximum of $500,000 for public road work associated with an economic development related project of regional significance, provided the project creates primary employment. Additionally, although lesser shares will be considered, the grantee should provide an equal local match.

Bicycle and Pedestrian Grant Program

The State Bicycle and Pedestrian Grant Program provides funds for highways, county roads and local streets where improvements are needed for pedestrians and/or bicyclists. Eligible project types include: ADA upgrades; completing short sections of missing sidewalks or bike

lanes; street crossing improvements; intersection improvements; and minor widening for bike lanes or shoulders.

Community Development Block Grants

The Federal Department of Housing and Urban Development administers the Community Development Block Grant Program. Funds are allocated based on city size and Demographics, such as income levels and housing standards. In some communities, street reconstruction projects in older neighborhoods have been funded by this program. Many other cities use these funds to provide or improve the sidewalk system in older neighborhoods, particularly in the vicinity of schools.

Local Funding

The paragraphs below summarize local options for funding projects in Aurora.

City Gas Tax

The City could levy a per gallon tax on fuel sold in Aurora. Typical taxes range from $0.01 to 0.03 per gallon and Woodburn, Tillamook, and The Dalles are examples of communities that have used such a tax. The City could contract with the State Fuel Tax Branch to collect and administer the tax.

Local Vehicle Registration Fee

This would operate similarly to the existing statewide system. Although the method has been discussed, no City or county governments have implemented such a program.

Local Property Tax Levies/Street Bonds

This method is typically used to fund road improvements that will benefit an entire community. General obligation bonds are supported by a property tax levy on assessed value of property. This method requires voter approval of bond issues and, because of the high costs of bond underwriting, is not usually viable for funding single projects that cost less than $2,000,000.

Local Improvement Districts (LIDs)

LIDs levy special assessment charges on property owners within a defined area such as a neighborhood, street frontage or industrial/commercial district, with each property assessed a portion of total project cost. LIDs are commonly used for street paving, drainage, parking facilities and sewer lines. The justification for such levies is that many of these public works improvements provide a direct benefit or enhancement to the value of nearby land, thereby providing direct financial benefits to its owners. LIDs are typically used for local street projects that cannot be funded through other means. State law and city code govern the formation of LIDs, the assessment methodology, and other factors. LIDs are usually funded by the participants, but may also be combined with other funding sources to leverage all available resources. LIDs can be initiated by property owners or the City, and the collected funds are commonly used to repay debt on bonds incurred to undertake the infrastructure improvements. These bonds are guaranteed by payments from the affected properties through a property lien that sunsets when the LID share is paid off. LIDs typically require at least 51 percent of the affected properties to approve the LID. Costs can be determined based on road frontage or square footage.

Reimbursement District or Zone of Benefit District

Public or private entities that build road systems can be compensated by future property owners at a proportional rate, as development occurs. Usually limited to private construction

of roads, this mechanism can be useful for public/private developments. Implementation of these districts requires local legislative action.

Road User, or Street Utility, Fees

This method would charge City residents and nonresidential users a monthly or yearly fee for use of the City road system, similar to water and sewer utility fees. User fees go to maintenance activities and have been instituted in a number of communities. The City of Medford's TSP, for example, recommends that the Medford user fee generate over $100 million over the 20-year life of the plan. A fee of this type would free up other local transportation dollars (such as gas tax receipts) to be used for constructing transportation projects.

Transportation System Development Charges (SDCs)

SDCs are fees paid by land developers to cover a portion of the increased system capacity needed to accommodate new development. Development charges are calculated to include the costs of impacts on services, such as increased school enrollment, parks and recreation use, or traffic congestion. The City of Aurora's Transportation SDC is currently $2,095 per single-family house, with higher rates charged to commercial and industrial properties based on the relatively higher numbers of trips these uses generate.

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APPENDIX A

Existing Transportation System Inventory

APPENDIX A
2009 STREET INVENTORY
City of Aurora Transportation System Plan

Street Segment	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	# of Travel Lanes	Curbs	On-Street Parking	Sidewalk	Bikeway	Pavement Condition
Airport Road											
Ehlen Road to Kasel Court	County	m. arterial	35	60	21-22	2	no	no	no	no	fair
Kasel Court to Albers Way/Lloyd's Lane	County	m. arterial	35	60	21-22	2	no	no	no	no	fair
Albers Way to Smith Lane	County	m. arterial	35	60	21-22	2	no	no	no	no	fair
Smith Lane to north city limits	County	m. arterial	35	60	21-22	2	no	no	no	no	fair
Smith Lane											
Airport Road to eastern terminus	City	local	NP	25	15	1	no	no	no	no	gravel
Albers Way											
Airport Road to eastern terminus	City	local	NP	50	30	2	yes	yes	yes	no	good
Lloyd's Lane											
Airport Road to western terminus	City	private	NP	25	21-34	1	no	no	no	no	good
Kasel Court											
Airport road to western terminus	City	local	NP	50	28-29	2	yes	yes	yes	no	good
Ehlen Road											
west city limits to Airport Road	County	p. arterial	35	70/80	24-27	2	no	no	no	yes	good
Airport Road to Mill Creek Bridge	County	p. arterial	35	60/90	24	2	no	no	no	yes	good
Mill Creek Bridge to Highway 99E	County	p. arterial	25	80/90	40-49	2	n/side	no	n/side	yes	good
Highway 99E											
south city limits to Orchard Avenue	ODOT	p. arterial	50	80	24/40	2	no	no	no	no	good
Orchard Avenue to Ottaway Road	ODOT	p. arterial	35	80	24/40	2	int	no	int	no	good
Ottaway Road to Bob's Avenue	ODOT	p. arterial	35	80/90	24/36	2	no	no	no	no	good
Bob's Avenue to 4th Street	ODOT	p. arterial	30	80	24/36	2	no	no	no	yes	good
4th Street to 3rd Street	ODOT	p. arterial	30	80	36/50	3	no	no	no	yes	good
3rd Street to Main Street	ODOT	p. arterial	30	80	36/50	3	no	no	no	yes	good
Main Street to 2nd Street	ODOT	p. arterial	30	80	36/50	3	yes	no	yes	yes	good
2nd Street to Ehlen Road	ODOT	p. arterial	30	80	36/50	3	yes	no	yes	no	good
Ehlen Road to north city limits	ODOT	p. arterial	45	90	24/36	2	int	no	no	no	good

APPENDIX A
2009 STREET INVENTORY
City of Aurora Transportation System Plan

Street Segment	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	# of Travel Lanes	Curbs	On-Street Parking	Sidewalk	Bikeway	Pavement Condition
Main Street											
Ottaway Road to Bob's Avenue	City	collector	25	60	22-42	2	no	yes	int	no	fair-good
Bob's Avenue to 4th Street	City	collector	25	60	20-40	2	yes	yes	yes	no	poor-fair
4th Street to 3rd Street	City	collector	NP	66	42-74	2	yes	yes	yes	no	good
3rd Street to Highway 99E	City	collector	25	90	65-66	2	yes	yes	east side	no	good
Highway 99E to 2nd Street	City	collector	25	90	65	2	yes	yes	yes	no	poor-fair
2nd Street to Ehlen Road	City	collector	25	90	65	2	yes	yes	yes	no	poor-fair
Filbert Street											
Umbenhower Lane to Orchard Avenue	City	local	NP	50	27-29	2	e/side	no	w/int, e/side	no	good
Orchard Avenue to Hemlock Avenue	City	local	NP	50	27-29	2	yes	no	yes	no	good
Hemlock Avenue to Walnut Avenue	City	local	NP	50	16-17	2	no	west side	no	no	good
Walnut Street to Ottaway Road	City	local	NP	50	21-23	2	no	no	no	no	good
Ottaway Road to northern terminus	City	local	NP	50	20	2	no	yes	no	no	good
Walnut Street											
Orchard Avenue to Filbert Street	City	local	15	50/60	19-20	2	int	yes	int	no	fair
Ottaway Road											
western terminus to Highway 99E	City	collector	NP	60	36	2	yes	yes	s/side, n/int	no	good
Highway 99E to Filbert Street	City	collector	NP	30/60	24	2	n/int	no	n/int	no	fair
Filbert Street to Yukon Street	City	collector	NP	30/40	25	2					
Yukon Street to Main Street	City	collector	NP	40	24	2	s/int	no	s/int	no	fair
Main Street to Liberty Street	City	collector	NP	40	22-23	2	s	no	s	no	good
Liberty Street to Yakima Street	City	collector	NP	40	22-24	2	s	no	s	no	good
Yakima Street to Yosemite Street	City	collector	NP	40	24-23	2	s	no	s	no	good
Yosemite Street to Liberty Street	City	collector	NP	40	11-15	2	no	no	no	no	fair
Liberty Street to Jenny Marie Lane	City	local	NP	20/35	12	2	no	no	no	no	good
Jenny Marie Lane to Cody Lane	City	local	NP	35	18-20	2	n	no	n	no	good
Cody Lane to eastern terminus	City	local	NP	35	22-23	2	n	no	n	no	good
Park Avenue											
Liberty Street to Cody Lane	City	local	NP	40/45	20-23	2	int n/side	south side	int n/side	no	fair/gravel
Cody Lane to eastern terminus	City	local	NP	40/45	20-23	2	no	south side	int n/side	no	fair/gravel

APPENDIX A
2009 STREET INVENTORY
City of Aurora Transportation System Plan

Street Segment	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	# of Travel Lanes	Curbs	On-Street Parking	Sidewalk	Bikeway	Pavement Condition
Liberty Street											
Ottaway Road to Park Avenue	City	local	25	40/50	17-21	2	no	w/side	no	no	fair
Park Avenue to Bob's Avenue	City	local	NP	60	18-20	2	e/side	no	no	no	poor
Bob's Avenue to 4th Street	City	local	NP	40/60	17-24	2	int	yes	int w/side	no	poor-fair
4th Street to 3rd Street	City	local	NP	40	15-16	2	no	yes	no	no	poor-fair
3rd Street to 2nd Street	City	local	NP	90	20-48	2	yes	west side	yes	no	poor
2nd Street to Highway 99E	City	local	NP	90	21/31	2	yes	west side	e/int	no	fair
Highway 99E to 1st Street	City	local	NP	90	35	2	no	no	no	no	poor
Bob's Avenue											
Highway 99E to Main Street	City	local	25	60	18	2	int	yes	yes	no	poor-fair
Main Street to Sayre Street	City	local	NP	60	22-24	2	no	s/side	no	no	poor
Sayre Street to Liberty Street	City	local	NP	60	31-33	2	no	yes	yes	no	poor
Sayre Drive (Sayre is a drive not a street)	City										
southern terminus to Bob's Avenue	City	local	25	33.8	48-20	2	no	no	no	no	gravel
Bob's Avenue to northern terminus	City	local	25	33.8	12 23	2	no	no	no	no	gravel
4th Street											
Highway 99E to Main Street	City	local	NP	40	15-17	2	no	no	no	no	poor
Main Street to Liberty Street	City	local	NP	40	30/47	2	int	yes	int	no	good
3rd Street											
Western terminus to Martin Street	City	local	NP	40	25-20	1	no	no	no	no	gravel
Martin Street to Highway 99E	City	local	NP	40	12-30	2	no	yes	no	no	gravel
Highway 99E to Main Street	City	local	NP	65	38-39	2	s/side	no	s/side	no	poor
Main Street to Liberty Street	City	local	NP	65	22-25	2	yes	yes	yes	no	poor
Liberty Street to eastern terminus	City	local	NP	45	23-23		no	no	no	no	gravel
2nd Street											
Martin Street to Main Street	City	local	NP	90	33-25	2	no	no	no	no	gravel
Main Street to Highway 99E	City	local	25	90	38-53	2	yes	yes	yes	no	good
Highway 99E to Liberty Street	City	local	25	90	23	2	yes	yes	yes	no	fair
Liberty Street to eastern terminus	City	local	NP	90	52	2	yes	n/side	yes	no	poor

APPENDIX A
2009 STREET INVENTORY
City of Aurora Transportation System Plan

Street Segment	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	# of Travel Lanes	Curbs	On-Street Parking	Sidewalk	Bikeway	Pavement Condition
1st Street											
Ehlen Road to Liberty Street	City	local	25	90	24	2	no	no	no	no	poor
Liberty Street to Highway 99E	City	local	25	90	24	2	no	no	no	no	poor
Martin Street											
3rd Street to 2nd Street	City	local	NP	40/45	18-18	2	yes	yes	yes	no	gravel
Hemlock Avenue											
Filbert Street to Yukon Street	City	local	25	50	32	2	yes	yes	yes	no	good
Seal Rock Avenue											
Yukon Street to Yosemite Street	City	local	25	50	32	2	yes	yes	yes	no	good
Yosemite Street to eastern terminus	City	local	25	50	32	2	yes	yes	yes	no	good
Smith Rock Avenue											
Yukon Street to Yosemite Street	City	local	NP	50	32	2	yes	yes	yes	no	good
Rooster Rock Avenue											
Yukon Street to Yakima Street	City	local	NP	50	32	2	yes	yes	yes	no	good
Yakima Street to Yosemite Street	City	local	NP	50	32	2	yes	yes	yes	no	good
Yosemite Street											
Seal Rock Avenue to Smith Rock Avenue	City	local	NP	50	30-30	2	yes	yes	yes	no	good
Smith Rock Avenue to Rooster Rock Avenue	City	local	NP	50	32	2	yes	yes	yes	no	good
Rooster Rock Avenue to Ottaway Road	City	local	NP	50	32	2	yes	yes	yes	no	good
Yakima Street											
Rooster Rock Avenue to Ottaway Road	City	local	NP	50	32	2	yes	yes	yes	no	good
Yukon Street											
Ottaway Road to Rooster Rock	City	local	NP	50	32	2	yes	yes	yes	no	good
Rooster Rock to Smith Rock	City	local	NP	50	32	2	yes	yes	yes	no	good
Smith Rock to Seal Rock Avenue	City	local	NP	50	32	2	yes	yes	yes	no	good
Seal Rock Avenue to southern terminus	City	local	NP	50	32	2	yes	yes	yes	no	good

APPENDIX A
2009 STREET INVENTORY
City of Aurora Transportation System Plan

Street Segment	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	# of Travel Lanes	Curbs	On-Street Parking	Sidewalk	Bikeway	Pavement Condition
Umbenhower Lane											
Western terminus to Filbert Street	City	local	NP	33	21-23	1	n/side	yes	n/side	no	good
Cody Lane											
Ottaway Road to Park Avenue	City	local	NP	54	29-29	2	yes	yes	yes	no	good
Jenny Marie Lane											
Ottaway Road to northern terminus	City	local	NP	35/40	25-25	2	no	no	no	no	good

APPENDIX B

Relevant Plans and Policies

1. RELEVANT PLANS AND POLICIES

1.1 OREGON TRANSPORTATION PLANNING RULE (1991)

The Oregon Transportation Planning Rule (TPR) requires local jurisdictions to develop a TSP to accommodate future travel demand resulting from adopted land uses. The plan must accommodate all travel modes in use within the City, be consistent with the Oregon Transportation Plan (OTP), and be coordinated with federal, State, and local agencies and various transportation providers.

The TPR requires every local TSP to assess existing facilities for their adequacy and deficiencies; develop and evaluate system alternatives needed to accommodate land uses in the acknowledged comprehensive plan; and adopt local land use regulations to support implementation of the preferred alternative. The City TSP must describe public transportation services for the transportation disadvantaged and identify service inadequacies. The City TSP must also ensure its functional classification system is consistent or compatible with those applying to facilities maintained by adjacent jurisdictions.

The TPR includes a requirement for local governments to adopt land use or subdivision regulations for urban areas that, "...provide for safe and convenient pedestrian, bicycle and vehicular circulation, to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel in areas where pedestrian and bicycle travel is likely if connections are provided, and which avoids wherever possible levels of automobile traffic which might interfere with or discourage pedestrian or bicycle travel." Local governments are required to establish their own standards or criteria for providing streets and accessways consistent with the TPR. Examples of these measures include standards for spacing of streets or accessways, and standards for excessive out-of-direction travel.

1999 TSP Assessment

While the Aurora TSP and Development Code both include general requirements to provide safe and convenient pedestrian, bicycle, and vehicular travel, additional measures could be developed to strengthen these standards. For example, additional standards could be provided to require pedestrian accessways to be provided at reasonable distances (for example, every 300-600 feet; between residential developments, schools, parks, commercial areas, and through parking lots). Standards could also be developed to require additional pedestrian amenities (for example, benches, plazas, and lighting) and internal pedestrian circulation within commercial areas.

1.2 OREGON TRANSPORTATION PLAN (2006)

ODOT's OTP utilizes several planning documents to guide transportation planning efforts and transportation system improvements in the State. The OTP is ODOT's overall policy guiding document. The OTP and its modal elements represent the State's TSP and drive all transportation planning in Oregon. The plans provide a framework for cooperation between ODOT and local jurisdictions and offer guidance to cities and counties for developing local modal plans. Table B-1 shows the different modal plans that have been established and the year the plan was adopted by the Oregon Transportation Commission (OTC).

Table B-1. Adopted Elements of the Oregon Transportation Plan

Oregon Transportation Plan or Plan Element	Year Adopted
Aviation System Plan	2000
Bicycle and Pedestrian Plan	1995
Transportation Safety Action Plan	2004, Amended 2006
Public Transportation Plan	1997
Highway Plan	1999, Reaffirmed 2006
Rail Freight and Passenger Plan	2001

The OTC originally adopted the OTP in September 1992, and an update of the OTP was adopted by the OTC in September 2006. The OTP has seven goals: (1) Mobility and Accessibility, (2) Management of the System, (3) Economic Vitality, (4) Sustainability, (5) Safety and Security, (6) Funding the Transportation System, and (7) Coordination, Communication and Cooperation. The OTP meets a legal requirement that the OTC develop and maintain a plan for a multimodal transportation system for Oregon. Additionally, the OTP implements the federal Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU, 2005) requirements for the State transportation plan. The OTP also meets land use planning requirements for State agency coordination and the Goal 12 TPR. This rule requires ODOT, and the cities and counties of Oregon to cooperatively plan and develop balanced transportation systems.

The OTP also requires local governments to prepare an analysis of future city, county, and state funding for the short, medium, and long term planning horizons and to develop transportation improvement alternatives given a revenue constrained funding scenario (Investment Scenario's, Level 1-3).

1999 TSP Assessment

The 1999 Aurora TSP included a financial analysis but did not take into consideration a revenue constrained funding scenario. The 2009 TSP will need to include an updated financial analysis that is developed consistent with the 2006 Oregon Transportation Plan method of analysis. The updated financial analysis shall include an analysis of future local, county, and state funding in order to consider transportation improvements possible for the short, medium, and long term planning horizon.

1.3 OREGON BICYCLE AND PEDESTRIAN PLAN (1995)

The Oregon Bicycle and Pedestrian Plan (OBPP) guides planning and the design and operation of facilities for bicycle and pedestrian travel. This Plan is divided into two sections, (1) Policy & Action and (2) Planning, Design, Maintenance & Safety. Section 1, Policy & Action, provides background information and addresses the goals, actions, and implementation strategies ODOT proposes to improve bicycle and pedestrian transportation. The material on Walkway Planning, Design Maintenance & Safety, provides guidelines to ODOT, cities and counties in design, construction and maintenance of pedestrian and bicycle facilities.

The OBPP is often used by local governments as a guide for the planning and design of facilities for these travel modes. The 2003 HDM also contains sidewalk and bicycle lane standards that are inconsistent, and in some cases more stringent than those found in the 1995 OBPP. An update of the OBPP was due for completion in 2007. This update will modify the standards in the OBPP to bring them into consistency with the HDM.

1999 TSP Assessment

As of this writing, the ODOT website does not show that the OBPP update has been completed. If it is completed during the update of the Aurora TSP, the updated plan and the Aurora TSP and implementing ordinances will be reviewed for consistency. The current OBPP identifies the goal of bike lanes and sidewalks on 100% of urban state highways which corresponds to the current City TSP. The OBPP also identifies six foot to eight foot sidewalks as standard sidewalks widths within city limits and six feet as the standard width for paved pedestrian and bike lanes along urban arterial and collectors. Updated sidewalk and multi-use path standards will be included in the Development Code and in the TSP as a part of this TSP update process.

1.4 OREGON TRANSPORTATION SAFETY ACTION PLAN (2006)

The Oregon Transportation Safety Action Plan established the safety priorities for Oregon by identifying 70 actions relating to all modes of transportation, including roadway, driver, and vehicle aspects. Included in the plan is a specific action regarding the way safety issues should be considered in local transportation planning. According to the plan, local transportation plans, as well as modal and corridor plans, should consider the following:

- Involvement in the planning process of engineering, enforcement, and emergency service personnel as well as local transportation safety groups;
- Safety objectives; and
- Resolution of goal conflicts between safety and other issues.

1999 TSP Assessment

The Aurora TSP was acknowledged and is consistent with the Oregon Transportation Safety Action Plan. During the Aurora TSP update, if changes are proposed, they will be compared to the Safety Action Plan to ensure any changes to the TSP are consistent with the Safety Action Plan.

1.5 OREGON PUBLIC TRANSPORTATION PLAN (1997)

The Oregon Public Transportation Plan is primarily focused on public transportation in metropolitan and urban areas. Aurora's most recent estimated population is 920 (Portland State University Center for Population Research 2006). The Oregon Public Transportation Plan's minimum public transportation LOS standards for rural communities with a population less than 2,500 that will apply to Aurora by the year 2015 include:

- Provide public transportation service to the general public based on locally established service and funding priorities.
- Provide an accessible ride to anyone requesting service.
- Provide a coordinated centralized scheduling system in each county and at the state level.
- Provide phone access to the scheduling system at least 40 hours weekly between Monday and Friday.
- Respond to service requests within 24 hours (not necessarily provide a ride within 24 hours).

1999 TSP Assessment

The CAT serves the North Marion County area. CAT provides public transportation service to North Marion County, including the City of Aurora, consistent with the LOS standards established in the 1997 Oregon Public Transportation Plan. Public transportation services

available to Aurora residents include fixed route service to Canby and Woodburn seven times daily, Monday – Friday, via the CAT orange line. Dial-a-ride service is currently not available to Aurora residents. Goals and policies in the current Aurora TSP and Comprehensive Plan support the continued operation of regional transit services.

1.6 OREGON HIGHWAY PLAN (1999)

The OHP defines policies and investment strategies for Oregon's State highways for the next 20 years. Additionally, it refines the goals and policies of the OTP and is part of Oregon's Statewide Transportation Plan. The OHP has three main elements:

- The Vision presents a vision for the future of the State highway system, describes economic and demographic trends in Oregon, describes future transportation technologies, summarizes the policy and legal context of the Highway Plan, and contains information on the current highway system;
- The Policy Element contains goals, policies, and actions in five policy areas: system definition, system management, access management, travel alternatives, and environmental and scenic resources; and
- The System Element contains an analysis of State highway needs, revenue forecasts, descriptions of investment strategies and implementation strategies, and performance measures.

The Highway Plan gives policy and investment direction to corridor plans and transportation system plans that are being prepared around the State, but it leaves the responsibility for identifying specific projects and modal alternatives to these plans.

1999 TSP Assessment

Specifically relevant to the Aurora area are the Highway Plan traffic operational and access management standards that apply to Oregon 99E.

The 1999 TSP (Table 7-2, pg 7-8) includes access management standards for Oregon 99E that range from 275 feet to 475 feet depending on the posted speed limit for each roadway segment. The City's access management spacing standards do not appear to be consistent with the requirements stated in the OHP for regional highways which are specified as ranging from 350 feet to 750 feet for speeds between 30 and 35 mph.

The OHP also identifies Oregon 99E as having a maximum volume-to-capacity (V/C) ratio of 0.85 for statewide, non-freight route, highways outside of a Metropolitan Planning Organization (MPO) and Special Transportation Area (STA) with speed limits equal to or less than 35 mph. South of Orchard Avenue, the speed limit increases to 50 mph and the maximum V/C ratio changes to 0.80.

The City intends to apply to ODOT for the establishment of a STA designation within the City's downtown area. If implemented within Aurora, the City would work with ODOT to apply special highway standards within the STA related to access management, signal spacing, travel time and level of service, and street improvements.

