

Introduction, Report Organization, and Summary of Findings

Introduction

This report summarizes the existing conditions and deficiencies for the OR 126 Expressway corridor between Interstate 5 and McKenzie Highway (Main Street) in Springfield, Oregon¹. The following conditions and deficiencies are examined:

- Roadway geometrics
- Access spacing
- Safety/crash history
- Existing traffic operations (2005)
- Future no-build traffic operations (2025)

When OR 126 was originally constructed in the 1960s, it served a rural area. As development and population increased, traffic congestion has increased, and it is expected to worsen in the future as growth continues. Future developments (e.g. PeaceHealth, Hammer site, and the 800+ acre Jasper-Natron site located southeast of the OR 126 & Main Street intersection) are expected to increase traffic on the mainline and at interchanges and intersections. ODOT has designated the OR 126 mainline as an expressway and a freight route from I-5 to Main Street.

In general, many of the primary existing deficiencies for the OR 126 Expressway are related to traffic operations, specifically at interchanges and intersections. Future no-build traffic operations analysis shows worsened congestion issues along the OR 126 mainline and at intersections within the study area.

Other notable deficiencies include a lack of route continuity for the corridor and issues with driver expectations, specifically near the 52nd Street at-grade intersection. Heading east, the roadway abruptly changes from an access-restricted facility with interchanges that drives like a freeway to an at-grade signalized facility that drives more like a commercial arterial. The transition between these two roadway designs does not support the function of the roadway as an expressway, and causes difficulty for drivers. Although safety analysis shows that the crash rate for all segments of the corridor is below the state average, the most common type of collision along the corridor mainline is rear-end, indicating issues at interchanges and at-grade intersections.

Access spacing is also a deficiency. Some segments of the expressway do not meet accepted expressway interchange spacing standards (e.g. the distances between I-5 and Pioneer Parkway and between Mohawk Boulevard and 42nd Street are too short). In addition, access spacing involving public and private accesses near interchange ramp terminals does not meet existing standards at multiple locations along the corridor. This can lead to special challenges when designing concepts for the future.

¹ This OR 126 Expressway Management Plan conditions and deficiencies report does not include analysis of the I-5/I-105 interchange. Conditions for that interchange was included as part of the I-5 State of the Interstate Report (2000). For additional information regarding this interchange please contact Tom Boyatt, ODOT Senior Regional Planner, at (541) 747-1354.

Geometric deficiencies are analyzed to determine potential safety and operations issues with the roadway design. Much of the corridor is in good condition in terms of geometric standards (for example, lane and shoulder width), and in general, the corridor functions as it should, route continuity and congestion notwithstanding. However, the notable deficiencies – operations, spacing, and other spot deficiencies – will need to be taken into account during future phases of the OR 126 Expressway Management Plan (EMP).

Corridor Overview

The segment of OR 126 examined in this report comprises approximately six miles of roadway also known as the Eugene-Springfield Highway. Designed in the 1960s, the entire length of the corridor lies within the city of Springfield. OR 126 is an urban statewide highway that provides a connection between the coast and Central Oregon, serves intra-urban travel within the Eugene-Springfield metropolitan area, and provides access to several key north-south facilities within the city of Springfield and Lane County. The highway is designated as an expressway and is part of the National Highway System.

Within the study area, OR 126 is a four-lane, mostly median-divided section posted at 55 miles per hour. The corridor contains four grade-separated interchanges (Interstate 5 directional system interchange, Pioneer Parkway, Mohawk Boulevard, and 42nd Street) and two signalized at-grade intersections (52nd Street and McKenzie Highway/Main Street). There are no private accesses or unsignalized intersections along OR 126 within the study area.

Figure 1 is a map of the OR 126 corridor study area.

