
US 20/Oregon 34 Access Management and Expressway Plan

Corvallis Bypass to Peoria/
Wolcott Road Segment

Prepared for
Oregon Department of Transportation

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Prepared by





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Acronyms

ADT	average daily traffic
AMP	access management plan
BA	biological assessment
BMP	best management practice
CLOMR	Certified Letter of Map Revision
CTWLTL	continuous two-way left-turn lane
CWA	Clean Water Act
DEQ	Oregon Department of Environmental Quality
DHV	design hourly volumes
ECSI	Environmental Cleanup Site Information
EFU	Exclusive Farm Use
ESA	Endangered Species Act
FCM	Forest Conservation Management (Linn County zoning district)
FEMA	Federal Emergency Management Agency
F/F	Farm/Forest (Linn County zoning district)
FIRM	Flood Insurance Rate Map
GIS	geographic information systems
GLO	Government Land Office
LCC	Linn County Development Code
LI	Limited Industrial (Linn County zoning district)
NFA	no further action
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NHS	National Highway System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OAR	Oregon Administrative Rules
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
ORNHIC	Oregon Natural Heritage Information Center
OSU	Oregon State University
OTC	Oregon Transportation Commission
OSHPO	Oregon State Historic Preservation Office

PMT	Project Management Team
RCM	Rural Commercial
RR	Rural Residential (Linn County zoning district)
SIP	Safety Improvement Program
SPIS	Safety Priority Index System
STIP	State Transportation Improvement Program
TPAU	Transportation Planning Analysis Unit (ODOT)
TPR	Transportation Planning Rule
TSP	Transportation System Plan
UGB	urban growth boundary
v/c	volume-to-capacity ratios
VMT	vehicle miles traveled
WRGO	Willamette River Greenway Overlay (Linn County zoning district)

Executive Summary

This plan examines safety and highway operational conditions within the area of Oregon 34 located between the Corvallis Bypass and Wolcott Road. This study was precipitated by the designation of Oregon 34 as an Expressway and the high number of vehicular crashes within the study area, particularly in the immediate vicinity of the Oregon 34/Corvallis Bypass and Oregon 34/Peoria Road intersections. These intersections are considered to be among the worst crash locations on the state highway system when ranked according to crash frequency and severity.

Several key factors contribute to poor safety conditions within the study area:

- Traffic flow is interrupted by numerous driveways and roads that intersect with the highway, reducing roadway efficiency and increasing potential for accidents.
- Traffic volumes exceed state capacity standards.
- Poor driver expectancy conditions are present on westbound Oregon 34 approaching the study segment. Drivers traveling at highway speeds encounter sudden stop conditions at the Peoria Road traffic signal.

Existing and projected traffic conditions indicate that additional highway capacity will be needed near the end of the planning horizon (2027) to meet the Oregon Highway Plan mobility standards for a statewide highway expressway and freight route. This plan however, uses access management as a central strategy to mitigate existing safety conditions in the study area and to allow for future changes to address mobility. Resolving property access issues will allow highway operation and property access to be accomplished in the manner that best deals with highway safety and highway mobility needs.

As part of this AMP, 14 different roadway access and intersection control alternatives were reviewed. All of these alternatives were intended to control access and increase roadway safety for all roadway users in the project segment. Alternatives were scored against threshold and evaluation criteria developed and adopted by the AMP Steering Team, which included officials from ODOT, Linn County, Benton County, and the City of Corvallis. Ideas, concerns, and feedback on alternatives were also obtained from the public through small group meetings with land, home, and business owners and through a community open house.

The Alternatives

Fourteen alternatives were identified and evaluated:

- **Seven north frontage road options** were evaluated that close public and private access roads on the north side of Oregon 34 between the Corvallis Bypass and Wolcott Road. Six of these options entail realigning Wolcott Road to create a four-legged intersection with Oregon 34 (and Peoria Road). One option entails realigning Peoria Road to create a four-legged intersection with Oregon 34 (and Wolcott Road).

- **Two south frontage road options** were evaluated that close all public and private access roads on the south side of Oregon 34.
- **One roundabout option** in which roundabouts would be installed at three study segment intersections of Oregon 34: Corvallis Bypass, Morse Brothers driveway, and Peoria Road.
- **Two options** that would **relegate** all existing **access** roads within the study area to **right-in/right-out movements only**.
- **Two options** to **create a wide intersection** at Oregon 34 and between the existing alignments of Peoria Road and/Wolcott Road.

The Preferred Alternative

A preferred alternative package was chosen on the basis of performance against evaluation criteria, comparison with other feasible alternatives, and potential for improving safety conditions. The preferred package entails:

- Closing all access roads on the study segment between the Corvallis Bypass and Peoria Road
- Building local access roads both north and south of the highway
- Creating a bicycle/pedestrian path north of the highway
- Realigning Wolcott Road so that it forms a four-legged intersection with Oregon 34 and Peoria Road
- Implementing a collection of other safety and operational roadway treatments

The “N1-Modified” package includes a local access road and bicycle/pedestrian multi-use path. This north frontage road system was selected because it best minimized impacts to agricultural land and farm operations, out-of-direction travel, and impacts on local businesses and residences. The road linking between the bypass signalized intersection and Electric Road, however, would impact the Trysting Tree Golf Course by using land now part of the golf course. This road was identified by Oregon State University officials and Trysting Tree Golf Course officials as the preferred solution for access to the golf course and to the adjacent farmlands owned and used for agricultural research by OSU.

The selected south road system, “Alternative S1,” had fewer impacts on potentially environmentally sensitive land and provided more direct travel routes than the other south frontage road alternative.

To further address safety concerns, a number of safety and operational roadway treatments are proposed for implementation. These include intersection, intersection approach, and highway segment treatments. These improvements would address safety concerns in the interim period before the local access road system is completed, and would augment the safety of these roads when all system segments have been constructed.

The plan also prioritizes implementation of improvements by phase. The established priority is based on available funding in the 2006-2009 State Transportation Improvement Program, the cost of future phases, and the expected increase in future highway safety.

Table ES-1 summarizes the prioritized actions included in the preferred alternative package. Figure ES-1 shows these priorities as components of the preferred alternative.

TABLE ES-1
Recommended Actions to Improve Safety on Oregon 34 and Peoria Road

Location	Action	Benefit
Priority 1: Peoria Road/Wolcott Rd. Realignment and Traffic Signal		
Wolcott Road	Realign Wolcott Road to create a four-legged intersection with Oregon 34; the realigned Wolcott Road would be directly across from Peoria Road.	Provides for safer and more orderly movement of vehicles, including the movement of farm equipment, onto and across Oregon 34. Eliminates conflicting movements in the center left-turn lane East of the current intersection.
North of Oregon 34	Construct a local access frontage road between the realigned Wolcott Road west to the Oregon Department of Fish and Wildlife (ODFW) building driveway.	Provides users access to Oregon 34 via proposed signalized intersection at the realigned Wolcott Road. Replaces previous direct driveway access.
Oregon 34 and Peoria Road Intersection	Extend the existing right-turn lane on eastbound Oregon 34 at the Peoria Road intersection to provide adequate vehicular queuing and deceleration length. Add a second left-turn lane on Peoria Road.	Separates travel movements at the intersections ensuring speed consistency and reducing the likelihood for rear-end crashes. Increases the intersection capacity and efficiency.
Priority 2A: Multi-use Path from ODFW Building to Crew Dock Road		
North of Oregon 34	Construct a bicycle/pedestrian path alongside the frontage road between the OSU crew docks driveway east to Electric Road. Construct a stand-alone bicycle/pedestrian path between Electric Road east to tie-in with the frontage road at the ODFW office building driveway.	Provides safe off-highway route for bicyclists and pedestrians from Corvallis to the OSU Research Farm facility, ODFW, and Trysting Tree Golf Course. Also eliminates contra-flow bike movements on N-shoulder, and provides safe accommodations for recreational bicyclists riding between downtown Corvallis and the Peoria Road cycling route.
Priority 2B: North Side Frontage Road from Electric Road to Crew Dock Road		
North of Oregon 34	Construct a local access road between the Oregon State University (OSU) crew docks driveway east to Electric Road.	Provides access to Oregon 34 via the existing Corvallis Bypass signalized intersection at the OSU crew docks driveway and consolidates access at the signal.
Priority 3A: South Side Frontage Road from Morse Brothers Driveway to Peoria Road		
South of Oregon 34	Construct a local access road between the Morse Brothers Driveway to Peoria Road (at a point approximately 750 feet south of the Oregon 34/Peoria Road intersection).	Provides users access to Oregon 34 via the proposed four-legged signalized intersection at Peoria Road. Replaces previous direct highway access.

TABLE ES-1
 Recommended Actions to Improve Safety on Oregon 34 and Peoria Road

Location	Action	Benefit
Priority 3B: South Side Frontage Road from Morse Brothers Driveway to Ireland Lane		
South of Oregon 34	Construct a local access road between Ireland Lane and the Morse Brothers Driveway.	Provides users access to the proposed Allen B. Berg Park, to be developed as a recreational ball-field park.
All Priority Phases		
Highway access locations between the Corvallis Bypass and Peoria Road intersections with Oregon 34	Consolidate roadway approaches at the public intersections of Oregon 34/Peoria-Wolcott Road and Oregon 34/Corvallis Bypass. Close road approaches (both public roads and private driveways).	Consolidates turning movements onto and across Oregon 34. Reduces conflict points for through vehicles.
Entire study segment	Install a variety of low-cost safety and operational treatments in the vicinity of the study segment. This includes improvements: <ul style="list-style-type: none"> – At the two segment signalized intersections (greater illumination, and pedestrian crossing treatments) – In the areas approaching the intersections (wider longitudinal pavement markings and raised pavement markings) – In highway segment treatments (curb/gutter improvements, striped medians, landscaping, and greater illumination). 	The resulting enhancement of driver awareness, visibility, and pedestrian crossing treatments is expected to cost-effectively improve roadway safety conditions between the Corvallis Bypass and Wolcott Road.

This AMP was prepared in collaboration with ODOT, Linn County, Benton County, and the City of Corvallis.

SECTION 1

Introduction

What follows is information on the context in which this AMP was developed. This includes a discussion of existing study area conditions, which made evident the problems the AMP needed to address.

AMP Purpose

The purpose of this AMP is to provide a planning tool to support the implementation of cost-effective access management and safety treatments within the study area that will:

- Improve safety conditions along the study segment and its intersections;
- Meet or move toward meeting the technical requirements of the study area's designation as an expressway (including access spacing and mobility standards);
- Provide safe, reliable access to private properties, recreation areas, and businesses for motorists, bicyclists, and pedestrians; and
- Meet Linn County Land Use permit development criteria.

Appendix A provides a description of the AMP planning process.

AMP Context

This AMP is part of a larger study, the Oregon 34 Expressway Management Plan, which addresses needs along the entire 19.5-mile length of Oregon 34 designated as an expressway. This plan is the result of an extensive amount of work performed previously by ODOT to evaluate and remedy conditions on Oregon 34.

The 2004-2007 Statewide Transportation Improvement Program (STIP) included two projects for the segment of Oregon 34 being studied in this AMP. The first project, completed in summer 2005, entailed the construction of dual left-turn lanes at the intersection of Oregon 34 and the Corvallis Bypass and the installation of added traffic signs and signals. The second project, for which this AMP is providing planning-level analysis, is described in the STIP as the construction of frontage roads on both the north and south sides of the highway and the implementation of access control.

AMP planning and transportation improvements are being funded through the STIP's Safety Improvement Program (SIP). The primary purpose of the SIP is to identify where the most serious crashes occur in the state system and apply the most cost-effective measures to reduce them. The intent of SIP projects is to make as many improvements as possible within the scope and budget of the project and to document the decision-making process.

Study Area

The study area for this AMP, shown in Figure 1-1, is the section of Oregon 34 between the Corvallis Bypass/Oregon 34 intersection to the west and the Wolcott Road/Oregon 34 intersection to the east (The purpose of identifying the study area is to define the transportation improvement impact area). The study area also includes the area approximately 0.75 mile north and south of the highway.

Transportation Problem Context

Oregon 34 is four-lane, higher speed facility that is mostly rural in character. In spite of its rural setting, there are several private and commercial accesses within the study area.

The study area:

- Is classified as an expressway and a Statewide Freight Route.
- Is part of the National Highway System (NHS).
- Is a state-designated safety corridor (roadside signs alert motorists to this designation).
- Has a speed limit of 50 miles per hour. This limit rises to 55 miles per hour immediately east of the study segment.
- Roadway includes two travel lanes in each direction and a continuous two-way left-turn lane (CTWLTL), and provides access to adjacent land via signalized and unsignalized intersections.

Land Uses

Primary land uses in the study area are: agriculture, recreation, education, and aggregate resource extraction and processing, as shown in Figure 1-1.

There are several prominent land uses on the north side of Oregon 34 within the study area. This includes the Oregon State University (OSU) crew dock and maintenance building, which are located adjacent to the Willamette River. These parcels are accessed from a driveway that intersects with Oregon 34 directly across from the Corvallis Bypass. In addition, the Trysting Tree Golf Course and the OSU Experimental Farms are located to the east and are accessed from Electric Road. The Oregon Department of Fish and Wildlife (ODFW) and two private farm residences are located farther east.

The primary land uses on the south side of Oregon 34 between the Corvallis Bypass and Peoria Road are a Morse Brothers rock quarry, city parklands (currently being farmed), wetlands, and private residences. Wetlands cover a significant portion of the land to the south. A small convenience store is located east of Peoria Road.

The study area serves as a primary entrance and exit route for the City of Corvallis from points east and southeast. Because of this, there is a heavy volume of vehicles heading to and from Corvallis from the Oregon 34/Interstate 5 interchange, as well as traffic flowing onto Oregon 34 from Peoria Road, a heavily used Linn County arterial road. The numerous

traffic generators and attractions in Corvallis, most notably OSU, create consistent high-volume traffic conditions within the study area.

Safety and Operational Conditions

A review and analysis of crash and traffic data reveals the presence of poor safety and operational conditions. Both signalized intersections in the study area (Peoria Road and Corvallis Bypass) are among the top 10 percent of SPIS locations. ODOT volume/capacity ratio (v/c) standards are exceeded at both of these locations, indicating that both intersections have an increased likelihood for geometric or operational deficiencies based on higher than typical crash rates. Vehicle queues often reach considerable lengths along westbound Oregon 34 at the Corvallis Bypass intersection. As a result, motorists are unable to make left turns across the CTWTL to access public roads and driveways.

Eighteen approaches (both public streets and private driveways) intersect the study area. Aside from the two signalized intersections at Corvallis Bypass and Peoria Road, study area approach intersections are unsignalized and allow full-turning movements both to and from the highway. This results in a significant number of vehicle conflict points along Oregon 34, a situation that runs counter to safety objectives and the desired operational characteristics of an expressway. This situation is exacerbated during weekday peak-hour travel periods, when there are often few gaps in either eastbound or westbound traffic. Particularly problematic among the unsignalized intersections in the study area is the Morse Brothers driveway, where large trucks must exit and enter the high traffic-volume roadway.

As noted, this AMP is part of a broader ODOT effort to address safety and operational deficiencies on the expressway-designated sections of US 20/Oregon 34. As part of this effort, an additional left-turn lane has been constructed on westbound Oregon 34 at the Corvallis Bypass intersection. The dual left-turn lanes will shorten peak hour vehicle queue lengths, enhance operation of the signalized intersection at the Corvallis Bypass, and mitigate conflicts with accesses at Ireland Lane and Electric Road.