1.7 OREGON RAIL FREIGHT AND PASSENGER PLAN (2001)

This plan presents an overview of the rail system in Oregon. It outlines the State rail planning process and examines specific rail lines in detail that may be eligible for State or Federal financial assistance. The Plan examines the trend of service on low-density rail lines increasingly provided by the short haul (Class III) railroads. In addition, the plan describes minimum LOS standards for freight and passenger rail systems in Oregon. The previously

adopted Passenger Policy and Plan (1994) is now a component of the Oregon Rail Freight and Passenger Plan.

In 1999, the OTC adopted policies relating to rail service, one of which is relevant to the Aurora TSP if the railroad ROW is used in the future for rail service and stated as follows:

- Policy 4: Integrate rail freight considerations into the State's land use planning process.
    - Action 1. Recognize the social, economic, and environmental importance of rail freight service.
    - Action 2. Encourage land use zoning and ordinances that enhance and protect existing rail freight service.
    - Action 3. Work with communities to minimize conflicts between railroad operations and other urban activities.
    - Action 4. Assist in removing constraints to improved railroad operating efficiency within urbanized areas. Work with communities to consolidate or close existing grade crossings and prevent the establishment of unjustifiable new grade crossings.

1999 TSP Assessment

Relative to the Aurora area, a railroad right-of-way (ROW) runs north/south through the middle of the City. The current TSP does not identify future right-of-way or future pedestrian accessways which interfere or cross the existing Union Pacific line.

It should be noted that Oregon Revised Statute (ORS) 197.794 requires that cities provide notice to railroad companies upon certain applications for land use decisions, limited land use decisions or expedited land use decisions. As used in this section, "railroad companies" has the meaning given that term in ORS 824.200. If a railroad-highway crossing provides or will provide the only access to land that is the subject of an application for a land use decision, a limited land use decision or an expedited land division, the applicant must indicate that fact in the application submitted to the decision maker. The decision-maker shall provide notice to the Department of Transportation and the railroad company whenever the decision-maker receives the information described under subsection (2) of this section. [2003 c.145 §2]

1.8 OREGON ADMINISTRATIVE RULES REGARDING ACCESS MANAGEMENT (OAR 734-051)

ODOT manages access to the highway facilities of the State to the degree necessary to maintain functional use, highway safety, and the preservation of public investment consistent with the 1999 OHP and adopted local comprehensive plans. The purpose of Oregon's Access Management Rules is to govern the issuing of construction, operation, maintenance, and use permits for approaches onto State highways, State highway rights-of-way, and properties under the State's jurisdiction. These rules also govern closure of existing approaches, spacing standards, medians, variances to the standards, appeal processes, and grants of access.

Through these rules, the State indicates its policy to manage the location, spacing, and type of road and street intersections and approaches on State highways to assure the safe and efficient operation of State highways consistent with their classification, and the designation of the particular highway segment. OAR 734-051 contains policies and standards regulating access, and generally holds that access control should be considered beneficial when:

- Protecting resource lands;
- Preserving highway capacity on land adjacent to an UGB; or

- Ensuring safety on segments with sharp curves, steep grades, or restricted sight distance or those with a history of accidents.

1999 TSP Assessment

State Oregon 99E runs through Aurora from north to south with minimal turns or curves through the city limits. ODOT plans and Aurora's TSP call for coordination to address issues related to Oregon 99E and there has been good coordination among the parties since the original TSP was adopted. OAR 734-051 requires that the Aurora TSP and Development Code include access management standards that comply with the requirements of the OHP. See OHP above.

1.9 FREIGHT MOVES THE OREGON ECONOMY

This publication states, "Freight plays a major role in moving the Oregon economy. Most freight moves by truck, rail, waterway, air, and pipeline with trucks accounting for the greatest volume." According to the publication, Oregon's major roadway corridors for moving freight correspond to federal or state highways. This publication indicates that those highways not on the State Highway Freight System have common problems, including: congestion; access; pavement in poor condition; and inadequate bridges. It also notes that freight haulers experience congestion related problems, including difficulty making turning movements between local roads and highways.

1999 TSP Assessment

Though the City of Aurora is not on the State Highway Freight System, the City has one highway on the State Highway System, Oregon 99E, that receives frequent truck traffic. Truck traffic on Oregon 99E experiences congestion during peak hours in the downtown commercial core.

1.10 STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM 2008-2011

The STIP is the State's transportation capital improvement program. It fulfills the requirements of the Federal Safe, Accountable, Flexible, Efficient, Transportation Equity Act: a Legacy for Users (2005). The STIP lists the schedule of transportation projects for the four-year period from 2008 to 2011. It is a compilation of projects utilizing various federal and State funding programs, and includes projects on the State, County and City transportation systems as well as projects in the National Parks, National Forests, and Indian Reservations.

1999 TSP Assessment

There are two improvement projects programmed in the 2008 to 2011 STIP for the Aurora area:

- Key 14805. Milepoints 24.71 to 24.91. Oregon 99E/Pudding River Relief Channel Bridge #01830. To include repair of cracks in caps & columns; seismic retrofit; retrofit rails.
- Key 13624. Milepoints 24.93 to 45.89. Oregon 99E Aurora-Salem Paving and Safety Improvements. To include a pavement overlay.

1.11 MARION COUNTY COMPREHENSIVE PLAN, TRANSPORTATION ELEMENT (ADOPTED 1998 AND UPDATED 2005)

The Comprehensive Plan for Marion County establishes the official goals and objectives related to future development in the County. These goals and policies are divided into nine Sections:

A. Agricultural Lands.

B. Forest and Farm/Timber Lands.

C. Rural Development.

D. Urbanization.

E. Transportation.

F. Parks and Recreation.

G. Economic Development.

H. Environmental Quality and Natural Resources.

I. Energy.

Section E, Transportation, includes a mission statement and nine goals with objectives as stated below.

MISSION STATEMENT: Develop a balanced, multi-modal transportation system to accommodate planned growth, facilitate economic development, recognize fiscal reality, and maintain a high standard of livability and safety.

GOAL 1: Improve transportation system safety.

Objective 1.1: Improve system safety for and between all modes of transportation.

Objective 1.2: Dedicate adequate resources to ensure that the transportation system is properly maintained and preserved.

GOAL 2: Provide an accessible, efficient and practical transportation system appropriate to both urban and rural areas throughout the County.

Objective 2.1: Improve mobility and access options to transportation facilities throughout Marion County for transportation system users.

Objective 2.2: Facilitate goods movement into and out of area; increase freight (truck, rail, air and water) mobility and inter-modal transfer.

Objective 2.3: Facilitate shipping of goods by most efficient and least-impacting means possible.

Objective 2.4: Address changing characteristics of trucking, aviation, agriculture and rail industries.

Objective 2.5: Facilitate system connections as needed to improve efficiency and access.

GOAL 3: Provide sufficient transportation capacity.

Objective 3.1: Address existing priorities and projected growth.

Objective 3.2: Adequately provide for the transportation needs of residents, businesses, customers and visitors.

Objective 3.3: Encourage and support actions that reduce demand on the transportation system.

Objective 3.4: Encourage and support actions that maximize value and efficiency of the existing system.

GOAL 4: Recognize fiscal reality.

Objective 4.1: Facilitate best usage of available financial resources.

Objective 4.2: Be ready to use additional resources efficiently if they become available, and be able to show what benefit results from those resources.

Objective 4.3: Facilitate procurement of grant funding.

Objective 4.4: Recognize that due to financial limitations, not all goals and objectives will be met to the ideal extent.

GOAL 5: Work in partnership with communities to address needs and values.

Objective 5.1: Minimize adverse impact of transportation system on quality of life in communities.

Objective 5.2: Facilitate regional through movement of goods and services while minimizing conflict between through movement and livability in central city areas.

Objective 5.3: Minimize adverse impact of transportation system on quality of life and environment in rural areas.

Objective 5.4: Foster cooperation between the County and cities to address a wide variety of transportation issues.

GOAL 6: Promote alternative modes of transportation.

Objective 6.1: Facilitate provision of opportunities for a variety of transportation options.

Objective 6.2: Reduce dependence on any one mode of transportation.

Objective 6.3: Facilitate and support improved connections between different modes.

Objective 6.4: Support land use planning strategies that facilitate efficient transportation system use and development.

GOAL 7: Consider land use and transportation relationships.

Objective 7.1: Integrate land use planning and transportation planning to manage and plan the transportation system.

Objective 7.2: Minimize detrimental effects of transportation improvements on rural land uses.

Objective 7.3: Ensure an environmentally responsible/environmentally sound transportation system that minimizes adverse impacts on air and water.

Objective 7.4: Ensure transportation-related activities comply with clean air and water requirements and fish and wildlife habitat management regulations.

Objective 7.5: Protect established land uses including prime farmland, forestland and other natural resources.

GOAL 8: Address transportation policy issues and intergovernmental coordination.

Objective 8.1: Improve coordination with all affected jurisdictions to meet future transportation needs.

Objective 8.2: Facilitate development of coordinated transportation design standards.

Objective 8.3: Emphasize facilitation, rather than restriction/regulation of business.

Objective 8.4: Ensure cost-effective investment in transportation. Improvements should be fiscally responsible, economically efficient and realistic.

Objective 8.5: Comply with applicable Transportation Planning Rule requirements for rural transportation system planning.

Objective 8.6: Maintain an ongoing public involvement process.

GOAL 9: Provide a useful plan document.

Objective 9.1: Accurately reflect the existing and future transportation systems, issues and needs of Marion County.

Objective 9.2: Identify methods for funding recommended actions.

Objective 9.3: Provide clear planning direction.

Objective 9.4: Maintain and update a list of issues for further study.

Objective 9.5: Extend usable life of existing facilities; provide a maintenance element.

Objective 9.6: Provide for a periodic review and update of the Plan that allows for improvements to be made as circumstances change regarding transportation issues throughout the County.

1999 TSP Assessment

The Aurora and Marion County Plans were acknowledged and are coordinated. No conflicts have been identified between the Aurora TSP and Marion County Comprehensive Plan.

1.12 MARION COUNTY RURAL TRANSPORTATION SYSTEM PLAN (2005)

The Marion County Rural Transportation System Plan (RTSP) also serves as the Transportation Element of the County's Comprehensive Plan. The Marion County RTSP includes the physical and operational conditions of County transportation facilities including: roadways, bicycle and pedestrian facilities, traffic control devices, public transportation providers, rail crossings, airports, ferries, pipelines, and utility and communication lines.

Marion County Transportation Projects

The Marion County RTSP also identifies a 20-year recommended improvement project list for Marion County. The project list includes existing and future needs of the Marion County rural roadway system and the improvements recommended to address those needs, as well as transportation system needs, besides roads, that move people and goods. Below are the needs and recommended improvements from the Marion County RTSP near the Aurora urban area:

- **Marion County Off-Roadway Bicycle and Pedestrian Improvements**. Mill Creek – There is an effort to develop a trail along Mill Creek from Woodburn to Hubbard to Aurora, with possible connections to other destinations in northern Marion County. This trail would provide good scenery, community connectivity, and economic development potential. Though there is some property owner opposition to developing this trail, further analysis and planning of this trail is recommended, and the City generally supports the trail for the transportation, recreation, and economic development opportunities that come with it, provided that its impacts can be appropriately mitigated.
- **Recommended Transit Service Corridors.** While it is not a public transportation provider, Marion County supports and works with local service providers towards implementing programs for the provision of transportation services. The County works with the WHEELS Community Transportation Program, including the

Chemeketa Area Regional Transportation System (CARTS), run by Oregon Housing and Associated Services (OHAS) and intends to continue to do so. The RTSP includes an evaluation of existing public transportation services and resources, an identification of unmet transportation needs, and a list of prioritized strategies to meet the identified transportation needs:

- Oregon 99E from Woodburn (through Hubbard, and Aurora) to Canby and Oregon City, perhaps continuing to downtown Portland – This would connect with Portland-area TriMet and/or the SMART. If a future Metropolitan Area eXpress (MAX) line, a service of TriMet, is constructed in the area, this service should then also connect with one of the southern MAX stations. Extending this service to Gervais, Mt. Angel, and Silverton might also be worth consideration.
- Interstate 5 from Woodburn (through Hubbard and Aurora or Donald) to Wilsonville, Tualatin, and Portland (with possible express service from Woodburn to the downtown Portland Transit center) – This would connect with TriMet and/or SMART. If a future MAX line is constructed in the area, this service should then also connect with one of the southern MAX stations. A connection would also be appropriate to any commuter rail line established in the area (such as a Wilsonville to Beaverton commuter line). Extending this bus line to Gervais, Mt. Angel, and Silverton might also be worth consideration.

- **Recommended Corridor Studies.** Oregon 99E from Salem to Clackamas County – This study would consider safety, capacity, goods movement, regional traffic movement, community livability, economic vitality, and other issues. Oregon 99E serves as the major transportation route to and through the communities of Woodburn, Hubbard, Aurora, Gervais, and Brooks, as well as connecting these communities with Salem. This highway also serves as a major farm-to-market route for the significant agricultural businesses and farms in the area. Traffic volumes have increased on this road to the point where delay and poor LOS are common occurrences, and capacity problems are worsening quickly. In addition, as this road bisects many of these communities, the high volume of traffic can have a detrimental effect on quality of life in surrounding communities, businesses, and the economy. This study would consider safety, capacity, goods movement, regional traffic movement, community livability, economic vitality, and other issues. This study may be combined with study of Oregon 99E in Clackamas County, as Oregon City or Canby may be logical northern endpoints for this study.

Air Plan – Aurora State Airport Master Plan Update

This plan was completed in 1999, and is summarized in the Marion County RTSP. Aurora State Airport has a single asphalt concrete runway with a full-length parallel taxiway. The runway is 5,000 feet long by 100 feet wide, and is equipped with Medium Intensity Runway Lights (MIRLs) with Visual Approach Slope Indicators (VASIs) at both ends. Runway pavement strength is rated at 30,000 pounds for aircraft with single wheel landing gear and 45,000 for aircraft with two wheels per landing gear. Improvements planned for construction by 2018 are summarized in the 1999 Aurora State Airport Master Plan Update.

Rail Plan

Marion County supports continued and increased freight and passenger rail service along the existing rail lines in Marion County. The County generally supports improvements that would increase the efficiency of rail transportation (freight and/or passenger) as long as the impacts of these improvements can be appropriately addressed. The County also supports

continuation and expansion of the existing passenger rail service through Marion County. Improvements to maintain and/or improve track speeds for freight and/or passenger service are encouraged.

1999 TSP Assessment

The Aurora TSP could be updated to include the Marion County Off-Roadway Bicycle and Pedestrian Improvements listed in the County RTSP project list located near the Aurora urban area. The bicycle and pedestrian plan found in the 1999 Aurora TSP does not include a plan to develop a trail along Mill Creek.

The public transportation service improvements identified in the County transportation project list are not included in the Aurora TSP. Since the completion of the 1999 Aurora TSP, the Canby Area Transit (CAT) has been created. Expanded services between the cities of Aurora and Woodburn and Aurora and Canby continues to be a public transportation need along with additional public transportation for special events. The Aurora TSP could be revised to include an update to services provided as well as an identification of unmet transportation needs and a list of prioritized strategies to meet the identified transportation needs. A special focus of the plan is to identify opportunities for transportation coordination between the numerous transportation providers and human service agencies. There is also a need for bus shelters to better identify bus stop areas.

The Aurora TSP could be updated in include support for a corridor study between Oregon 99E from Salem to Clackamas County to consider safety, capacity, goods movement, regional traffic movement, community livability, economic vitality, and other issues consistent with the County's Recommended Corridor Studies.

The Aurora TSP could be updated with a policy to support increased freight and passenger rail service along existing lines consistent with the County's Rail Plan. The Aurora TSP currently includes a policy to increase the use of alternative modes of transportation through improved access, safety, and service.

The Aurora TSP could be updated to include additional information regarding the Aurora State Airport Master Plan Update (1999).

1.13 AURORA COMPREHENSIVE PLAN (1989, 2000)

The City of Aurora Comprehensive Plan was adopted by the City of Aurora in 1979 and acknowledged by the Land Conservation and Development Commission on January 27, 1983. Since 1979, the Plan has undergone Periodic Reviews in 1981, 1987, and 1998 with final adoption of the most recent version in 2002. The purpose of the Plan is to provide for orderly growth and to encourage development of a community that meets the needs of its current and future residents. The Plan is the City's highest policy document and establishes the policy framework for future growth decisions.

The Aurora Comprehensive Plan goals and policies relevant to the TSP include the following:

- Planning Process, Policy 4. Elements in the comprehensive plan which will receive special attention include growth and urbanization, transportation, public facilities, recreation, and economic development.
- Growth and Urbanization, Objective. Achieve orderly development in the community by providing a workable program for managing growth.
- Air, Water, and Land Resources, Policy 3. The City will more carefully control the relationship of future development to and abutting Oregon 99E. Permitted development will be subject to adequate setback and buffer requirements to minimize noise impacts.

- Energy, Policy 4. The City will support development of mass transit, carpooling, and bicycle and pedestrian facilities to reduce dependence on the automobile.
- Public Facilities, Objective 1. Provide adequate public facilities and services necessary to accommodate the City's growth until the year 2020.
- Public Facilities, Objective 2. Plan and develop these facilities and services in a coordinated, efficient, and economical manner.
- Public Facilities, Policy 12. Street Lighting: The City will require future development to include adequate street lighting facilities.
- Transportation Policies, Objective 2. Encourage transportation improvements which support the community's economic development and create a pedestrian friendly atmosphere.
- Transportation Policies, Objective 3. Establish a street system which is consistent with orderly growth, minimizes conflicts with adjacent land use, and provides a circulation system which is safe and efficient for both vehicles and pedestrians.
- Transportation Policies, Objective 4. Encourage energy conservation through efficient transportation planning.
- Transportation Policies, Objective 5. Promote a multi-agency regional transportation strategy.
- Transportation Policies, Policies 1. The City will be guided by the updated 1999 TSP in developing a transportation system including but not limited to:
    a. Identifying public transportation services to meet the needs of those who are transportation disadvantaged.
    b. Encouraging the use of carpools, vanpools, and other strategies to increase automobile and energy efficiency.
    c. Providing bike paths and ADA compliant sidewalks to connect schools, parks, and shopping facilities with residential areas when economically feasible.
    d. Establishing priorities for the expenditure of state and federal highway funds within the City.
    e. Designating and protecting corridors for future collector streets to ensure adequate access for developing areas within the City and UGB.

1999 TSP Assessment

The findings section of the Transportation section of the Comprehensive Plan will need to be updated with the adoption of the 2009 TSP update.

1.14 AURORA PARKS MASTER PLAN (2005)

The City of Aurora adopted a Parks Master Plan in 2005 to guide the future development of parks and recreation facilities in the city. The Parks Master Plan includes a chapter on the Mill Creek Greenway Trail (Chapter 5) that discusses the need for a comprehensive guide and/or master plan to the acquisition, development, public use, and management of the trail between Woodburn and Aurora. The chapter also emphasizes the need to work closely with the City of Woodburn in accomplishing these goals. In addition, the Parks Capital Improvement Plan includes a line item and budget for development of the Mill Creek Greenway.

1999 TSP Assessment

The 1999 TSP does not indicate a pedestrian and bicycle trail along Mill Creek and should be updated in the 2009 TSP to be consistent with the 2005 Parks Plan.

1.15 AURORA MUNICIPAL CODE (2003)

By establishing specific standards for development, the Aurora Municipal Code implements portions of the Aurora TSP. Specific standards established within the Aurora Municipal Code include:

- Street Design Standards

  The Aurora Development Code includes street standards as found in Subchapter 16.34.020 and 16.34.030.1 that indicate right-of-way and improvement widths consistent with standards found in the TSP and public works design standards.

- Access

  The Development Code includes access control standards as found in Section 16.34.040.E.4 that indicate the minimum access spacing standards between all driveways and streets. However, the access spacing standard is referenced under a subsection regarding flag lots and the same subsection should be referenced again as an independent item. Reference to access spacing standards in the TSP could also be added under each of the zoning districts.

- Blocks

  Section 16.34.040.B states that "No block shall be more than one thousand (1,000) feet in length between street corner lines unless it is adjacent to an arterial street, or unless the topography or the location of adjoining streets justifies an exception." The recommended minimum length of blocks along an arterial street is one thousand eight hundred (1,800) feet. ODOT recommends no more than 600 feet for each block face. The City may wish to consider reducing the maximum length from 1000 feet to 600 feet.

- Sidewalks

  Subsection 16.34.060.A. requires sidewalks on all public streets except as exempted by the Aurora transportation system plan and shall be constructed, replaced or repaired in accordance with the city's public works design standards, Appendix A, Illustrations 10, 11, and 12 set out at the end of this title. The City does not yet have adopted public works design standards but is working diligently to have these completed. Appendix A Illustrations 10, 11, and 12 require five foot minimum sidewalks except as exempted by Ordinance 419 (Historical Residential, Historic Commercial, Ehlen Road, etc.). Updated sidewalk and multi-use path standards will be included in the Development Code and in the TSP as a part of this TSP update process.

- Bikeways

  Section 16.34.110.A. states that developments adjoining proposed bikeways as shown in the Aurora transportation system plan shall include provisions for the future extension of such bikeways through the dedication of easements or rights-of-way. Section 16.34.110.B. indicates that minimum width for bikeways is four paved feet per travel lane.

1999 TSP Assessment

- Access spacing standards in the TSP (Table 7-2, pg 7-8) need to be updated to reflect Oregon 99E requirements for regional highway spacing ranging from the 350 feet to 750 feet. The City will work with ODOT to pursue establishment of an STA within the downtown core which may revise lighting and spacing standards within the STA.
- TSP Table 7-2 access spacing needs to be updated.

  TSP Table 7-1 does not decipher between Rural Arterial and Arterial in regards to sidewalk width requirements. Updated sidewalk and multi-use path standards will be included in the Development Code and in the TSP as a part of this TSP update process.
- Section 16.34.110.B. does not correspond with Table 7-1 of the TSP which requires a minimum bikeway width of six feet.
- The subdivision, PUD, and/or SDR application requirements lack a requirement for a traffic impact analysis if requested by the City.
- The TSP CAC has suggested development of a three-quarter street improvement requirement, or "late comer ordinance," as there are concerns that the current half-street improvement requirement is not satisfactory for the provision of transit.

APPENDIX C

Existing Conditions

1. INVENTORY OF EXISTING CONDITIONS

This appendix provides analysis of existing transportation conditions and supports the City of Aurora Transportation System Plan (TSP). This appendix provides a review of existing land uses and demographics, and the existing transportation system as it relates to all travel modes, including a discussion of traffic volumes and operations, crash history, and roadway access. The intersection analysis worksheets and traffic analysis methodologies which support this appendix are included in Technical Memorandum #1: Existing and Future Conditions, available from the City of Aurora.

1.1 BUILDABLE LANDS ANALYSIS

Land Use and Demographic Data

The City of Aurora is approximately 313 acres in size, including roadway rights of way. The land within the Aurora city limits is subject to Aurora land use ordinances and policies, including the Aurora Comprehensive Plan. The Aurora Comprehensive Plan uses four designations for all lands within the City; Commercial, Industrial, Low Density Residential (R-1), Moderate Density Residential (R-2) (see Table C-1).

Table C-1. City of Aurora Comprehensive Plan Designations

Designation	Acreage
Commercial	43.3
Industrial	28.6
R-1	166.3
R-2	14.5

In Aurora, most of the land with commercial designation is adjacent to Oregon 99E, as well as along the portions of Main Street and Ehlen Road that are within the historic downtown. Industrial land is located east of the rail line and west of Oregon 99E, in the southern part of the City. Commercially designated lands form a buffer between all Industrial properties and Oregon 99E. Most R-1 designated land within the City is located to the east of Oregon 99E, with the addition of lands north of Ehlen Road. The 14.5 acres of R-2 zoned land is all on the east side of Oregon 99E, abutting the southern city limits.