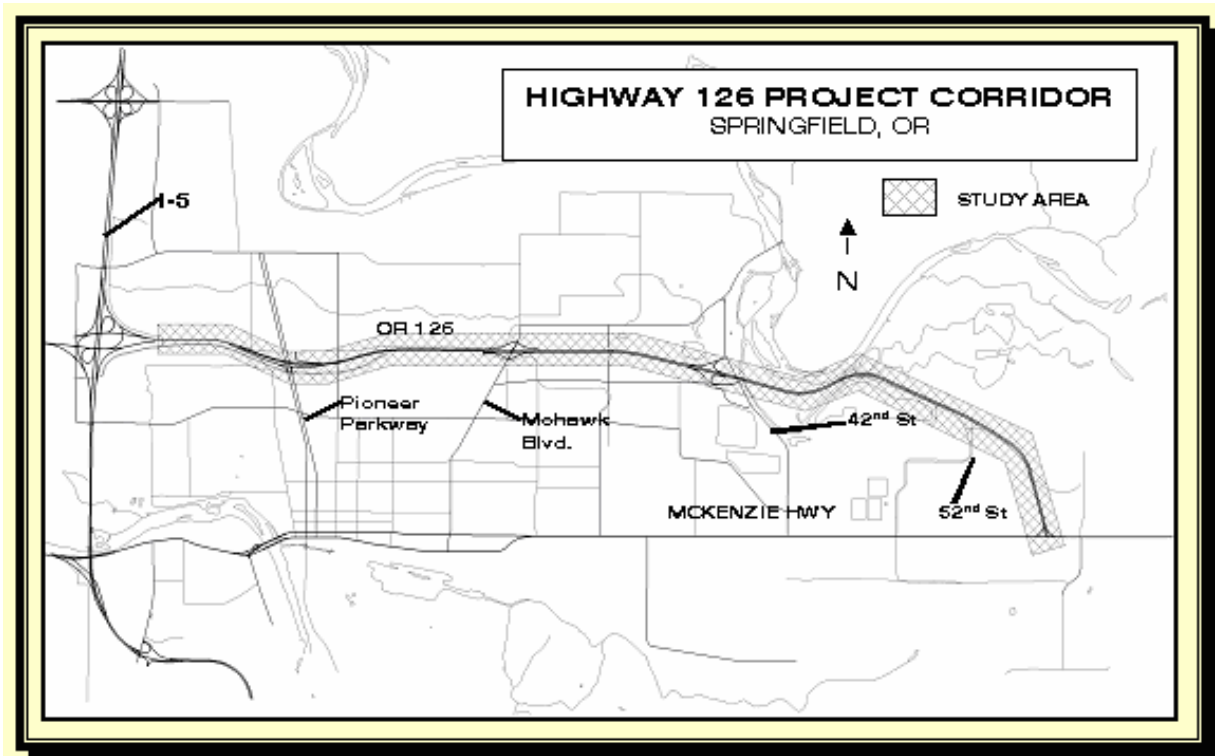


Figure 1. Project Area Map

Report Organization

This report is organized as follows:

1. Introduction, Report Organization, and Summary of Findings
2. Project Goals
3. Reviewed Plans and Policies Summary
4. OR 126 Mainline Conditions and Deficiencies
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 - Access
 - Safety/Crash History
 - Existing Traffic Operations
 - Future Traffic Operations
5. OR 126/Q Street/Pioneer Parkway Interchange Conditions and Deficiencies
 - Geometric Conditions and Deficiencies
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8. OR 126/52nd Street Intersection Conditions and Deficiencies
 - Geometric Conditions and Deficiencies
 - Access
 - Safety/Crash History
 - Existing Traffic Operations
 - Future Traffic Operations
9. OR 126/Main Street Intersection Conditions and Deficiencies
 - Geometric Conditions and Deficiencies
 - Access
 - Safety/Crash History
 - Existing Traffic Operations
 - Future Traffic Operations

Summary of Findings

Relevant findings are summarized below. More specific findings can be found in the sections related to the OR 126 mainline or the five interchanges/intersections along the mainline.

- Many planned developments along the corridor (e.g., PeaceHealth, Hammer, Jasper-Natron area development, bus rapid transit) are likely to affect how OR 126 functions as an expressway.
- The distances between I-5 and Pioneer Parkway and Mohawk Boulevard and 42nd Street do not meet accepted expressway interchange access spacing standards. All OR 126 mainline interchanges and intersections do not meet accepted access spacing standards for *new* interchanges (1.9 miles).
- Access spacing for roadways and driveways near interchange ramp terminals do not meet existing standards at many locations along the corridor, leading to special challenges when designing concepts for the future.
- Route continuity and driver expectations are significant issues along the corridor. Near the OR 126/52nd Street and the OR 126/Main Street intersections, the roadway transitions from a roadway segment that feels like a freeway to one that feels like a commercial corridor (and vice versa), which creates congestion and safety concerns.
- Crash rates for all mainline segments of the corridor are below the state average, indicating (on the surface) no special safety concerns at current travel volumes. However, most of the crashes along the corridor are rear-ends, indicating issues with existing interchanges and intersections (e.g., the 52nd Street intersection), referred to as inconsistency in route continuity. Drivers do not expect to encounter an at-grade, signalized intersection along a freeway-like facility. The primary collision type at both the OR 126/52nd Street and OR 126/Main Street intersections is rear-end. Crash rates for all interchange ramps and intersections along the corridor are lower than average and do not signify the need for further analysis. There are no SPIS locations along the corridor.
- Geometric deficiencies for several of the interchanges and intersections along the corridor involve vertical stopping sight distance, acceleration and deceleration lanes, guardrails and turning lanes.
- All mainline sections analyzed along OR 126 currently meet mobility performance standards outlined in both the state Oregon Highway Plan (OHP) and the Highway Design Manual (HDM), except in the eastbound direction between the Interstate 5 interchange and Mohawk Boulevard.

- Future no-build traffic operations analysis (year 2025) for mainline OR 126 shows that conditions on the mainline will worsen; most of the eastbound direction (Interstate 5 to 52nd Street) will operate at congestion levels worse than OHP and HDM standards. The westbound direction, however, is expected to meet OHP and HDM standards.

- Existing (2005) traffic operations do not meet accepted mobility performance standards at the following intersection locations in the study area:
 - 2nd Street/Q Street
 - OR 126 Eastbound ramps/Pioneer Parkway
 - Pioneer Parkway/Centennial Boulevard
 - 18th Street/Mohawk Boulevard
 - 42nd Street/OR 126 Eastbound ramps
 - OR 126/Main Street
 - Main Street/58th Street.