This STIP safety project also included the following improvements:

- Mast arm advanced warning signs with flashing beacons on both westbound and eastbound Oregon 34 before the Peoria Road intersection (to replace existing roadside warning signs);
- Westbound advance guide sign for Peoria Road;
- Advanced guide and directional signage on westbound Oregon 34 prior to the Corvallis Bypass intersection;
- Guide signage at the Corvallis Bypass intersection for motorists on all legs of the intersection;
- Highway route signage; and
- New traffic signal heads at the Corvallis Bypass intersection.

Future Projects

Future traffic volumes will most likely require the removal of at-grade intersections at the Corvallis Bypass and Peoria Road intersections. It is assumed that a variety of interchanges could be constructed at these intersections. This assumption was factored into the analysis of potential AMP alternatives in order to avoid construction of improvements that would later be incompatible with an interchange.

Five potential interchange concepts, shown in Appendix B, were identified at the outset of planning for this AMP.

Public Involvement

The goals of the public involvement program for this project were to build a planning process that: (1) balances the needs and issues of residences and businesses in the study area, including those who depend on the highway; and (2) garners the informed support and acceptance of affected communities and interests. A key objective was to elicit public discussion of the issues affecting the selection of access management alternatives to ensure future safe and efficient conditions within the study area.

The public involvement program involved individual property owner interviews and meetings, a community open house, and mailings. Detailed discussion of the public involvement process is provided in Section 8.

Deficiencies Assessment

Safety Assessment

The purpose of this safety assessment was to identify existing deficiencies and needed improvements to reduce crash rates within the study area. Currently, the intersection of Oregon 34/Peoria Road is listed on the state's Safety Priority Index System (SPIS), which includes the top 10 percent of locations (based on a 0.1-mile segment) ranked according to crash frequency and severity. The Peoria Road intersection was ranked 16th on the 2004 SPIS list of intersections with the highest crash frequency and severity in Region 2. The Corvallis Bypass and Electric Road intersections (both are included within the same 0.1-mile segment) were also included on the 2004 SPIS list.

Existing safety deficiencies were identified by documented crash records from January 1, 1998, to December 31, 2002, for the segment of Oregon 34 between the Willamette River and Terra Circle Drive (Mileposts 0.13 to 1.94). This extended segment of Oregon 34 was reviewed to ensure upstream crashes related to vehicular queuing were included. Key findings of the crash records are summarized as follows:

- A high percentage of crashes occurred during the a.m. and p.m. peak hours; the majority of these were rear-end crashes in the vicinity of the Peoria Road and Corvallis Bypass intersections. These findings suggest a correlation between the observed congestion and associated vehicular queuing in the corridor.
- There was one recorded crash involving a bicyclist in the study area. Stakeholders indicated that there is a high degree of discomfort for bicyclists and pedestrians along Oregon 34 due to high vehicular speeds and the high number of large trucks in the corridor. This suggests the need to consider alternatives that reduce the interaction and potential conflicts among pedestrians, bicyclists, and motorists.

A detailed safety analysis is provided below.

Study Area Crash Summary

The following section summarizes the type, severity, time-of-day, travel mode, and other characteristics related to the crash summary for the study area.

Crash Types

Table 2-1 summarizes crashes by type and year along Oregon 34 between the Willamette River and Terra Circle Drive (Mileposts 0.13 and 1.94).

TABLE 2-1
Oregon 34 Study Area: Crash Summary

Year	Crash Type									Total
	Turning	Head-On	Angle	Rear-End	Side-Swipe	Fixed Object	Backing	Bicycle	Other	
1998	4	0	1	24	3	0	0	0	0	32
1999	3	1	0	29	0	0	2	0	0	35
2000	2	1	0	23	1	1	0	0	3	31
2001	5	0	1	23	3	3	0	0	1	36
2002	1	0	0	32	4	0	0	1	0	38
Total	15	2	2	131	11	4	2	1	4	172
Percent	9%	1%	1%	76%	6%	2%	1%	<1%	2%	100%

As shown in Table 2-1, 100 of the 131 total reported crashes (76 percent) were rear-end crashes. Of these, 57 occurred in the westbound direction and 43 occurred in the eastbound direction. Figure 2-1 plots crash locations along the corridor.

Crash Severity

Table 2-2 shows the severity of the reported crashes by year.

TABLE 2-2
Oregon 34 Study Area: Crash Severity

Year	Crash Severity		
	Non-Injury Crash	Injury Crash	Fatality
1998	18	13	1
1999	21	14	0
2000	14	17	0
2001	15	21	0
2002	24	14	0
Total	92	79	1
Percent	53%	46%	1%

As shown in Table 2-2, there was one reported fatality along the corridor during the 5-year analysis period. The reported fatality occurred near Electric Road at Milepost 0.71. Crash records indicate that the crash was a sideswipe crash resulting from an unsafe passing attempt that pushed the passing vehicle into an oncoming truck. The crash killed the teenage driver and her two teenage passengers. The fatality occurred on a clear, dry day.

Review of ODOT data indicates that, statewide, approximately 60 percent of all recorded crashes are non-injury crashes, 39 percent are injury crashes, and 1 percent are crashes that involve fatalities. This indicates that crashes along Oregon 34 produce more injuries than average. However, this ODOT data is not listed by facility type and includes comparison to all statewide highways and freeways of both similar and dissimilar characteristics.

Pavement and Lighting Conditions

Table 2-3 shows the distribution of crashes according to pavement surface conditions and illumination.

TABLE 2-3
Oregon 34 Study Area: Crash Characteristics

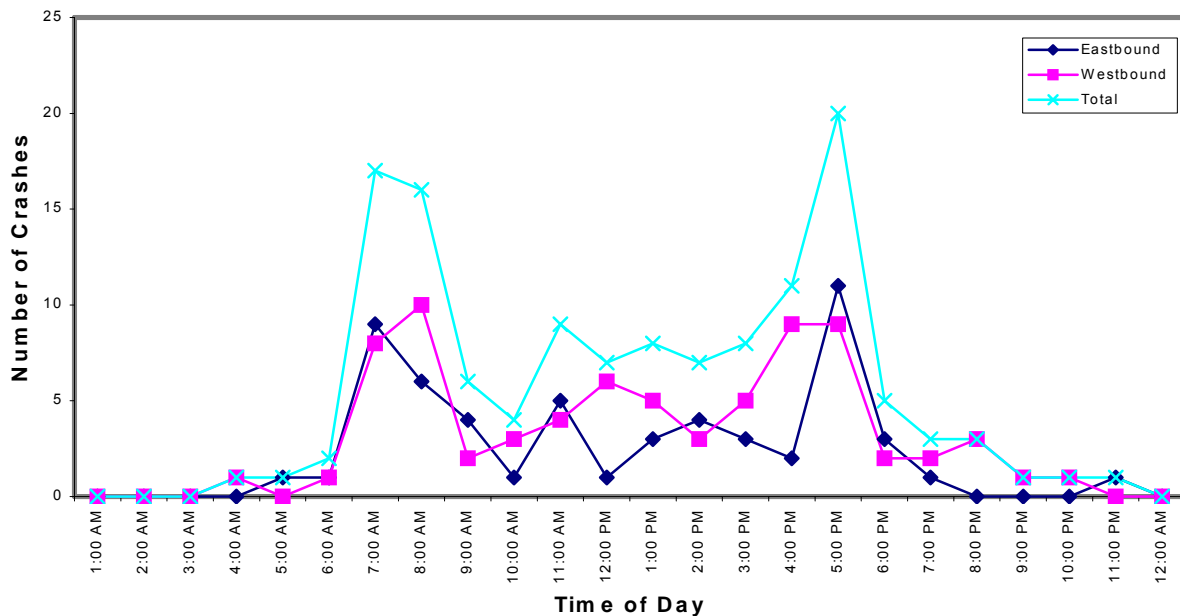
Year	Pavement Conditions			Light and Illumination Conditions				
	Dry	Wet	Unknown	Day	Dawn	Dusk	Dark (lit)	Dark (unlit)
1998	18	14	0	29	1	1	0	1
1999	18	16	1	23	2	3	3	4
2000	21	10	0	21	4	1	2	3
2001	24	12	0	30	1	0	3	2
2002	31	6	1	35	0	1	1	1
Total	112	58	2	138	8	6	9	11
Percent	65%	34%	1%	80%	5%	3%	5%	6%

Table 2-3 shows that 80 percent of the crashes occurred during the day and 65 percent of the crashes occurred on dry pavement.

Time of Day

Crash data by time of day along the corridor were also reviewed in an effort to identify crash patterns. The results from this analysis are summarized in Chart 2-1.

CHART 2-1
Oregon 34 Study Area: Crash Data by Time of Day



The peaks in the crash profile shown in Chart 2-1 correspond to the peaks in traffic volumes in the study area throughout the day. This is likely indicative of the queuing and congestion that occur at the Peoria Road and Corvallis Bypass intersections during the a.m. and p.m. peak hours.

Pedestrian and Bicycle Crashes

Crashes related to pedestrians and bicycles along the corridor were reviewed for the 1998 through 2002 analysis period. During this 5-year period, there was one reported crash associated with bicyclists and no pedestrian-involved crashes.

The bicycle crash occurred east of Peoria Road and involved a single bicyclist. The crash report indicates that the bicyclist was traveling too fast along the roadway segment, lost control, and crashed. While this is the only reported bicycle crash within the study segment during the 1998 to 2002 analysis period, local residents reported many close calls and a hesitation to walk or bicycle due to heavy traffic along Oregon 34. Moderate levels of bicyclists and pedestrians use Oregon 34 between downtown Corvallis and Peoria Road.

Oregon 34/Peoria Road Intersection Crashes

Crashes at the signalized Oregon 34/Peoria Road intersection were reviewed separately due to the high number of crashes at this location. An analysis of crash patterns revealed that approximately 69 crashes along the corridor occurred at or appeared to be related to the Peoria Road traffic signal. Of these, 61 were rear-end crashes. The prevalence of rear-end crashes indicates driver inattention and low driver expectancy for a traffic signal approaching the Peoria Road intersection. It should also be noted that this number only includes crashes along Oregon 34; crashes along Peoria Road were not reviewed.

Access Conditions

The study area is within a section of Oregon 34 that is designated as an expressway. The purpose of the expressway classification is to maintain mobility by providing for safe and efficient high-speed and high-volume traffic movements. Its primary function is to provide for interurban travel and connections to ports and major recreation areas with minimal interruptions. The existence of multiple access points into the study area represents “interruptions” – or conflict points – that hinder the roadway from functioning in the manner intended by the expressway designation. Conflict points are locations along a roadway at which a highway user crossing, merging with, or diverging from a road or driveway conflicts with another motorist using the same road or driveway. Drivers make more mistakes and are more likely to have crashes when they are presented with the complex driving situations created by numerous conflict points.

A prime strategy for promoting increased safety and improved mobility is to manage access to the highway. Access management involves planning the location, design, and operation of driveways, medians, and intersections to provide access while, at the same time, preserving safety and roadway efficiency. Access management involves:

- Restricting the number of direct accesses to major surface streets,
- Providing reasonable indirect access,
- Effectively designing driveways, and
- Enforcing safe and efficient spacing of driveways to limit the number and location of conflict points.

Existing Accesses

Within the study area, there are 18 approaches to Oregon 34, as follows:

- 5 commercial/industrial driveways
- 5 residential driveways
- 5 public roads
- 3 private roads

Figure 2-2 depicts the location of these approaches.

Spacing Standards

Spacing standards provide protection for highway traffic from the hazards of unrestricted and unregulated entry from adjacent property driveways and at-grade intersections. Oregon Administrative Rule 734-051-0115 specifies access management standards for ODOT facilities. The standards are based on the functional classification of the highway, the general type of land use (i.e., rural, urban), and the posted speed. As highlighted in Table 2-4, the spacing standard relevant to the study area is 5,280 feet (1 mile).

TABLE 2-4
 ODOT Spacing Standards for Statewide Highways

Posted Speed (miles per hour)	Rural		Urban			
	Expressway (feet)	Other (feet)	Expressway (feet)	Other (feet)	UBA (feet)	STA (feet)
≥55	5,280	1,320	2,640	1,320		
50	5,280	1,100	2,640	1,100		
40 & 45	5,280	990	2,640	990		
30 & 35		770		770	720	*
≤25		550		550	520	*

*See Oregon Highway Plan, Appendix C, “Notes on Tables 13, 14, and 15,” note #4.

Currently, none of the spaces between existing approaches within the study area meet state spacing standards.

Traffic Operations Assessment

The movement of people and goods is a vital roadway function of Oregon 34. To ensure future mobility along the corridor, existing and future traffic operations were reviewed.

Existing and No-Build Condition Analysis

Based on the roadway classification and surrounding land uses, the Oregon Highway Plan identifies a maximum volume-to-capacity (v/c) ratio of 0.70 (reflective of a speed greater than 45 miles per hour in an area outside of an urban growth boundary [UGB]).

Traffic volumes used throughout the analysis for this AMP were based on a report prepared in March, 2002,¹ provided in Appendix C. Design hourly volumes (DHVs) throughout the corridor were estimated using a 2.7 percent annual growth rate based on historical growth trends. Operational deficiencies were identified along the corridor under both existing and future no-build (2027) conditions at key study area intersections, as documented in Table 2-5.

The existing and future no-build conditions shown in Table 2-5 were prepared in 2002 and do not reflect the installation of the dual westbound turn lanes at the bypass.

¹ Technical Memorandum #1, Existing Conditions No-Build Analysis: Oregon 34 Expressway Refinement Plan, Corvallis-Lebanon Highway MP 0.06-16.73 and Corvallis-Newport Highway MP 54.03-56.80 – Linn & Benton Counties. Prepared by ODOT’s Transportation Planning and Analysis Unit (TPAU), March, 2002.

TABLE 2-5
Intersection Operations Analysis Results—30th Highest Hour

Intersection	Volume-to-Capacity Ratio (v/c)	
	Year 2000	Year 2027
Corvallis Bypass/Oregon 34 ¹	1.25	2.07
Oregon 34/Electric Road ²	0.13	0.95
Oregon 34/Morse Brothers ²	1.43	> 2.0
Oregon 34/Peoria Road	1.01	1.77
Oregon 34/Wolcott Road ²	0.01	0.06

¹ The traffic operations analysis was prepared in 2002 and does not reflect the recently installed dual westbound left-turn lanes at the Oregon 34/Corvallis Bypass intersection. Updated intersection analyses reflecting recent intersection improvements are included in Section 5.

² Volume-to-capacity ratio at unsignalized intersections is shown is for the critical movement.

As shown in Table 2-5, all of the study intersections, except the intersection of Oregon 34/Wolcott Road, need to be improved by 2027 to meet the ODOT mobility standard of 0.70. The intersections of Peoria Road, the Corvallis Bypass, and Morse Brothers need to be improved under existing conditions.

The Oregon 34/Corvallis Bypass intersection was recently reconstructed to address operational and safety deficiencies. This project provided dual westbound left-turn lanes along the highway and dual receiving lanes on the south intersection approach. This improvement is not intended to be a long-term solution. Updated operational analyses show that—even with this modification—the intersection will continue to exceed ODOT mobility standards during both the weekday a.m. and p.m. peak periods; it will, however, significantly reduce intersection control delay and queuing.