Buildable Lands

The project study area is 409 acres in size, and includes all land within the UGB. An assessment of buildable lands[1] for this area was performed to predict likely future development. The MWVCOG analyzed, parcel by parcel, the general land uses allowed within the study area, and assumed that either the existing zoning designation or the comprehensive plan designation would apply. The Buildable Lands data used in this report were compiled prior to completion of the 2009 Comprehensive Plan Update and Buildable Lands Inventory and represent the best data estimates available at the time.

[1] Buildable acreage does not include land that is physically constrained (for example, wetlands and steep slopes) or lands zoned Flood Hazard as residential or commercial development is not permitted in this zone. Buildable acreage for residential property has been reduced by 25% to account for land dedicated to public uses, such as easements and roadways.

Table C-2 shows the amount of available developable land, by land use type[2], within the study area. Figure C-1 shows the location of developable land. The information contained in both the table and figure is presented by relevant Transportation Analysis Zones (TAZs), which was used to determine new projected trips generated through 2030.

Table C-2. Aurora Buildable Acreage

TAZ	Comprehensive Plan Zoning Designation	Buildable Acreage
#1	Historic Residential	28.91
#2	Historic Residential	16.13
	Industrial	0.58
	Commercial	0.62
#3	Industrial	0.74
#4	Historic Residential	1
	R-1	2.240
#5		0
#6	Historic Residential	0.15
#7	R-1	1.680
#8	R-1	5.140
#9	Industrial	1.66
	Light Industrial	2.17
	Commercial	4.720
#10	R-1	1.160
#11	R-1	0.820
#12	R-1	7.220
#13	Industrial	4
	Commercial	4.34
#14	R-1	21.64
	R-2	23.17
	Total Historic Residential	46.19
	Total R-1	39.9
	Total R-2	23.17
	Total Industrial	6.98
	Total Light Industrial	2.17
	Total Commercial	9.68
	Total Buildable Acreage	**128.09**

[2] "Land use types" are a hybrid of Zoning and Comprehensive Plan designations, and are categorized using Zoning labels. Historic Residential Zoning is an overlay which allows fewer units per acre than R-1.

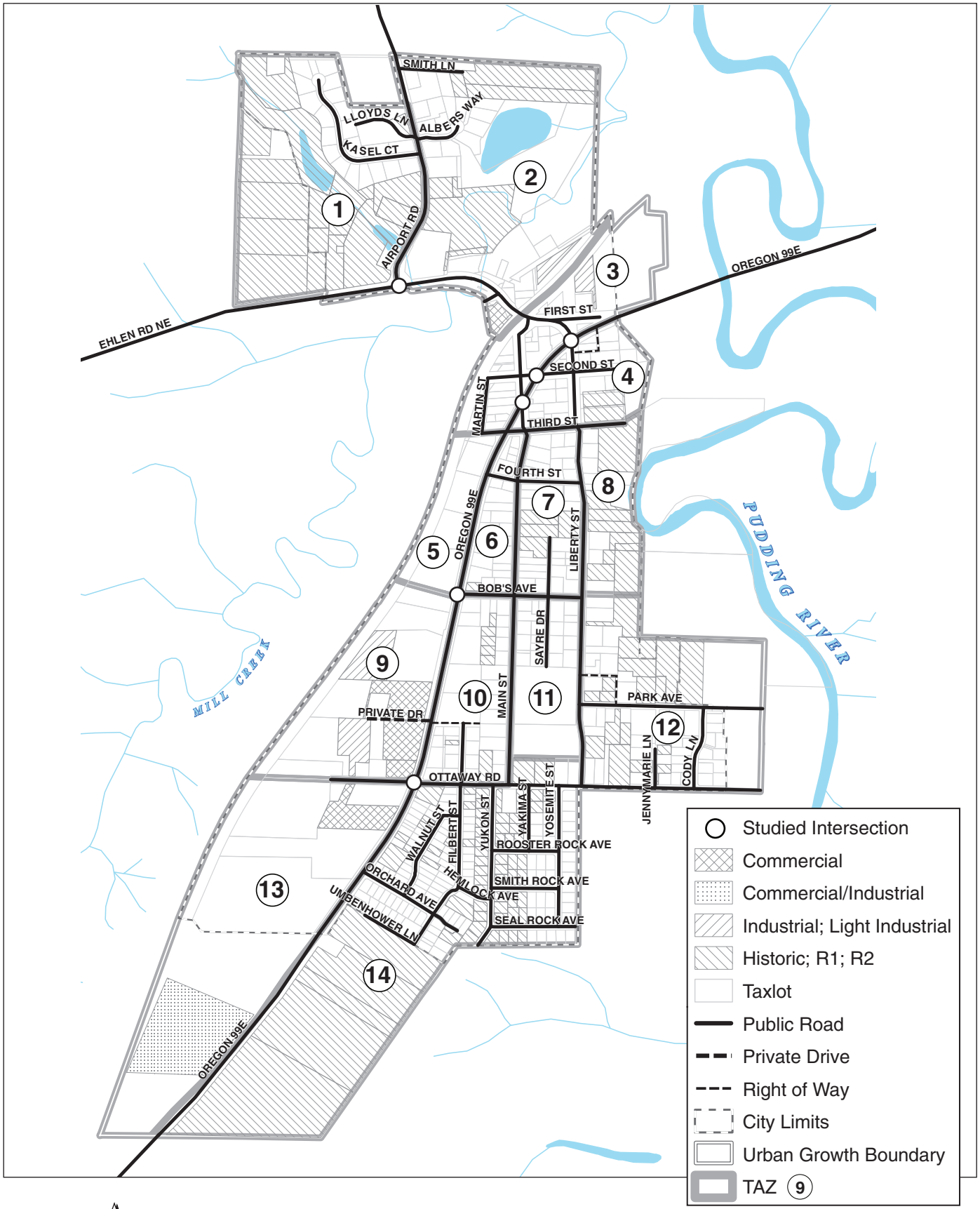

Figure C-1
Buildable Land Inventory

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1.2 EXISTING (2008) TRAFFIC OPERATIONS

This section addresses transportation system volumes and operations on Oregon 99E at key intersections in the Aurora study area in the year 2008:

- Oregon 99E at Liberty Street/1st Street (signalized)
- Oregon 99E at 2nd Street (unsignalized)
- Oregon 99E at Main Street (unsignalized)
- Oregon 99E at Bob's Avenue (unsignalized)
- Oregon 99E at Ottaway Road (unsignalized)

2008 transportation system volumes and operations are also addressed at:

- Ehlen Road at Airport Road (unsignalized)

Each of the unsignalized intersections is stop-controlled on the minor street approach. Only the Oregon 99E/Liberty Street intersection operates with a traffic signal. 2008 lane configurations and traffic control for the six study area intersections are shown in Figure C-2.

Intersections Operational Standards

Within the state of Oregon, traffic operations are evaluated based on two sets of criteria or standards. The operative standard used by ODOT for state highways is the volume-to-capacity (V/C) ratio, and is expressed in terms of a ratio between traffic volumes and the roadway or intersection's capacity. Many local communities assess the quality of traffic performance in terms of intersection or roadway levels of service (LOS). These two operational standards are described below.

Volume-to-Capacity Standard

The Oregon Highway Plan (OHP) Volume/Capacity (V/C) mobility standards apply to Oregon 99E within the City of Aurora. Within the city, Oregon 99E is classified as a Regional Highway for the segment southwest of 4th Avenue and northeast of Liberty Street. Oregon 99E is classified as a Regional Highway with a Special Transportation Area (STA) designation from Liberty Street to 4th Avenue. The V/C standard represents the maximum ratio for "acceptable" traffic operations. A V/C ratio of 0.85 means that 85 percent of the capacity of the roadway is utilized based on an established planning level capacity and measured traffic volume. The peak hour, maximum V/C standards for Oregon 99E are:

- Inside the UGB and outside the STA boundary:
  - With speeds less than or equal to 35 mph the mobility standard is 0.85.
  - With speeds greater than 35 mph the standard is 0.80.
- Inside the UGB and inside the STA boundary:
  - The operations standard V/C ratio is 0.95.

An STA designation also provides for modified access management, signal, travel time, and street improvement standards. These standards emphasize local accessibility and community function over capacity and through traffic needs.

Airport Road and Ehlen Road are Marion County facilities, with a V/C standard of 0.90 and a Level of Service (LOS) standard of E. Currently, the study area intersections generally experience minimal delays and operate within their respective V/C or LOS standards. The

exception is the southbound movement at Airport Road and Ehlen Road, a county intersection that has a failing LOS F.

Traffic queuing analysis measures the length of vehicles stopped at intersections during peak periods and is another measure of how well the roadway system is performing. Analysis conducted at the intersection of Oregon 99E and Liberty/1st Street indicates that both the eastbound left turn lane and the southbound right turn lane currently exceed the available vehicle storage for these movements. During peak periods, traffic will occasionally spill back into the through travel lanes blocking traffic that does not desire to turn.

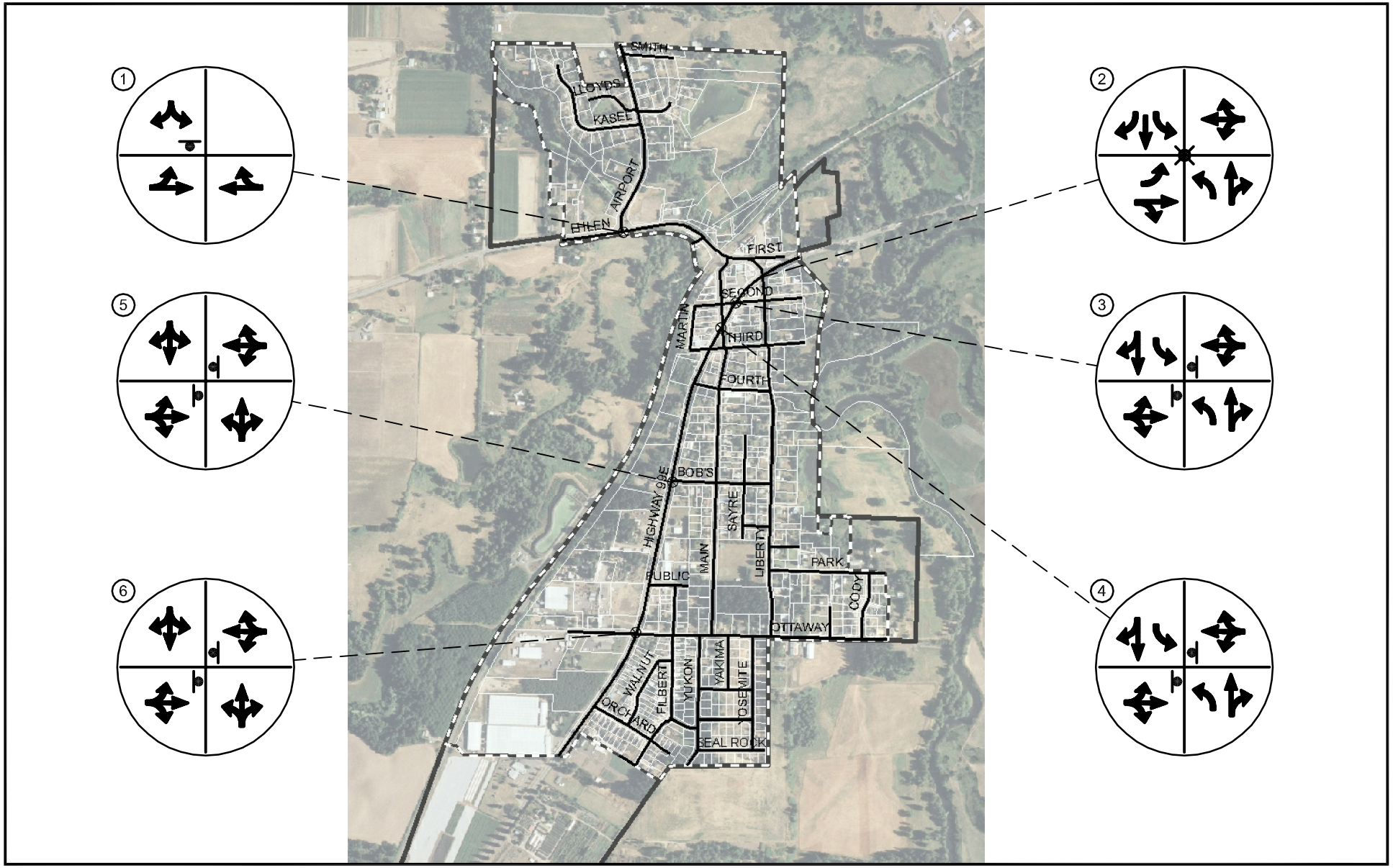
Intersection Level of Service Standard

Another measure of intersection operating performance during peak travel periods is based on average control delay per vehicle entering the intersection. This delay is calculated using equations that take into account turning movement volumes, intersection lane geometry and traffic signal features, as well as characteristics of the traffic stream passing through the intersection, including time required to slow, stop, wait, and accelerate to move through the intersection. Various levels of delay are then expressed in terms of LOS for either signalized or unsignalized intersections. The various LOS range from LOS A (free-flow conditions) through LOS F (operational breakdown). Between LOS A and LOS F, progressively higher LOS grades reflect increasingly worse intersection performance, with higher levels of control delay and increased congestion and traffic queues. Characteristics of each LOS are briefly described below in Table C-3.

Table C-3. Level of Service Definitions

	Average Delay/Vehicle (sec.)		
Level of Service	**Signalized**	**Unsignalized**	**Description**
A (Desirable)	<10 seconds	<10 seconds	Very low delay; most vehicles do not stop.
B (Desirable)	>10 and <20 seconds	>10 and <15 seconds	Low delay resulting from good progression, short cycle lengths, or both.
C (Desirable)	>20 and <35 seconds	>15 and <25 seconds	Higher delays with fair progression, longer cycle lengths, or both.
D (Acceptable)	>35 and <55 seconds	>25 and <35 seconds	Noticeable congestion with many vehicles stopping. Individual cycle failures occur.
E (Unsatisfactory)	>55 and <80 seconds	>35 and <50 seconds	High delay with poor progression, long cycle lengths, high V/C ratios, and frequent cycle failures.
F (Unsatisfactory)	>80 seconds	>50 seconds	Very long delays, considered unacceptable by most drivers. Often results from over-saturated conditions or poor signal timing.

Source: 2000 Highway Capacity Manual, Transportation Research Board.



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LEGEND

SIGNALIZED INTERSECTION

STOP SIGN CONTROLLED INTERSECTION

N

Figure 2-3
Existing Intersection Characteristics

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Traffic Volumes

ODOT provided 16 hour turning movement counts for the study intersections, based on data that had been collected in October 2007. An adjustment to the count data was required to translate data from previous years so that they all represented 2008 volumes. Additionally, as traffic volumes vary with the seasons, further adjustments were required for counts taken outside of the peak season to ensure that they reflect "typical" conditions or the 30th Highest Hour (30th HV). The 30th highest hour of the year is the hourly volume used for design of roadway improvement projects. Hours higher than the 30th are typically holidays and other high-traffic days of the year, and it is not appropriate to design for the highest hour as the design may be overbuilt. The methodology and calculation for these adjustments is summarized in Appendix B of Technical Memorandum #1. The traffic count data is summarized in Figure C-3 and reflects the 30th HV traffic volumes.

Traffic Operations at Study Intersections

The analysis of existing 30th HV traffic operations was conducted using a Synchro traffic simulation model developed specifically for the study area intersections. This model includes field-verified geometrics and other relevant physical data. Analysis procedures follow guidelines from the ODOT Transportation Planning and Analysis Unit (TPAU).

Table C-4 summarizes existing (2008) traffic operations for the 30th HV at the intersections in the study area. Data in these tables includes the overall intersection V/C ratios, average intersection delay, and intersection levels of service (LOS). V/C ratios above 1.0 are useful indicators of potential concerns such as sub-optimal signal timing or inadequate turn lane storage. Intersection analysis worksheets are included in Appendix C of Technical Memorandum #1. Currently, the study area intersections generally experience minimal delays and operate within acceptable V/C standards. The southbound movement at Airport and Ehlen Road, a county intersection, has a failing LOS of F.

Table C-4. 2008 Traffic Operations Analysis Results

	V/C Ratio	Critical Delay (sec/vehicle)	Critical LOS
Signalized Intersection			
Oregon 99E @ Liberty-1st Street	0.86	56.0	E
Unsignalized Intersection / Critical Movement			
Airport Rd @ Ehlen Rd			
Southbound	0.88	68.9	**F**
Oregon 99E @ 2nd Street			
Southtbound Left	0.33	0.2	A
Oregon 99E @ Main Street			
Eastbound	0.18	12.9	B
Southbound Left	0.29	0.40	A
Oregon 99E @ Bob's Avenue			
Eastbound	0.00	0.0	A
Westbound	0.03	15.9	C
Oregon 99E @ Ottaway Road			
Eastbound	0.23	25.0	D
Westbound	0.03	16.9	C

Notes:

(1) V/C ratio is a ratio between traffic volumes and the roadway or intersection's capacity.

(2) LOS means intersection level of service.

(3) "Critical Delay" and "Critical LOS" refers to the delay or LOS experienced for the specific intersection traffic movement listed.

(4) Shading indicates failure to meet standard.

Traffic Observations at Liberty Street and Ottaway Road

Traffic count data was provided for the Liberty and Ottaway Road intersection from 7:00 to 9:00 AM and 4:00 to 6:00 PM. The counts indicate that approximately 54 trips pass through the intersection in the AM peak and 50 pass through the intersection in the PM peak. Currently the intersection is comprised of three approaches with the southbound (Liberty Street) stop controlled. There appears to be insufficient sight distance for southbound vehicles at the intersection. Grading and vegetation removal may be required to remedy the situation.

Intersection Traffic Queuing

Vehicle back-ups or "queues" at an intersection can have an effect on traffic safety and operations. Queues that exceed the available storage space at turn lanes can "spill back" and block the adjacent through lanes, creating a temporary reduction in capacity and increased delay. Traffic blocking intersections can act as unexpected obstructions that can result in a crash. In through lanes, long queues can block access to turn lanes, driveways, and minor street approaches, in addition to spilling back into other intersections.

For purposes of this appendix, the 95th percentile vehicle queue length has been used to identify where potential traffic queuing problems might currently exist. Calculation of the 95th percentile queue is based on the anticipated arrival patterns, duration of interruptions, and the ability of the intersection to recover from momentary heavy arrival rates. Traffic queuing analysis worksheets are included in Appendix C of Technical Memorandum #1 and are summarized in Table C-5, below.

Traffic queuing results shown in Table C-5 indicate that at the intersection of Oregon 99E and Liberty/1st Street both the eastbound left turn lane and the southbound right turn lane currently exceed the available vehicle storage for these movements.

Table C-5. Summary of Intersection Queuing

	Existing Storage (ft)	2008 Queue (ft)
Signalized Intersection		
Oregon 99E @ Liberty/1st Street		
Southbound Right	275	50
Eastbound Left	215	560
Unsignalized Intersection / Critical Movement		
Airport Road @ Ehlen Road		
Southbound	*	250
Oregon 99E @ 2nd Street		
Eastbound	*	25
Oregon 99E @ Main Street		
Eastbound	*	25
Westbound	*	0
Oregon 99E @ Bob's Avenue		
Westbound	*	0
Eastbound	*	0
Oregon 99E @ Ottaway Road		
Eastbound	*	50
Westbound	*	0

Notes:
(1) Lengths rounded to nearest 25 feet.
(2) Signalized intersections Estimated using Synchro.
(3) Estimated using Two-Minute Rule.
(4) * Single approach lane.

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LEGEND

XXX → TURNING MOVEMENT BY VOLUME BY DIRECTION OF TRAFFIC

N

Figure 2-4
2008 Intersection Turning Movements (30th HV)

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1.3 CRASH HISTORY

Crash data for the study area intersections were provided by the ODOT for a 9-year period from 1998 through year 2006. Analysis of this data was conducted for both roadway segments through the study area and the key intersections.

Roadway Segment Crash Analysis

Roadway segment crash data is analyzed on the basis of accidents per million vehicle miles of travel (MVMT), which considers both the number of crashes and the level of exposure to crashes expressed in terms of the total traffic volume carried along the roadway segment.

Table C-6 identifies crash data for the one mile segment of Oregon 99E in Aurora city limits. Using 5-year crash data, analysis indicates that none of the segments experience crash rates greater than 1.0/MVMT. Additionally, none of the segments experienced crash rates that exceed the average crash rate of 0.71 for all rural principal arterial highways in Oregon for the period from 2003 through 2007, (according to the ODOT Crash Rate Table II). A review of the data for Oregon 99E through the study area indicates that many of the collisions are rear end or turning movement crashes at public and private access points.

Table C-6. 2001-2006 Oregon 99E Segment Crash History

	Crash Type					Crash Severity			Total	
Segment	Rear-end	Turn	Angle	Side-swipe	Other	PDO	Injury	Fatal	Reported Crashes	Crash Rate/ MVMT
Oregon 99E										
Aurora City Limits (approx. I mile)	6	2	1	2	1	7	5	0	12	0.40

Source: ODOT 2008.

Notes:

(1) PDO means Property Damage Only. "Other" crashes include backing, pedestrian collisions, and hitting fixed objects.

(2) MVMT means million vehicle miles of travel.

The ODOT Project Safety Management System tracks crash data by district for segments and specific sites. The Safety Investment Program Segment Ratings rate the number of fatal/injury crashes per 5 mile segments from Category 1 (with zero crashes) to Category 5 (with more than 10 crashes). Using 2005-2007 data, Oregon 99E in the study area is rated as a Category 3 (3 to 5 fatal/injury crashes per 5 mile segment). According to the Safety Priority Index System (SPIS) there are no crash sites in the study area that require monitoring or mitigation.

Intersection Crash Analysis

The number of crashes per million entering vehicles (MEV) is used to calculate an intersection's "crash rate." The rate is then compared to crash rates on similar type of facilities throughout Oregon. A rate greater than other similar facilities is commonly used as a threshold to identify locations that warrant further analysis, potentially leading to implementation of measures to improve safety.

Table C-7 identifies crash rates and types and severity at study area intersections. None of the study intersections exceed 1.0/MEV. No further analysis is recommended.

Table C-7. 2001-2006 Aurora Study Area Intersection Crash History

Intersection	Crash Type					Crash Severity			Total	
	Rear-end	Turning	Angle	Side-swipe	Other	PDO	Injury	Fatal	Reported Crashes	Crash Rate/ MEV
Oregon 99E @ Liberty Street	5	1	0	0	0	3	3	0	6	0.17
Oregon 99E @ 2nd Street	0	0	0	0	0	0	0	0	0	0.00
Oregon 99E @ Main Street	3	1	1	0	0	3	2	0	5	0.27
Oregon 99E @ Bob's Avenue	0	0	0	0	0	0	0	0	0	0.00
Oregon 99E @ Ottaway Road	4	0	0	0	0	2	2	0	4	0.22
Ehlen Road @ Airport Road	2	1	0	0	0	2	1	0	3	0.14

Source: ODOT 2006.

Note:

(1) PDO means Property Damage Only and MEV means Million Entering Vehicles. "Other" crashes include sideswipes and head on collisions.

1.4 BRIDGE CONDITIONS

There are three bridges within or near the city limits; the Mill Creek Bridge, the Pudding River Relief Bridge #01830, and the Pudding River Bridge #027043.

Mill Creek Bridge

The Mill Creek Bridge is located on Ehlen Road within the Aurora city limits and crosses Mill Creek. This bridge is owned and maintained by Marion County and is listed on Marion County's bridge inventory. This bridge was replaced in 1995 and is not considered as structurally deficient by Marion County or ODOT[3]. Marion County rates its bridges on a sufficiency rating from a scale of zero to 100. The higher the rating, the better the condition of the bridge. The Mill Creek Bridge on Ehlen Road has a sufficiency rating of 95.3 at the time of this update, which indicates that the bridge is in excellent condition.

Pudding River Relief Bridge

The Pudding River Relief Bridge #01830 is located on Oregon 99E and is 0.02 miles north of the city limits. This bridge is maintained by ODOT and is listed in the 2008-2011 Statewide Transportation Improvement Program for repair to cracks in caps and columns, seismic retrofit, and retrofit of rails in 2010[4].