- Future no-build traffic operations analysis (2025) shows that all intersections currently operating at substandard levels of congestion are expected to continue operating at substandard levels in the future. In addition, the following intersections – currently meeting operating standards – are anticipated to operate at substandard levels:
 - Laura Street/Q Street
 - Pioneer Parkway/Hayden Bridge Road
 - Pioneer Parkway/Q Street
 - 19th Street/Hayden Bridge Road
 - 19th Street/Marcola Road
 - Mohawk Boulevard/OR 126 Westbound ramps
 - Mohawk Boulevard/OR 126 Eastbound ramps
 - Marcola Road/42nd Street
 - 42nd Street/OR 126 Westbound ramps
 - 42nd Street/Olympic Street
 - OR 126/52nd Street
 - Jasper Road/Mount Vernon Road.

OR 126 EMP Project Vision and Goals

Introduction

The following OR 126 Expressway Management Plan (EMP) project goals are based on discussions held at OR 126 EMP Project Management Team (PMT) meetings and the existing statewide goals framework. The goals represent PMT consensus and will be used to guide the remainder of the OR 126 EMP planning process.

OR 126 Expressway Management Plan Team Vision

Develop a plan with flexible phasing approaches for implementation that can be approved locally and acknowledged by the state partners.

OR 126 Goals

Goal 1. Mobility and Capacity.

- 1a. Ensure that the OR 126 EMP seeks to preserve and enhance mobility along the OR 126 Expressway (Interstate 5 to McKenzie Highway/Main Street).
- 1b. Ensure that the OR 126 EMP provides solutions that improve traffic operations along the corridor and at corridor interchanges and intersections.
- 1c. Ensure that the OR 126 EMP addresses interchange/intersection issues at the following specific locations: Main Street/McKenzie Highway, Q Street, Mohawk Boulevard, 52nd Street and 42nd Street.
- 1d. Ensure that the OR 126 EMP helps to further the goal of a multimodal transportation system that serves the needs of residents, businesses, visitors and freight.
- 1e. Ensure that all OR 126 EMP analysis and concept development recognize the importance of freight movement along the corridor, including the corridor's designation as a freight route.

Goal 2. Safety.

- 2a. Ensure that the OR 126 EMP provides solutions that improve transportation safety along the corridor and at corridor interchanges and intersections.

Goal 3. Coordination and Communication.

- 3a. Ensure that the OR 126 EMP works to be consistent with goals and objectives of the state, region, county and local communities regarding transportation.
- 3b. Ensure that the OR 126 EMP clearly communicates ODOT's policies regarding expressways and interchange area management plans.
- 3c. Ensure that the OR 126 EMP planning process includes communications with public and elected officials regarding project goals and purpose, as well as the structure of the planning process (see *Appendix A, Expressway and Interchange Area Management Plan Approval Matrix*).

Goal 4. Land Use.

- 4a. Ensure that the OR 126 EMP promotes the facilitation of a balance between land use and transportation.
- 4b. Ensure that the OR 126 EMP recognizes the importance of environmental, natural, cultural and historical features.

Goal 5. Transit, Pedestrian and Bicycle Transportation.

- 5a. Ensure that analysis, planning and recommendations in the OR 126 EMP integrate transit, pedestrian and bicycle transportation modes when appropriate, to serve all members of the community.

Goal 6. Funding and Implementation.

- 6a. Ensure that the OR 126 EMP seeks to protect public investment in existing facilities and future improvements.
- 6b. Ensure that the OR 126 EMP leads to project recommendations that can garner public support for implementation.

OR 126 Expressway Management Plan Plan, Policies, and Study Review Summary

Document Summary Overview

The existing plan and policy framework affects the establishment of project purpose and goals and the conceptualization and definition of specific project concepts. The project team reviewed state, regional, and local plans and policies as well as traffic studies for specific developments in the project area.

The purposes of this review include:

1. Build effectively on previously adopted plans and policies;
2. Validate the EMP's relationship and consistency with other relevant federal, state, regional, and local plans and policies.
3. Provide guidance and structure for development of project concepts.

The following are discussed:

- Federal and Statewide Policy and Planning Documents
- Regional Plans and Policies
- Local Plans and Studies
- Findings and Conclusions

Appendix A includes an approval matrix detailing the jurisdictional approvals necessary for the OR 126 Expressway Management Plan (EMP) and other applicable federal and local plans. **Appendix B** includes detailed abstracts of relevant federal, state, regional, and local plans.

Policy and Planning Documents Summary

The following sections summarize the major federal, state, regional and local policy abstracts, as included in Appendix B, relevant to the OR 126 Expressway Management Plan.

Federal Policy Summary

The Federal Interchange Policy/Interstate Access Policy (1998) applies to any changes to I-5 interchanges or roadways influencing interchange/interstate operations and safety. The OR 126 corridor is not an interstate facility, and the I-5 interchange at the west end of the corridor is not to be studied as part of the Expressway Management Plan (EMP). Therefore, concepts developed as part of the EMP will not conflict with the Federal Interchange Policy.

State Policy Summary

Statewide transportation policy and planning documents primarily address statewide transportation networks, and some, such as the Oregon Transportation Plan (OTP), cover all modes. The plans and policies also provide a general policy framework for transportation planning in Oregon. The OR 126 EMP project goals derive from statewide policy direction, which includes such goals as providing safe and efficient movement of passengers and freight and providing safety, mobility, economic prosperity, minimal impacts to the natural environment, and community livability. State modal plans provide similar goals that are mode-specific, such as improving bicycle and pedestrian facilities or rail facilities. The EMP is designed to be consistent with statewide policy direction.