High turning volumes necessitate dual northbound turn lanes at the Oregon 34/Peoria Road intersection today. While providing substantial operational benefits, the provision of the left-turn lanes is not adequate to meet short-term or long-term mobility standards. Due to the critical need for this improvement, all alternative analyses presented in Section 5 reflect its completion. Alternatives to address the long-term needs at this and other study intersections were reviewed as part of the alternatives analyses.

Review of projected mainline operations (segments of Oregon 34 between intersections) revealed that additional through-travel lanes are needed on Oregon 34 to meet ODOT mobility standards.

SECTION 3

Environmental Constraints Analysis

The purpose of the environmental constraints analysis was to examine potential environmental constraints on the development of transportation improvements in the study area. This was a screening-level analysis intended to guide the formulation of alternatives and to suggest how project improvements can be implemented in the face of potential constraints.

The results of the analysis suggest the need for further in-depth environmental study, including biological field assessment of threatened and endangered species, wetland assessment, and hydraulic modeling/floodplain analysis.

Natural Environment Constraints

Relevant environmental constraints and the presence of Goal 5 resources in the study area are discussed below. Goal 5 is a statewide planning goal for safeguarding environmental resources. Goal 5 and related Oregon Administrative Rules (OAR Chapter 660, Divisions 16 and 23) describe how cities and counties are to plan and zone land to conserve resources listed in the goal.

Topography

The topography in the study area is primarily flat or gently sloping, with areas of steep (>25 percent) slopes along the Willamette River bank and the Willamette River Channel. The natural topography has been altered by human activities in a large portion of the study area (e.g., aggregate quarry, golf course). Man-made storm drainage ditches exist adjacent to Oregon 34.

Geologic Hazards

Types of geologic hazards include landslides, earthquakes, and erosion/deposition. Potential earthquake and landslide risks for Benton County were evaluated by Wang and others². Because the study area borders Benton County, this evaluation was used to analyze geologic hazards for the purpose of this study.

Terrains that are particularly prone to landslide activity include sloping terrain underlain by deeply weathered rock or shale, slopes consisting of loose materials overlying dense materials, and layered materials of contrasting permeabilities. In the study area, the topography is relatively flat and generally not prone to slides. However, areas where slopes exceed 25 percent, such as the banks of the Willamette River, are prone to landslides. These areas are also more prone to erosion and deposition from natural events or human activities.

Earthquake actions such as ground shaking or surface faulting can damage facilities through vibration or displacement. Earthquakes may also induce landslides on steep or unstable

² Wang, Zhenming, Graham, Gregory B, and Madin, Ian P., 2001. *Earthquake Hazard and Risk Assessment and Water-Induced Landslide Hazard in Benton County, Oregon*. Oregon Department of Geology and Mineral Industries.

slopes and cause compaction or liquefaction of soil. Two Quaternary-age faults are located within 3 miles of the study area. The Owl Creek Fault is a northwest-trending fault located 2 miles east of the study area, and the Corvallis Fault is a northeast-southwest-trending fault located 3 miles west of the study area. Wang indicates these faults do not pose a significant risk. The primary ground-shaking hazards that could affect the study area, such as the Cascadia subduction zone, are located outside of the region. Wang indicates that the Holocene channel and floodplain alluvial deposits along the banks of the Willamette River are moderately to highly susceptible to liquefaction.

Soils

Linn County and Benton County Soil Survey maps indicate soils in the study area consist primarily of silt loam, silty clay loam, and loam with localized areas of sandy and gravelly loam. The predominant soil series present in the area include Chehalis silt clay loam, Chapman loam, and Cloquato silt loam.

Figure 3-1 shows soil types present in the study area.

Riparian Corridors

Riparian corridors include water areas and fish habitat such as the Willamette River and Willamette River Channel, adjacent riparian areas, and wetlands within the study area.

The Willamette River is included on the Oregon Department of Environmental Quality's (DEQ) 303(d) list of water quality-limited streams. Per the 2002 list, the 303(d) parameters for the section of the Willamette River within the study area are:

- Dissolved oxygen
- Fecal coliform
- Mercury, and
- Temperature.

Wetlands

Several National Wetlands Inventory (NWI) mapped wetlands occur within the study area, south of the highway, as shown in Figure 3-2. No local wetlands inventory has been conducted in this area, and no listed wetlands are located north of the highway.

NWI wetlands are mapped using aerial photography and often do not reflect an accurate account of the wetlands present in the field. CWA Section 404 regulations stipulate that permits can only be granted for development with the least environmentally damaging practicable alternative. A wetland delineation and functional assessment must be performed to determine the type and full extent of the potential wetland impacts.

The two areas of wetlands present south of the highway are palustrine scrub/shrub (PSS) and palustrine forested (PFO); these wetlands were assessed in the field as low and medium quality wetlands, respectively. The assessment was based on obvious biological features such as presence of native plant species and potential wildlife habitat. Positions in the landscape and wetland size were also considered. Hydrologic and water quality functions were not considered.

Federal, State, and Local Permitting Requirements

Based on the field assessment and office review of available data, all proposed AMP project improvements may meet or be mitigated to meet natural resource federal, state, and local permitting requirements. State and federal wetland permits must be secured if it is determined that project alternatives will have an impact on wetlands.

The Linn County Natural Resource Element Code does not reveal a need to secure additional county wetland permits.

As noted, a wetland delineation of the study area must be performed to quantify and describe the area and type of wetlands on which proposed improvements could potentially have an impacted. Delineations in the Willamette Valley are generally performed in the spring when natural hydrology of the study area is obvious.

Federal Wild and Scenic Rivers

The reach of the Willamette River that is located in the study area is not a designated Federal Wild and Scenic River.

Oregon Scenic Waterways

Waterways in the study area, including the Willamette River and Muddy Creek, are not included on the Oregon Department of State Lands list of Designated Scenic Waterways.³

Groundwater Resources

The study area is not within any of the Critical Groundwater Areas or Groundwater Limited Areas designated by the Oregon Water Resources Commission.

Floodplain

Most of the study area is located within the 100-year floodplain designated by the Federal Emergency Management Agency (FEMA).⁴ The study area is highly susceptible to flooding. The segment of Oregon 34 within the study area was designed to be overtopped in a flood event. Extensive flooding occurred in the study area during 1996, closing Oregon 34 for several days because floodwaters overtopped the highway. The highway also was overtopped for one day during the December 2005/January 2006 flooding event.

As part of the process of identifying environmental constraints for the proposed project, an investigation of potential issues related to development in a regulatory floodplain was conducted. It was determined that a substantial portion of the project is located within the 100-year flood inundation zone as designated by FEMA.

The extent of the FEMA 100-year flood inundation area is shown in Figure 3-2. A copy of the Flood Insurance Rate Maps (FIRMs) for the study area is included as Appendix D.

³ As defined in ORS 390.826

⁴ Flood Insurance Rate Map (FIRM) Panel 350, Linn County, September 29, 1986

Federal, State, and Local Permitting Requirements

The area inundated by the 100-year flood (base flood) is defined by Linn County's Flood Management Code⁵ as an "area of special flood hazard." Development within any area of special flood hazard is required to address the regulations of the Flood Management Code through a conditional land use permit. The County's decision criteria for allowing development within a floodplain is included as part of Appendix E.

Potential roadway improvements will require the placement of fill material below the 100-year flood elevation. The 100-year flood elevation at Oregon 34 is approximately 219 feet. The Linn County Building Code specifies the following:

"All fill placed at or below the base flood elevation shall be balanced with at least an equal amount of material removed either on site or from an approved nearby area at or below the base flood elevation in the same drainage basin."

Appendix D (FIRM map) illustrates 100-year flood water surface elevation contours in the vicinity of the study area.

Placement of fill within the floodplain must be approved by the county floodplain administrator, and is allowed when the following conditions are met:

- 1) A development permit is obtained;
- 2) The net effect of fill and excavation operations (on site) constitutes no positive change in fill volume;
- 3) The proposed fill or excavation will not change the direction or velocity of flood water flow;
- 4) The proposed fill or excavation will not cause a compounding of flood hazards; or
- 5) A registered engineer shall certify that the proposed project will not cause a rise in the base flood elevation during a 100-year event or create conditions that would be detrimental to adjacent or neighboring properties.

A no rise certification (see Item #5) is submitted with the permit application, and requires modeling the hydraulics of the proposed condition. Following a 30 percent level design, a series of at least two new surveyed floodplain transects⁶ will need to be performed in the vicinity of the proposed development and will need to be added to the existing and proposed condition hydraulic models. The hydraulic analysis is required by Section 60.3(d)(3) of the FEMA National Flood Insurance Program (NFIP) regulations. Other development that could alter or obstruct the flow of flood water (guard rails, jersey barriers, etc.) would be included in the hydraulic analysis.

In the event that the proposed development results in any increase in the 100-year flood water level, FEMA must review and comment on the project. This involves applying for a Certified Letter of Map Revision (CLOMR) from FEMA. All requests for CLOMRs must be supported by detailed flood hazard analyses prepared by a qualified professional engineer.

⁵ Linn County Building Code, Chapter 870.

⁶ A monitoring research technique that marks a transverse along which measurements can be taken.

FEMA will also charge fees to cover its costs for the review and the CLOMR process can be very time consuming.

Willamette River Greenway

A portion of the study area lies within the boundary of the Willamette River Greenway, shown in Figure 3-3. Oregon Statewide Planning Goal 15 requires that each city and county in which the Willamette River Greenway is located shall, in its comprehensive plan and implementing ordinances, provide regulations to “protect, conserve, enhance, and maintain the natural, scenic, historical, agricultural, economic, and recreational qualities of lands along the Willamette River.”⁷ Linn County provides regulations to address Goal 15 in the Linn County Land Development Code (LCC). The LCC establishes a Willamette River Greenway Overlay (WRGO) district to regulate development inside the Willamette River Greenway boundary.⁸

Roadway improvements are not permitted outright in the WRGO district; therefore, a Greenway Conditional Use Permit must be obtained from Linn County. The decision criteria for Greenway Conditional Use Permit approval are included in Appendix E.

Threatened and Endangered Species

Office Review

A query of the Oregon Natural Heritage Information Center (ORNHIC) database identified 42 records of threatened and endangered species, candidate species, species of concern, and sensitive plant and animal species within a 2-mile radius of the study area. The study area identified for the purpose of this query includes 11 South, Range 5 West, Sections 35 and 36, and Township 12 South, Range 5 West, and Sections 1 and 2. This AMP report focuses only on federal- and state-listed threatened and endangered species.

ORNHIC query results indicate that no listed threatened or endangered plant or animal species have been directly observed within the study area. However, one listed bird species, two listed fish species, and four listed plant species have been observed within a 2-mile radius of the study area. These federal- or state-listed species include the following:

- **Birds:** Aleutian Canada goose (*Branta Canadensis leucopareia*). Several Aleutian Canada geese were observed in a mixed flock of Canada geese between Corvallis and Albany in late 1993 and early 1994. Since the publication of the ORNHIC list for this project, the Aleutian Canada goose has been de-listed in the state of Oregon.
- **Fish:** Chinook salmon, spring run (*Oncorhynchus tshawytscha*), Oregon Chub (*Oregonichthys crameri*). ODFW StreamNet maps indicate that the Willamette River adjacent to the study area provides rearing and migration habitat for Chinook salmon, spring run.
- **Vascular plants:** Bradshaw’s lomatium (*Lomatium bradshawii*), Nelson’s sidalcea (*Sidalcea nelsoniana*), Peacock larkspur (*Delphinium pavonaceum*), and Kincaid’s lupine (*Lupinus sulphureus*). Several populations of Bradshaw’s lomatium have been identified northwest

⁷ OAR 660-015-0005 (Goal 15: Willamette River Greenway).

⁸ LCC 931.600 – 931.680.

of the study area, along the confluence of Jackson and Frazier Creeks. Seven sitings of Nelson’s sidalcea have been recorded within proximity to the study area, with several sited along Muddy Creek. One siting of Peacock larkspur was recorded west of Corvallis in 1991. Kincaid’s lupine has not been observed in the Corvallis area in the last 90 years.

ORNHIC query results are provided in Appendix F.

Site Reconnaissance

A site reconnaissance was performed on May 11, 2005. The purpose of this visit was to identify potential rare plant habitat on which the proposed project may have an impact.

No listed plant species were encountered during the preliminary site reconnaissance. Based on a review of the habitat requirements for each of these species and the documentation provided by ORNHIC, it is highly unlikely that Bradshaw’s lomatium, Peacock larkspur, or Kincaid’s lupine would be present within the work areas of Alternatives S1 and S2. However, Nelson’s sidalcea is likely to occur in the study area. A rare plant survey should be performed to ensure that listed species do not occur within the study area. If a rare plant is identified during the survey, its location should be identified on project maps so that impact avoidance measures and best management practices (BMPs) can be integrated with the project design. Table 3-1 illustrates the habitat requirements and preferred timing for botanical surveys to determine the presence of the listed plant species. The survey times are coincident with flower blooming times.

TABLE 3-1
Rare Plant Survey Timing

Scientific Name	Common Name	Listing Status	Habitat	Survey Time	Likelihood of Occurring in Study Area
<i>Lomatium bradshawii</i>	Bradshaw's lomatium	Endangered	Grassy swales and along waterways; in seasonally flooded areas	April-May	Not Likely
<i>Lupinus sulphureus</i> spp. <i>kincaidii</i>	Kincaid's lupine	Threatened	Banks, meadows, open woods	April-June	Not Likely
<i>Sidalcea nelsoniana</i>	Nelson's sidalcea	Threatened	Wetlands and stream banks	May-September	Likely
<i>Delphinium pavonaceum</i>	Peacock larkspur	Endangered	Roadsides, grassland communities	May-June	Not Likely

The study area contains an Endangered Species Act (ESA)-listed water body: the Willamette River. ODFW maps show Chinook salmon and Oregon Chub present in this portion of the Willamette River (Oregon chub were last observed in 1945).

Though unlikely, the proximity of alternatives to the riparian zone of the Willamette River could lead to impacts on the Willamette River and, subsequently, the listed species.

Federal, State, and Local Permitting Requirements

Section 7 of the ESA must be addressed because the project has a federal nexus. This will likely entail the need to submit a federal permit (Clean Water Act [CWA] Section 404/10

permit). Section 7 requires that federally listed species be addressed through the preparation of a biological assessment (BA).

It is recommended that rare plant surveys be conducted according to the schedule outlined in Table 3-1. If wetland permits are required (federal nexus), a BA to address ESA-listed plant and animal species potentially occurring on the site must be prepared and submitted to the appropriate natural resource agencies.

Approved Oregon Recreation Trails

The study area does not have an impact on any Oregon State Parks Department-designated recreational trails.⁹

Natural Areas

No natural areas, as designated by the Oregon State Register of Natural Heritage Resources, occur in the study area.

Wilderness Areas

No federally designated wilderness areas occur in the study area.

Mineral and Aggregate Resources

One aggregate resource site within the project study area is identified as a significant aggregate resource. Owned by the Morse Brothers company, the site exceeds 270 acres in size and has been in operation for more than 30 years. Located south of Oregon 34, the site is listed in the Benton County Inventory of Aggregate Resource Sites. Expansion of the site was authorized by Benton County in 1999. Legislation adopted in 2003 changed the county boundary between Benton and Linn Counties, moving the site from Benton County into Linn County. Linn County has not updated its inventory since the county boundary was changed.