Pudding River Bridge

The Pudding River Bridge #02743 is located on Oregon 99E at milepost 24.67 which is 0.16 miles north of the city limits. The Pudding River Bridge is maintained by ODOT and is not

[3] Source: N. Vaslev, Marion County Public Works Department. "Marion County Rural Transportation System Plan 2005."

[4] Source: Oregon Department of Transportation. "Final Statewide Transportation Improvement Program 2008-2011,.November 2007."

listed in the 2008-2011 Statewide Transportation Improvement Program as scheduled for maintenance or repair[5].

1.5 ACCESS MANAGEMENT AND CONDITIONS

The term access management refers to the process of balancing the need for vehicle access to parcels of land adjacent to roadways with the need for safe and efficient through movement of vehicular traffic on the roadway. Access management can be implemented by a variety of means. These include median controls (for example, raised concrete medians); driveway spacing and/or driveway consolidation (so that there are fewer driveways serving one parcel or multiple parcels), requiring that driveways be placed on lower order streets where a parcel abuts both higher and lower order streets; and intersection spacing to reduce the number of conflict points or signal-controlled locations along a street, as the frequency of these locations can reduce the benefits of effective signal timing progression.

Access management is closely related to street functional classification. Typically, when access controls are in place, the frequency of driveways and intersecting streets is more restrictive along state highways and major arterials where the movement of traffic takes a higher priority. Access controls are less restrictive along collector streets where there is greater balance between access and mobility. Access controls are restricted only by safety considerations along local streets where property access is the primary function of the street.

Frequent driveway and cross-street access can significantly degrade traffic operations along major streets as motorists must contend with people slowing to turn into adjacent property or attempting to get back onto the major street from a side access location. Not only do frequent driveways adversely affect the operational capacity of a road, they also affect safety since each driveway or intersecting street represents a potential conflict point for through-moving vehicles. The strip development that often occurs as a result of the lack of access control is often inhospitable to pedestrians and bicyclists, and its dispersed uses make efficient transit service difficult.

Access management can be most effectively implemented during the land development process when access locations and localized street improvements can be adapted to ensure that adjacent street traffic-carrying functions are not degraded. Access management controls are more difficult to implement along streets with developed property due to possible right-of-way limitations and/or the concerns of property owners about business or on-site circulation impacts. In these cases, access controls can be incorporated into a roadway improvement project.

Along state highways, access is commonly controlled by ODOT through the purchase of access rights. New access to/from a state highway is provided consistent with the standards adopted in the OHP for each highway classification, its location within an urban or rural area, and its posted speed. Access management guidelines for state highways are published in OAR 734-051. Access management standards for Oregon 99E within the Aurora area are shown in Table C-8.

Figure C-4 illustrates the number of private and public access points along Oregon 99E and Ehlen Road in Aurora.

[5] Source: Oregon Department of Transportation. "2008 Bridge Log."

Table C-8. Highway Access Management Spacing Standards in Aurora

	Public and Private Approach Spacing [1]	
Posted Speed (mph)	**OR 99E (Outside STA)**	**STA (Liberty St. to 4th Ave)**
≥ 55	990 feet	
50	830 feet	
40 & 45	750 feet	
30 & 35	425 feet	**(2)**
≤ 25	350 feet	**(2)**

Source: Table 14. Oregon Highway Plan.

Notes:

(1) Measurement of the approach road spacing is from centerline to centerline on the same side of road.

(2) 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 for driveways is 175 feet (55 meters) or mid-block if the current city block is less than 350 feet (110 meters).

On the approximate 1 mile segment of Oregon 99E in the city limits, there are 25 access points, equaling roughly one access per 211 feet. The excessive number of access points has the potential to degrade traffic operations and affect safety along Oregon 99E. There are an additional 15 access points along Ehlen Road.

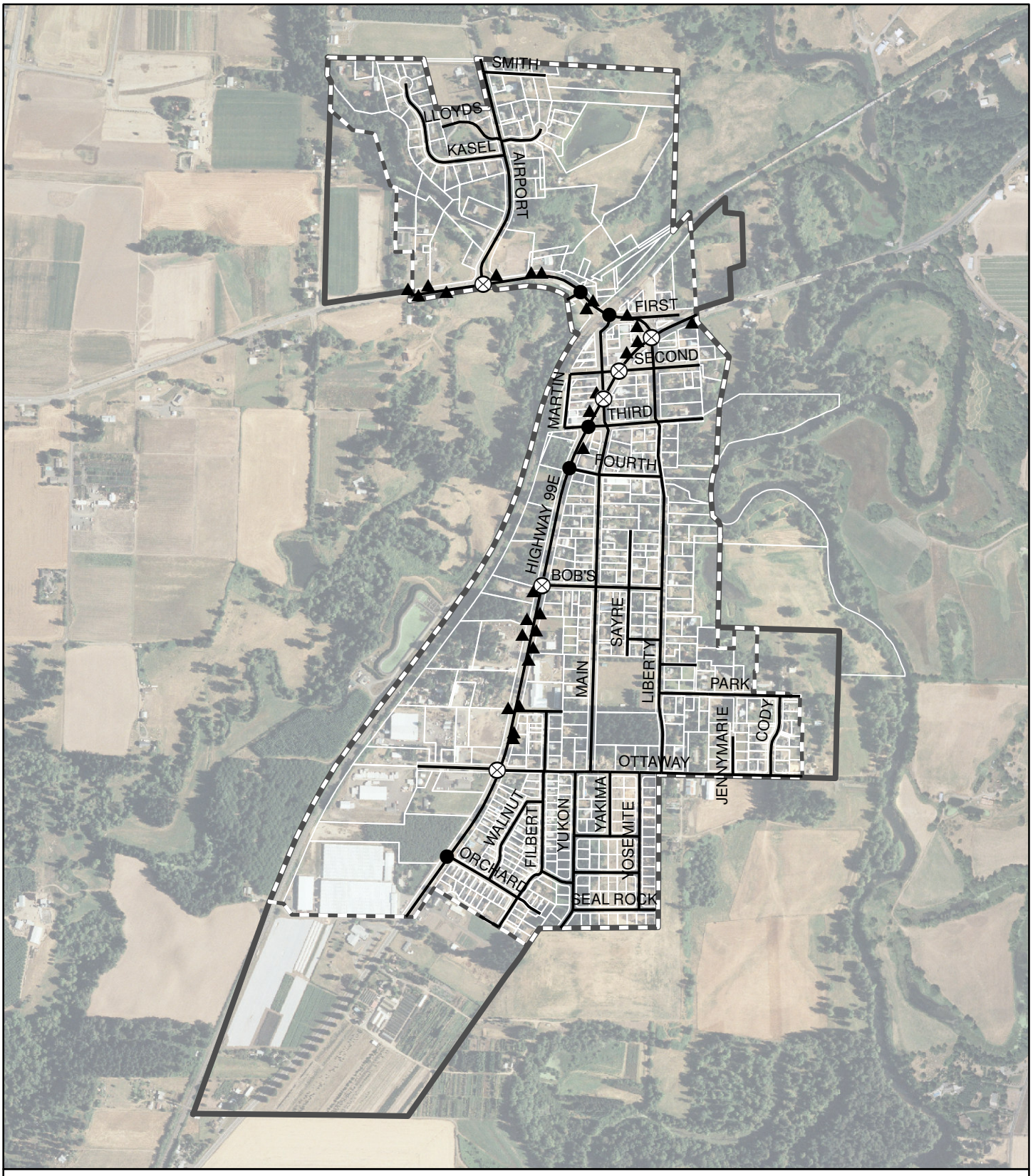

Figure C-4
Aurora Driveway Inventory

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APPENDIX D

Future Conditions

1. ANALYSIS OF FUTURE CONDITIONS

This appendix presents a discussion of expected future traffic growth within the Aurora Urban Growth Boundary (UGB) and relates this growth to expected future (2030) traffic volumes and operational conditions at key intersections in the study area. Two types of operational analysis are included in this appendix – no build and mitigated. No build analysis is the study of operations of key study intersection, assuming no new significant transportation demand management or capacity increasing investments occur within the City of Aurora between 2009 and 2030. Mitigated analysis is the study of operations of key intersections assuming the construction of transportation improvements needed to accommodate future traffic growth. The intersection analysis worksheets and traffic analysis methodologies which support this appendix are included in Technical Memorandum #1: Existing and Future Conditions and Technical Memorandum #2: Transportation System Alternatives. Technical Memorandums #1 and #2 are available from the City of Aurora.

1.1 FUTURE (2030) NO-BUILD TRAFFIC OPERATIONS

2030 Traffic Volumes

The 2030 traffic volume forecasts prepared for the Aurora TSP are based on the 2007 traffic counts collected by the Oregon Department of Transportation (ODOT) for this project. These counts were adjusted to reflect seasonal variations in traffic levels consistent with the guidance provided in ODOT's Analysis Procedures Manual. The counts were also adjusted to reflect general traffic growth between 2007 and 2008, using growth factors derived from ODOT's Transportation Planning and Analysis Unit's (TPAU) future volume historic trending tables. For the development of the 2030 future no-build forecast volumes, the growth factor was applied to through traffic on Oregon 99E only.

Land use/demographic data tables provided by Mid-Willamette Valley Council of Governments (MWVCOG) were used to forecast future turn-movement volumes for the minor streets. The technical process followed ODOT's Level 2 methodology for cumulative analysis, based on the forecasted development by Transportation Analysis Zone (TAZ). Based on community growth and development assumptions, it is anticipated that there will be approximately 900 new 30 HV peak trips on the Aurora Street system by 2030.

2030 Traffic Operations

The Synchro traffic simulation model developed specifically for the study area intersections was also used to assess traffic operations with forecasted 2030 (30 HV) volumes in Figure D-1. This assessment assumes that no improvements would be made to the existing street system, thus incorporating the street network characteristics illustrated in Figure D-1.

Table D-1 summarizes the results of 2030 traffic operational analysis for the 30 HV at the study area intersections. Data in this table includes the overall intersection Volume-to-Capacity (V/C) ratios, average intersection delay, and intersection Level of Service (LOS). V/C ratios above 1.0 are useful indicators of potential concerns such as sub-optimal signal timing, inadequate turn lane storage, or overall intersection saturation.

As indicated in the table, without any improvements to the existing roadway system, the signalized intersection of Liberty and Oregon 99E and the unsignalized intersections at Oregon 99E/Ottaway Road and Airport Road/Ehlen Road would fail to meet their relevant mobility standards.

Table D-1. 2030 No-Build Traffic Operations Analysis Results

	V/C Ratio	2030 No Build Critical Delay (sec/vehicle)	Critical LOS
Signalized Intersection/Critical Movement			
Oregon 99E @ Liberty/1st Street	**1.19**	**>150.0**	**F**
Eastbound Left	**1.43**	**>150.0**	**F**
Unsignalized Intersection/Critical Movement			
Airport Road @ Ehlen Road			
Eastbound	0.03	0.9	A
Southbound	**1.22**	**1.22**	**F**
Oregon 99E @ 2nd Street			
Eastbound	0.13	28.9	D
Southbound Thru-Right	0.64	0.0	A
Westbound	0.11	24.1	C
Oregon 99E @ Main Street			
Eastbound	0.44	28.3	C
Southbound Thru-Right	0.57	0.0	A
Westbound	0.17	25.4	D
Oregon 99E @ Bob's Avenue			
Westbound	0.55	100.4	F
Eastbound	0.43	87.8	F
Oregon 99E @ Ottaway Road			
Eastbound	**1.16**	**>150.0**	**F**
Westbound	**1.99**	**>150.0**	**F**

Notes:
(1) V/C ratio is a ratio between traffic volumes and the roadway or intersection's capacity.
(2) LOS means intersection level of service.
(3) "Critical Delay" and "Critical LOS" refer to the delay or LOS experienced for the specific intersection traffic movement listed.
(4) Shading indicates failure to meet existing County or State V/C standards, as appropriate.

Intersection Traffic Queuing

Traffic queuing results shown in Table D-2 indicate that at the intersection of Oregon 99E and Liberty/1st Street, both the eastbound left turn lane and the southbound right turn lane will continue to exceed the available vehicle storage for these movements.

Table D-2. Summary of 2030 Intersection Queuing

	Existing Storage (ft)	2030 Queue (ft)
Signalized Intersection		
Oregon 99E @ Liberty/1st Street		
Southbound Right	275	170
Eastbound Left	215	960
Unsignalized Intersection/Critical Movement		
Airport Road @ Ehlen Road		
Southbound	*	325
Oregon 99E @ 2nd Street		
Eastbound	*	25
Oregon 99E @ Main Street		
Eastbound	*	25
Westbound	*	25
Oregon 99E @ Bob's Avenue		
Westbound	*	25
Eastbound	*	25
Oregon 99E @ Ottaway Road		
Eastbound	*	275
Westbound	*	50

Notes:
(1) Signalized intersections Estimated using Synchro.
(2) Estimated using Two-Minute Rule.
(3) * Single approach lane.

1.2 FUTURE (2030) MITIGATED TRAFFIC OPERATIONS

The Synchro traffic simulation model developed specifically for the study area intersections was used to assess traffic operations with forecasted 30th highest hourly traffic volumes (30 HV) in 2030. This assessment, along with signal and turn warrant analysis, resulted in several intersections requiring improvements to accommodate future traffic growth and obtain operational standards.

Table D-3 summarizes the results of 2030 traffic operational analysis for the 30 HV at the study area intersections with and without improvements. Data in this table includes the overall intersection V/C ratios, average intersection delay, and intersection LOS. V/C ratios above 1.0 are useful indicators of potential concerns such as sub-optimal signal timing, inadequate turn lane storage, or overall intersection saturation. With the addition of mitigation listed in Table D-3, the key study intersections will achieve acceptable standards.

Table D-3. 2030 No-Build and Mitigated Traffic Operations Analysis Results

	2030 No Build			2030 Mitigated		
	V/C Ratio	**Critical Delay (sec/vehicle)**	**Critical LOS**	**V/C Ratio**	**Critical Delay (sec/vehicle)**	**Critical LOS**
Signalized Intersection/Critical Movement						
Oregon 99E @ Liberty/1st Street	**1.19**	**>150.0**	**F**	0.84	111.5	C
Eastbound Left	**1.43**	**>150.0**	**F**	0.91	59.2	E
Unsignalized Intersection / Critical Movement						
Airport Road @ Ehlen Road				Signalize and add southbound left turn lane and westbound right turn lane,		
Eastbound	0.03	0.9	A	0.74	11.1	B
Southbound	**1.22**	**1.22**	**F**	0.65	41.2	A
Oregon 99E @ 2nd Street				No Change		
Eastbound	0.13	28.9	D	0.13	28.9	D
Southbound Thru-Right	0.64	0.0	A	0.64	0.0	A
Westbound	0.11	24.1	C	0.11	24.1	C
Oregon 99E @ Main Street				No Change		
Eastbound	0.44	28.3	C	0.44	28.3	C
Southbound Thru-Right	0.57	0.0	A	0.57	0.0	A
Westbound	0.17	25.4	D	0.17	25.4	D
Oregon 99E @ Bob's Avenue				Add southbound left turn lane		
Westbound	0.55	100.4	F	0.16	22.0	C
Eastbound	0.43	87.8	F	0.13	22.3	C
Oregon 99E @ Ottaway Road				Signalize and add northbound/southbound left turn lanes, left and right turn lanes on eastbound approach, and left on westbound approach		
Eastbound	**1.16**	**>150.0**	**F**	0.75	11.6	D
Westbound	**1.99**	**>150.0**	**F**	0.32	29.9	C

Notes:

(1) V/C ratio is a ratio between traffic volumes and the roadway or intersection's capacity.

(2) LOS means intersection level of service.

(3) "Critical Delay" and "Critical LOS" refer to the delay or LOS experienced for the specific intersection traffic movement listed.

(4) Shading indicates failure to meet existing County or State V/C standards, as appropriate.

ODOT uses Signal Warrants 1, Case A and Case B, from the Manual on Uniform Traffic Control Devices (MUTCD), which deal primarily with high volumes on the intersecting minor street and high volumes on the major-street. The unsignalized intersections were evaluated for preliminary signal warrants using the minimum vehicular traffic and interruption of continuous flow warrants, Case A and Case B, respectively.

The analysis indicated that the intersection of Ottaway Road and Oregon 99E would meet Case B preliminary warrants for the major street at 100% of signal warrants. A signal was assumed as mitigation at this intersection in addition to turn lane improvements. Meeting preliminary warrants is necessary to install a signal on state highways, but it does not mean a signal should be recommended or guarantee its installation. Considerations to be evaluated include safety concerns, alternatives to signalization, signal systems, delay, queuing, bike and pedestrian needs, railroads, access, consistency with local plans, and local agency support. Before a signal can be installed, a field warrant analysis is conducted by the Region. If warrants are met, the State Traffic Engineer will make the final decision on the installation of a signal. Roundabouts may also be considered as an intersection traffic control treatment instead of signalization.

The intersection of Ehlen Road and Airport Road is under the jurisdiction of Marion County. ODOT analysis procedures (which are consistent with County procedures) were applied to this intersection and the results indicated that a southbound left and westbound right turn lane were warranted. The intersection did not meet ODOT or County preliminary signal warrants. However, even with the addition of the turn lanes, the southbound left turn movement would experience a delay of 110.0 seconds, a 1.05 V/C, and an LOS F in 2030. The addition of a signal at the intersection would achieve acceptable operations and was included as an improvement project.

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LEGEND

XXX → TURNING MOVEMENT BY VOLUME BY DIRECTION OF TRAFFIC

N

Figure D-1
2030 (No Build)
Intersection Turning Movements

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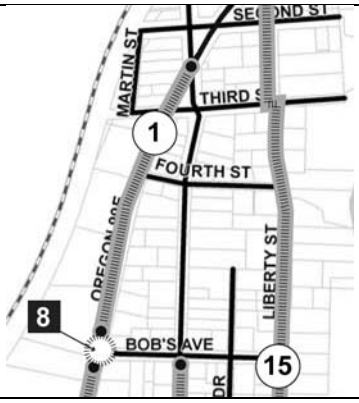
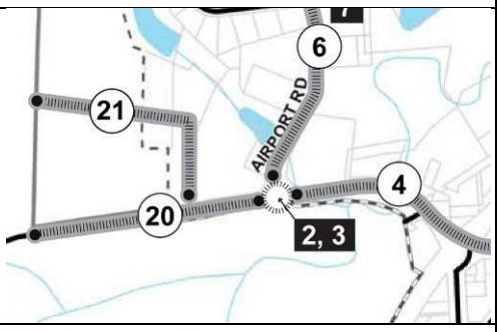
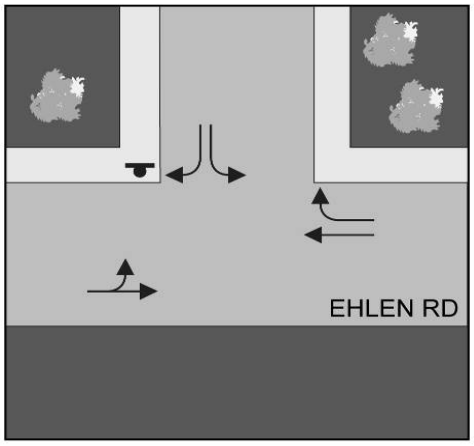
APPENDIX E

Project Description and Cost Estimates

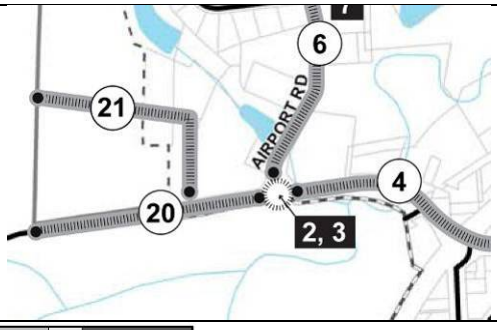
Project Number: 1	**Priority:** High	**Project Location Map**
Location: OR 99E: Main Street to Bob's Avenue		
Description: Add sidewalks, bike lanes and parking. Preliminary design is complete and additional funding for construction is being sought. **Considerations:** Consider incorporating a southbound left turn lane at Bob's Avenue (project #8) into the design of this project.		

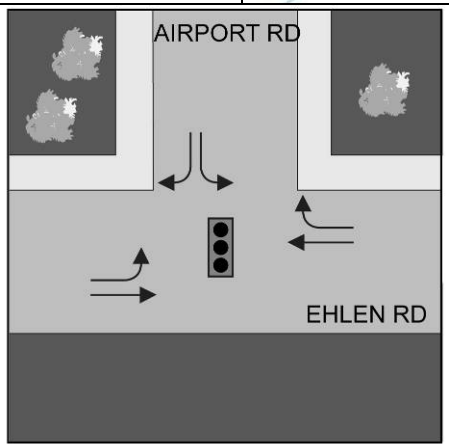
Improvement Concept	To Be Determined		
Planning Level Cost Estimate	$400,000	**Construction Estimate**	Short-Term (2009–2015)

Project Number: 2	**Priority:** High	**Project Location Map**
Location: Ehlen Road and Airport Road Intersection		
Description: Add southbound left turn lane and westbound right turn lane. **Considerations:** Addresses existing traffic delays.		

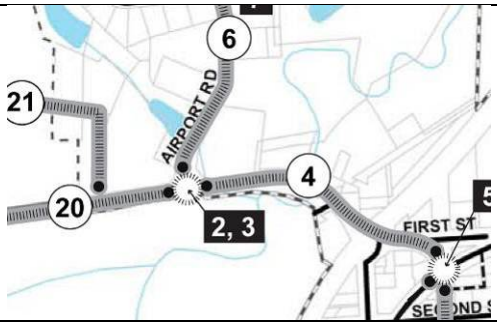
Improvement Concept			
Planning Level Cost Estimate	$150,000	**Construction Estimate**	Short-Term (2009–2015)

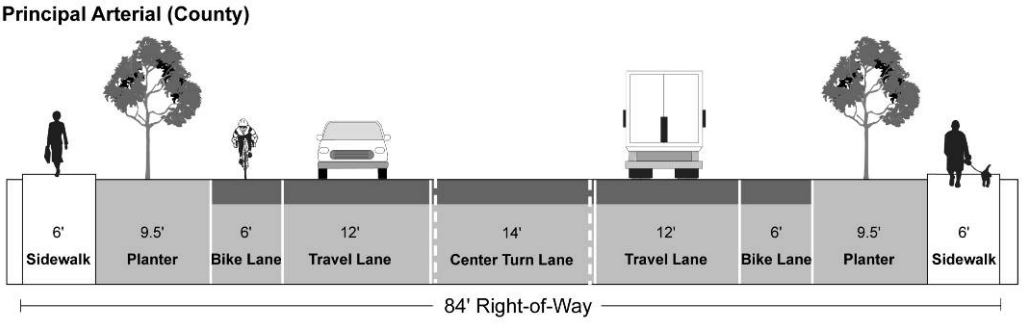
Project Number: 3	**Priority:** Low	**Project Location Map**
Location: Ehlen Road and Airport Road Intersection		
Description: Install signal and eastbound left turn lane when warranted. **Considerations:** Marion County approval required for signal installation. Pedestrian crossing enhancements should be considered with signalization.		