Of the statewide documents, the 1999 Oregon Highway Plan (OHP) is the most significant for the OR 126 EMP in terms of shaping specific project concepts. The OHP defines the state highway classification system, which establishes the four levels of importance (Interstate, Statewide, Regional and District). The levels of importance provide direction for managing the system. This direction includes specific guidance with respect to project elements such as access control, signalization, and medians. OR 126 is classified as a statewide highway, and is also designated as a freight route.

The OHP has standards and exceptions criteria that must be closely matched to the project. Of particular importance is the set of actions associated with Policy 3C, Interchange Access Management Areas, and Oregon Administrative Rule (OAR) 734, Division 51. Policy 3C provides the framework from which project concepts will be derived. The intent of this policy is to manage grade-separated interchange areas to ensure safe and efficient operation between connecting roadways. OAR 734, Division 51 governs the issuance of permits to approach or gain access to state highways, and helps implement policy direction outlined in the OHP related to the maintenance of a safe and efficient transportation system.

EMP development is also based on requirements in the Major Investment Policy of the OHP. The Major Investment Policy (Policy 1G) discusses:

- (1) maintaining highway performance and improving safety by improving system efficiency and management, which is preferable to adding capacity, and
- (2) that state, regional, and local partnerships are important to address highway performance and safety needs.

EMPs must be completed before major improvements can be made to expressways or their interchanges/intersections.

The interchange spacing standards in the OHP mirror those of the federal policy, and are not consistent with developing additional accesses on OR 126. As noted in Policy 3C.2, interchange access management spacing standards do not retroactively apply to interchanges existing prior to adoption of the OHP; at time of redevelopment, it is the goal to move in the direction of the spacing standards. Policy 3D provides for deviations from the adopted access management standards and policies through an application process to ensure statewide consistency. In addition, the Oregon Transportation Commission (OTC) Policy for New Interchanges establishes stringent criteria for access spacing related to new interchange development.

The State Agency Coordination Program (ORS 197.180; OAR 660.30) discusses the compliance of state agencies with statewide planning goals and comprehensive plans. The State Agency Coordination (SAC) Program between ODOT and the Department of Land Conservation and Development (DLCD) defines how ODOT will carry out its programs affecting land use in a manner consistent with LCDC goals and compatible with acknowledged comprehensive plans. The EMP will be developed in accordance with this SAC agreement.

The state Collaborative Environmental and Transportation Agreement for Streamlining (CETAS) discusses the need to coordinate reviews on environmental issues for transportation projects. This project will consider this Agreement.

Regional Plans and Studies Summary

The Central Lane Metropolitan Planning Organization (MPO) Regional Transportation Plan (RTP) is the most significant regional document for the OR 126 EMP. The RTP establishes the projects that will be considered for inclusion in the Statewide Transportation Improvement Program (STIP). The RTP is a federal requirement that is adopted by the Metropolitan Planning Organization – Metropolitan Policy Committee (MPC).

Other regional studies reviewed include the Willamette Valley Transportation Strategy (1995) (WVTS), Commuting in the Willamette Valley (1998) (CWV), and the Bus Rapid Transit Concept, Major Investment Study Final Report. The WVTS recognizes highways as the backbone of the Willamette Valley Transportation System, but seeks an increased emphasis on urban transit and intercity rail as part of the implementation of the community livability scenario. Many of the other elements of the strategy have been addressed and incorporated in the OHP. The WVTS also requests increased travel demand management. The CWV provides insight that there is a low potential for intercity commuter trip diversion as a percent of total trips, which would influence some types of project solutions in this case.

The Bus Rapid Transit Concept, Major Investment Study Final Report (1999) provides a strategy for increasing transit ridership in the area. It is significant to the project in terms of the need to include specific project design elements related to transit as part of expressway concept development. According to the Lane Transit District (LTD), the next bus rapid transit corridor in Springfield will be the Pioneer Parkway Corridor, serving the Gateway area. This corridor could be operational in 2006. Main Street is also identified as a BRT corridor.

Local Plans and Studies Summary

TransPlan is the most significant local document for the OR 126 EMP. TransPlan is the joint local transportation system plan for the City of Springfield, City of Eugene, and metropolitan Lane County. TransPlan is a functional plan of Metro Plan, the joint locally adopted comprehensive plan. Both plans meet state requirements. TransPlan provides the base assumptions for land use and the transportation network from which forecast traffic will be derived for the EMP. It also states the functional classification of local facilities adjacent to the interchange. This is significant for establishing the parameters for designing elements of the interchange as it transitions to the local distribution system, such as whether particular ramp terminals should be signalized or free-flow.

Local plans and local traffic studies for particular developments relevant to the OR 126 corridor were also reviewed. Some of the local plans discuss goals and objectives specific to the transportation network along OR 126. In accordance with the Transportation Planning Rule (TPR), local comprehensive plans and transportation system plans contain goals and objectives that relate to all of the transportation modes, including vehicular, pedestrian, bicycle, and transit.