Energy Sources

No existing energy sources, as defined by OAR 660-023-0190(1) (a), occur in the study area.

Open Space

No open spaces specifically listed in the LCC occur within the study area. However, a significant portion of the study area is open space;¹⁰ this includes the Trysting Tree Golf Course, located north of Oregon 34, and Alan B. Berg Park, located south of Oregon 34.

The 36-acre undeveloped park located between the Corvallis Bypass and the Willamette River is designated as open space by the City of Corvallis.

Scenic Views and Sites

No publicly designated scenic views or sites occur in the study area.

⁹ As defined in OAR 736-009.

¹⁰ As defined in OAR 660-023-0190(1).

Hazardous Materials

Oregon Department of Environmental Quality

The DEQ facility profiler database was queried to determine whether any hazardous waste or cleanup sites or leaking tank sites are known to be present in the study area. Four sites in DEQ's database are located in the study area. Detailed information for these sites is included as Appendix G.

Three of the four sites are in DEQ's Environmental Cleanup Site Information (ECSI) database. The ECSI database tracks sites in Oregon with known or potential contamination from hazardous substances, and records sites at which DEQ has made no further action (NFA) determinations. The three sites are as follows:

- **Site ID 311 – Roche Road Demolition Site.** This site is a former landfill located between the Corvallis Bypass and Ireland Lane. The landfill, approximately 10 acres in size and 30 feet deep, received green waste, building demolition materials, and industrial wastes. Arsenic and chromium were detected in the groundwater. Pyrophoric waste was reportedly disposed in the landfill. The last action taken was a 1997 expanded preliminary assessment performed by the state. The ECSI report indicates additional site investigation is required.
- **Site ID 625 – Morse Brothers Pond.** The pond is an old quarry site. Atrazine was detected in samples collected from the pond. DEQ indicated NFA was required because atrazine is present in groundwater throughout much of the Willamette Valley and Morse Brothers does not use or store this chemical.
- **Site ID 1034 – R & J Radiator Service.** This site, located at 33901 SE Peoria Road, was a radiator shop until 1990. Radiator cleanout solution was disposed in a ditch that runs into a trench approximately 6 to 8 feet deep and 50 feet long. Heavy metals in soil are a potential concern, and potential impacts on groundwater are unknown. DEQ indicates this site requires further investigation.

State Fire Marshall

The Oregon State Fire Marshall database was queried to determine whether any spills or other reported incidents occurred in the study area. Query results indicate six spill incidents and one vehicle fire occurred that involved diesel, hydraulic fluid, lubricants, or pesticides. No significant impact on environmental media was reported. The incident reports are provided in Appendix G.

Historical/Cultural Resources

A preliminary cultural resource evaluation was conducted to identify any known cultural resources constraint issues in the study area. A summary of the findings is presented below. Several archival sources were consulted: the Oregon State Historic Preservation Office (OSHPO), Government Land Office (GLO) maps, and the Linn County Planning Office.

OSHPO File Search

OSHPO records indicate that the project vicinity has been intensely studied in the past. In 1997, a fiber optic line was installed parallel to Peoria Road, Oregon 34, and the Corvallis

Bypass (Musil 1997). Archaeological monitoring of backhoe trenching conducted during this project did not reveal any cultural resources within the study area.

West of the project limits, archaeological testing and research conducted during the Oregon 34 Corvallis Bypass Project revealed historic trash dumps, particularly on the western banks of the Willamette River adjacent to the original Marysville Townsite.¹¹ Sanborn Fire Insurance Map research conducted for that project indicates that there is moderate potential for the presence of extensive historic deposits along the west bank of the Willamette River (Ibid.). Archaeological testing for that project also revealed the presence of very sparsely scattered, isolated occurrences of prehistoric stone tool manufacturing debris. These investigations suggest the potential exists for discovery of prehistoric archaeological sites in the immediate project vicinity.

The Russell Poultry Farm is a historic property located within the study area at 28690-28696 Oregon 34. Information provided to OSHPO documents the site's eligibility for the National Register of Historic Places. OSHPO has concurred that this property is eligible for listing in the National Register of Historic Places. The Section 106 Determination of Eligibility (DOE) for the Russell Poultry Farm and the OSHPO concurrence are included as Appendix H. Project actions with the potential to have an impact on the farm must adhere to federal regulations that protect such properties.¹²

Goal 5 Historic Resources

Goal 5 historic resources are present in the project vicinity.¹³ The historic Orleans Townsite was located on the east bank of the Willamette River. This town was constructed in 1851, and a massive flood of the Willamette River in 1861 completely destroyed the town (Works Progress Administration n.d.). Archaeological remnants of the town are believed to be present, although the exact location of the original townsite has not been confirmed.¹⁴ The townsite is believed to begin just south of the Oregon 34 crossing and extend southward. The Orleans Cemetery is also a Goal 5 resource.

The Russell Poultry Farm is on Linn County's official list of Goal 5 historic resources.

Potential for Other Historic Resources

An extensive study conducted along Waterfront Park in Corvallis analyzed the potential for cultural resource discoveries in this area.¹⁵ An examination of Historic Sanborn Fire Insurance Maps, GLO maps, and inventories of historic buildings located in the study vicinity concluded that historic cultural resources have a moderate to high probability of being discovered along the Willamette River within the study area.¹⁶

Although no prehistoric resources have been documented within the Oregon 34 study area, waterfront areas have a generally moderate to high probability for prehistoric cultural resources.

¹¹ (Jenkins 1987; Oregon Archaeological Survey 1983).

¹² 49 U.S.C. 1653(f) (Section 4(f) of the USDOT Act of 1966).

¹³ (Wegner 2005).

¹⁴ (Chappel 1992).

¹⁵ (Littlefield 1998).

¹⁶ (Littlefield 1998).

Built Environment Constraints

Existing Zoning and Land Use

The entirety of the study area is located in unincorporated Linn County and is subject to the land use planning regulations of Linn County. However, the proximity of the City of Corvallis and Benton County require that project planning be coordinated with those jurisdictions as well.

Planning

Linn County places a significant emphasis on the need for transportation and land use planning to be performed in coordination with one another. Several sections from the LCC and Transportation Plan Code are pertinent to the planning and implementation of transportation improvements for this project. Project-relevant LCC sections are addressed in the “zoning” subsection below.

The Linn County Transportation Plan implements the state’s Transportation Planning Rule and specifies what transportation improvements inside Linn County are permitted outright, require a Linn County Conditional Use Permit, or require a plan text amendment. The decision-making process to implement certain improvements should consider the particular permitting requirements of various types of improvements. Linn County permitting requirements for transportation improvements are contained in LCC 907.230.

Zoning

North of Oregon 34, the study area is zoned entirely Exclusive Farm Use (EFU). South of Oregon 34, the study area contains a mixture of zoning districts, including EFU, Rural Commercial (RCM), Limited Industrial (LI), and Rural Residential (RR).

Study area zoning districts are shown in Figure 3-3.

Project-Relevant Issues

All project-related new development must be in compliance with relevant regulations set forth in the LCC for the applicable zoning district in which the development is taking place. Of the project-relevant zoning districts, only the EFU zone contains regulations relevant to transportation improvements.¹⁷ (Transportation improvements are permitted outright in the RCM, LI, and RR zones.) Any new project-related development in the EFU zone will necessitate the preparation and submission of a Linn County Conditional Use Permit (Type IIA).

Various transportation improvements may be permitted conditionally, based on review of a Linn County Conditional Use Permit.¹⁸ The County reviews decision criteria applicable to the development use type. For the improvements being proposed in this AMP, applicable criteria to be addressed are found in LCC 933.310 and 933.900.

¹⁷ The scope of actions proposed in this AMP fall under the title of “transportation improvements” as defined in LCC 920.100 (B) (301) (b).

¹⁸ Under LCC 928.320(B)(8)(a) and (b).

The decision criteria for a Linn County Conditional Use Permit in an EFU zone are contained in Appendix C.

Land Uses

The study area is located in unincorporated Linn County, in close proximity to the City of Corvallis, which is about 0.5 mile west and across the Willamette River. North of Oregon 34, the study area is predominantly used for agricultural and recreational purposes. South of Oregon 34, there is a mixture of agricultural land, aggregate extraction, recreational parkland, commercial businesses, and low-density single-family residential use. The residential area inside the study area boundary is primarily located south and east of the Oregon 34/Peoria Road intersection, while the few commercial establishments are located primarily within the Oregon 34/Peoria Road intersection area.

Property owners located along the Oregon 34 corridor that could be impacted by project improvements include the following:

- **OSU:** owns crew dock facilities, a public golf course (Trysting Tree), and OSU Experimental Farms. All of these facilities are located along the north side of Oregon 34 in close proximity to OSU's Corvallis campus.
- **City of Corvallis:** owns two City park properties: Allen B. Berg Park (73.37 acres) and the undeveloped park located between the Corvallis Bypass and the Willamette River (36.03 acres). Both of these parks are currently "natural" parks: neither contains any existing recreational facilities.
- **Morse Brothers:** owns approximately 272 acres on the south side of Oregon 34 between the slough and the Willamette River. Morse Brothers is one of Oregon's largest suppliers of aggregate and related byproducts and contracting services.
- **ODFW:** operates a research lab with a staff of approximately 50 people.
- **Private businesses**
- **Private residences**

Project Relevant Issues

General issues associated with making transportation system improvements along a corridor with existing developed properties such as Oregon 34 include the need to:

- Pursue coordinated planning with property owners
- Provide access to all properties
- Compensate for displacement or taking of property
- Mitigate financial impacts of project actions on property owners

Project-specific constraints and issues include:

- **Compensation costs.** Cost consideration issues are as follows:
 - Affected residential and commercial properties in the likely path of project frontage road improvements must be purchased or proportionately compensated.

- Several working farm properties are in the likely path of project frontage road improvements; affected farm properties must be purchased or proportionately compensated.
- If existing private property accesses to Oregon 34 are closed and new accesses cannot be feasibly provided, these entire properties must be purchased.
- **Public parks.** If the two identified City of Corvallis parks or the publicly owned Trysting Tree Golf Course are subject to future transportation improvements, a Section 4(f) analysis (of the National Transportation Act) would be required due to the Federal nexus that exists on this project.
- **Historic property.** The Russell Poultry Farm site has been determined to be eligible for the National Register of Historic Places by OSHPO (Appendix H). Federal regulations protect such properties, allowing use for transportation purposes only when it is demonstrated that there is no feasible and prudent alternative, and when all possible planning to minimize harm to the site is included in the project.
- **OSU Research Farms.** OSU representatives noted early in the project planning process that new roadway should be located as immediately adjacent to Oregon 34 as possible. Reasons for this include:
 - Dividing the experimental farm area with a paved roadway will disrupt the efficacy of long-term research currently being conducted. A frontage road located at the edge of the farm property would have much less impact.
 - Users of a frontage road could be exposed to agricultural treatments used on the farm.
- **Major property owners** such as OSU, City of Corvallis, and Morse Brothers, as well as other owners such as the Eastgate Veterinary Clinic, have expressed willingness to coordinate with project efforts to allow for the construction of project improvements. This should allow for greater flexibility in conceiving and implementing project improvements.
- **Trysting Tree Golf Course** property could potentially be used to create an off-street bicycle/pedestrian path. During the planning process, Trysting Tree Golf Course representatives indicated they are interested in relocating the two golf course holes located adjacent to Oregon 34, which would provide ample space for frontage road/multi-use path improvements through this property.

Figure 3-4 depicts project-relevant land use constraints.

Forecasted Land Uses

Geographic information system (GIS) data¹⁹ was used to identify vacant parcels within the study area boundary. This was done to establish generalizations concerning buildable land and the potential for increased trip generation.

¹⁹ In addition to GIS data owned by CH2M HILL, GIS data was obtained from Linn County and the City of Corvallis.

Of the 127 parcels located within the study area, 43 are undeveloped. However, all of these 43 undeveloped parcels are “constrained” with regard to development because they are located within the 100-year floodplain.²⁰ According to Linn County’s Flood Building Code “all new construction and substantial improvements of any residential structure shall have the bottom of the lowest horizontal structural member of the lowest floor (including basement) elevated to a minimum of 18 inches above base flood elevation or the depth designated on the FIRM.”²¹ Based on the study area’s average base flood elevation line of 220 feet and average ground elevation of 213 feet, a developer must raise a structure 8.5 feet (difference in elevation plus 1.5 feet per county code). Given that raising structures 8.5 feet off of the ground would be cost-prohibitive, no significant development or related increase in trip generation is expected on study area parcels.

Existing land uses are consistent with the LCC. The nature of land ownership within the study area and the extent of flooding constraints make large-scale development highly unlikely for the foreseeable future.²² The unlikelihood of development in the study area is reinforced in LCC Chapter 907.110(B)(1), which states, “Linn County recognizes the rural nature of the county...Therefore, the County does not foresee significant impacts on the County-owned transportation system from upcoming developments.”

These are the current potential land uses in the study area:

- The City of Corvallis Parks and Recreation’s *Allen B. Berg/MLK Parks Master Plan* documents that the City has plans to develop both **Allen B. Berg Park** and the park formerly known as **MLK Park**. The park formerly known as MLK Park is slated for low-impact development such as nature trails and picnic areas; Allen B. Berg Park is slated for more intensive development of such facilities as recreational ball fields and associated amenities (restrooms, etc.). The City also wishes to create a wildlife viewing area around the existing pond at Allen B. Berg Park.
- The owners of the **Eastgate Veterinary Clinic**, located in immediate proximity to the Oregon 34 and Peoria Road/Wolcott Road intersection, anticipate that they will be dividing the property. This division could include separating the house from the clinic property and the subsequent creation of an additional lot between the clinic and Peoria Road.

Project-Relevant Issues

- Regarding Corvallis Parks Department plans for Allen B. Berg Park and the park formerly known as MLK Park, the addition of recreational amenities will drastically change the need for public access. In addition to providing for this future access need, project improvements should avoid precluding the planned development of the park.
- Regarding the Eastgate Veterinary Clinic plans, the property owner has indicated that if right-of-way is taken from the property, it may impact the property division proposal.

²⁰ Floodplain issues related to the Oregon 34 AMP project are discussed in detail in Technical Memorandum 3A.

²¹ LCC 870.140 [870.140 refers to residential structures; however, via 870.142, this same building requirement refers to non-residential structures as well].

²² This statement assumes no Measure 37 claims.

The property owner would like to use the clinic's existing driveway as the only access for the resulting three parcels.

SECTION 4

Problem Statement

The Steering Team defined and adopted a problem statement prior to developing alternatives. The problem statement characterizes current safety issues as well as future safety issues (projected to 2027) should no roadway improvements be made.

The problem statement includes six components:

1. Traffic volumes and vehicle speeds create unsafe and inconvenient travel for bicyclists and pedestrians.

Many employees and students accessing the OSU Experimental Farms, Trysting Tree Golf Course, ODFW, and OSU crew docks use non-motorized modes of travel due to the close proximity to downtown Corvallis and the OSU campus. This results in higher volumes of non-motorized travel than is typical for a rural expressway. Some bicyclists are traveling eastbound on the westbound shoulder, presumably because they perceive this to be safer than attempting to cross the highway under the traffic conditions, or because it is a shorter route to their destination. This type of travel, necessitated by highway conditions, is unsafe because for bicyclists and pedestrians are traveling against vehicular flow, a scenario that could result in head-on crashes with oncoming traffic. Additionally, non-motorized users of Oregon 34 report that gravel on the shoulders can create an impediment to comfortable bicycle travel.