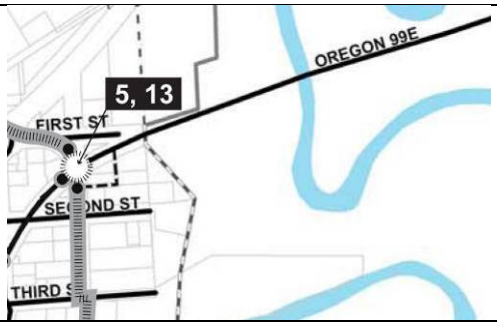
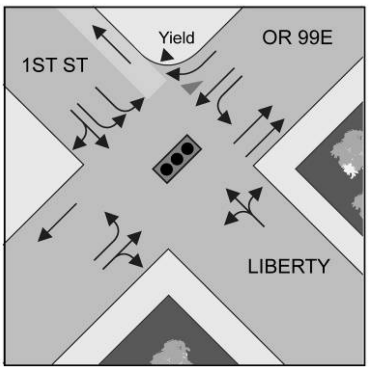


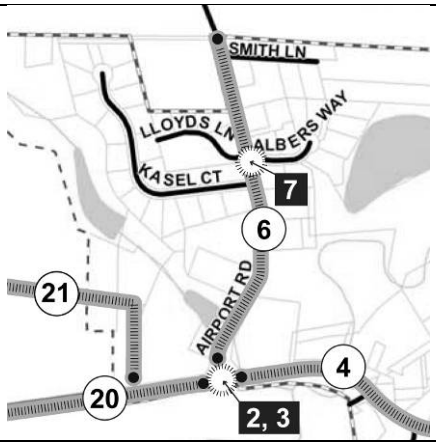
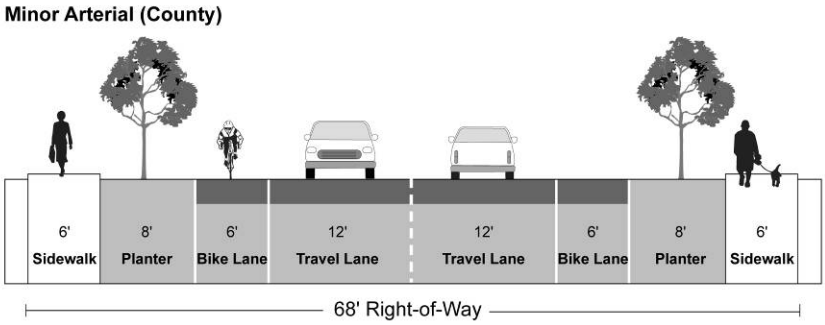
Improvement Concept			
Planning Level Cost Estimate	$379,000	**Construction Estimate**	Development Dependent

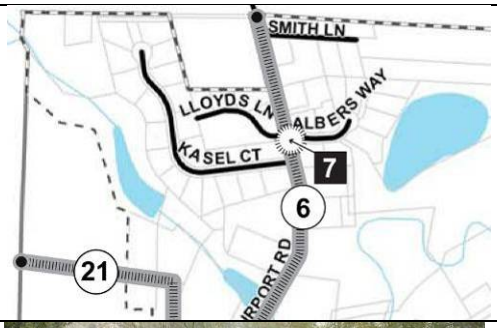
Project Number: 4	**Priority:** High	**Project Location Map**
Location: Ehlen Road: Airport Road to OR 99E		
Description: Improve to principal arterial standard (Phase 2). **Considerations:** Provide multi-use path on north side of roadway as interim measure (Phase 1). Potential to add new street lighting and street trees.		

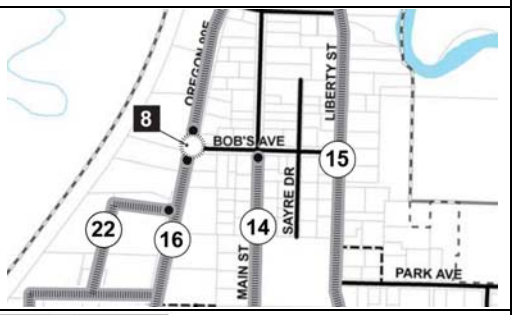
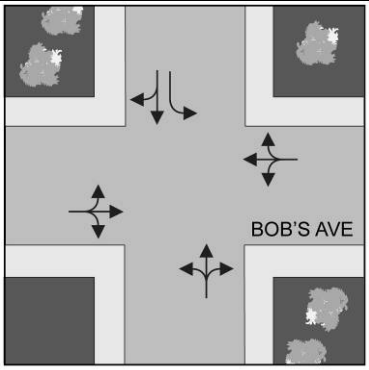


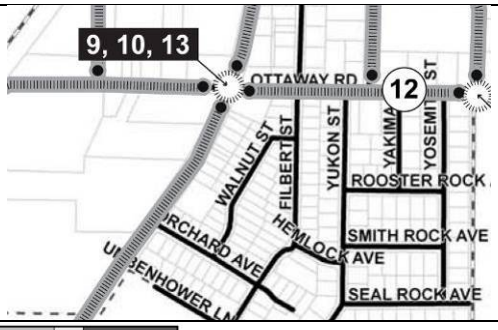
Improvement Concept (Phase 2)			
Planning Level Cost Estimate	$116,000 (Phase 1) $853,000 (Phase 2)	**Construction Estimate**	Phase 1: Short-Term (2009–2015) Phase 2: Development Dependent

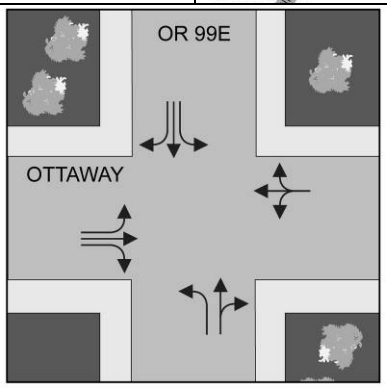
Project Number: 5	**Priority:** Low	**Project Location Map**
Location: OR 99E and Liberty Street Intersection		
Description: Add 2nd eastbound left turn lane and corresponding receiving lane and channelize the southbound right turn lane. **Considerations:** Design should consider impacts to historical properties. Landscape retaining walls likely required.		
Improvement Concept		
Planning Level Cost Estimate	$611,000	**Construction Estimate** Long-Term (2021–2030)

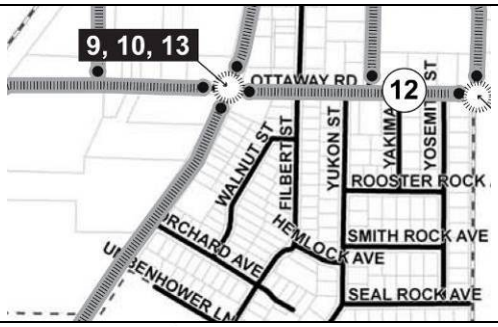
Project Number: 6	**Priority:** High	**Project Location Map**
Location: Airport Road: City Limits to Ehlen Road		
Description: Improve roadway to minor arterial standard (Phase 2). **Considerations:** Access/driveway consolidation needed. Potential to add street lighting, street trees. Interim 6'-8' protected shoulders (Phase 1)		
Improvement Concept		
Planning Level Cost Estimate	$292,000 (Phase 1) $1,022,000 (Phase 2)	**Construction Estimate** Phase 1: Short-Term Phase 2: Development Dependent

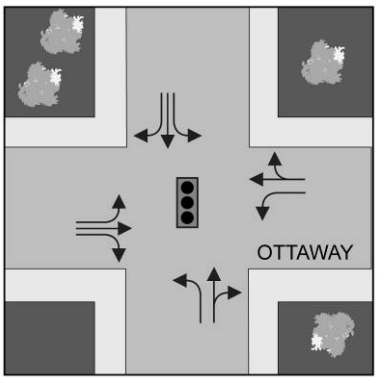
Project Number: 7	**Priority:** High	**Project Location Map**
Location: Airport Road and Kasel Court/Albers Way		
Description: Provide bus stop. **Considerations:** Provide covered shelter. Provide lighting and bike rack.		
Improvement Concept		
Planning Level Cost Estimate	$6,000	**Construction Estimate** Short-Term (2009–2015)

Project Number: 8	**Priority:** Low	**Project Location Map**
Location: OR 99E and Bob's Avenue Intersection		
Description: Add southbound left turn lane on OR 99E. **Considerations:** Consider incorporating this project into the design of project #1.		
Improvement Concept		
Planning Level Cost Estimate	$142,000	**Construction Estimate** Long-Term (2021–2030)

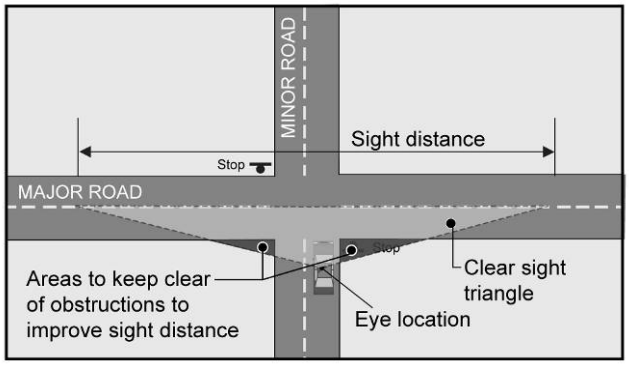
Project Number: 9	**Priority:** High	**Project Location Map**
Location: OR 99E and Ottaway Road Intersection		
Description: Install turn lanes and intersection improvements including sidewalks and ADA ramps. **Considerations:** Crosswalks must be approved by ODOT. Consider adding pedestrian activated crosswalk illuminated warning device.		

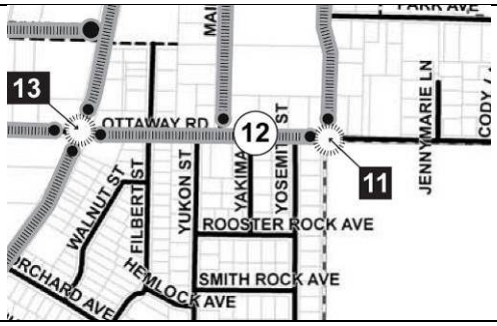
Improvement Concept			
Planning Level Cost Estimate	$311,000	**Construction Estimate**	Short-Term (2009–2015)

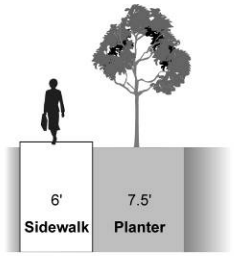
Project Number: 10	**Priority:** Low	**Project Location Map**
Location: OR 99E and Ottaway Road Intersection		
Description: Install signal and westbound turn lane when warranted. **Considerations:** ODOT analysis and approval required.		

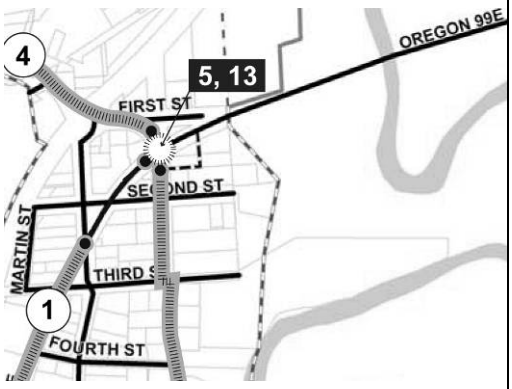
Improvement Concept			
Planning Level Cost Estimate	$326,000	**Construction Estimate**	Development Dependent

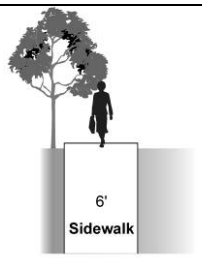
Project Number: 11	**Priority:** High	**Project Location Map**
Location: Ottaway Road and Liberty Street Intersection		
Description: Improve intersection to provide better sight distance. **Considerations:** Removal of vegetation. Improve approach grade. Work may require easement from private property owners.		

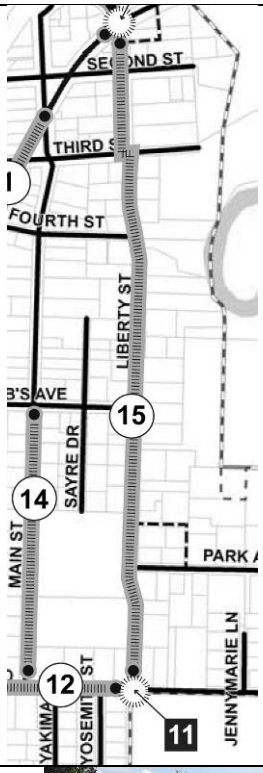
Improvement Concept			
Planning Level Cost Estimate	$46,000	**Construction Estimate**	Short-Term (2009–2015)

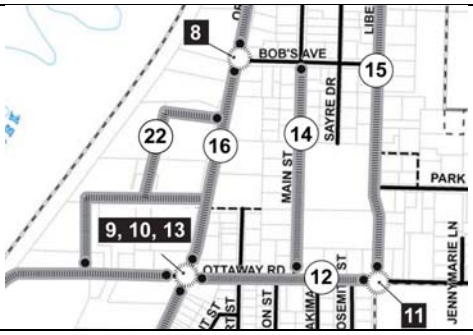
Project Number: 12	**Priority:** Medium	**Project Location Map**
Location: Ottaway Road: OR 99E to Liberty Street		
Description: Complete missing sidewalk segments. **Considerations:** Attached or detached sidewalks. Potential to add street lighting, street trees, and landscape buffer.		

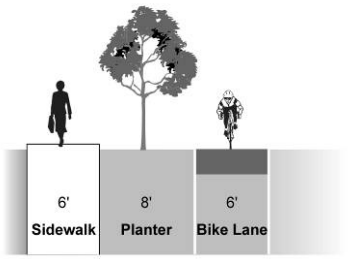
Improvement Concept			
Planning Level Cost Estimate	$263,000	**Construction Estimate**	Medium-Term (2016–2020)

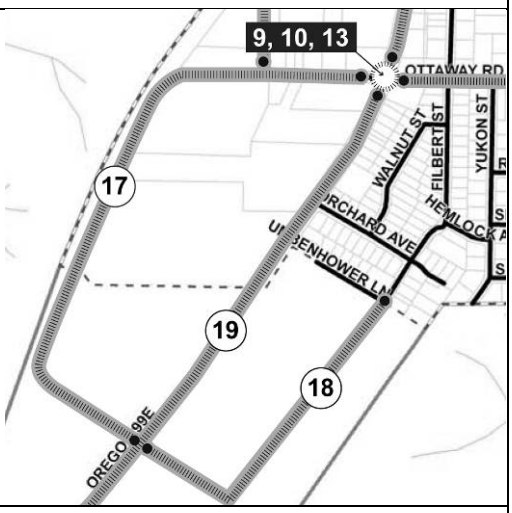
Project Number: 13	**Priority:** High	**Project Location #1**
Location: OR 99E at Ottaway Road and OR 99E at Liberty Street		
Description: Improve bus stops. **Considerations:** Provide covered shelter. Provide lighting and bike rack.		
Improvement Concept		**Project Location #2** 
Planning Level Cost Estimate	$13,000	**Construction Estimate** Short-Term (2009–2015)

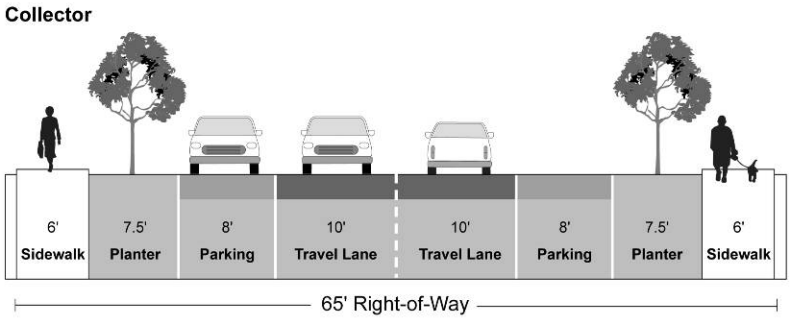
Project Number: 14	**Priority:** High	**Project Location Map**
Location: Main Street: Bob's Avenue to Ottaway Road		
Description: Complete sidewalks to provide continuous facilities and add sharrows on pavement. **Considerations:** Attached or detached sidewalks. Potential to add street lighting, street trees, and landscape buffer.		
Improvement Concepts	 "Sharrows" 	
Planning Level Cost Estimate	$425,000	**Construction Estimate** Short-Term (2009–2015)

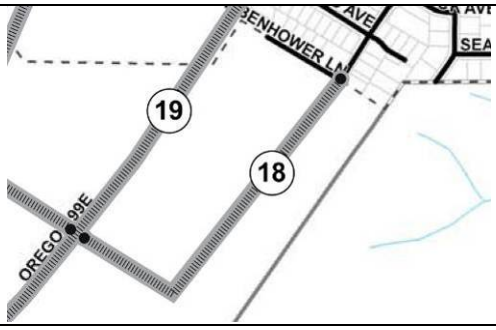
Project Number: 15	**Priority:** Medium	**Project Location Map**
Location: Liberty Street		
Description: Install traffic calming measures per TSP measures. **Considerations:** Chicanes, traffic circles, and chokers. Street trees.		
Improvement Concept		
Planning Level Cost Estimate	$137,000	**Construction Estimate** Medium-Term (2016–2020)

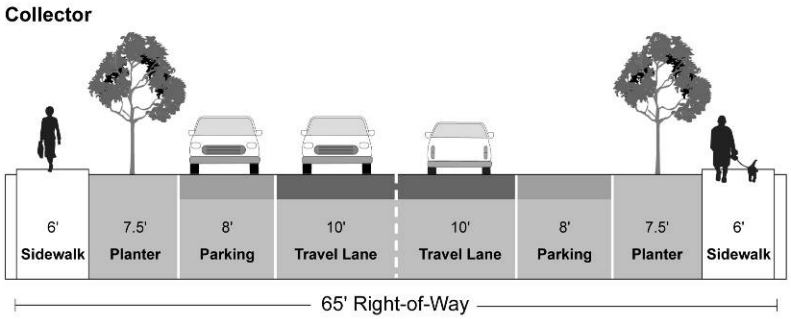
Project Number: 16	**Priority:** Low	**Project Location Map**
Location: OR 99E: Bob's Avenue to Ottaway Road		
Description: Provide bike lanes and sidewalks, not improving to full principal arterial travel way.		

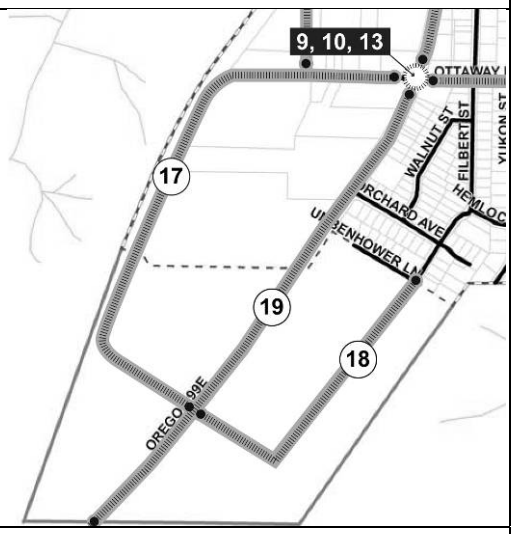
Improvement Concept			
Planning Level Cost Estimate	$856,000	**Construction Estimate**	Long-Term (2021–2030)

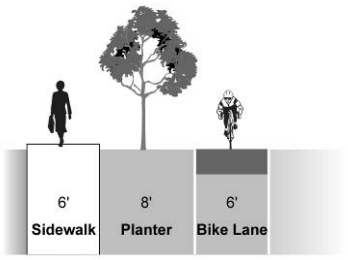
Project Number: 17	**Priority:** Low	**Project Location Map**
Location: New Collector Roadway: West Ottaway Road, south to OR 99E		
Description: New collector roadway.		

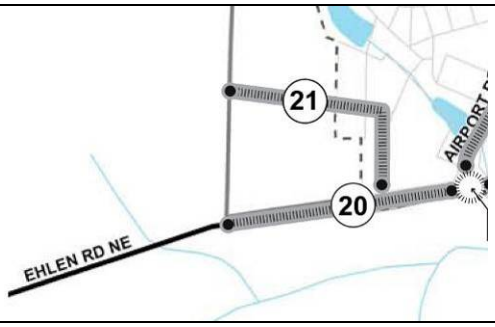
Improvement Concept			
Planning Level Cost Estimate	$2,045,000	**Construction Estimate**	Development Dependent

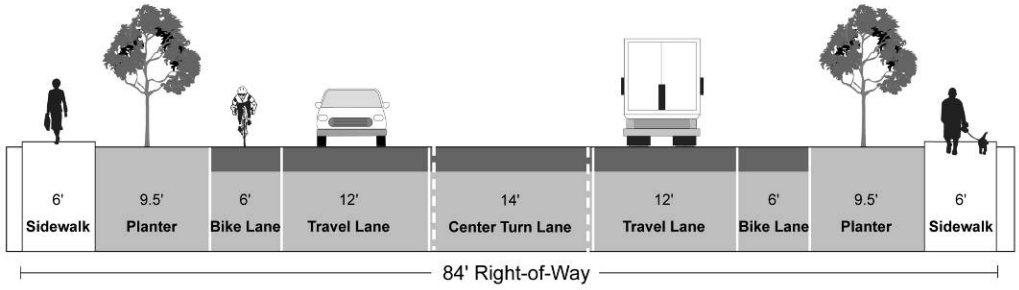
Project Number: 18	**Priority:** Low	**Project Location Map**
Location: New Collector Roadway: Filbert Street Extension to Oregon 99E		
Description: Construct new collector roadway.		

Improvement Concept			
Planning Level Cost Estimate	$1,252,000	**Construction Estimate**	Development Dependent

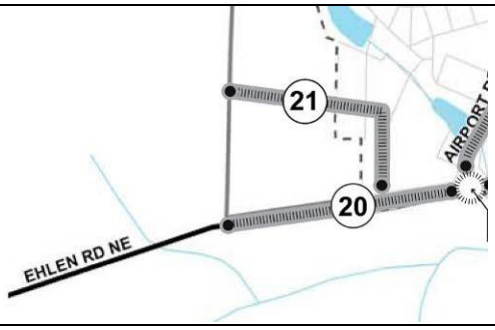
Project Number: 19	**Priority:** Low	**Project Location Map**
Location: OR 99E: Ottaway Road to south UGB		
Description: Provide bike lanes, planter, and sidewalks.		

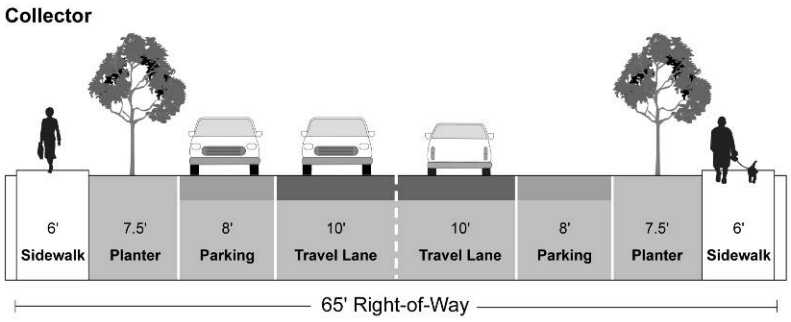
Improvement Concept			
Planning Level Cost Estimate	$1,322,000	**Construction Estimate**	Development Dependent

Project Number: 20	**Priority:** Low	**Project Location Map**
Location: Ehlen Road: UGB to Airport Road		
Description: Improve roadway to principal arterial standard.		

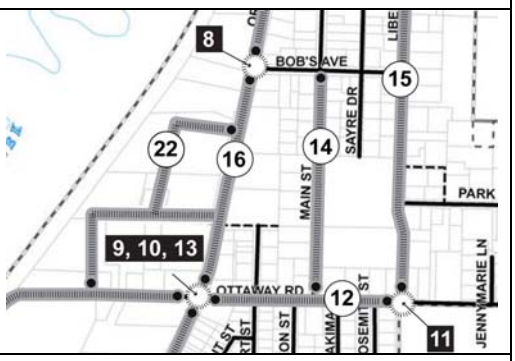
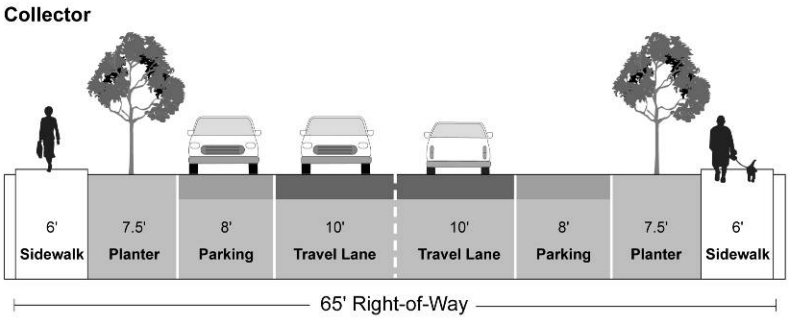
Improvement Concept	

Planning Level Cost Estimate	$899,000	**Construction Estimate**	Development Dependent

Project Number: 21	**Priority:** Low	**Project Location Map**
Location: New Collector Radway (from Ehlen Road, via Williams Court to Cole Lane)		
Description: Construct new collector roadway. **Considerations:** Consider pedestrian connections north and northeast to Kasel Court.		