The City of Springfield's Gateway Refinement Plan (1992) and its amendments address the area of OR 126 bound by I-5 to the west and Pioneer Parkway to the east. This plan emphasizes the significance of development in the Gateway area with respect to the Gateway Mall, motels, tourism, and convention facilities. The amendments discuss changes in land use relevant to the PeaceHealth development.

The Springfield Commercial Lands Study (1999-2003) designates land uses and specifies regional development nodes that affect the regional transportation system and the OR 126 Expressway. The recent proposal by PeaceHealth to build a new hospital off of Pioneer Parkway is expected to induce significant changes in land use and travel demand in the corridor area. These changes are incorporated into the EMP's travel forecasting assumptions.

Traffic studies for specific developments in the area, such as the Jasper-Natron Specific Area Plan, PeaceHealth, and others, provide input regarding localized traffic demands that are anticipated to affect the expressway. Traffic forecasting assumptions include growth related to future development of the Jasper-Natron area. It is important to determine the adequacy of these studies and their relationship to areawide traffic modeling in developing specific project concepts.

Findings and Conclusions

OR 126 was designed and built in the 1960s primarily as a bypass and alternative to Main Street for freight and other through traffic. However, at the time the highway was built, the Eugene-Springfield region had a significantly smaller population and traffic volumes were much lower than today. A combination of at-grade and grade-separated interchanges was constructed which met traffic demands in the 1960s but are substandard for today's traffic volumes.

The segment of OR 126 between Interstate 5 and Main Street/McKenzie Highway is designated a Principal Arterial in TransPlan, and is designated an Expressway in the OHP. Per the OHP it must provide adequate system capacity, safety, and efficiency, including efficiency for the movement of freight and passengers by truck and bus.

Ongoing and future development near the OR 126 expressway is expected to cause large changes in land use and increases in vehicle traffic. Certain planned developments, such as the PeaceHealth medical facility, Jasper-Natron area development, and developments at the Hammer site, are anticipated to directly affect the OR 126 corridor. Bus rapid transit implementation along the Pioneer Parkway and Main Street corridors will also need to be accounted for when developing concepts for the future of OR 126.

The expressway designation allows ODOT to address short-, medium-, and long-term issues along the OR 126 corridor. For example, the OR 126 intersection at Main Street and the Q Street/2nd Street intersection will likely require phasing of short- and long-term solutions to coincide with available funding and pending private development actions. Another example would be the short-term capacity improvements for the OR 126/Pioneer Parkway interchange that are part of the PeaceHealth facility Conditions of Approval.

OR 126 Mainline Conditions and Deficiencies

Introduction

OR 126 mainline conditions regarding geometric conditions and deficiencies, safety/crash history, and traffic operations between Interstate 5 and Main Street are discussed in this section. Specific interchanges, interchange ramps, and intersections are discussed in separate sections.

When OR 126 was originally constructed in the 1960s, it served a rural area. As development and population increased, traffic congestion has increased, and it is expected to worsen in the future as growth continues. Future developments (e.g. PeaceHealth, Hammer site, and the 800+ acre Jasper-Natron site located southeast of the OR 126 & Main Street intersection) are expected to increase traffic on the mainline and in the corridor area. ODOT has designated the OR 126 mainline as an expressway and a freight route from I-5 to Main Street.

In terms of existing traffic operations, most mainline sections meet the relevant performance standards in the Oregon Highway Plan (OHP), meaning that for the most part, existing (2005) congestion along the mainline is not a serious problem at this time. Exceptions include the eastbound mainline segments from Interstate 5 to Pioneer Parkway and from Pioneer Parkway to Mohawk Boulevard, which operate worse than OHP standards.

Mainline congestion is expected to worsen in the future. With regard to future no-build (2025) conditions, all eastbound segments from 52nd Street to I-5 operate worse than ODOT OHP and Highway Design Manual (HDM) standards. 2025 westbound traffic along the corridor is expected to meet both OHP and HDM standards for all segments.

There is a visible lack of route continuity coupled with issues related to driver expectations along the corridor, particularly near the 52nd Street intersection. Geometric deficiencies are analyzed to determine potential safety issues with the roadway design. Geometric deficiencies include vertical stopping sight distance, vertical clearance, superelevation, median design, guardrails, interchange spacing, pavement condition, and bridge condition. The OR 126 mainline includes several locations with existing geometric and safety deficiencies, although many geometrics are adequate based on ODOT standards.

Along the mainline, the distances between I-5 and Pioneer Parkway and Mohawk Boulevard and 42nd Street do not meet ODOT expressway interchange access spacing standards. No interchanges or intersections along the OR 126 corridor meet the ODOT access spacing standards for new interchanges (1.9 miles). With regard to safety, the mainline demonstrates a below-average crash rate, compared to state averages.

Appendix C contains the methods used to analyze geometric conditions and deficiencies, safety, and existing (2005) and future (2025) no-build traffic operations for the OR 126 mainline and interchanges/intersections.

Mainline Geometric Conditions and Deficiencies

OR 126 mainline geometric conditions and deficiencies are summarized in Table 1. All geometric deficiency tables for the OR 126 mainline and the five interchanges and intersections along the corridor are contained in Appendix D.