2. Unsafe conditions for farm vehicles traveling across and along the segment.

Because there are farming areas north and south of the study area, large, slow-moving farm vehicles can often be found moving along and/or crossing Oregon 34. This type of movement is concentrated at the Wolcott Road/Peoria Road intersections and results in an unsafe situation wherein farm vehicles are forced to conflict with the higher-speed through-traffic on the highway. This situation can be expected to continue in the future, given the extent of EFU-designated land in and near the study area.

3. Flooding along segment creates safety, mobility, and emergency access problems.

The study area is located in designated floodplain. The study area is extremely susceptible to flooding, which can quickly evolve into an impassible safety hazard during even minor flood events. The result of such flooding is significant impediments to mobility, emergency access, and connectivity in the area.

4. Limited freight and passenger traffic mobility through segment erodes safety conditions.

The two signalized intersections in the study area limit its practical capacity. Both intersections are expected to fail within the next 20 years, even with the dual westbound left-turn lanes constructed at the Corvallis Bypass intersection during 2005. Additional near-term (within the next 5 years) solutions are needed to maintain appropriate vehicular mobility levels through the study area. Over the long term, system-wide solutions are needed to

maintain appropriate mobility levels in the study area. This will subsequently help mitigate the current poor safety conditions.

5. High volumes of through-traffic make it difficult and unsafe to access Oregon 34 from adjacent streets.

The gaps in traffic flow that are required for vehicles to make safe movements onto and off of Oregon 34 do not frequently occur during peak traffic times, resulting in significant delays at intersections and driveways. Additionally, the queuing from both the Corvallis Bypass and Peoria Road intersections create access problems for non-signalized intersections and driveways. This difficulty entering, leaving, and crossing Oregon 34 creates hazardous safety conditions and limits access to businesses, residences, and other destinations.

6. Signalized intersections along the segment experience higher than average crash rates.

Both of the signalized intersections located in the study area (Peoria Road and the Corvallis Bypass) are listed by ODOT as among the top 10 percent SPIS sites. Factors contributing to the current unsafe highway conditions and the significantly above-average crash history include speed changes and inconsistencies between driver expectancy and facility performance at study area intersections.

Alternatives Identification and Evaluation

Formulation of Alternatives

Potential alternatives were developed on the basis of previous ODOT transportation studies, and input from such sources as affected property owners, the general public, and members of the Steering Team. Project staff compiled this input and developed written descriptions for all alternatives and graphical representations of some alternatives.

Threshold Screening Criteria

Each alternative was evaluated using threshold criteria developed by the project team and adopted by the Steering Team. If an alternative met each of the threshold criteria, it was forwarded for further evaluation.

The criteria are as follows:

1. Volume-to-Capacity (v/c) Ratio

Does the alternative maintain or improve the v/c ratio for Year 2000 existing and 2027 build conditions versus the no-build?

Existing (Year 2000) v/c ratios are as follows:

Oregon 34/Peoria Road = 0.92¹

Oregon 34/Corvallis Bypass = 1.20²

Forecasted (Year 2027) No-Build v/c ratios are as follows:

Oregon 34/Peoria Road = 1.58

Oregon 34/Corvallis Bypass = 2.00

¹ All analyses, including both year 2000 and year 2027, assume the realignment of the Peoria Road/Wolcott Road intersections and dual northbound left-turn lanes.

² All analyses include the dual westbound left-turns at the Oregon 34/Corvallis Bypass intersection.

2. Safety

Does the alternative incorporate project elements that fall under ODOT's STIP work-type definition for safety projects?

Safety project elements will not prohibit the inclusion of:

- *Capital improvements such as passing lanes, turn lanes, and wider shoulders*
- *Access management*
- *New guardrails*
- *Illumination, delineation, or signing*

- *Channelization within the existing roadway at intersections*
- *Continuous shoulder rumble strips*

3. Design Requirements

Does the alternative meet ODOT and Linn County design requirements? If not, are design deviations feasible and appropriate?

4. Access Management Standards

Does the alternative meet or move toward access management (Oregon Revised Statute 734, Division 51) requirements?

5. Bicycle Facilities

Does the alternative include bicycle facilities on the segment that meet ODOT standards?

6. Floodplain Development

Can the alternative be permitted through Linn County's Flood Management Code?

7. Cultural and Natural Resources Permitting

Does the alternative meet, or can it be mitigated to meet, natural resource and cultural resource county, state, and federal permitting requirements (based on consultation with permitting agencies)?

A summary of threshold screening results for identified alternatives is shown in Figure 5-1.

Alternatives Considered and Dismissed

Several alternatives were evaluated on the basis of the screening criteria. Appropriate alternatives, which met the criteria, were further considered. Other potential corridor improvements, which didn't meet the criteria, were dismissed. The justification used to dismiss the inappropriate alternatives is discussed below.

A summary of screening criteria results is provided in Appendix I.

Alternative: Roundabout

The roundabout alternative was designed to address the safety deficiencies associated with congestion and speed differentials that occur in the corridor today. In this alternative, roundabouts would be installed at three study segment intersections: Corvallis Bypass, Morse Brothers driveway, and Peoria Road intersections. A raised median would be installed along Oregon 34 to restrict other intersections and accesses to right-in, right-out movements only. U-turns would only be accommodated at the roundabouts.

A double-lane roundabout at the Oregon 34/Corvallis Bypass intersection would operate with a v/c ratio of approximately 0.81 under year 2000 conditions and greater than 3.00 under year 2027 conditions. At the Oregon 34/Peoria Road intersection, the double-lane roundabout would operate with a v/c ratio of 1.03 under existing conditions and greater than 3.00 under year 2027 conditions.

Additionally, widening the roundabouts to include more than two circulatory lanes would negate the safety benefits of the roundabouts and, therefore, would not achieve the original objectives of the alternative. As traffic operations under Year 2000 conditions show that the roundabout alternative would exceed the available intersection capacity, this alternative was removed from further consideration. Level-of-service worksheets are included in Appendix K.

Alternative: Right-In/Right-Out, Center U-Turn

Similar to the roundabout alternative, the right-in/right-out, center u-turn would be designed to restrict access along Oregon 34 to right-in, right-out movements while allowing u-turns at selected locations. In this alternative, a wide median would separate the travel lanes, restrict movements at all of the existing access locations along the corridor, and provide the needed maneuvering space for cars and trucks to make a u-turn at the existing traffic signal locations (Corvallis Bypass and Peoria Road).

Operational analysis shows the v/c ratio worsening at the Oregon 34/Corvallis Bypass intersection under existing conditions (v/c ratio of 1.45) and year 2027 conditions (v/c ratio of approximately 2.38) due to the increased intersection clearance times, increased westbound left-turn demand, and elimination of the right-turn overlap signal phasing in the northbound direction.. Level-of-service worksheets are included in Appendix K.

Alternative: Right-In/Right-Out, Truck Turn-Around Loop

This alternative is similar to the previous right-in/right-out alternative, with the exception of the type of u-turn treatment used at the Peoria Road intersection. Here, a truck turn-around loop is used (for truck u-turn movements). Eastbound trucks or large farm vehicle u-turns would be accommodated via a new loop road constructed north of the Peoria Road alignment. In this alternative, a raised median would be installed along Oregon 34 to limit movements to right-in, right-out only.

This alternative was dismissed based on safety concerns, citing weaving issues created from trucks leaving Morse Brothers intending to make a u-turn at Peoria Road. Further, provision of a raised median along Oregon 34 would require a u-turn movement at the Corvallis Bypass intersection that would further degrade roadway safety along the corridor. Similar to the Right-In/Right-Out, Center U-turn alternative, median widening may be required to accommodate westbound u-turns. This median widening and accommodation of u-turns would degrade intersection operations at the Corvallis Bypass intersection by increased intersection clearance times, increased westbound left-turn demand, and elimination of the northbound right-turn overlap signal phasing, resulting in a v/c ratio of 1.45.

Alternatives Considered for Evaluation

Based on the screening and preliminary assessment of safety and operational aspects, the following alternatives were recommended to and approved by the Steering Team as alternatives appropriate for detailed evaluation. These alternatives, shown together in Figure 5-2, were designed to:

- Consolidate direct highway access onto Oregon 34,

- Maintain or improve traffic operations,
- Improve roadway safety, and
- Provide multi-modal connections throughout the study area.

A summary of how the alternatives considered for evaluation measured up to the screening criteria is as follows:

- **V/C Ratio:** Maintain or improve traffic operations from the base condition on the system as a whole. With the frontage road concepts individual intersection volume-to-capacity ratios may be slightly reduced due to access closures and consolidation of movements. However, the high volume-to-capacity ratio at private driveways will be dramatically improved by rerouting turning movements to the traffic signals, thereby improving volume to capacity ratios throughout the corridor.
- **Safety:** Each alternative contains access management elements, which falls under the definition of a STIP safety project.
- **Design Requirements:** Each alternative is in accordance with both ODOT and Linn County design requirements. Frontage roads were conceptually designed to the standard of a Linn County Typical Road Section.
- **Access Management Standards:** Each alternative included the closure of all access locations (both public streets and private driveways) on Oregon 34 between the Corvallis Bypass and Peoria Road/Wolcott Road. Highway approaches would be closed after appropriate frontage roads have been completed to accommodate affected users.
- **Bicycle Facilities:** All frontage road options provide a low-volume shared roadway that would be conducive to bicycle travel.
- **Floodplain Development:** Screening-level analysis determined that proposed alternatives could be designed in a manner that would meet Linn County Floodplain Code regulations. Additional analysis of floodplain impacts is provided as part of the “Preferred Alternatives” section of this document.
- **Cultural and Natural Resources Permitting:**
 - All north and south frontage road alternatives, each of which has an impact on land zoned as EFU, would meet applicable Linn County Conditional Use Permit criteria for developing on land zoned Exclusive Farm Use. This is detailed in Section 7 of this document.
 - All north frontage road alternatives, each of which has an impact on land inside the Willamette River Greenway Boundary, would meet the county criteria for a Greenway Permit. This is detailed in Section 7 of this document.
 - Based on knowledge of the site collected within the scope of this study, all north and south frontage road alternatives would meet federal, state, and county natural resource permitting requirements with regard to wetlands, threatened and endangered species, and historical resources. However, for the south frontage road alternatives, further field studies need to be performed in order to make a final determination of permitting feasibility of either of the alternatives. Wetland

delineations, rare plant surveys, and cultural resource surveys need to be conducted to determine which alternatives will have the least impact on the natural and historic environment.

The alternatives carried forward for consideration included a series of frontage roads. The north frontage road alternatives (N series) provide a vehicular connection between the crew dock access road and the realigned Wolcott Road intersection. The south frontage road alternatives (S series) form a new connection between Ireland Lane and Peoria Road.

Additionally, all alternatives forwarded for evaluation included the closure of all direct highway access locations in the study area, as well as intersection, intersection approach, and highway segment improvements. The particulars of these improvements are discussed as part of the preferred alternative package in Section 6.

The need for dual northbound left-turn lanes at the Oregon 34/Peoria Road intersection was previously identified in the Traffic Operations Assessment. This improvement is not adequate to meet ODOT mobility standards under existing or future conditions; however, provision of a second northbound turn lane will significantly improve traffic operations and queuing on the northbound approach. Although this improvement is needed under existing conditions, connection of a new south frontage road that relies on the Oregon 34/Peoria Road intersection for highway access would further increase the need for such improvements. The remainder of this section describes individual frontage road alternatives.

North Frontage Road Alternative N1

Alternative N1 consisted of a realignment of Wolcott Road to form a signalized north leg of Peoria Road. As part of this alternative, a new frontage road along the north side of Oregon 34 would connect Wolcott Road to parcels located to the west. This new frontage road would be constructed adjacent to the existing highway. To accommodate future vehicular queuing, it would intersect Wolcott Road approximately 200 feet north of the Peoria Road traffic signal. The Wolcott Road/frontage road intersection would be unsignalized.

Alternative N1 would require the acquisition of right-of-way from the farmland north of Peoria Road. The existing Wolcott Road alignment would be vacated. With a north frontage road, the v/c ratio at Peoria Road would increase to 0.93 due to the consolidation of movements at the traffic signal. The Corvallis Bypass will continue to operate with a v/c ratio of 1.20. Traffic operations, vehicular conflict points, speed consistency, and access along the corridor would be improved from the base condition with the removal of unsignalized driveway traffic between the ODFW driveway and Peoria Road. All of the north frontage road concepts share these benefits regardless of the roadway alignment.

Alternative N1 is illustrated in Figure 5-3.

North Frontage Road Alternative N1-Modified

Following meetings between ODOT and property owners, Alternative N1 was modified to provide a pedestrian- and bicycle-only connection between the ODFW office building driveway and Electric Road. Between the OSU crew docks and Electric Road, a frontage road would provide vehicular access to properties near the west end of the segment and serve

pedestrian and bicyclist needs. This alternative would create a new off-highway route for pedestrians and bicyclists between the OSU crew docks and Wolcott Road. Additionally, this modification would provide access for existing property owners along the north side of Oregon 34 via either Electric Road or the realigned Wolcott Road/Peoria Road traffic signal.

Alternative N1-Modified is projected to operate with a v/c ratio of 0.93 at the Peoria Road intersection and a v/c ratio of 1.20 at the Corvallis Bypass.

N1-Modified was chosen as the preferred alternative because it provides safety and operational benefits throughout the study area by:

- Removing all access locations on the north side of Oregon 34,
- Providing an off-highway route for bicyclists and pedestrians throughout the corridor, and
- Minimizing needed right-of-way and farm impacts north of the highway.

N1-Modified is illustrated in Figure 5-3a and is described in more detail in Section 6 and Section 7.

North Frontage Road Alternative N2

In Alternative N2, the north frontage road would be constructed as a backage road near the ODFW office building. The intent of this alternative was to provide additional vehicular queue storage for the southbound approach to the Oregon 34/Peoria Road intersection. Three modified alignments for Alternative N2 were reviewed in detail and are discussed as follows.

Alternative N2A

In Alternative N2A, the transition from a frontage road to a backage road would occur west of the ODFW office building. This would reduce potential impacts on existing structures located along Oregon 34. The backage road would continue east to a three-legged intersection with Wolcott Road, approximately 600 feet north of Oregon 34.

The primary disadvantages of this alternative are as follows:

- The roadway would divide fields used by the local landowners near Wolcott Road,
- The roadway would separate farm buildings from fields currently used as pasture; and
- It would require more pavement and right-of-way than Alternative N1.

The additional distance from Oregon 34 via the backage road would result in a small amount of additional out-of-direction travel beyond that created by the N1 frontage road concept.

Alternative N2A is projected to operate with a v/c ratio of 0.93 at the Peoria Road intersection and a v/c ratio of 1.20 at the Corvallis Bypass.

Alternative N2A is illustrated in Figure 5-4.

Alternative N2B

Alternative N2B would transition the frontage road into a backage road immediately east of the ODFW office building driveway. This alignment provides a greater offset from the

structures located on the property adjacent to Wolcott Road. This alternative would require a pavement length similar to Alternative N2A.

Alternative N2B is projected to operate with a v/c ratio of 0.93 at the Peoria Road intersection and a v/c ratio of 1.20 at the Corvallis Bypass.

Alternative N2B is illustrated in Figure 5-4.