Improvement Concept	

Planning Level Cost Estimate	$754,000	**Construction Estimate**	Development Dependent

Project Number: 22	**Priority:** Low	**Project Location Map**
Location: New Collector Roadway (from West Ottaway Road, north to Bob's Avenue/Oregon 99E intersection) **Description:** Construct new collector roadway. **Considerations:** Accommodations for truck turn movements to industrial/commercial properties. Seek to consolidate/close Oregon 99E driveway connections. City may consider obtaining rights-of-way as opportunities develop.		
Improvement Concept		
Planning Level Cost Estimate	$1,639,000	**Construction Estimate** Development Dependent

Planning Estimate (Parametrix)

Project Number	2
Section Summary	Ehlen Road and Airport Road
Roadway Classification	Principal Arterial
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	14-foot wide turn lane @ 200 feet length
Sidewalk	
Planting Strip	
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL

Project Cost Estimate Provided by Marion County

	TOTAL	$150,000

Planning Estimate (Parametrix)

Project Number	3
Section Summary	Ehlen Road and Airport Road
Roadway Classification	Principal Arterial -Minor Arterial
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	Add turn lane
Sidewalk	
Planting Strip	
Other	Signalization

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$20,427
2	SIGNAL	1	LS	1.00	$150,000
3	AGGREGATE BASE	190	TON	20.00	$3,800
4	SEEDING	1	LS	1,000.00	$1,000
5	EARTHWORK	10	CY	12.00	$120
6	LEVEL 2, 1/2 INCH DENSE HMAC	120	TON	80.00	$9,600
7	CONCRET INLET	2	EACH	1,800.00	$3,600
8	PAVEMENT STRIPING	800	LF	0.25	$200
9	LANDSCAPING	1	LS	2,000.00	$2,000
10	EROSION CONTROL	0.2	AC	5,000.00	$1,000
11	CLEARING AND GRUBBING	5%	LS	1.00	$8,566
12	SIGNING	3%	LS	1.00	$5,397
13	TRAFFIC CONTROL	5%	LS	1.00	$9,264
14	SURVEYING	5%	LS	1.00	$9,727

	ROADWAY CONSTRUCTION SUBTOTAL	$224,701
	CONTINGENCY(35%)	$78,646
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)	$75,837
	TOTAL	$379,184

Planning Estimate (Parametrix)

Project Number	4-Phase 1
Section Summary	Ehlen Road (1300 ft)
Roadway Classification	Arterial
Travel Lanes	
Parking	
Bikeway	6 foot-convert existing shoulder
Median/Turn Lane	
Sidewalk	12 ft asphalt path on side one side @ 1200 ft
Planting Strip	4 foot proposed landscaped/swale or guardrail
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$6,268
3	AGGREGATE BASE	350	TON	20.00	$7,000
4	SEEDING-LANDSCAPING	1	LS	8,000.00	$8,000
5	EARTHWORK	200	CY	12.00	$2,400
6	EROSION CONTROL	0.5	AC	5,000.00	$2,500
7	LEVEL 2, 1/2 INCH DENSE HMAC	250	TON	80.00	$20,000
	BIKE LANE STENCIL	6	EA	75.00	$450
9	CONCRETE CURB AND SIDEWALK	100	LF	50.00	$5,000
9	12 INCH DRAIN PIPE, 5 FT DEPTH	120	LF	45.00	$5,400
10	DITCH INLET	2	EACH	1,800.00	$3,600
11	PAVEMENT STRIPING	400	LF	0.25	$100
12	CLEARING AND GRUBBING	5%	LS	1.00	$750
13	SIGNING	3%	LS	1.00	$1,656
14	TRAFFIC CONTROL	5%	LS	1.00	$2,843
15	SURVEYING	5%	LS	1.00	$2,985
	ROADWAY CONSTRUCTION SUBTOTAL				$68,952
	CONTINGENCY(35%)				$24,133
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$23,271
	TOTAL				$116,357

Planning Estimate (Parametrix)

Project Number	4-Phase 2
Section Summary	Ehlen Road (1300 ft)
Roadway Classification	Principal Arterial
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	
Sidewalk	
Planting Strip	
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$45,926
2	AGGREGATE BASE	2060	TON	20.00	$41,200
3	SEEDING-LANDSCAPING	1	LS	8,000.00	$8,000
4	EARTHWORK	200	CY	12.00	$2,400
5	EROSION CONTROL	1	AC	5,000.00	$5,000
6	LEVEL 2, 1/2 INCH DENSE HMAC	1960	TON	80.00	$156,800
7	CONCRETE CURB AND SIDEWALK	2600	LF	50.00	$130,000
8	CONCRETE INLET	6	EACH	1,800.00	$10,800
9	CONCRETE MANHOLE	2	EACH	3000	$6,000
10	12 INCH DRAIN PIPE, 5 FT DEPTH	600	LF	45.00	$27,000
11	BIKE LANE STENCIL	6	EA	75.00	$450
12	PAVEMENT STRIPING	5200	LF	0.25	$1,300
13	CLEARING AND GRUBBING	5%	LS	1.00	$19,448
14	SIGNING	2%	LS	1.00	$8,168
15	TRAFFIC CONTROL	5%	LS	1.00	$20,828
16	SURVEYING	5%	LS	1.00	$21,870
	ROADWAY CONSTRUCTION SUBTOTAL				$505,190
	CONTINGENCY(35%)				$176,816
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$170,502
	TOTAL				$852,508

Planning Estimate (Parametrix)

Project Number	5
Section Summary	Oregon 99E and 1st Street
Roadway Classification	Arterial
Travel Lanes	12 ft receiving lane @ 800 ft length

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$32,891
	ROADWAY CONSTRUCTION SUBTOTAL				$361,796
	CONTINGENCY(35%)				$126,629
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$122,106
	TOTAL				$610,531

Planning Estimate (Parametrix)

Project Number	6-Phase 1
Section Summary	Airport Road (1650 ft)
Roadway Classification	Minor Arterial
Sidewalk/bikeway	6-8 foot-asphalt bicycle/pedestrian shoulder

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$15,744
2	AGGREGATE BASE	725	TON	20.00	$14,500
3	SEEDING-LANDSCAPING	1	LS	8,000.00	$8,000
4	EARTHWORK	300	CY	12.00	$3,600
5	EROSION CONTROL	0.5	AC	5,000.00	$2,500
6	LEVEL 2, 1/2 INCH DENSE HMAC	840	TON	80.00	$67,200
7	DITCH INLET	4	EACH	1,800.00	$7,200
8	RETAINING WALL	500	SF	60.00	$30,000
9	RAILING	100	LF	50.00	$5,000
10	PAVEMENT STRIPING/MARKINGS	3500	LF	0.25	$875
11	CLEARING AND GRUBBING	5%	LS	1.00	$1,125
12	SIGNING	2%	LS	1.00	$2,800
13	TRAFFIC CONTROL	5%	LS	1.00	$7,140
14	SURVEYING	5%	LS	1.00	$7,497
	ROADWAY CONSTRUCTION SUBTOTAL				$173,181
	CONTINGENCY(35%)				$60,613
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$58,448
	TOTAL				$292,242

Planning Estimate (Parametrix)

Project Number	6-Phase 2
Section Summary	Airport Road (1650 ft)
Roadway Classification	Minor Arterial
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	
Sidewalk	
Planting Strip	
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$55,040
2	AGGREGATE BASE	2600	TON	20.00	$52,000
3	SEEDING-LANDSCAPING	1	LS	8,000.00	$8,000
4	EARTHWORK	200	CY	12.00	$2,400
5	EROSION CONTROL	1	AC	5,000.00	$5,000
6	LEVEL 2, 1/2 INCH DENSE HMAC	2500	TON	80.00	$200,000
7	CONCRETE CURB AND SIDEWALK	3400	LF	50.00	$170,000
8	CONCRETE INLET	4	EACH	1,800.00	$7,200
9	12 INCH DRAIN PIPE, 5 FT DEPTH	400	LF	45.00	$18,000
10	CONCRETE MANHOLE	2	EACH	3000	$6,000
11	BIKE LANE STENCIL	6	EA	75.00	$450
12	PAVEMENT STRIPING	6800	LF	0.25	$1,700
13	CLEARING AND GRUBBING	5%	LS	1.00	$23,538
14	SIGNING	1%	LS	1.00	$4,943
15	TRAFFIC CONTROL	5%	LS	1.00	$24,962
16	SURVEYING	5%	LS	1.00	$26,210
	ROADWAY CONSTRUCTION SUBTOTAL				$605,442
	CONTINGENCY(35%)				$211,905
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$204,337
	TOTAL				$1,021,683

Planning Estimate (Parametrix)

Project Number	7
Section Summary	Airport Road
Roadway Classification	Minor Arterial
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	
Sidewalk	
Planting Strip	
Other	Bus Stop pad, shelter, lighting

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION (10%)		LS	1.00	$446
2	AGGREGATE BASE	2	TON	20.00	$40
3	CONCRETE PAD	80	SF	10.00	$800
4	LIGHTING	2	EACH	800.00	$1,600
5	LANDSCAPING	1	LS	500.00	$500
6	EARTHWORK	2	CY	12.00	$24
7	SHELTER	1	LS	1,500.00	$1,500
8	SIGNING	5%	LS	1.00	$246
	ROADWAY CONSTRUCTION SUBTOTAL				$4,910
	CONTINGENCY(10%)				$491
	PRELIMINARY & CONSTRUCTION ENGINEERING (10%)				$540
	TOTAL				$5,942

Planning Estimate (Parametrix)

Project Number	8
Section Summary	Oregon 99E and Bobs Avenue
Roadway Classification	Arterial-Local
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	14' turn lane @ 200 feet
Sidewalk	
Planting Strip	
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION (10%)		LS	1.00	$7,669
2	LEVEL 2, 1/2 INCH DENSE HMAC	280	TON	80.00	$22,400
3	AGGREGATE BASE	380	TON	20.00	$7,600
4	CONCRETE SIDEWALK	50	LF	50.00	$2,500
5	CONCRETE INLET	2	EACH	1,800.00	$3,600
6	PAVEMENT STRIPING	400	LF	0.25	$100
7	12 INCH DRAIN PIPE, 5 FT DEPTH	50	LF	45.00	$2,250
8	SEEDING	1	LS	1,500.00	$1,500
9	EARTHWORK	2000	CY	12.00	$24,000
10	EROSION CONTROL	0.2	AC	5,000.00	$1,000
11	CLEARING AND GRUBBING	5%	LS	1.00	$3,248
12	SIGNING	2%	LS	1.00	$1,364
13	TRAFFIC CONTROL	5%	LS	1.00	$3,478
14	SURVEYING	5%	LS	1.00	$3,652
	ROADWAY CONSTRUCTION SUBTOTAL				$84,361
	CONTINGENCY(35%)				$29,526
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$28,472
	TOTAL				$142,359

Planning Estimate (Parametrix)

Project Number	9
Section Summary	Oregon 99E and Ottaway Road
Roadway Classification	Arterial-Local
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	14' turn lanes @ 200 ft, new westbound approach
Sidewalk	6 ft sidewalks
Planting Strip	
Other	Intersection corner improvements

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION (10%)		LS	1.00	$16,773
2	LEVEL 2, 1/2 INCH DENSE HMAC	480	TON	80.00	$38,400
3	AGGREGATE BASE	420	TON	20.00	$8,400
4	CONCRETE SIDEWALK	200	LF	50.00	$10,000
5	CONCRETE INLET	4	EACH	1,800.00	$7,200
6	PAVEMENT STRIPING	1200	LF	0.25	$300
7	12 INCH DRAIN PIPE, 5 FT DEPTH	100	LF	45.00	$4,500
8	CONCRETE MANHOLE	2	EACH	3000	$6,000
9	PEDESTRIAN WARNING DEVICE	2	EACH	15,000.00	$30,000
10	LANDSCAPING	1	LS	4,000.00	$4,000
11	ADA RAMPS	4	EACH	2,000.00	$8,000
12	EARTHWORK	2000	CY	12.00	$24,000
13	EROSION CONTROL	0.25	AC	5,000.00	$1,250
14	CLEARING AND GRUBBING	5%	LS	1.00	$7,103
15	SIGNING	2%	LS	1.00	$2,983
16	TRAFFIC CONTROL	5%	LS	1.00	$7,607
17	SURVEYING	5%	LS	1.00	$7,987
	ROADWAY CONSTRUCTION SUBTOTAL				$184,502
	CONTINGENCY(35%)				$64,576
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$62,270
	TOTAL				$311,348

Planning Estimate (Parametrix)

Project Number	10
Section Summary	Oregon 99E and Ottaway Road
Roadway Classification	Arterial-Local
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	
Sidewalk	
Planting Strip	
Other	Signalization

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$17,552
2	SIGNAL	1	LS	1.00	$150,000
3	AGGREGATE BASE	5	TON	20.00	$100
4	SEEDING	1	LS	1,000.00	$1,000
5	EARTHWORK	10	CY	12.00	$120
6	LEVEL 2, 1/2 INCH DENSE HMAC	10	TON	80.00	$800
7	EROSION CONTROL	0.2	AC	5,000.00	$1,000
8	CLEARING AND GRUBBING	2%	LS	1.00	$3,060
9	SIGNING	2%	LS	1.00	$3,122
10	TRAFFIC CONTROL	5%	LS	1.00	$7,960
11	SURVEYING	5%	LS	1.00	$8,358
	ROADWAY CONSTRUCTION SUBTOTAL				$193,072
	CONTINGENCY(35%)				$67,575
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$65,162
	TOTAL				$325,809

Planning Estimate (Parametrix)

Project Number	11
Section Summary	Liberty Street and Ottaway Road
Roadway Classification	Local-Collector
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	
Sidewalk	
Planting Strip	
Other	Intersection improvements

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$2,495
2	AGGREGATE BASE	1	TON	20.00	$20
3	SEEDING	1	LS	1,000.00	$1,000
4	EARTHWORK	800	CY	12.00	$9,600
5	EROSION CONTROL	0.2	AC	5,000.00	$1,000
6	LEVEL 2, 1/2 INCH DENSE HMAC	50	TON	80.00	$4,000
7	CLEARING AND GRUBBING	1	LS	5,000.00	$5,000
8	SIGNING	10%	LS	1.00	$2,062
9	TRAFFIC CONTROL	10%	LS	1.00	$2,268
	ROADWAY CONSTRUCTION SUBTOTAL				$27,445
	CONTINGENCY(35%)				$9,606
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$9,263
	TOTAL				$46,314

Planning Estimate (Parametrix)

Project Number	12
Section Summary	Ottaway Road (1600 ft)
Roadway Classification	Collector
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	
Sidewalk	6 ft sidewalks both sides
Planting Strip	
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$14,150
2	AGGREGATE BASE	220	TON	20.00	$4,400
3	SEEDING-LANDSCAPING	1	LS	3,000.00	$3,000
4	EARTHWORK	535	CY	12.00	$6,420
5	EROSION CONTROL	0.2	AC	5,000.00	$1,000
6	LEVEL 2, 1/2 INCH DENSE HMAC	50	TON	80.00	$4,000
7	CONCRETE CURB AND SIDEWALK	1600	LF	50.00	$80,000
8	CONCRETE INLET	4	EACH	1,800.00	$7,200
9	CONCRETE MANHOLE	2	EACH	3000	$6,000
10	12 INCH DRAIN PIPE, 5 FT DEPTH	200	LF	45.00	$9,000
11	CLEARING AND GRUBBING	5%	LS	1.00	$6,051
12	SIGNING	1%	LS	1.00	$1,271
13	TRAFFIC CONTROL	5%	LS	1.00	$6,417
14	SURVEYING	5%	LS	1.00	$6,738
	ROADWAY CONSTRUCTION SUBTOTAL				$155,646
	CONTINGENCY(35%)				$54,476
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$52,531
	TOTAL				$262,653

Planning Estimate (Parametrix)

Project Number	13
Section Summary	OR 99E at Ottaway and Liberty
Roadway Classification	Local
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	
Sidewalk	
Planting Strip	
Other	Bus Stop pad, shelter, bicycle rack, lighting

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION (10%)		LS	1.00	$943
2	AGGREGATE BASE	4	TON	20.00	$80
3	CONCRETE PAD	160	SF	10.00	$1,600
4	LIGHTING	4	EACH	800.00	$3,200
5	LANDSCAPING	1	LS	1,000.00	$1,000
6	EARTHWORK	4	CY	12.00	$48
7	BICYCLE RACK	2	EACH	1,000.00	$2,000
8	SHELTER	2	LS	1,500.00	$1,500
9	SIGNING	2%	LS	1.00	$207
	ROADWAY CONSTRUCTION SUBTOTAL				$10,371
	CONTINGENCY(10%)				$1,037
	PRELIMINARY & CONSTRUCTION ENGINEERING (10%)				$1,141
	TOTAL				$12,549

Planning Estimate (Parametrix)

Project Number	14
Section Summary	Main Street (1400 ft)
Roadway Classification	Collector
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	
Sidewalk	6 ft sidewalks both sides
Planting Strip	
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$22,919
2	AGGREGATE BASE	380	TON	20.00	$7,600
3	SEEDING-LANDSCAPING	1	LS	3,000.00	$3,000
4	EARTHWORK	600	CY	12.00	$7,200
5	EROSION CONTROL	0.3	AC	5,000.00	$1,500
6	LEVEL 2, 1/2 INCH DENSE HMAC	0	TON	80.00	$0
7	CONCRETE CURB AND SIDEWALK	2800	LF	50.00	$140,000
8	CONCRETE INLET	6	EACH	1,800.00	$10,800
9	CONCRETE MANHOLE	2	EACH	3000	$6,000
10	12 INCH DRAIN PIPE, 5 FT DEPTH	400	LF	45.00	$18,000
11	CLEARING AND GRUBBING	5%	LS	1.00	$9,705
12	SIGNING	2%	LS	1.00	$4,076
13	TRAFFIC CONTROL	5%	LS	1.00	$10,394
14	SURVEYING	5%	LS	1.00	$10,914
	ROADWAY CONSTRUCTION SUBTOTAL				$252,108
	CONTINGENCY(35%)				$88,238
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$85,086
	TOTAL				$425,432

Planning Estimate (Parametrix)

Project Number	15
Section Summary	Liberty Street (2200 ft)
Roadway Classification	Local
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	
Sidewalk	
Planting Strip	
Other	Traffic Calming, humps and islands

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$7,386
2	AGGREGATE BASE	380	TON	20.00	$7,600
3	SEEDING-LANDSCAPING	1	LS	5,000.00	$5,000
4	EARTHWORK	600	CY	12.00	$7,200
5	LANDSCAPE ISLANDS	2000	SF	12.00	$24,000
6	LEVEL 2, 1/2 INCH DENSE HMAC	100	TON	80.00	$8,000
7	SPEED HUMPS	4	EACH	3,000.00	$12,000
8	SIGNING	5%	LS	1.00	$3,190
9	TRAFFIC CONTROL	5%	LS	1.00	$3,350
10	SURVEYING	5%	LS	1.00	$3,517
	ROADWAY CONSTRUCTION SUBTOTAL				$81,242
	CONTINGENCY(35%)				$28,435
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$27,419
	TOTAL				$137,096

Planning Estimate (Parametrix)

Project Number	16
Section Summary	OR 99E-Bobs Ave to Ottaway (1400 ft)
Roadway Classification	Local
Travel Lanes	
Parking	
Bikeway	6 ft bike lane
Median/Turn Lane	
Sidewalk	6 ft sidewalks both sides
Planting Strip	
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$46,103
2	AGGREGATE BASE	1070	TON	20.00	$21,400
3	SEEDING-LANDSCAPING	1	LS	8,000.00	$8,000
4	EARTHWORK	950	CY	12.00	$11,400
5	EROSION CONTROL	0.5	AC	5,000.00	$2,500
6	LEVEL 2, 1/2 INCH DENSE HMAC	640	TON	80.00	$51,200
7	CONCRETE CURB AND SIDEWALK	2800	LF	50.00	$140,000
8	LANDSCAPE RETAINING WALL	2000	SF	60.00	$120,000
9	CONCRETE INLET	6	EACH	1,800.00	$10,800
10	CONCRETE MANHOLE	2	EACH	3000	$6,000
11	12 INCH DRAIN PIPE, 5 FT DEPTH	400	LF	45.00	$18,000
12	BIKE LANE STENCIL	6	EA	75.00	$450
13	PAVEMENT STRIPING	2800	LF	0.25	$700
14	CLEARING AND GRUBBING	5%	LS	1.00	$19,523
15	SIGNING	2%	LS	1.00	$8,199
16	TRAFFIC CONTROL	5%	LS	1.00	$20,909
17	SURVEYING	5%	LS	1.00	$21,954
	ROADWAY CONSTRUCTION SUBTOTAL				$507,138
	CONTINGENCY(35%)				$177,498
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$171,159
	TOTAL				$855,795

Planning Estimate (Parametrix)

Project Number	17
Section Summary	New Collector Street (3000 ft)
Roadway Classification	Collector
Travel Lanes	36 feet
Parking	allowed both sides
Bikeway	none
Median/Turn Lane	
Sidewalk	6 ft sidewalks both sides
Planting Strip	
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$110,195
2	AGGREGATE BASE	6700	TON	20.00	$134,000
3	SEEDING-LANDSCAPING	1	LS	10,000.00	$10,000
4	EARTHWORK	9000	CY	12.00	$108,000
5	EROSION CONTROL	2	AC	5,000.00	$10,000
6	LEVEL 2, 1/2 INCH DENSE HMAC	4200	TON	80.00	$336,000
7	CONCRETE CURB AND SIDEWALK	6000	LF	50.00	$300,000
8	CONCRETE INLET	8	EACH	1,800.00	$14,400
9	12 INCH DRAIN PIPE, 5 FT DEPTH	1000	LF	45.00	$45,000
10	CONCRETE MANHOLE	4	EACH	3000	$12,000
11	PAVEMENT STRIPING	3200	LF	0.25	$800
12	CLEARING AND GRUBBING	5%	LS	1.00	$48,510
13	SIGNING	1%	LS	1.00	$10,187
14	TRAFFIC CONTROL	2%	LS	1.00	$20,578
15	SURVEYING	5%	LS	1.00	$52,474
	ROADWAY CONSTRUCTION SUBTOTAL				$1,212,144
	CONTINGENCY(35%)				$424,250
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$409,098
	TOTAL				$2,045,492

Planning Estimate (Parametrix)

Project Number	18
Section Summary	New Collector Street (1800 ft)
Roadway Classification	Collector
Travel Lanes	36 feet
Parking	allowed both sides
Bikeway	none
Median/Turn Lane	
Sidewalk	6 ft sidewalks both sides
Planting Strip	yes
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	0.1	LS	1.00	$67,444
2	AGGREGATE BASE	4100	TON	20.00	$82,000
3	SEEDING-LANDSCAPING	1	LS	8,000.00	$8,000
4	EARTHWORK	6000	CY	12.00	$72,000
5	EROSION CONTROL	1.5	AC	5,000.00	$7,500
6	LEVEL 2, 1/2 INCH DENSE HMAC	2500	TON	80.00	$200,000
7	CONCRETE CURB AND SIDEWALK	3600	LF	50.00	$180,000
8	CONCRETE INLET	6	EACH	1,800.00	$10,800
9	12 INCH DRAIN PIPE, 5 FT DEPTH	600	LF	45.00	$27,000
10	CONCRETE MANHOLE	2	EACH	3000	$6,000
11	PAVEMENT STRIPING	2000	LF	0.25	$500
12	CLEARING AND GRUBBING	5%	LS	1.00	$29,690
13	SIGNING	1%	LS	1.00	$6,235
14	TRAFFIC CONTROL	2%	LS	1.00	$12,594
15	SURVEYING	5%	LS	1.00	$32,116
	ROADWAY CONSTRUCTION SUBTOTAL				$741,879
	CONTINGENCY(35%)				$259,658
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$250,384
	TOTAL				$1,251,921