Table 1. OR 126 Mainline Geometric Deficiencies

Criterion	Acceptable?	Deficiency	Standard	Remarks
Vertical SSD	No	Insufficient vertical SSD at Sta. 214+70; existing length 380' Insufficient vertical SSD at Sta. 290+70; existing length 1580'	575' 1700'	
Vertical Clearance	No	ODOT bridge log reports clearance of overpass over Pioneer Parkway as "intolerable".	17.5'	
Maximum Vertical Grades	A			
Superelevation	No	Insufficient superelevation in the westbound lanes on two curves between 42nd and 52nd Streets as revealed by windshield survey.	3.5° and 4.0°, respectively ¹	
Horizontal SSD	A			
Median Design	No	Median sub-standard between Interstate 5 and Mohawk Blvd. Median sub-standard between 42nd Street and McKenzie Hwy.	10' min width with concrete barrier	"As Constructed" plans call out an 8.4' median with concrete barrier Urban expressway standards do not allow for a grassy depressed median. That excepted, the median just west of 52nd street is approximately 45' and narrows to between 35 and 40' to the east.
Lane Widths	A			
Shoulder Widths	A			
Guardrails Barriers End Treatments ²	No	Deficient guardrail end section at Sta. 295+65 RT Deficient guardrail end section at Sta. 301+30 LT Deficient guardrail end section at Sta. 345+90 LT Deficient guardrail end section at Sta. 374+20 RT Deficient guardrail end section at Sta. 379+70 LT	Flared end or impact attenuator	Buried end section Buried end section Buried end section No flare at end No flare at end
Interchange & Intersection Spacing	No – I-5 & Pioneer Parkway; Mohawk & 42nd A – All others	The Mohawk & 42 nd Street and I-5 & Pioneer Parkway interchange spacing do not meet ODOT standards. Intersections meet at-grade expressway intersection standards.	1 mile interchange; ½ mile at-grade intersection	No interchanges or intersections along OR 126 meet standards for new expressway interchanges, per OHP Appendix C, Table 12 (1.9 miles).

¹ Superelevation in percent.

² The conditions of guardrail runs were not evaluated. The precision is beyond the scope of a planning study. For the purposes of future cost estimating of facility upgrades, end treatments are only an indicator or the acceptability of the entire run. It is ODOT's practice to replace the entire run if the run is touched.

Criterion	Acceptable?	Deficiency	Standard	Remarks
Pavement Condition	No	Deteriorating pavement surface between Interstate 5 and Pioneer Pkwy in EB lanes.		PMS rates pavement as "fair"; windshield survey revealed alligator cracking in travel lanes and edge spalling between right shoulder and outside travel lane
Bridge Condition	No	ODOT bridge log reports 5th Street overpass as needing urgent maintenance. ODOT bridge logs report several bridges requiring deck joint seal repairs.		
Crash History	A			There are no sections exceeding the statewide average for comparable facilities.

Note: A = Acceptable

Mainline Vertical Alignment

Vertical Stopping Sight Distance

The vertical stopping sight distance (SSD) determines the maximum safe speed permissible on a vertical curve. SSD is evaluated based on the ability of a driver being able to see an object six inches high in the roadway, reacting, and successfully stopping to avoid striking the object. Vertical curve SSD was evaluated based upon Figures 5-1 and 5-2 of the HDM.

Of the seven vertical curves on the mainline in the study corridor, two are deficient. The first is a sag curve east of the 5th Street overpass that is shorter than standards recommend. This sag curve deficiency is most likely to affect driver comfort rather than safety, as the issue is related to outrunning the headlights when driving at night. The second deficient vertical curve is a 1,580-foot crest curve at the 28th Street overpass, which does not meet requirements for a 60-miles-per-hour (mph) design speed. However, using criteria in Fig 5-1 of the HDM, the curve accommodates a design speed of 55 miles per hour (mph), which is the current posted speed.

Vertical Clearance

The required vertical clearance for expressways is 17.5 feet, as shown in Table 8-1 of the HDM. Mohawk Boulevard is the only overpass with a vertical clearance deficiency within the study corridor (16 feet). An ODOT bridge inspection dated 12/17/2002 states that the overpass clearance is tolerable (although it does not record the clearance height). There are four crossroads that underpass the mainline: Pioneer Parkway, 5th Street, 28th Street, and 42nd Street. Each meets minimum clearance criteria, as stated in ODOT bridge inspection reports dated 12/17/2002, with the exception of the OR 126 overpass over Pioneer Parkway. The bridge inspection report for Pioneer Parkway states that clearance is “basically intolerable requiring a high degree of corrective action.”

Maximum Vertical Grades

Along the mainline, all vertical grades are less than the HDM Table 8-1 maximum of 5 percent.

Mainline Horizontal Alignment

Superelevation

In lieu of as-constructed data regarding superelevation, observations were made while driving the corridor at 55 mph to identify problem areas. Based on a drive of the site during field observations, the superelevation of two horizontal westbound curves between Mohawk Boulevard and 52nd Street appeared to be inadequate and may require a greater degree of superelevation.

Horizontal Stopping Sight Distance

All curves along the project corridor have adequate horizontal stopping sight distance based on a windshield survey. Standard distances for each curve were calculated using Figure 5-3 of the HDM.

Mainline Cross-Section Design Elements

Travel Lane Widths

All mainline travel lanes meet the 12-foot minimum requirement included in Table 8-1 of the HDM.

Roadway Shoulder Widths

All mainline right and left side shoulders meet the respective 8- and 4-foot minimum requirement included in Table 8-1 of the HDM.