Alternative N2C

Alternative N2C would include the construction of a backage road approximately 1,000 feet north of Oregon 34, west of the ODFW office building to Wolcott Road. This is a much greater offset than Alternatives N2A or N2B. The intent of this alternative was to avoid dividing farmlands near Wolcott Road. This alternative would require the greatest amount of pavement and out-of-direction travel of the northern alignment concepts.

Alternative N2C is projected to operate with a v/c ratio of 0.93 at the Peoria Road intersection and a v/c ratio of 1.20 at the Corvallis Bypass.

Alternative N2C is illustrated in Figure 5-4.

North Frontage Road Alternative N3

Alternative N3 differs from Alternatives N1 and N2 in how it connects into Wolcott Road. In this alternative, the frontage road aligns with Wolcott Road. Access to Oregon 34/Peoria road is provided via a short road segment that meets the frontage road in a t-intersection.

Alternative N3 is projected to operate with a v/c ratio of 0.93 at the Peoria Road intersection and a v/c ratio of 1.20 at the Corvallis Bypass.

Alternative N3 is illustrated in Figure 5-5.

North Frontage Road Alternative N4

Unlike Alternatives N1 through N3, which entail a realigned Wolcott Road, Alternative N4 would realign Peoria Road with the existing Wolcott Road, and would require a new traffic signal be installed at this location. The traffic signal at the existing Peoria Road/Oregon 34 intersection would be removed and direct highway access via the abandoned leg of Peoria Road would be removed. Wolcott Road would transition westbound into the frontage road, and a new three-legged intersection would connect into the existing Wolcott Road alignment to provide access to the north.

Alternative N4 is projected to operate with a v/c ratio of 0.93 at the Peoria Road intersection and a v/c ratio of 1.20 at the Corvallis Bypass.

Alternative N4 is illustrated in Figure 5-6.

South Frontage Road Alternative S1

In this alternative, a frontage road would extend west from Peoria Road to Allen B. Berg Park. The frontage road would redirect Morse Brothers truck traffic and vehicular traffic from parcels on the south side of Oregon 34 to Peoria Road. By eliminating unsignalized truck-turning movements onto Oregon 34, speed consistency and roadway safety will be improved along the highway.

The frontage road would intersect with Peoria Road approximately 800 feet south of Oregon 34 and would require a 200-foot-long bridge connection over a tributary ravine located between Peoria Road and the channel of the Willamette River. A segment of frontage road with 12-foot travel lanes and 6-foot shoulders would extend west from Peoria Road to the existing Morse Brothers driveway. The widened travel lanes and shoulders would accommodate large truck traffic traveling into and out of the Morse Brothers property. From the Morse Brothers driveway west to Allen B. Berg Park, the frontage road would narrow to provide 11-foot travel lanes and 2-foot shoulders.

With a south frontage road, the v/c ratio at Peoria Road would increase to 0.93 due to the consolidation of movements at the traffic signal. The v/c ratio at the Corvallis Bypass is projected to be 1.20. Traffic operations, vehicular conflict points, speed consistency, and access along the corridor would be improved due to the removal of unsignalized driveway traffic entering Oregon 34 between the Morse Brothers driveway and Peoria Road. All of the south frontage road concepts share these benefits regardless of the roadway alignment.

Alternative S1 was chosen as the preferred alternative because it would provide safety and operational benefits throughout the corridor by removing all access locations on the south side of Oregon 34, eliminating truck-turning movements onto Oregon 34, and improving safety conditions along the highway. This alternative would also be expected to have less impact on potentially environmentally sensitive land near Peoria Road than Alternative S2. Alternative S1 is described in more detail in Section 6 and Section 7.

South Frontage Road Alternative S2

Alternative S2 was similar to Alternative S1 except that it connects into Peoria Road farther south than Alternative S1, providing additional spacing between the intersections to minimize the potential for future queue interaction.

Alternative S2 is projected to operate with a v/c ratio of 0.93 at the Peoria Road intersection and a v/c ratio of 1.20 at the Corvallis Bypass.

Alternative S2 is illustrated in Figure 5-7.

Evaluation Criteria

A total of 19 evaluation criteria and respective performance measures were developed by the project team and then divided into five broad categories:

- Vehicular mobility and safety,
- Land use,
- Environmental,
- Bicycle and pedestrian safety, and
- Implementation.

Table 5-1 presents the adopted evaluation criteria and performance measures.

TABLE 5-1
Evaluation Criteria and Performance Measures

Criterion	Performance Measure
<i>Vehicular Mobility and Safety</i>	
East-West Mobility on Oregon 34	Length of time the system will function before additional solutions are required.
Speed Consistency on Oregon 34	Difference in estimated speed (highest to lowest) along corridor.
Intersection Safety	Ability of alternative to address high frequency of rear-end crashes. A qualitative scale (1-3) measuring the following factors: <ul style="list-style-type: none"> • Signage and notification • Geometrics 1 = Poor incorporation of features 2 = Fair incorporation of features 3 = Good incorporation of features
Access Management	Number of conflict points along segment.
Out-of-Direction Travel Distance	A quantitative distance measurement from the Corvallis Bypass and Peoria Road intersection to two separate locations along the corridor.
Impacts on Local Road Network	A qualitative scale (1-3) measuring the following factors: <ul style="list-style-type: none"> • Safety conditions on local roads • Access conditions on local roads • Operational performance conditions on local roads 1 = Negative impact on local road network 2 = Negligible impact on local road network 3 = Positive impact on local road network
Access Management	Number of conflict points along segment.
Accommodation of Farm Vehicle Movements	Reduction in travel time along Oregon 34. A qualitative scale (1-3) measuring the following factors: <ul style="list-style-type: none"> • Amount of frontage road that parallels Oregon 34 • Improvement to signalized crossings • Shoulder width 1 = Poor incorporation of features 2 = Fair incorporation of features 3 = Good incorporation of features

TABLE 5-1
Evaluation Criteria and Performance Measures

Criterion	Performance Measure
Land Use	
Residential Displacement	Number of houses displaced.
Affected Historic Properties	Number of properties potentially eligible for National Register of Historic Properties adversely impacted.
Business Displacement	Number of businesses adversely impacted.
Farm Use Impact	<p>A qualitative scale (1-3) measuring the following factors:</p> <ul style="list-style-type: none"> • Viability of continued working farm use (i.e., will the resulting size of parcel[s] created by road division be sufficient for the purpose of profitable farming) • Interference with farm functions (based on proximity of new roadway to farm structures/facilities and difficulty for machinery crossing any new roadway through farm) • Number of EFU acres displaced (based on actual footprint of alternative) <p>1 = Significant adverse impact to farm use 2 = Moderate adverse impact to farm use 3 = No adverse impact to farm use</p>
Urbanizing Pressure	<p>A qualitative scale (1-3) measuring “urbanization pressure” impact:</p> <p>1 = Urbanizes area 2 = Moderate effect regarding urbanization 3 = Negligible effect regarding urbanization</p>
Environmental	
Wetlands	Number and quality of wetland acres altered.
Water Quality	Impervious surface added.
Bicycle and Pedestrian Safety	
High Quality Pedestrian/Bicycle Environment	<p>A qualitative scale (1-3) measuring the following factors:</p> <ul style="list-style-type: none"> • Vehicle speed/ design speed along route • Vehicle volume (ADT) along Route • Type/quality of route • Crossing quality (this incorporates numerous factors such as the type of crossing, available gaps, the sight distance, and the complexity) • Directness of route (with respect to dominant travel pattern to OSU property) <p>1 = Poor bicycle/pedestrian environment 2 = Fair bicycle/pedestrian environment 3 = Good bicycle/pedestrian environment</p>

TABLE 5-1
Evaluation Criteria and Performance Measures

Criterion	Performance Measure
Implementation	
Compatibility with Planned Future Land Use	Percentage of project cost that is usable/compatible with future alternatives.
Construction Staging and Traffic Maintenance During Construction	A qualitative scale (1-3) measuring: <ul style="list-style-type: none"> • Ability to construct improvements without impacting operations on Oregon 34 • Maintenance of access to businesses and residences 1 = Poor incorporation of features 2 = Fair incorporation of features 3 = Good incorporation of features
Phasability	A qualitative scale (1-3) measuring: <ul style="list-style-type: none"> • Ability to build alternative in segments • Ability to match available funding with improvements suggested • Ability to acquire right-of-way and permit with respect to schedule 1 = Poor incorporation of features 2 = Fair incorporation of features 3 = Good incorporation of features
Cost	Cost of design, right-of-way acquisition, and construction.

Evaluation of Feasible Alternatives

Each of the feasible frontage road alternatives was evaluated using the performance measures and stated assumptions for each criterion, as detailed in Figure 5-8. Project staff compared and evaluated the north frontage road alternatives and the south frontage road alternatives.

The results of the alternatives evaluation are shown in Figure 5-9. A summary of the rationale behind the dismissal of feasible alternatives (based on evaluation results) is provided in Appendix A.

Post-Evaluation Alternatives

Following the evaluation process, results were displayed at a community open house. Participants subsequently identified two new alternatives for evaluation by the project team. Both alternatives differed from the alternatives presented in that they did not involve realigning either Wolcott or Peoria Roads. Both alternatives sought to address the poor traffic safety conditions in the vicinity of the Peoria Road/Wolcott Road and Oregon 34 intersection without realigning Wolcott Road, building a frontage road, and “taking” farmland in the process. Both of these alternatives were measured against threshold screening criteria to determine whether they merited further evaluation.

Post-Evaluation Alternative #1

The first alternative consisted of adding a second traffic signal that would operate in coordination with the existing Oregon 34/Peoria Road traffic signal.

This alternative was dismissed because it failed to meet screening Criteria #1, #2, #3, and #4.

Recent traffic counts at the Oregon 34/Wolcott Road intersection indicate very low levels of traffic to and from Wolcott Road. These traffic volumes are not sufficient to warrant a new traffic signal. From an operational perspective, installing an unwarranted traffic signal would increase the delay for motorists at the Oregon 34/Wolcott Road intersection. Further, because of the proximity to the Peoria Road intersection, vehicular queues would extend through the downstream intersections during peak hours, further degrading operations and creating potential safety concerns. Providing left-turn storage at the Wolcott Road intersection may also be a physical constraint because it would be located in the opposing left-turn bay for southbound traffic on Peoria Road. A second traffic signal could also be confusing to drivers because they would simultaneously see two closely spaced and potentially conflicting traffic signal indications while approaching the intersections on Oregon 34. Installing an unwarranted traffic signal may, in fact, *increase* the number of crashes, as drivers are less likely to expect to stop. Therefore, this alternative does not meet Criteria #1 and #2.

This alternative calls for two traffic signals spaced approximately 240 feet apart, which would not comply with ODOT's 2,640-foot spacing requirements for traffic signals on an expressway. Therefore, this alternative does not meet Criterion #3.

Additionally, by not closing any existing approaches to the highway, this alternative did not support access management standards for an expressway; thus it did not meet threshold Criterion #4.

Post-Evaluation Alternative #2

The second alternative proposed that Wolcott Road be controlled through a single traffic signal at Peoria Road that would control all movements at the Oregon 34/Peoria Road and Oregon 34/Wolcott Road intersections. The result of this option would be a wide intersection in which vehicles traversing north or south over Oregon 34 would be required to do so in a "jog" fashion. The spacing of these intersections would require a 300-foot offset between the eastbound and westbound crosswalks.

This alternative was dismissed because it failed to meet screening Criteria #1, #2, #3, and #4.

Traffic and safety operations analysis showed that both v/c ratio and safety conditions would worsen with this alternative at the Oregon 34/Peoria Road intersection. Due to the increased clearance traffic signal time (the yellow and all-red traffic signal phase for vehicles to safely pass through the intersection) traffic operations would degrade to a v/c ratio of 1.06. Safe passage for bicyclists and pedestrians would further add to the traffic signal timing requirements. This additional clearance time would significantly detract from the capacity of the intersection. Furthermore, this level of clearance time would most likely not

be allowed as a design exception by ODOT. Therefore, Criteria #1, #2, and #3 would not be met.

Additionally, by not closing any existing approaches to the highway, this alternative did not support access management standards for an expressway; thus did not meet threshold Criterion #4.

Preferred Alternative

What follows is a description of the preferred alternative package, including how it will improve safety conditions in the study area.

North Frontage Road

Description

Alternative N1-Modified was selected as the preferred north frontage road option. In this alternative, Wolcott Road would be realigned to create a four-legged intersection with Oregon 34, locating the realigned Wolcott Road directly across from Peoria Road. This action would allow for a safer and more orderly movement of vehicles, including the movement of farm equipment onto and across Oregon 34 from points north of Oregon 34.

A segment of frontage road with two 11-foot travel lanes and 4-foot shoulders would extend west from the realigned Wolcott Road to a point just past the driveway of the ODFW building, where it would terminate in a cul-de-sac turnaround. A 12-foot bicycle\pedestrian path would extend west from the ODFW office building to Electric Road. Another segment of frontage road would extend west from Electric Road to the OSU crew dock access road; this segment of frontage road would have two 11-foot travel lanes and 4-foot shoulders.

Benefits

This alternative provides safety and operational benefits throughout the study area by:

- Removing all access locations on the north side of Oregon 34,
- Providing an off-highway route for bicyclists and pedestrians throughout the corridor, and
- Minimizing needed right-of-way and farm impacts north of the highway.

The frontage road connection to Wolcott Road and the planned realignment would provide a safe signalized crossing location for farm vehicles to travel between farmlands north and south of Oregon 34.

This alternative creates a continuous route for bicyclists and pedestrians from Corvallis to Peoria Road. The frontage road connects to the Crew Dock access road, which, in turn, connects to the bike path on the Van Buren Bridge (via the existing path underneath the bridges).

Realigning Peoria Road and Wolcott Road would provide several safety and operational benefits. Operationally, it would provide only a slight increment of delay at the Oregon 34/Peoria Road traffic signal, while providing the needed connectivity for farm equipment to cross the highway. The realignment would also reduce conflict points at the Wolcott Road intersection by consolidating access to the Peoria Road alignment. Consolidation of access would enable drivers to more easily detect approaching conflict points and prepare accordingly. The single intersection resulting from a realignment of Peoria Road and Wolcott Road

would better meet driver expectations and be in compliance with ODOT's designation of the roadway as an expressway.

Additionally, the western portion of the north frontage road would provide access to Electric Road via the Oregon 34/Corvallis Bypass traffic signal, thereby eliminating the current CTWLTL conflict.

Preferred north frontage road Alternative N1-Modified is illustrated in detail in Figure 6-1.

South Frontage Road

Description

Alternative S1 was selected as the preferred south frontage road option. A segment of frontage road with 12-foot travel lanes and 6-foot shoulders would extend west from Peoria Road to the existing Morse Brothers driveway. (The widened travel lanes and shoulders would accommodate large truck traffic traveling into and out of the Morse Brothers property.) This segment would include a 200-foot-long bridge to span a tributary of the Willamette Channel. Another segment of frontage road, with 11-foot travel lanes and 2-foot shoulders, would extend west from the Morse Brothers driveway to Allen B. Berg Park.

Benefits

This alternative would provide safety and operational benefits throughout the corridor by removing all access locations on the south side of Oregon 34.

The construction of a south frontage road would allow Morse Brothers truck traffic to be redirected to Peoria Road, thereby eliminating truck-turning movements onto Oregon 34 and improving safety conditions along the highway.