Planning Estimate (Parametrix)

Project Number	19
Section Summary	OR 99E-Ottaway to UGB (3200 ft)
Roadway Classification	Principal Arterial
Travel Lanes	
Parking	
Bikeway	6 ft bike lanes
Median/Turn Lane	
Sidewalk	6 ft sidewalks both sides
Planting Strip	
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$71,234
2	AGGREGATE BASE	2450	TON	20.00	$49,000
3	SEEDING-LANDSCAPING	1	LS	12,000.00	$12,000
4	EARTHWORK	200	CY	12.00	$2,400
5	EROSION CONTROL	1	AC	5,000.00	$5,000
6	LEVEL 2, 1/2 INCH DENSE HMAC	1460	TON	80.00	$116,800
7	CONCRETE CURB AND SIDEWALK	6400	LF	50.00	$320,000
8	CONCRETE INLET	10	EACH	1,800.00	$18,000
9	12 INCH DRAIN PIPE, 5 FT DEPTH	1600	LF	45.00	$72,000
10	CONCRETE MANHOLE	4	EACH	3,000.00	$12,000
11	BIKE LANE STENCIL	6	EA	75.00	$450
12	PAVEMENT STRIPING	6400	LF	0.25	$1,600
13	CLEARING AND GRUBBING	5%	LS	1.00	$30,463
14	SIGNING	1%	LS	1.00	$6,397
15	TRAFFIC CONTROL	5%	LS	1.00	$32,305
16	SURVEYING	5%	LS	1.00	$33,921
	ROADWAY CONSTRUCTION SUBTOTAL				$783,569
	CONTINGENCY(35%)				$274,249
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$264,455
	TOTAL				$1,322,273

Planning Estimate (Parametrix)

Project Number	20
Section Summary	Ehlen Road-UGB to Airport Road (1000 ft)
Roadway Classification	Principal Arterial
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	
Sidewalk	
Planting Strip	
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$48,428
2	AGGREGATE BASE	930	TON	20.00	$18,600
3	SEEDING-LANDSCAPING	1	LS	8,000.00	$8,000
4	EARTHWORK	200	CY	12.00	$2,400
5	EROSION CONTROL	2	AC	5,000.00	$10,000
6	LEVEL 2, 1/2 INCH DENSE HMAC	1660	TON	80.00	$132,800
7	CONCRETE CURB AND SIDEWALK	2800	LF	50.00	$140,000
8	CONCRETE INLET	4	EACH	1,800.00	$7,200
9	12 INCH DRAIN PIPE, 5 FT DEPTH	350	LF	45.00	$15,750
10	CONCRETE MANHOLE	2	EACH	3,000.00	$6,000
11	LANDSCAPE RETAINING WALL	1200	SF	60.00	$72,000
12	BIKE LANE STENCIL	6	EA	75.00	$450
13	PAVEMENT STRIPING	4000	LF	0.25	$1,000
14	CLEARING AND GRUBBING	5%	LS	1.00	$20,710
15	SIGNING	1%	LS	1.00	$4,349
16	TRAFFIC CONTROL	5%	LS	1.00	$21,963
17	SURVEYING	5%	LS	1.00	$23,061
	ROADWAY CONSTRUCTION SUBTOTAL				$532,711
	CONTINGENCY(35%)				$186,449
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$179,790
	TOTAL				$898,951

Planning Estimate (Parametrix)

Project Number	21
Section Summary	New Collector-Ehlen Rd via Williams to Cole Lane
Roadway Classification	Collector
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	
Sidewalk	
Planting Strip	
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$40,622
2	AGGREGATE BASE	3000	TON	20.00	$60,000
3	SEEDING-LANDSCAPING	1	LS	8,000.00	$8,000
4	EARTHWORK	200	CY	12.00	$2,400
5	EROSION CONTROL	2	AC	5,000.00	$10,000
6	LEVEL 2, 1/2 INCH DENSE HMAC	1600	TON	80.00	$128,000
7	CONCRETE CURB AND SIDEWALK	2400	LF	50.00	$120,000
8	CONCRETE INLET	4	EACH	1,800.00	$7,200
9	CONCRETE MANHOLE	2	EACH	3,000.00	$6,000
10	12 INCH DRAIN PIPE, 5 FT DEPTH	350	LF	45.00	$15,750
11	PAVEMENT STRIPING	1200	LF	0.25	$300
12	CLEARING AND GRUBBING	5%	LS	1.00	$17,883
13	SIGNING	1%	LS	1.00	$3,755
14	TRAFFIC CONTROL	2%	LS	1.00	$7,586
15	SURVEYING	5%	LS	1.00	$19,344
	ROADWAY CONSTRUCTION SUBTOTAL				$446,839
	CONTINGENCY(35%)				$156,394
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$150,808
	TOTAL				$754,041

Planning Estimate (Parametrix)

Project Number	22
Section Summary	New Collector-W Ottaway, north (2600 ft)
Roadway Classification	Collector
Travel Lanes	
Parking	
Bikeway	
Median/Turn Lane	
Sidewalk	
Planting Strip	
Other	

ITEM NO.	BID ITEM DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	MOBILIZATION	10%	LS	1.00	$88,314
2	AGGREGATE BASE	7200	TON	20.00	$144,000
3	SEEDING-LANDSCAPING	1	LS	10,000.00	$10,000
4	EARTHWORK	200	CY	12.00	$2,400
5	EROSION CONTROL	2	AC	5,000.00	$10,000
6	LEVEL 2, 1/2 INCH DENSE HMAC	3600	TON	80.00	$288,000
7	CONCRETE CURB AND SIDEWALK	5200	LF	50.00	$260,000
8	CONCRETE INLET	8	EACH	1,800.00	$14,400
9	12 INCH DRAIN PIPE, 5 FT DEPTH	800	LF	45.00	$36,000
10	PAVEMENT STRIPING	3000	LF	0.25	$750
11	CONCRETE MANHOLE	4	EACH	3,000.00	$12,000
12	CLEARING AND GRUBBING	5%	LS	1.00	$38,878
13	SIGNING	1%	LS	1.00	$8,164
14	TRAFFIC CONTROL	2%	LS	1.00	$16,492
15	SURVEYING	5%	LS	1.00	$42,054
	ROADWAY CONSTRUCTION SUBTOTAL				$971,452
	CONTINGENCY(35%)				$340,008
	PRELIMINARY & CONSTRUCTION ENGINEERING (25%)				$327,865
	TOTAL				$1,639,325

APPENDIX F

Implementation Ordinances

1. INTRODUCTION

The code modifications in this report were developed in coordination with the TSP update Citizens Advisory Committee, the Planning Commission, and City Council and cover the topics of:

- Access spacing standards
- Pedestrian circulation standards
- Street standards
- Roadway operational standards
- Traffic impact analysis requirements
- Roadway improvement requirements
- Street tree requirements
- Bicycle Parking
- Driveway standards
- Right of way requirements

1.1 ACCESS SPACING STANDARDS

Background

Access spacing standards are an important component of a TSP and development code. Three separate jurisdictions own the public roadways within the City of Aurora – the City of Aurora, Marion County, and the State of Oregon – with each jurisdiction establishing their own standards for regulating the spacing of the streets and driveways which intersect with their roadways.

The existing City of Aurora development code has the following references to access spacing:

> *16.34.030 (V)(Streets) Intersection spacing for streets and driveways shall be in accordance with Table 7-2 of the adopted Aurora transportation system plan. Where spacing standards cannot be satisfied, shared driveways serving no more than two residences may be permitted with a recorded reciprocal access and maintenance agreement. (Ord. 419 §§ 13, 14, 2002; Ord. 415 § 7.92.030, 2002)*
>
> *16.34.040 (E)(4) (Blocks and Lots) All affected driveways shall meet the access spacing standard on Table 7-2 of the Aurora transportation system plan except where flag lots on adjacent properties share a common property line and the driveway for each flag lot is constructed immediately adjacent to the common property line and functions as a shared driveway with a recorded reciprocal access and maintenance agreement; and*

The existing City of Aurora TSP includes the following access spacing standards:

Table 7-2
Access Spacing Standard

Functional Classification	Posted Speed Range	Minimum Spacing between Driveways and/or Streets
Highway 99E	30 to 40 mph	275-475
Arterial	25-35 mph	150 feet
Collector	25 mph	75 feet
Local	25 mph	50 feet

Action Items

The access spacing standards table in the TSP shall be updated and added to Aurora's development code. The updated table will maintain the current access spacing standards for collector roadways, but access spacing standards for local residential streets will be reduced to 16 feet. The updated table will reflect Marion County's access spacing standards for their Arterial roadways, and pursuant to a request by ODOT, access spacing standards for their facility (Oregon 99E) will not be included in the access spacing standards table.

The changes to the Aurora development code are as follows:

16.34.030 (V)(Streets)

(1) Access spacing **standards** between streets and/or driveways ~~shall be in accordance with Table 7-2 of the adopted Aurora transportation system plan.~~ **are:**

Spacing Requirements for Accesses on State, County, and City Roadways

Functional Classification	Distance[1]
Principal Arterial (State)	[2]
Principal Arterial (County)	**400 feet from any intersection with Oregon 99E or Airport Road**
	300 feet from any other intersection of private access
Minor Arterial (County)	**400 feet from the intersection with Ehlen Road**
	300 feet from any other intersection of private access
Collector	**75 feet**
Local Residential	**16 feet**

Notes:

(1) Distances are measured from inside edge to inside edge of driveways and roadways, excluding driveway aprons

(2) For access spacing requirements on Oregon 99E, consult Oregon Administrative Rules 734-051

Where access spacing standards cannot be satisfied, ~~shared driveways serving no more than two residences may be permitted with a recorded reciprocal access and maintenance agreement. (Ord. 419 §§ 13, 14, 2002; Ord. 415 § 7.92.030, 2002)~~ **joint and cross access and shared driveways are encouraged pursuant to 16.34.030 (V) (2) & (3).**

(2) Where access spacing standards cannot be satisfied, a shared driveway serving no more than two residences may be permitted with a recorded

reciprocal access and maintenance agreement (Ord. 419 §§ 13, 14, 2002; Ord. 415 § 7.92.030, 2002)

(3) Where access spacing standards cannot be satisfied, adjacent non-residential properties are encouraged to develop a system of joint use driveways and crossover easements for vehicles and pedestrians. Pursuant to this section, property owners developing a system of joint use driveways and crossover easements shall:

(a) Record an easement with the deed allowing cross access to and from other properties served by the joint use driveways and cross access or service drive

(b) Record an agreement with the City of Aurora stating that pre-existing driveways will be closed and eliminated after construction of the joint-use driveway

(c) Record a joint maintenance agreement with the deed defining maintenance responsibilities of property owners

(4) New property access shall not be permitted within fifty (50) feet of an intersection unless no other reasonable access to property is available. Where no other alternatives exist, the City may allow construction of an access connection at a point less than 50 feet from an intersection, provided the access is as far away from the intersection as possible. In such cases, the City may impose turning restrictions (i.e., right in/out, right in only, or right out only)

16.34.040 (E)(4) (Blocks and Lots) All affected driveways shall meet the access spacing standard**s found in 16.34.030 (V)(1)** ~~on Table 7-2 of the Aurora transportation system plan~~ except where flag lots on adjacent properties share a common property line and the driveway for each flag lot is constructed immediately adjacent to the common property line and functions as a shared driveway with a recorded reciprocal access and maintenance agreement; and

1.2 PEDESTRIAN CIRCULATION REQUIREMENTS

Background

Oregon's Transportation Planning Rule requires safe and convenient pedestrian internal circulation and connections to external pedestrian destinations. The existing Aurora development code includes the following regulation pertaining to pedestrian circulation:

> *16.34.050 (C) When desirable for public convenience, a pedestrian or bicycle way may be required to connect a cul-de-sac or to pass through an unusually long or oddly shaped block or otherwise provided appropriate circulation. (Ord. 415 § 7.92.050, 2002)*

Action Item

To ensure adequate pedestrian circulation in future developments and better comply with Oregon's Transportation Planning Rule, the following code language will be included in Aurora's development code:

16.34.210 Pedestrian Circulation
To ensure safe, direct, and convenient pedestrian circulation, all developments, except single-family detached housing (i.e., on individual lots), shall provide a continuous pedestrian system. The pedestrian system shall be based on the standards in subsections A-C, below:
A. Continuous Walkway System. The pedestrian walkway system shall extend throughout the development site and connect to all future phases of development, and to existing or planned off-site adjacent trails, public parks, and open space areas to the greatest extent practicable. The developer may also be required to connect or stub walkway(s) to adjacent streets and to private property with a previously reserved public access easement for this purpose
B. Safe, Direct, and Convenient. Walkways within developments shall provide safe, reasonably direct, and convenient connections between primary building entrances and all adjacent streets, based on the following definitions:
1. Reasonably direct. A route that does not deviate unnecessarily from a straight line or a route that does not involve a significant amount of out-of-direction travel for likely users.
2. Safe and convenient. Routes that are reasonably free from hazards and provide a reasonably direct route of travel between destinations.
3. "Primary entrance" for commercial, industrial, mixed use, public, and institutional buildings is the main public entrance to the building. In the case where no public entrance exists, street connections shall be provided to the main employee entrance.
4. "Primary entrance" for residential buildings is the front door (i.e., facing the street). For multifamily buildings in which each unit does not have its own exterior entrance, the "primary entrance" may be a lobby, courtyard, or breezeway which serves as a common entrance for more than one dwelling.
C. Connections Within Development. Connections within developments shall be provided as required below:
1. Walkways shall connect all building entrances to one another to the extent practicable;
2. Walkways shall connect all on-site parking areas, storage areas, recreational facilities and common areas, and shall connect off-site adjacent uses to the site to the extent practicable. Topographic or existing development constraints may be cause for not making certain walkway connections

1.3 STREET STANDARDS

Background

Street design standards dictate how new roads should be constructed and how existing roads should be modified over time. Three jurisdictions—the City of Aurora, Marion County, and the State of Oregon—own, manage, and maintain roads within Aurora's Urban Growth Boundary (UGB). Though the City does not have authority over county and state roadways, adopting local design standards for these roadways will help the City influence decisions regarding future roadway improvements on the County's Airport and Ehlen Roads and the State of Oregon's 99E.

Action Items

The following table will be included in Aurora's development code.

16.34.030(A)(5)

Street Design Standards[(1)]

Classification	Pavement Width (ft)	Sidewalks Width (ft)	Planting Strips (ft)	Bikeway Width (ft)	Parking	ROW (ft)(2)
Local Residential[(3)]	32	5	5	None	2 sides	54
Collector[(3)]	36	6	7.5	None[(4)]	2 sides[(4)]	65
Minor Arterial[(3)(5)(6)] (County)	36	6	8	6	None	68
Principal Arterial (County)[(6)(7)]	50	6	9.5	6	None	84
Principal Arterial (State) [(8)]	48-50	8	6	6	None	84
Alleys	16	None	None	None	None	16

Notes:

(1) Street Design Standards for roadways within the National Historic District are subject to historic review board approval on a case-by-case basis.

(2) Additional right-of-way and roadway improvements may be required at major intersections to provide for turn lanes and for corner radii.

(3) Planter strips are required unless approved otherwise by the City. Planting strips should be at least 4 feet wide to accommodate tree plantings. In commercially zoned areas, the City may require wider sidewalks which encroach into the planting strip area.

(4) Collectors serving residential areas and historic commercial areas can accommodate on-street parking and shared use of road space by bicyclists and motor vehicles. These shared roadways will be designated with "sharrows." "Sharrows" are markings painted directly onto the road to promote the awareness that the road is a shared traffic lane to be used by both motorists and bicyclists. Collector Streets which serve primarily a mix of commercial and industrial properties will have bike lanes in lieu of on-street parking.

(5) On an interim basis, two 6-8 foot protected shoulders may be installed adjacent to two 12 foot travel lanes, on a case-by-case basis as approved by the County.

(6) City standards are advisory to Marion County on Marion County-owned roadways.

(7) On an interim basis, a multi-use path, separated from the roadway, and on-street bike lanes may be allowed instead of sidewalks and planting strips on a case-by-case basis as approved by the County.

(8) City standards are advisory on ODOT managed roadways.

To provide consistency with the revised street standards, the following additional changes to Aurora's development code are necessary:

16.04.020 (Meaning of common words)

"Alley" means a public way or thoroughfare **of** ~~less than~~ sixteen (16) feet ~~but not less than ten (10) feet in width~~ which has been dedicated or deeded to the public for public use, and provides a secondary means of access to the back or side of abutting properties that have access on another street.

"Street Classifications."

1. Alley: a public way or thoroughfare **of** ~~less than~~ sixteen (16) feet ~~but not less than ten (10) feet in width~~ which has been dedicated or deeded to the public for public use, and provides a secondary means of access to the back or side of abutting properties that have access on another street.

16.34.110 Bikeways.

A. Developments adjoining proposed bikeways as shown in the Aurora transportation system plan shall include provisions for the future extension of such bikeways through the dedication of easements or rights-of-way.

B. Minimum width for bikeways**, where required,** is **six** ~~four~~ paved feet per travel lane. (Ord. ~~415 § 7.92.110, 2002~~)

1.4 ROADWAY OPERATIONAL STANDARDS

Background

The Transportation Planning Rule [660-12-045(2)(b)] requires local governments to adopt standards to protect future operation of roads, transit ways, and major transit corridors. The Oregon Highway Plan similarly calls for the creation of performance standards to protect the mobility of state owned transportation facilities. Within the State of Oregon, traffic operations are evaluated based on two sets of criteria or standards. The operative standard used by ODOT for state highways is the volume-to-capacity (V/C) ratio, and is expressed in terms of a ratio between traffic volumes and the roadway or intersection's capacity. Many local communities assess the quality of traffic performance in terms of intersection or roadway levels of service (LOS). These two operational standards are described below.

Volume-to-Capacity Standard

As adopted in the 1999 Oregon Highway Plan, ODOT uses V/C ratios to measure state highway performance rather than intersection or roadway levels of service. A V/C ratio expresses the relationship between traffic volumes and the roadway or intersection's theoretical capacity. Various V/C thresholds are applied to all state highways based on functional classification of these facilities. Within Aurora, Oregon 99E is classified as a Regional Highway for the segment southwest of 4th Avenue and northeast of Liberty Street. Oregon 99E is classified as a Regional Highway with a Special Transportation Area (STA) designation from Liberty Street to 4th Avenue. The V/C standard represents the maximum ratio for "acceptable" traffic operations. A V/C ratio of 0.85 means that 85 percent of the capacity of the roadway is utilized based on an established planning level capacity and measured traffic volume. The peak hour, maximum V/C standards for Oregon 99E are:

- Inside the UGB and outside the STA boundary:
  - With speeds less than or equal to 35 mph the mobility standard is 0.85.
  - With speeds greater than 35 mph the standard is 0.80.
- Inside the UGB and inside the STA boundary:
  - The operations standard V/C ratio is 0.95.

Airport Road and Ehlen Road are Marion County facilities, and as their intersection is unsignalized, it has a V/C standard of 0.90 and a Level of Service (LOS) standard of E.

Intersection Level of Service Standard

Another measure of intersection operating performance during peak travel periods is based on average control delay per vehicle entering the intersection. This delay is calculated using equations that take into account turning movement volumes, intersection lane geometry and traffic signal features, as well as characteristics of the traffic stream passing through the intersection, including time required to slow, stop, wait, and accelerate to move through the

intersection. Various levels of delay are then expressed in terms of LOS for either signalized or unsignalized intersections. The various LOS range from LOS A (free-flow conditions) through LOS F (operational breakdown). Between LOS A and LOS F, progressively higher LOS grades reflect increasingly worse intersection performance, with higher levels of control delay and increased congestion and traffic queues. Characteristics of each LOS are briefly described in the table below.

Level of Service Definitions

	Average Delay/Vehicle (sec.)		
Level of Service	**Signalized**	**Unsignalized**	**Description**
A (Desirable)	<10 seconds	<10 seconds	Very low delay; most vehicles do not stop.
B (Desirable)	>10 and <20 seconds	>10 and <15 seconds	Low delay resulting from good progression, short cycle lengths, or both.
C (Desirable)	>20 and <35 seconds	>15 and <25 seconds	Higher delays with fair progression, longer cycle lengths, or both.
D (Acceptable)	>35 and <55 seconds	>25 and <35 seconds	Noticeable congestion with many vehicles stopping. Individual cycle failures occur.
E (Unsatisfactory)	>55 and <80 seconds	>35 and <50 seconds	High delay with poor progression, long cycle lengths, high V/C ratios, and frequent cycle failures.
F (Unsatisfactory)	>80 seconds	>50 seconds	Very long delays, considered unacceptable by most drivers. Often results from over-saturated conditions or poor signal timing.

[Source: 2000 Highway Capacity Manual, Transportation Research Board]

Action Items

The City of Aurora does not currently have adopted V/C or LOS standards for their intersections, making it more difficult to assess whether a new development should be responsible for funding improvements to intersections the development impacts (for example, funding turn lanes or traffic signals). Aurora will adopt an LOS standard of D for signalized intersections and E for unsignalized intersections. This standard is based on the understanding that delay is more acceptable and causes fewer impacts to motorists on lower volume roads (local residential and collector roads) and the City does not control the higher volume roads within its UGB (Ehlen Road, Airport Road, and Oregon 99E). This standard also results in fewer city intersections being widened for turn lane installations, and therefore provides pedestrians with a shorter distance to travel when crossing city streets. The City also will adopt Marion County's V/C and LOS standards for their roadways and reference state standards. These revisions to standards are included in the table below.

16.34.030 (W)

Traffic Operations Standards

Roadway Functional Classification[1,2]	Intersection Type	Operations Standard
Local Residential	Signalized, All-way Stop & Roundabout	LOS D
	Unsignalized	LOS E
Collector	Signalized, All-way Stop & Roundabout	LOS D
	Unsignalized	LOS E
Minor Arterial (County)[3]	Signalized, All-way Stop & Roundabout	LOS D .85 V/C
	Unsignalized[4]	LOS E .90 V/C
Principal Arterial (County)[3]	Signalized, All-way Stop & Roundabout	LOS D .85 V/C
	Unsignalized[4]	LOS E 90 V/C
Principal Arterial (State)[5]	Regional Highway	[5]
	Regional Highway (STA)	[5]

Notes:

1) For intersections where state owned roadways cross city or county owned roadways, state traffic operations standards are used in place of city and/or county standards. Where county owned roadways cross local roadways, county operations standards are used in place of city standards.

2) For intersections where two roadways owned by the same jurisdiction cross, the traffic operations standards of the street with the higher functional classification are used (Collector is higher than Local Residential and Principal Arterial is higher than Minor Arterial)

3) Source: Marion County Regional Transportation System Plan

4) LOS F may be allowed at county-owned unsignalized intersections if the movement has relatively low volume (as determined by County staff) and there is no indication that a safety problem will be created

5) Oregon Department of Transportation operations standards apply to Oregon 99E within the City of Aurora. Within the City, Oregon 99E has two designations, each with its own operations standard. The portion of Oregon 99E from Liberty Street to 4th Avenue is a Regional Highway with Special Transportation Area designation. The remaining portion of Oregon 99E is a Regional Highway.

1.5 TRAFFIC IMPACT ANALYSIS REQUIREMENTS

Background

Many jurisdictions require developers to analyze the potential off-site transportation impacts of their development as a condition of development review. When a traffic impact analysis (TIA) is undertaken, a jurisdiction has the opportunity to require off-site impacts are addressed prior to approving the development. The City of Aurora does not currently have a TIA requirement.

Action Item

The City will adopt the following TIA requirement and use the TIA checklist in Appendix A to assist in administering the TIA requirement. Both the TIA requirement and checklist are adapted from the City of Stayton's TIA requirements.