Median Design

Two median deficiencies were found along the project corridor. The median between Interstate 5 and Mohawk Boulevard is deficient. The design plans identify an 8.4-foot median with concrete barrier for approximately 3,685 feet. The minimum standard found in Table 8-1 of the HDM is a 10-foot median for four-lane roadways with concrete barriers. The grass median does not meet urban design standards, and contributes to a confusing transition for drivers.

The portion of OR 126 east of Mohawk Boulevard has a depressed grassy median. Chapter 8 of the HDM (“Urban Non-Freeway Design”) does not list depressed grassy medians as a median treatment option. The desirable median width for urban freeways, according to the HDM, is 76 feet. The grass median width on OR 126 varies from 36 feet to 45 feet from the terminus of OR 126 at McKenzie Highway westward to approximately 500 feet west of 52nd Street.

The existing median contributes to issues with driver expectations. Drivers do not expect to travel eastbound from a stretch of roadway that drives like a freeway and then come to a signalized intersection. Westbound drivers also experience a sharp change between a roadway segment that appears like a commercial corridor and a segment that appears like a freeway. For 52nd Street to remain “at-grade”, the facility would need to transition to an urban expressway cross-section shortly after 42nd Street.

Guardrails/Barriers

All guardrail end sections were observed during a windshield survey to determine if any required modification. Along the mainline, five end sections need modification via installed impact attenuators or flared end sections. A deficient concrete-barrier end section was discovered during the windshield survey east of the Mohawk Boulevard overpass. The end section is concealed in an earthen mound that should be replaced by an impact attenuator or appropriate guardrail flared end section.

Mainline Pavement Condition

Pavement condition along this segment of OR 126 was evaluated based on information found in the ODOT Pavement Management System (PMS) data and a windshield driving survey. OR 126 between the Interstate 5 interchange and Pioneer Parkway is identified as “fair” condition in the PMS. The windshield survey confirmed the presence of alligator cracking in the travel lanes, edge spalling along the joint between the travel lanes and shoulder pavement, and that the shoulder pavement is in poor condition. The remainder of the corridor is identified as being in “good” condition in the PMS. A field site visit verified that rating.

Mainline Bridge Condition

Bridge structure conditions along OR 126 were evaluated based on information provided in bridge inspection reports by ODOT’s Bridge Management System staff. The structural elements of the bridges evaluated include the deck, superstructure, substructure, drainageway beneath (if applicable), and culvert/retaining walls.

In general, the bridges and culverts along the corridor are in “good” condition, with some in “very good” condition. The bridge at 5th Street was noted as having pavement issues in the westbound lanes requiring “urgent” maintenance. A few of the bridges were noted as having pavement deterioration at the edges of the deck, requiring joint seal repairs.

Access

Mainline Interchange and Intersection Spacing

None of the interchanges or intersections along this segment of OR 126 meets interchange spacing standard requirements for new interchanges, per the Chapter 6.2 of the HDM. For urban freeways/expressways, the minimum spacing standard for new interchanges is 1.9 miles.

ODOT also maintains a standard for existing interchange access spacing between the start and end of adjacent ramp tapers (i.e., from the taper end of an on-ramp to the taper start of the next off-ramp). According to Appendix C – Table 18 of the OHP, this standard is 1 mile for both “fully-developed urban” and “urban” surroundings. The portion of OR 126 between Interstate 5 and Mohawk Boulevard is assumed to be “fully-developed urban”, while the section between Mohawk Boulevard and 42nd Street is assumed to be “urban”. This spacing standard is not relevant for the OR 126/52nd Street intersection and the OR 126/Main Street intersection because these at-grade intersections do not have ramps. However, ODOT also maintains a standard for at-grade expressway intersections, which is 0.5 miles. Table 2 compares both access spacing along the corridor to the appropriate standards. Appendix E contains all access spacing tables for the OR 126 mainline and interchanges along the corridor.

Table 2. OR 126 Mainline Ramp Taper Spacing

Crossroad	Existing Spacing (mi)	Standard Spacing (mi)	Meet Standard?	Notes
Interstate 5				
	0.6	1.0	No	Spacing does not meet standards for existing expressway interchanges, per OHP Appendix C, Table 18. Spacing does not meet standards for new expressway interchanges, per OHP Appendix C, Table 12 (1.9 miles).
Pioneer Parkway				
	1.0	1.0	Yes	Spacing meets standards for existing expressway interchanges, per OHP Appendix C, Table 18. Spacing does not meet standards for new expressway interchanges, per OHP Appendix C, Table 12 (1.9 miles).
Mohawk Boulevard				
	0.9	1.0	No	Spacing does not meet standards for existing expressway interchanges, per OHP Appendix C, Table 18. Spacing also does not meet standards for new expressway interchanges, per OHP Appendix C, Table 12 (1.9 miles).
42 nd Street				
	1.5	0.5	Yes	Spacing meets standards for existing at-grade expressway intersections, per OHP Appendix C, Table 13. Spacing meets standards for existing expressway interchanges, per OHP Appendix C, Table 18. Spacing does not meet standards for new interchanges, per OHP Appendix C, Table 12 (1.9 miles).
52 nd Street				
	0.9	0.5	Yes	Spacing meets standards for existing expressway at-grade intersections, per OHP Appendix C, Table 13. Spacing does not meet standards for new expressway interchanges, per OHP Appendix C, Table 12 (1.9 miles).
McKenzie Hwy/Main Street				

Mainline Safety/Crash History

Vehicle crash data for the section of OR 126 from the Interstate 5 Overpass to Main Street were analyzed for the years 1998 to 2002. ODOT Crash Analysis and Reporting Unit provided the data. Comparing the average crash rate from 1998 to 2002 for each segment shown in Table 3 to a 5-year statewide average crash rate (1998-2002) and the 2003 statewide average crash rate for expressways shows that rates for all segments of OR 126 are significantly lower than statewide average crash rates. Due to the below-average crash rates of OR 126 roadway segments, no sections of the mainline were further investigated.