In comparison with Alternative S2, Alternative S1 would be expected to have less impact on potentially environmentally sensitive land near Peoria Road. Based on a review of National Wetland Inventory maps, Alternative S1 would impact an estimated 0.39 acres of wetlands, while Alternative S2 would impact approximately 0.89 acres of wetlands.

The south frontage road would be a suitable low-volume service road for Allen P. Berg Park. The City of Corvallis master plan for this park calls for the development of a ball field complex.

Preferred south frontage road Alternative S1 is illustrated in detail in Figure 6-1.

Low-Cost Safety and Operational Improvements

Analysis of safety and operational data and iterative discussions with the Steering Team led to the consensus development of additional low-cost improvements. These improvements are designed to effectively work in concert with the selected frontage road alternatives to improve safety and operational conditions along Oregon 34.

Safety and operational treatments were identified along Oregon 34 for the intersections, the intersection approaches, and the highway segment outside of the intersection approaches. Selected treatments are listed below.

Intersection Treatment

- **Intersection illumination**
- **Pedestrian crossing treatments**

Intersection Approach Treatments

- **Wider longitudinal pavement markings**
- **Transverse pavement markings**
- **Raised pavement markings (reflective)**

Oregon 34 Highway Segment Treatments

- **Extension of the right-turn-only lane on eastbound Oregon 34 at the Peoria Road intersection.** This action would shorten current vehicle queue lengths in the two through-travel lanes at this intersection. The likelihood of rear-end crashes would be decreased by this action because right-turning vehicles would be able to decelerate slowly from a higher speed rather than quickly decelerate to enter the existing short, right-turn lane. Mobility conditions would also be improved because more vehicles would be able to move through the intersection during eastbound green intervals.
- **Curb and gutter treatments**
- **Medians (recessed)**
- **Landscaping**
- **Street illumination**

Peoria Road Treatments

- **Reconstruction/widening of roadway**
- **Turn-lane pockets at south frontage road intersection**
- **Dual northbound turn-lanes to increase the intersection performance and reduce queuing**

A graphical depiction of proposed low-cost safety and operational improvements is provided in Figure 6-2.

SECTION 7

Permitting Requirements

A critical aspect of alternative evaluation is to first determine whether alternatives are consistent with applicable land development regulations and, therefore, feasible. An analysis conducted as part of this AMP revealed that the preferred alternative would, in fact, be in accordance with all applicable regulations. What follows is a discussion of the criteria associated with the necessary permitting requirements. Linn County Code requirements are provided in Appendix C.

The proposed AMP project improvements involve development of transportation facilities in an EFU zone, inside a designated floodplain, and within the Willamette River Greenway boundary. Therefore, two major permits must be obtained from Linn County prior to the construction of the proposed improvements:

- The first permit is a Linn County Conditional Use Development Permit, in which decision criteria related to both developing in an EFU zone and developing in a floodplain must be addressed.
- The second permit is a Greenway Conditional Use Permit, in which decision criteria related to project development *inside* the Willamette River Greenway boundary must be addressed.

The decision criteria for the Linn County Conditional Use Development Permit are excerpted in italics in the first part of this section,²³ along with responses that address how preferred alternative improvements meet the requirements. The decision criteria for the Greenway Conditional Use Permit are excerpted in italics in the second part of this section, along with responses that address how preferred alternative improvements meet the requirements.

Responses to both permits are based on the current level of knowledge garnered during this planning process. Responses must be refined prior to permit submission to reflect updated information (i.e., engineering design plans, further environmental analysis).

Linn County Conditional Use Development Permit

The Linn County Conditional Use Permit for AMP-proposed transportation improvements must address criteria from two sections of LCC Chapter 933: LCC 933.310 and LCC 933.900. These criteria contain the requirements for developing in both an EFU zone and a designated floodplain area.

²³ Excerpt source: Linn County Planning and Building Department *Rural Resource Zoning District Conditional Use Permit Application*.

LCC 933.310—Rural Resource Zone conditional uses; generally

Criterion 1: *The development site has physical characteristics needed to support the use. Those characteristics include, but are not limited to, suitability for a sewage treatment system and an adequate supply of potable water.*

Critical facilities and services related to the proposed AMP improvement project, such as water, sewer, stormwater drainage, and public utilities, have adequate capacity or will be improved to have adequate capacity to serve the project at the time it is completed.

Criterion 2: *The development will not be located within a mapped geologic hazard area or within a 100-year floodplain unless it is demonstrated that the proposal can be designed and engineered to comply with accepted hazard mitigation requirements.*

Proposed AMP project improvements would occur in an area inundated by the 100-year floodplain (base flood), defined by Linn County’s Flood Management Code (Linn County Building Code, Chapter 870) as an “area of special flood hazard.” Proposed roadway improvements would require both the excavation and the placement of fill material below the 100-year flood elevation. The 100-year flood elevation at Oregon 34 is approximately 220 feet.

Subsequent to the approval of the Linn County Conditional Use Permit, a floodplain development permit must be prepared. Linn County does not require applicants to address floodplain development criteria in the Linn County Conditional Use Permit itself, but rather in a subsequent building permit. The building permit is where the applicant addresses applicable floodplain development requirements that have been specified in the form of conditional use approval criteria after the Linn County Conditional Use Permit has been reviewed by the Linn County Floodplain Administrator.

The Linn County Floodplain Management Code, Chapter 870.144, contains the requirements that are applicable to the type of roadway construction-related improvements being proposed in this AMP.²⁴

Under 870.144(A), placement of fill within the floodplain must be approved by the Linn County Floodplain Administrator, and is allowed when the following conditions are met:

- 1) A development permit is obtained;
- 2) The net effect of fill and excavation operations (on site) constitutes no positive change in fill volume;
- 3) The proposed fill or excavation will not change the direction or velocity of flood water flow;
- 4) The proposed fill or excavation will not cause a compounding of flood hazards; **or**
- 5) A registered engineer shall certify that the proposed project will not cause a rise in the base flood elevation during a 100-year event or create conditions that would be detrimental to adjacent or neighboring properties.

²⁴ As noted, floodplain development requirements will be stated as conditions of approval upon review of proposed AMP project improvements by the Linn County Floodplain Administrator. These conditions of approval may exceed, or be fewer, than the likely applicable criteria noted here, depending on the particular set of improvements being proposed at the time.

Preliminary analysis performed for this AMP report demonstrates that proposed roadway improvements can be designed and engineered to comply with applicable hazard mitigation provisions. Because the existing Oregon 34 roadway acts as a continuous obstruction to flood flows, it is not expected that the development of the proposed frontage roads, which will take place below the level of the existing roadway, would result in increased 100-year water surface elevations.

Preferred alternative frontage roads (Alternative N1-Modified and Alternative S2) can be constructed without additional fill material below the 100-year water surface elevations. Additionally, the elevation of the proposed roadways lies below the elevation of the Oregon 34 roadway embankment for the entire length proposed. As further mitigation for fills, a structure is proposed for the south frontage road over the Willamette River channel tributary. Therefore, proposed AMP project improvements construction would likely be approved by the Linn County Floodplain Administrator. See Appendix J for detailed profiles and cut/fill volumes of the propose alternatives.

An absolute determination that the previous conditions would be met rests on the results of future hydraulic modeling. This modeling generally takes place during final configuration of the roadway/structure (usually at 30 percent design status).

Aside from necessary excavation and fill actions, proposed AMP project improvements do not include any other development that could alter or obstruct the flow of flood water (guard rails, jersey barriers, etc.).

Criterion 3: *The proposal will not have a significant adverse impact on sensitive fish or wildlife habitat.*

Based on the preliminary “red flag” analysis performed for this AMP report, it is highly unlikely that proposed AMP project improvements would have a significant adverse impact on either sensitive fish or wildlife habitat. The ORNHIC query results for the study area indicated that no listed fish, bird, or plant species have been directly observed within the study area. However, one listed bird species, four listed plant species, and two listed fish species have been observed within a 2-mile radius of the study area. Therefore, as noted in Section 3, further environmental analysis must be performed to confirm the preliminary conclusion that there would be no significant impact on fish or wildlife.

Criterion 4: *The proposed use will not force a significant change in, or significantly increase the cost of, accepted farm or forest practices on surrounding lands devoted to farm or forest use.*

One farm property (tax lot 11S05W36 02600) would be significantly affected by the proposed realignment of Wolcott Road and creation of the north frontage road segment from the realigned Wolcott Road west to the ODFW office building driveway. The Wolcott Road realignment would divide this tax lot into two pieces. Any existing farming activities on this tax lot would be directly affected by the proposed realignment and would need to be relocated to other parcels.

The impact of proposed AMP project improvements on surrounding agricultural land and working farm practices was a consideration during the evaluation of different alternative improvements. The evaluation process considered viability of existing farms affected by the

alternatives, potential interference from farm functions, and the number of EFU acres displaced as criteria (Table 5-1). For the entire study area, the proposed north frontage road option had less impact on farmland, when compared to the other feasible alternatives (Section 5, Figure 5-8 and Figure 5-9).

It is unlikely that proposed AMP project improvements would significantly increase the cost of accepted farm or forest practices on surrounding lands devoted to farm or forest use. Rather, by providing access to a signalized intersection at Wolcott Road and Oregon 34 (the result of the realignment of Wolcott Road), farm vehicle movement across Oregon 34 would be made less time-consuming and safer, which may provide a cost benefit.

Criterion 5: If in the forest area of the F/F or in the FCM zoning districts, the proposed use will not significantly increase fire hazard or significantly increase fire suppression costs or significantly increase risks to fire suppression personnel.

This criterion is not applicable. No proposed AMP project improvements would take place in the F/F (Farm/Forest) or FCM (Forest Conservation Management) zoning districts.

Criterion 6: The location, size, design, and operating characteristics of the proposed development will be made reasonably compatible with and have minimal impact on the livability and appropriate development of nearby property. The proposed use will be reviewed with respect to scale, bulk, coverage, density, the availability of necessary public facilities and utilities, traffic generation, road capacity and safety, and to other related impacts of the proposal.

The proposed north frontage road would impact the livability of nearby properties as a result of the proximity of the roadway to two existing residences. However, minimal impact would be expected since this frontage road would be a very low-volume road with no potential for through-traffic (the frontage road dead-ends just west of these two properties).

The proposed AMP project improvement frontage roads would be designed according to Linn County design standards for local roads. These standards require right-of-way widths of up to 70 feet, but portions of the frontage roads adjacent to OR 34 may be able to share right-of-way with ODOT, thus reducing the impact of the development on the two existing residences.

The evaluation process used the Vehicular Mobility, Land Use, and Implementation Criteria to indirectly measure each alternative's ability to meet Linn County Criterion 6. The impacts on the local road network, residential displacement, right-of-way impacts, and relative size of development were used as evaluation criteria (Table 5-1). The proposed north frontage road was more compatible with existing development, when compared to the other feasible alternatives (Section 5, Figure 5-8 and Figure 5-9).

It is not expected that any proposed AMP project improvements would have an adverse impact on the appropriate development of nearby properties.

Criterion 7: *If in the forest area of the F/F or in the FCM zoning districts, a written statement recorded with the deed or written contract with the county is obtained from the land owner which recognizes the rights of adjacent and nearby land owners to conduct forest operations consistent with the Forest Practices Act and Rules for the following uses.*

- (a) *Parks and campgrounds;***
- (b) *Reservoirs and impoundments;***
- (c) *Medical hardship dwellings;***
- (d) *Home occupations; and***
- (e) *Private accommodations for fishing.***

This criterion is not applicable. No proposed AMP project improvements would take place in the F/F or FCM zoning districts.

LCC 933.900—Transportation Improvements

Criterion 1: *Identify reasonable build design alternatives, such as alternative alignments, that are safe and can be constructed at a reasonable cost, not considering raw land costs, with available technology.*

Reasonable build alternatives are described in Section 5. The preferred alternative was selected on the basis of performance against evaluation criteria, comparison with other feasible alternatives, and potential for improving safety conditions.

Criterion 2: *Assess the effects of the identified alternatives on farm and forest practices, considering impacts to farm and forest lands, structures, and facilities, considering the effects of traffic on the movement of farm and forest vehicles and equipment, and considering the effects of access to authorized units of land created on farm and forest land.*

The following factors related to farm use impact were evaluated in Section 5 (Figure 5-8 and Figure 5-9) for each feasible alternative:

- Total number of agricultural acres displaced
- Interference with farm functions (based on proximity of new roadway of farm structures/facilities and difficulty for machinery crossing any new roadway through farm)
- Viability of continued working farm use
- Ability to accommodate farm vehicle movements both along and across Oregon 34

Criterion 3: *Select from the identified alternatives, the one, or combination of identified alternatives that has the least impact on lands in the immediate vicinity devoted to farm or forest use.*

Of the feasible alternatives evaluated, the preferred alternative contains the north frontage road alternative (Alternative N1-Modified) that had the least impact on the surrounding farm use lands, as illustrated in Figure 5-8 and Figure 5-9 in Section 5.

Linn County Greenway Permit

The decision criteria excerpted here are applicable solely to actions taking place within the Willamette River Greenway boundary. The Willamette River Greenway boundary is shown in Figure 3-3.

Criterion 1: *The proposal is consistent with the protection of land in the Exclusive Farm Use zoning district.*

A frontage road is being proposed inside the Willamette River Greenway boundary on land that is zoned EFU. However, this land is currently utilized as a golf course. Therefore, the proposed frontage road would not have an impact on agriculturally utilized land inside the Willamette River Greenway boundary.

Criterion 2: *The proposal is consistent with the protection of sensitive fish and wildlife habitat areas identified by the Oregon Department of Fish and Wildlife. Consideration of habitats shall include, but not be limited to, fish spawning sites, fresh water marshes, and great blue heron, osprey, and eagle nest trees, and trees adjacent to the nest trees.*

The land inside of the Willamette River Greenway boundary that would be impacted by the proposed frontage road development is currently in use as a golf course. There would be no impact on sensitive fish or wildlife habitat areas.

Criterion 3: *The proposal is consistent with the preservation of significant natural and scenic areas, viewpoints, and vistas.*

The land inside of the Willamette River Greenway boundary that would be impacted by proposed frontage road development is currently in use as a golf course. This land is no longer in a natural state and there would be no impact on any designated viewpoints or vistas.

Criterion 4: *The proposal is consistent with the enhancement and protection of the natural vegetative fringe to the maximum extent practicable.*

The land inside of the Willamette River Greenway boundary that would be impacted by proposed frontage road development is currently in use as a golf course. This land is no longer in a natural state. Proposed improvements would incorporate native vegetation to the greatest extent possible.

Criterion 5: *The protection, preservation, restoration, and enhancement of areas having ecological, scientific, historical, or archaeological significance are not significantly impaired by the proposal.*

The land inside of the Willamette River Greenway boundary that would be impacted by proposed frontage road development is currently in use as a golf course. There would be no known impacts on areas of ecological, scientific, historical, or archaeological significance.

Criterion 6: *The quality of the air, water, and land resources in and adjacent to the Greenway shall not be significantly impaired by the proposal.*

It is not expected that air, water, or land resources inside of or adjacent to the Willamette River Greenway boundary would be adversely impacted by project improvements. Inside of

the Willamette River Greenway boundary, the proposed frontage road would be a low-volume local access road serving visitors to the Trysting Tree Golf Course; the small number of vehicles that would utilize the frontage road would not be expected to have a measurable impact on air quality. With regard to water quality, proposed facilities would be in accordance with Linn County standards to ensure appropriate drainage design.