INTENT AND PURPOSE

A transportation impact analysis (TIA) provides an objective assessment of the anticipated modal transportation impacts associated with a specific land use action. A TIA is useful for answering important transportation-related questions such as:

- **Can the existing transportation system accommodate the proposed development from a capacity and safety standpoint?**
- **What transportation system improvements are necessary to accommodate the proposed development and meet the City's adopted transportation performance standards?**
- **How will access to the proposed development affect the traffic operations on the existing transportation system?**
- **What transportation impacts will the proposed development have on the adjacent land uses, including commercial, institutional, and residential uses?**
- **Will the proposed development meet current standards for roadway design?**

Throughout the development of the TIA (and beginning as early as possible), cooperation between City of Aurora staff, the applicant, and the applicant's traffic engineer is encouraged to provide an efficient and effective process.

The City of Aurora assumes no liability for any costs or time delays (either direct or consequential) associated with the preparation and review of a transportation impact analysis.

Depending on the nature and scope of the proposed development, the Aurora City Engineer or designee may reduce or remove portions of the traffic impact analysis requirements. City of Aurora City Engineer or designee may, at its discretion, and depending on the specific situation, require additional study components in a TIA beyond what is outlined in this section or waive requirements deemed inappropriate.

1. **<u>When a Transportation Impact Analysis is Required</u>. A TIA shall be required when:**
    a. **The development generates 25 or more peak-hour trips or 250 or more daily trips.**
    b. **An access spacing exception is required for the site access driveway(s) and the development generates 10 or more peak-hour trips or 100 or more daily trips.**
    c. **The development is expected to impact intersections that are currently operating at the upper limits of the acceptable range of level of service during the peak operating hour.**
    d. **The development is expected to significantly impact adjacent roadways and intersections that have previously been identified as high crash locations or areas that may have other operational or safety concerns, or**

areas that contain a high concentration of pedestrians or bicyclists such as a school.

e. Based on the engineering judgment of the City Engineer, the development or land use action would significantly affect the adjacent transportation system. Examples include, but are not limited to, proposals for non-single family development in single family residential areas, proposals adding traffic to or creating known or anticipated safety or neighborhood traffic concerns, or proposals that would generate a high percentage of truck traffic (more than 5% of site traffic).

2. <u>When a Transportation Assessment Letter is Required</u>. If a TIA is not required, the applicant's traffic engineer shall submit a transportation assessment letter to the City indicating the proposed development or land use action is exempt. This letter shall outline the trip-generating characteristics of the proposed land use and verify that the site-access driveways or roadways meet City of Aurora visual clearance requirements and roadway design standards.

The City Engineer may waive the requirement for a transportation assessment letter if a clear finding can be made that the proposed land use action does not generate 25 or more peak hour trips or 250 or more daily trips and the existing and or proposed driveway(s) meet the City's visual clearance requirements and access spacing standards.

3. <u>Traffic Impact Analysis Preparation</u>. A Traffic Impact Analysis shall be prepared by a professional engineer registered in the State of Oregon in accordance with the requirements of the road authority. In addition, the preparer should have extensive experience in the methods and concepts associated with transportation impact analysis. If the road authority is the Oregon Department of Transportation (ODOT), consult ODOT's regional development review planner and OAR 734-051-180.

4. <u>Contents of a Transportation Impact Analysis</u>. As a guide in the preparation of a transportation impact analysis, the City of Aurora recommends the following format be used to document the analysis.

a. *Table of Contents.* Listing of all sections, figures, and tables included in the report.
b. *Executive Summary.* Summary of the findings and recommendations contained within the report.
c. *Introduction.* Proposed land use action, including site location, building square footage, and project scope. Map showing the proposed site, building footprint, access driveways, and parking facilities. Map of the study area, which shows site location and surrounding roadway facilities.
d. *Existing Conditions.* Existing site conditions and adjacent land uses. Roadway characteristics (all transportation facilities and modal opportunities located within the study area, including roadway functional classifications, street cross section descriptions, posted speeds, bicycle and pedestrian facilities, on-street parking, and transit facilities). Existing lane configurations and traffic control devices at the study area

intersections. Existing traffic volumes and operational analysis of the study area roadways and intersections. Roadway and intersection crash history analysis.

e. ***Background Conditions (without the proposed land use action).*** **Approved developments and funded transportation improvements in the study area. Traffic growth assumptions. Addition of traffic from other planned developments. Background traffic volumes and operational analysis.**

f. ***Full Buildout Traffic Conditions (with the proposed land use action).*** **Description of the proposed development plans. Trip-generation characteristics of the proposed development (including trip reduction documentation). Trip distribution assumptions. Full buildout traffic volumes and intersection operational analysis. Intersection and site-access driveway queuing analysis. Expected safety impacts. Recommended roadway and intersection mitigations (if necessary).**

g. ***Site Circulation Review.*** **Evaluate internal site access and circulation. Review pedestrian paths between parking lots and buildings. Ensure adequate throat depth is available at the driveways and that vehicles entering the site do not block the public facilities. Review truck paths for the design vehicle.**

h. ***Turn Lane Warrant Evaluation.*** **Evaluate the need to provide turn lanes at the site driveways.**

i. ***Conclusions and Recommendations.*** **Bullet summary of key conclusions and recommendations from the transportation impact analysis.**

j. ***Appendix.*** **Traffic counts summary sheets, crash analysis summary sheets, and existing/background/full buildout traffic operational analysis worksheets. Other analysis summary sheets such as queuing and signal warrant analyses.**

k. ***Figures.*** **The following list of figures should be included in the Transportation Impact Analysis: Site Vicinity Map; Existing Lane Configurations and Traffic Control Devices; Existing Traffic Volumes and Levels of Service (all peak hours evaluated); Future Year Background Traffic Volumes and Levels of Service (all peak hours evaluated); Proposed Site Plan; Future Year Assumed Lane Configurations and Traffic Control Devices; Estimated Trip Distribution Pattern; Site-Generated Traffic Volumes (all peak hours evaluated); Full Buildout Traffic Volumes and Levels of Service (all peak hours evaluated).**

5. **<u>Study Area</u>. The study area shall include, at a minimum, all site-access points and intersections (signalized and unsignalized) adjacent to the proposed site. If the proposed site fronts an arterial or collector street; the study shall include all intersections along the site frontage and within the access spacing distances extending out from the boundary of the site frontage.**

Beyond the minimum study area, the transportation impact analysis shall evaluate all intersections that receive site-generated trips that comprise at least 10% or more of the total intersection volume. In addition to these requirements, the City Engineer (or his/her designee) shall determine any additional intersections or roadway links that might be adversely affected as a result of the proposed development. The applicant and the City Engineer (or his/her

designee) will agree on these intersections prior to the start of the transportation impact analysis.

6. **<u>Study Years to be Analyzed in the Transportation Impact Analysis</u>. A level-of-service analysis shall be performed for all study roadways and intersections for the following horizon years:**

    a. **Existing Year. Evaluate all existing study roadways and intersections under existing conditions.**
    b. **Background Year. Evaluate the study roadways and intersections in the year the proposed land use is expected to be fully built out, without traffic from the proposed land use. This analysis should include traffic from all approved developments that impact the study intersections, or planned developments that are expected to be fully built out in the horizon year.**
    c. **Full Buildout Year. Evaluate the expected roadway, intersection, and land use conditions resulting from the background growth and the proposed land use action assuming full buildout and occupancy. For phased developments, an analysis shall be performed during each year a phase is expected to be completed.**
    d. **Twenty-Year Analysis. For all land use actions requesting a Comprehensive Plan Amendment and/or a Zone Change, a long-term level-of-service analysis shall be performed for all study intersections assuming buildout of the proposed site with and without the comprehensive plan designation and/or zoning designation in place. The analysis should be performed using the future year traffic volumes identified in the Transportation System Plan (TSP). If the applicant's traffic engineer proposes to use different future year traffic volumes, justification for not using the TSP volumes must be provided along with documentation of the forecasting methodology.**

7. **<u>Study Time Periods to be Analyzed in the Transportation Impact Analysis.</u> Within each horizon year, a level-of-service analysis shall be performed for the time period(s) that experience the highest degree of network travel. These periods typically occur during the midweek (Tuesday through Thursday) morning (7:00 a.m. to 9:00 a.m.), mid-week evening (4:00 p.m. to 6:00 p.m.), and Saturday afternoon (12:00 p.m. to 3:00 p.m.) periods. The transportation impact analysis should always address the weekday a.m. and p.m. peak hours when the proposed lane use action is expected to generate 25 trips or more during the peak time periods. If the applicant can demonstrate that the peak-hour trip generation of the proposed land use action is negligible during one of the two peak study periods and the peak trip generation of the land use action corresponds to the roadway system peak, then only the worst-case study period need be analyzed.**

    Depending on the proposed land use action and the expected trip-generating characteristics of that development, consideration of non-peak travel periods may be appropriate. Examples of land uses that have non-typical trip generating characteristics include schools, movie theaters, and churches. The City Engineer (or his/her designee) and applicant should discuss the potential for additional study periods prior to the start of the transportation impact analysis.

8. **<u>Traffic Count Requirements.</u> Once the study periods have been determined, turning movement counts should be collected at all study area intersections to determine the base traffic conditions. These turning movement counts should typically be conducted during the weekday (Tuesday through Thursday) between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m., depending on the proposed land use. Historical turning movement counts may be used if the data are less than 12 months old, but must be factored to meet the existing traffic conditions.**

9. **<u>Trip Generation for the Proposed Development.</u> To determine the impacts of a proposed development on the surrounding transportation network, the trip-generating characteristics of that development must be estimated. Trip-generating characteristics should be obtained from one of the following acceptable sources:**

    a. **Institute of Transportation Engineers (ITE) Trip Generation Manual (latest edition).**
    b. **Specific trip generation studies that have been conducted for the particular land use action for the purposes of estimating peak-hour trip-generating characteristics. The City Engineer (or his/her designee) should approve the use of these studies prior to their inclusion in the transportation impact analysis.**
    c. **In addition to new site-generated trips, several land uses typically generate additional trips that are not added to the adjacent traffic network. These trips include pass-by trips and internal trips and are considered to be separate from the total number of new trips generated by the proposed development. The procedures listed in the most recent version of the Trip Generation Handbook (ITE) should be used to account for pass-by and internal trips.**

10. **<u>Trip Distribution.</u> Estimated site-generated traffic from the proposed development should be distributed and assigned on the existing or proposed arterial/collector street network. Trip distribution methods should be based on a reasonable assumption of local travel patterns and the locations of off-site origin/destination points within the site vicinity. Acceptable trip distribution methods should be based on one of the following procedures:**

    a. **An analysis of local traffic patterns and intersection turning movement counts gathered within the previous 12 months.**
    b. **A detailed market study specific to the proposed development and surrounding land uses.**

11. **<u>Intersection Operation Standards.</u> The City of Aurora evaluates the intersection operational performance of city-owned intersections based on levels of service standards. It should be noted that the Oregon Department of Transportation (ODOT) and Marion County have their own operations performance standards that apply to their facilities. The ODOT roadways operational performance is measured with volume-to-capacity analysis and Marion County's roadways**

operational performance is measured with volume-to-capacity analysis and level of service standards. Intersection operational performance standards for all road authorities within the City of Aurora are as found in 16.34.030 (W). When evaluating the volume-to-capacity ratio, the total traffic demand shall be considered.

a. A capacity analysis should be performed at all intersections within the identified study area.

b. **The City of Aurora requires all intersections within the study area to maintain an acceptable level of operations per Section 16.34.030 (W) upon full buildout of the proposed land use action. Calculations should be made using the methods identified in the most recent version of the Highway Capacity Manual (or by field studies), published by the Transportation Research Board. Any intersections not operating at standards described in 16.34.030 (W) will be considered to be unacceptable.**

12. **<u>Recommendations and Conclusions.</u> Provide descriptions and analysis of the appropriate conclusions, mitigation measures and recommended improvements necessary for compliance with the applicable standards. Include analysis showing that these measures will bring identified intersections and locations into compliance and include signal, turn lane, or other warrant analyses as appropriate. The TIA shall also specify the timing and phasing of any new traffic signals and the length of any new turn lanes. Any new parking facility needs shall be identified and the conformance of the proposed parking facilities to applicable standards. Any new pedestrian and bicycle transportation needs arising from the development shall also be identified.**

    Any and all mitigation measures recommended in the TIA shall be physically and economically feasible, and this feasibility may need to be demonstrated in questionable cases. In addition, the recommendations and conclusions presented in the TIA shall be consistent with and supported by the data, calculations, and analysis in the report. Inconsistent and/or unsupported conclusions will not be accepted, and may lead to the TIA being returned to the applicant's traffic engineer for correction.

13. **<u>Review Policy and Procedure.</u> The following criteria should be used in reviewing a transportation impact analysis as part of a subdivision or site plan review.**

    a. The road system is designed to meet the projected traffic demand at full build-out.
    b. Proposed driveways do not adversely affect the functional character of the surrounding roadways.
    c. Adequate intersection and stopping sight distance is available at all driveways.
    d. Proposed driveways meet the City's access spacing standard or sufficient justification is provided to allow a deviation from the spacing standard.
    e. Opportunities for providing joint or crossover access have been pursued.
    f. The site does not rely upon the surrounding roadway network for internal vehicular circulation.

g. The road system provides adequate access to buildings for residents, visitors, deliveries, emergency vehicles, and garbage collection.
h. Pedestrian circulation is provided per 16.34.210.

14. <u>Conditions of Approval.</u> As part of every land use action, the City of Aurora, Marion County (if access to a County roadway is proposed), and ODOT (if access to a state roadway is proposed) will be required to identify conditions of approval needed to meet operations and safety standards and provide the necessary right-of-way and improvements to develop the future planned transportation system. Conditions of Approval that should be evaluated as part of subdivision and site plan reviews include:

a. Consideration of joint and cross access and joint use driveways for developments that do not meet the designated access spacing policy.
b. Right-of-way dedications for future planned roadway improvements.
c. Half or three-quarter street improvements along site frontages that do not have full-buildout improvements in place at the time of development.

15. <u>Transportation Impact Analysis Checklist.</u> As part of the transportation impact analysis review process, all transportation impact analyses submitted to the City of Aurora must satisfy the requirements illustrated in the Checklist for Acceptance of a Transportation Impact Analysis. Incomplete and/or unacceptable TIAs will be returned to the applicant's traffic engineer for completion and/or correction.

Provide two (2) copies of the TIA report for City staff to review. If any portion of the study area falls within another jurisdiction (such as Marion County or ODOT roadways), consult that jurisdiction to determine the number of additional copies needed for review.

1.6 NON-REMONSTRANCE AGREEMENTS

Background

The TAC and CAC have requested revisions to the Aurora development code related to roadway improvement requirements for developers generally and the issuance of non-remonstrance agreements in lieu of street improvements specifically. The following non-remonstrance agreement regulations are included within the existing Aurora development code.

16.34.060 (C) (Sidewalks) The city may accept and record a non-remonstrance agreement for the required sidewalks from the applicant for a building permit for a single-family residence when the public works director determines the construction of the sidewalk is impractical for one or more of the following reasons:

1. The residence is an in-fill property in an existing neighborhood and adjacent residences do not have sidewalks;

2. Topography or elevation of the sidewalk base area makes construction of a sidewalk impractical. (Ord. 415 § 7.92.060, 2002)

16.34.030 (A)(2) Subject to approval of the planning commission, the city may accept and record a non-remonstrance agreement in lieu of street improvements if two or more of the following conditions exist:

A. A partial improvement creates a potential safety hazard to motorists or pedestrians;

B. Due to the nature of existing development on adjacent properties it is unlikely that street improvements would be extended in the foreseeable future and the improvement associated with the project under review does not, by itself, provide a significant improvement to street safety or capacity;

C. The improvement is associated with an approved land partition on property zoned residential and the proposed land partition does not create any new streets; or

D. Additional planning work is required to define the appropriate design standards for the street and the application is for a project which would contribute only a minor portion of the anticipated future traffic on the street.

Members of the TAC and CAC are concerned that this language is overly broad, resulting in a situation where development rarely results in street frontage improvements. This is of particular concern on primary pedestrian routes, many of which currently lack sidewalks.

Action Items

Non-Remonstrance Agreements

The City will limit conditions under which non-remonstrance agreements in lieu of street improvements and sidewalk improvements are allowed, as follows:

~~16.34.060 (C) (Sidewalks) The city may accept and record a non-remonstrance agreement for the required sidewalks from the applicant for a building permit for a single-family residence when the public works director determines the construction of the sidewalk is impractical for one or more of the following reasons:~~

~~1. The residence is an in-fill property in an existing neighborhood and adjacent residences do not have sidewalks;~~

~~2. Topography or elevation of the sidewalk base area makes construction of a sidewalk impractical. (Ord. 415 § 7.92.060, 2002)~~

16.34.030 (A)(2) Subject to approval of the planning commission, the city may accept and record a non-remonstrance agreement in lieu of street improvements if ~~two or more of~~ the following conditions exist:

A. partial improvement creates a potential safety hazard to motorists or pedestrians; **or**

B. Due to the nature of existing development on adjacent properties it is unlikely that street improvements would be extended in the foreseeable future and the improvement associated with the project under review does not, by itself, provide a significant improvement to street safety or capacity.

~~C. The improvement is associated with an approved land partition on property zoned residential and the proposed land partition does not create any new streets; or~~

~~D. Additional planning work is required to define the appropriate design standards for the street and the application is for a project which would contribute only a minor portion of the anticipated future traffic on the street.~~

The City may also, subject to review by their City Attorney, consider creating a voluntary payment in lieu of street improvements program, as follows:

> **16.34.030 (A) (3)** Subject to approval of the Planning Commission, the city may accept a payment in lieu of street improvements. To propose a payment in lieu of street improvements, the applicant shall prepare an engineering estimate for the cost of engineering, design and construction of the required frontage improvements. City staff will review and approve the engineering cost estimate and calculate the payment in lieu of street improvements. The payment in lieu of street improvements will generally be set at two-thirds of the estimated cost. Payment in lieu of street improvement funds collected by the City will be used to pay for improvements within public rights of way within the Aurora city limits.

1.7 HALF STREET IMPROVEMENTS

Background

The TAC has requested revisions to the Aurora development code related to half street improvements. The existing Aurora development code includes the following language:

> *16.34.030 (I) Half streets, while generally not acceptable, may be approved where essential to the reasonable development of the site when in conformity with the other requirements of these regulations, and when the commission finds it will be practical to require the dedication of the other half when adjoining property is divided or developed. Whenever a half street is adjacent to a tract to be divided or developed, the other half of the street shall be provided within such tract. Reserve strips and street plugs pursuant to subsection E of this section may be required to preserve the objectives of half streets.*

The TAC has identified the creation of half streets as an inefficient means of obtaining ultimate street build out of new streets, and has recommended the development code be revised to require three-quarter build out of new streets.

Action Items

The City of Aurora development code be modified as follows.

> 16.34.030 (I)**(1)** Half streets, while generally not acceptable, may be approved where essential to the reasonable development of the site when in conformity with the other requirements of these regulations, and when the commission finds it will be practical to require the dedication of the other half when adjoining property is divided or developed. Whenever a half street is adjacent to a tract to be divided or developed, the other half of the street shall be provided within such tract. Reserve strips and street plugs pursuant to subsection E of this section may be required to preserve the objectives of half streets.
>
> **16.34.030(I)(2) Where a half street improvement is otherwise acceptable, and additional development and/or redevelopment is expected to result in completion of the remaining half street sometime in the future, three-quarter street improvements are required in lieu of half street improvements.**

A request has also been made to require that the developer of the three-quarter street section be reimbursed for the cost of constructing the additional ¼ street width. Specifically, the request is to have the developer of the final ¼ street width reimburse the original developer. Assuming that in most cases the two developers will not have a private reimbursement

agreement in place at time of road construction, the City would need to establish a program of recording reimbursements owed, later collecting funds from developers of ¼ streets, and ultimately providing reimbursements.

1.8 STREET TREE REQUIREMENTS

Background

The TAC and CAC requested code language requiring street trees in planter strips throughout Aurora and requested information on types of trees which may be best suited to the varying planter strip widths included in the Aurora TSP. The existing Aurora development code includes the following language on street trees:

> *Section 16.34.030 (U) (Streets) Street trees shall be installed in the downtown corridor in accordance with the Aurora downtown improvement plan*
>
> *16.56.030 (J) (Gateway Development standards) A planting strip no less than six feet in width shall be provided between the sidewalks and the curb and the planting of street trees shall be required.*

Action Items

The Aurora development code will be modified as follows:

> 16.34.030 (U) (Streets) ~~Street trees shall be installed in the downtown corridor in accordance with the Aurora downtown improvement plan~~ **Within 6 months of developing frontage improvements, two (2) inch minimum caliper trees shall be installed in planting strips in accordance with the City of Aurora's street tree list. Prior to adoption of a street tree list, the City of Aurora's City Engineer will approve the street tree selection.**
>
> ~~16.56.030 (J) (Gateway Development standards) A planting strip no less than six feet in width shall be provided between the sidewalks and the curb and the planting of street trees shall be required.~~

1.9 BICYCLE PARKING

Background

Section 660-012-0045(3)(A) of the Transportation Planning Rule requires "Bicycle parking facilities as part of new multi-family residential developments of four units or more, new retail, office and institutional developments, and all transit transfer stations and park-and-ride lots"

Bicycle parking requirements in the existing Aurora development code are:

> *16.42.120 (Bicycle parking) At least one secured bicycle rack space shall be provided for each fifteen (15) parking spaces or portion thereof in any new commercial, industrial, or multifamily development. Bicycle parking areas shall not be located within parking aisles, landscape areas, or pedestrian ways. (Ord. 415 § 7.100.120, 2002)*

Action Item

The additional categories of development included in the Transportation Planning Rule will be referenced in the bicycle parking section of Aurora's development code, including a

specific requirement to provide bicycle parking at transit transfer stations, regardless of whether vehicular parking exists at such stations.

16.42.120 (Bicycle parking) At least one secured bicycle rack space shall be provided for each fifteen (15) parking spaces or portion thereof in any new commercial, industrial, **institutional,** ~~or~~ multifamily, or park-and-ride development. **Bicycle parking shall be provided at transit transfer stations as determined by the City Engineer.** Bicycle parking areas shall not be located within parking aisles, landscape areas, or pedestrian ways. (Ord. 415 § 7.100.120, 2002)

1.10 DRIVEWAY STANDARDS

Background

The City of Aurora lacks driveway width standards, and the TAC and CAC have recommended limiting the width of these facilities to provide a more pleasant and safer pedestrian experience.

Action Item

Add the following driveway width standards to Aurora's development code:

16.34.030 (P) (Streets) Concrete vertical curbs, curb cuts, wheelchair, bicycle ramps and driveway approaches shall be constructed in accordance with standards in the city's public works design standards as required by the Aurora transportation system plan. Driveways shall be asphalt or concrete, not less than four inches deep or two inches of asphalt on four inches of three-fourths-inch minus gravel**, or other hard durable and dustless surfaces such as cobblestone, unit masonry, scored and colored concrete, grasscrete, or combinations of above. Driveway width shall be 12' minimum and 24' maximum for two-car garages and up to 36 feet for three-car garages, unless otherwise approved by the City**.

1.11 RIGHT OF WAY REQUIREMENTS

Background

Concerns have been raised about new buildings being constructed within the future rights of way needed to bring existing roadways into compliance with street design standard widths. Aurora's existing development code provides some protection of rights of way, but only in instances where new construction includes a land division:

16.34.030 (A) (Streets) No development shall occur unless the development has frontage on or approved access to a public street:

(1) Whenever existing streets adjacent to or within a tract are of inadequate width, additional right-of-way shall be provided at the time of land division. Any new street or additional street width shall be dedicated and improved in accordance with this title, the Aurora transportation system plan and the public works design standards and specifications.

Action Item

To prevent new structures from encroaching into needed rights of way, the following language will be included in the development code:

16.34.030(A)(4)

New structures that are proposed to be constructed on lots abutting an existing public street that does not meet the minimum standards for right of way width shall provide setbacks sufficient to allow for the future widening of the right of way. Building permits shall not be issued unless yard setbacks equal to the minimum yard requirements of the zoning district plus the required minimum additional right of way width is provided