Criterion 7: *The proposal is consistent with the retention, in their natural state, of identified areas of annual flooding, floodplains, and wetlands to the maximum extent practicable.*

It is expected that proposed improvements can be designed and engineered to comply with accepted flood hazard mitigation requirements, thus retaining the natural flow state of Willamette River flood water.

Criterion 8: *The proposal shall not have a significant effect upon potentially erodible areas.*

The topography in the study area is relatively flat and generally not prone to slides or erosion. Regardless, frontage road improvements would be built in accordance with Linn County structural building requirements. Construction would include armored slopes and swales. Water removal techniques would be employed to disallow the concentration of stormwater that could aid erosion.

Criterion 9: *The proposal is compatible with existing uses in the surrounding area.*

The land inside of the Willamette River Greenway boundary that would be impacted by proposed frontage road development is currently in use as a golf course. The proposal is compatible in that the proposed frontage road is a public facility that will serve as an access road to a public recreational facility.

Criterion 10: *The proposal has been directed away from the Willamette River to the greatest extent possible.*

The proposed AMP project improvements are not in the immediate proximity of the Willamette River. At the closest point, proposed AMP project improvements are approximately 900 feet east of the regular bank of the Willamette River, separated by a private driveway leading to the OSU crew docks. The proposed AMP project improvements are located no closer to the river than necessary in order to provide a safe and suitable access road.

Criterion 11: *The maximum possible landscaping area, open space, and vegetation will be provided between the Willamette River and the proposal.*

Proposed AMP project improvements are not in immediate proximity to the Willamette River. The existing open area between the proposed AMP project improvements and the Willamette River would not be impacted.

Summary

The analysis performed for this AMP indicates that all of the improvements proposed as part of the preferred alternative would be permissible under applicable Linn County Development Regulations. However, further in-depth evaluation, particularly related to environmental resources as described in this section, must be undertaken to further substantiate this conclusion.

Public Involvement and Decision Structure

Roles and Responsibilities of Key Jurisdictions and Groups

Decision making for the Oregon 34 Expressway Management Plan was shared among the City of Corvallis, Linn and Benton Counties, and ODOT through a Steering Team. The Steering Team had responsibility for oversight of the public process and for ensuring that any alternatives considered the policies and needs of the jurisdictions. Ultimately, the AMP will be adopted by Linn County as part of its transportation system plan. The Steering Team liaisons from each jurisdiction briefed elected officials during work sessions at key decision points in the project. At these meetings, information generated by the Steering Team and project staff was presented to the community.

ODOT was responsible for managing and funding the project, soliciting and receiving public comment, and ensuring that the alternatives generated by the public and PMT were technically sound and consistent with state policies. ODOT developed the draft plan for presentation and adoption.

Steering Team

The Steering Team responsibilities included the following:

- Define project scope and applicable standards
- Manage project scope, schedule, and budget
- Receive public comment
- Direct, produce, and provide quality assurance of technical and public/agency involvement work

The Steering Team members included the following:

John DeTar	ODOT
Darrin Lane	Linn County
Jim Mitchell	City of Corvallis
Roger Irvin	Benton County Public Works
Dorothy Upton	ODOT Transportation Planning Administration Unit
Derryl James	ODOT Project Design
David Warren	ODOT
Bruce Erickson	ODOT
Robert Trevis	ODOT Access Management
Kathi McConnell	ODOT Region 2 Traffic
Steve Dockins	ODOT Area 4
Tom Boylan	ODOT District 4
Melissa Mallott	ODOT Right-of-Way
Mark Wigg	ODOT Environmental

The Steering Team was supported by:

Julia Kuhn	Kittelson & Associates
Joe Bessman	Kittelson & Associates
Brian Ray	Kittelson & Associates
Michael Hoffmann	CH2M HILL
John Willis	CH2M HILL
Jamie Damon	Jeanne Lawson Associates

The Steering Team met on four occasions in Corvallis to develop evaluation criteria, generate alternatives, review deliverables, and plan upcoming activities. Other technical resource individuals were included in these meetings, as needed.

Public Involvement Program

The Steering Team conducted a public involvement program that targeted affected property owners and businesses (Table 8-1), the purpose of which was to:

- Elicit and facilitate *public discussion* of the needs and issues affecting the land uses and access changes along Oregon 34 between Wolcott Road and the Willamette River.
- Generate a *collaborative problem-solving process* to identify solutions that address access and safety issues.
- Build *broad public understanding* of the project needs, access requirements, and other issues.
- Nurture and strengthen the *credibility of the partners* (ODOT, City of Corvallis, and Linn and Benton Counties) and the legitimacy of the process.

Program Elements

The public involvement program incorporated the following major elements:

- Research to identify affected property owners and businesses along Oregon 34
- One-on-one and small group meetings with affected property owners, businesses, and community services (i.e., police, fire, EMS, school transport)
- Community open house
- Mailing lists
- Phone calls
- Newsletters
- Media coordination and press releases

TABLE 8-1
Public Involvement Activity Summary

Date	Event or Activity	Purpose	Outcome
March and April 2005	Thirteen small group meetings with affected property owners, businesses, and public services (51 people attending)	Introduction of the project Solicitation of input on problems and issues related to access and safety Opportunity to suggest alternatives	Identification of issues and concerns Suggestions for alternatives to be considered
June 2005	Six small group meetings with affected property owners, businesses, and public services (35 people attending)	Discuss alternatives from the Steering Team Gather feedback on the alternatives	Agreement from group on range of alternatives to pursue Refinements to alternatives for Steering Team consideration
June 2005	Newsletter mailing to mailing list and carrier routes within the project vicinity	Summarize information gathered to date and outline next steps. Inform of community open house	
July 6, 2005	Community open house at the Corvallis Public Library (60+ people attended)	Opportunity for broader community to understand and comment on the project Opportunity for participants in the small group meetings to learn of each other's concerns	22 completed comment forms received at the community open house 2 additional comments were received via e-mail The majority of the comment forms favor the Steering Team recommendations
Throughout	Single point of contact	Answer questions and provide information for the public	
Throughout	Mailing list (property owners, business owners, and meeting attendees)	To be notified of meetings and kept informed of the project	
As needed	Media coordination and press releases	To inform broader community of project and meetings	

A summary of the Public Involvement can be found in Appendix L.

Implementation

Access Management Strategy Statement

The Steering Team recommends the following access management strategy for adoption and implementation:

Within the project limits, close all private and public approaches between the Corvallis Bypass and Peoria Road intersections, and acquire all access rights to property abutting the north and south sides of Oregon 34.

Figure 9-7 provides a listing of all affected approaches and properties in the study corridor and the actions that will be undertaken, respectively, to carry out the proposed project improvements of this AMP.

Priority Phases and Funding

AMP-recommended improvements were prioritized for implementation by phase based on:

- Feasibility of funding (the relative cost of constructing particular improvements), and
- Urgency of implementation relative to improvements' ability to expedite mitigation of existing safety problems.

The establishment of priority phasing was the result of Steering Team consensus approval. The recommended improvements associated with each priority phase are discussed below.

An overview of the priority phases is illustrated in Figure 9-1.

Priority Phase 1

Priority 1 road improvements are shown in detail in Figure 9-2. Priority 1 includes the following improvements:

- Construct Wolcott Road realignment.
- Construct frontage road extending west from realigned Wolcott Road to the ODFW office building driveway.
- Create a right-turn-only lane on eastbound Oregon 34 at Peoria Road intersection.
- Construct all "low-cost safety and operational treatments" (described in Section 6 and illustrated in Figure 6-2).
- Rebuild traffic signal at Peoria Road.
- Close all northside approaches to Oregon 34 between Peoria Road and ODFW.

- Close existing Wolcott Road approach to Oregon 34 (the segment of Wolcott Road between Oregon 34 and the realigned Wolcott Road will be vacated).
- Purchase right-of-way from two private residential properties.
- Purchase convenience store property located at southeast corner of Oregon 34/Peoria Road intersection.
- Widen Peoria Road to a point approximately 400 feet south of Oregon 34 to accommodate a three-lane south approach.

Priority 1 improvements were prioritized as such for these reasons:

- Realignment of Wolcott Road would provide immediate major safety benefits. It would eliminate turning movements in the intersection area, provide a signalized intersection for ODFW commuters, and allow safe crossing over Oregon 34 for farm vehicles.
- Intersection improvements are an important first step, one that should be taken before constructing either the north or south frontage roads systems. The north frontage road intersection should be realigned to correct road geometry. The south frontage road intersection needs realignment to accommodate a significant increase in truck traffic. To accommodate this additional traffic, there would need to be new signal timing, lane improvements, and curb returns.
- It is economically prudent to construct Wolcott Road realignment in conjunction with intersection improvements.

Implementation Funding

It is anticipated that Priority 1 improvements would be funded under the currently proposed 2004-2007 STIP safety project²⁵, for which said improvements are specified. STIP project funding requests are subject to approval review by the Oregon Transportation Commission, which then authorizes the dispensation of earmarked funding for project improvements.

Priority Phase 2 Improvements

Priority 2 improvements were subdivided into two sub-phases, as described below.

Priority 2A

Priority 2A entails these improvements:

- Construct a paved bicycle/pedestrian (multi-use) path extending west from the ODFW office building driveway to the OSU crew docks driveway.
- Purchase right-of-way from two properties: OSU Research Farm; Trysting Tree Golf Course.

²⁵ ODOT 2004-2007 Draft STIP project Key #12580 (titled in "OR34: Roche Street-Wolcott Road").

Priority 2A improvements were prioritized as such for these reasons:

A multi-use path is a comparatively low-cost improvement that effectively addresses the major concern for bicycle and pedestrian safety in the study area corridor. Because it is much less expensive than other preferred alternative improvements, the multi-use path is thus more feasible to build immediately. The path can be constructed as a stand-alone project once funding is available; and the segment west of Electric Road can be easily incorporated with later Priority 2B frontage road improvements. *When designing the western segment of the multi-use path, project engineers should consider its future function as a frontage road with regard to geometric design and pavement strength.*

Priority 2A improvements are shown in detail in Figure 9-3.

Priority 2B

Priority 2B includes the following improvements:

- Construct a frontage road extending east from the OSU crew docks driveway to Electric Road.
- Incorporate the multi-use path west of Electric Road, developed as part of Priority 2A, with development of the frontage road.
- Implement ancillary improvements to accommodate new frontage road traffic at the intersection of the OSU crew docks driveway with Oregon 34. The necessity and type of improvements must be established on the basis of expected functional performance of the intersection for the time period within which the road is anticipated to be built. Potential improvements include a right-turn-only lane on westbound Oregon 34 at the OSU crew docks driveway intersection, a traffic signal phasing adjustment at the intersection, and additional signage.
- Close all southbound approaches to Oregon 34 between ODFW and OSU crew dock access road.
- Purchase right-of-way from Trysting Tree Golf Course property.

Priority 2B improvements were prioritized as such for these reasons:

- Improvements allow closure of Electric Road access and would eliminate turning movement conflicts.
- Improvements fit with a probable available funding scenario.

Priority 2B improvements are shown in detail in Figure 9-4.

Implementation Funding

The multi-use path (Priority 2A) will likely be funded through a future STIP project or through ODOT's Bicycle and Pedestrian Program. Priority 2A improvements are anticipated to be proposed for STIP funding as a safety project.

Priority Phase 3 Improvements

Priority 3 was subdivided into two sub-phases, described below.

Priority 3A

Priority 3A entails the following improvements:

- Construct a frontage road extending west from Peoria Road to the Morse Brothers Driveway.
- Construct a vehicular bridge to span the Willamette Channel tributary along the route of the proposed frontage road.
- Create a left-turn lane pocket on northbound Peoria at south frontage road intersection.

Priority 3A improvements were prioritized as such for these reasons:

- Improvements would enhance mobility operations and safety conditions on Oregon 34 by eliminating truck turning movements onto the expressway.
- Implementing Priority 3A improvements involve higher costs associated with bridge construction and wetland mitigation. Thus, explaining implementation after Priority 1 and 2 improvements, which are lower cost.

Priority 3A improvements are shown in detail in Figure 9-5.

Priority 3B

Priority 3B constructs a frontage road extending west from the Morse Brothers Driveway to the future entrance of Allen B. Berg Park. (As noted in Section 3 of this report, though this park is currently undeveloped, the City of Corvallis has long-term plans to develop the site as a ball field complex.)

Priority 3B improvements were prioritized as such for these reasons:

- The frontage road would provide a safe access road for future park users. However, this segment would not be necessary until the park is actually developed.
- This segment of frontage road would allow for closure of the Ireland Lane approach to Oregon 34. However, closing this access would only remove a few turning movements onto Oregon 34, because Ireland Lane serves only two residences and one small business. This makes this access closure less critical than others along the study segment.

Priority 3B improvements are shown in detail in Figure 9-6.

Implementation Funding

We anticipate that Priority 3 improvements would be proposed for STIP funding as safety projects.

Cost

A summarized breakdown of estimated AMP construction costs, prioritized by implementation phase, is shown in Figure 9-8. A planning-level right-of-way estimate for all phases is also included in Figure 9-8. Explanatory text in support of the construction cost estimate is provided below.

Explanation of Construction Cost Estimate

The updated unit costs used in this spreadsheet are based on 2005 construction costs. Roadway improvements were quantified using concept-level CAD designs. Earthwork volumes were estimated using concept-level roadway models measured against an ODOT-provided digital terrain model (DTM). In areas without DTM coverage, earthwork volumes were interpolated.

Priority 1

This phase includes new roadway and intersection improvements. The new roadway would be used to realign Wolcott Road with Peoria Road and create a northern frontage road to connect the new realignment with the ODFW office building driveway. It would have two 11-foot travel lanes and 4-foot shoulders. A 20-foot long by 30-foot wide culvert would also be added. The Peoria intersection includes a new traffic signal.

The improvements at the Peoria Road intersection also include road widening and the addition of roadway improvements for each roadway approach. The right turn bay in the western approach of Oregon 34 would be expanded from 150 feet to 300 feet-ft with the addition of curb along the length of the turn lane.

Priority 2A

This phase includes a multi-use path from the ODFW office building driveway to the OSU Crew Docks Road. This path would be 12 feet wide. A 20-foot long by 11-foot wide culvert would also be added.

Priority 2B

This phase includes a new roadway and intersection improvements. The roadway would extend from Electric Road to the OSU Crew Docks Road. It would have two 11-foot travel lanes and 4-foot shoulders. Some intersection improvements would be required to accommodate the increased traffic due to the frontage road. A culvert would also be added.

Priority 3A

This phase includes new roadway, bridge, and reconstructed roadway. The new roadway would connect the Morse Brothers driveway with Peoria Road and would have two 12-foot travel lanes with 6-foot shoulders. These widened travel lanes and shoulders would accommodate large truck traffic traveling into and out of the Morse Brothers property. A 200-foot-long bridge would be required to span the Willamette Channel tributary along the proposed route of this frontage road. Peoria Road would be reconstructed from a point approximately 400 feet south of Oregon 34 to a point approximately 200 feet south of the intersection between Peoria Road and the new south frontage road.

Priority 3B

This phase involves a new roadway and a retaining wall. This roadway would extend from the Morse Brothers driveway to Allen B. Berg Park. It would have two 11-foot travel lanes with 2-foot shoulders. Because it would eventually serve as a park entrance, this roadway should be designed with smaller shoulders that encourage drivers to travel at slower speeds. There would also be a 350-foot long, 6-foot high retaining wall along part of this frontage road.

Multiple Choices

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