Electronic data regarding Safety Priority Index (SPIS) sites were also obtained from ODOT’s GIS Services Unit for OR 126. No portions of OR 126 within the study corridor exceed the 85th percentile on the statewide SPIS list. Since ODOT considers the 90th percentile the cut-off point for further investigation with regard to safety, no further safety analysis was conducted for the corridor in relation to SPIS.

Table 3. OR 126 Mainline Crash Rate Comparison

Begin. M.P.	End M.P.	Roadway Segment	Crash Rates					
			2002	2001	2000	1999	1998	Average
3.49	4.69	Interstate 5 overcrossing to Pioneer Parkway	0.18	0.29	0.14	0.14	0.22	0.19
4.69	6.1	Pioneer Parkway to Mohawk Boulevard	0.07	0.14	0.03	0.26	0.25	0.15
6.1	7.51	Mohawk Boulevard to 42nd Street	0.24	0.58	0.14	0.39	0.59	0.39
7.51	9.97	42nd Street to McKenzie Highway	0.34	0.04	0.26	0.22	0.49	0.27

Notes:

Crash rate data were obtained on the internet at http://www.odot.state.or.us/tdb/accident_data/pdf/2002shcrt.pdf and from Theresa Heyn, ODOT Crash Analyst (Table IV: 2003 Rate Comparison by Jurisdiction and Functional Classification).

Statewide Expressway Average Crash Rate (2003) = 0.87

Statewide Five-year Average Crash Rate (1998-2002) for Urban Secondary Freeways = 0.77

Statewide Five-year Average Crash Rate (1998-2002) for Urban Secondary Non-Freeways = 2.27

Table 4 provides an aggregate look at factors involved in crashes on the mainline of OR 126. Generally, most crashes occurred during dry, clear conditions in daylight. Most crashes resulted in “property damage only” (PDO) or minor injuries. No fatalities were recorded between 1998 and 2002. The predominant crash type along the mainline in recent years has been rear-end collisions, indicating potential issues at interchanges or intersections. Most drivers-at-fault were operating vehicles “too fast for conditions”, while other drivers failed to yield or disregarded signals (such as at 52nd Street or McKenzie Highway).

PRC crash data were also used to investigate crashes by day of week and time of day. Figure 1 demonstrates that crashes occur least on weekends and increase throughout the week, peaking on Fridays. Figure 2, which shows crashes by hour of the day, indicates that crashes occur more frequently during morning and evening rush hour, as well as during the lunch hour.

Appendix F contains all safety tables and figures for the OR 126 mainline as well as all safety data for the corridor (1998-2002).

Table 4. OR 126 Mainline Crash Factors

Year	1998	1999	2000	2001	2002	Total	Percentage
Total Crashes	58	36	22	28	32	176	100%
Roadway Surface							
Dry	47	26	17	23	27	140	80%
Wet	9	10	5	4	4	32	18%
Snow/ice	2	0	0	1	1	4	2%
Weather Conditions							
Clear	45	25	17	23	27	137	78%
Rain	7	8	4	3	3	25	14%
Cloudy	5	3	1	2	1	12	7%
Snow	1	0	0	0	1	2	1%
Crash Severity							
Property Damage Only	38	21	18	20	15	112	64%
Fatal	0	0	0	0	0	0	0%
Injury - Severe	3	0	0	1	1	5	3%
Injury - Other	11	15	4	7	16	59	34%
Crash Type							
Rear-end	27	19	11	21	13	91	53%
Turning	10	4	4	4	4	26	15%
Angled	6	2	3	0	6	17	10%
Sideswipe (overtaking)	4	5	1	3	3	16	9%
Other	8	4	3	3	4	21	12%
Error/Action							
Rear-end	23	18	9	16	19	83	47%
No ROW	8	3	4	3	2	21	12%
Improper Lane Change	4	5	1	4	3	17	10%
Disregard Signal	4	5	0	0	7	16	9%
Disregard Basic Rule	9	2	1	0	3	15	9%
Other	10	4	3	5	2	24	14%
Event/Cause							
Too Fast for Conditions	34	22	13	18	18	105	60%
Failure to Yield	10	4	5	2	5	27	15%
Disregarded Signal	6	5	0	0	7	18	10%
Improper Overtaking	4	5	1	3	3	16	9%
Other	4	0	2	3	1	10	6%
Lighting Conditions							
Daylight	39	26	17	23	24	129	73%
Dark, Lighted	12	3	4	4	4	28	16%
Dark, Unlighted	5	2	2	0	1	10	6%
Dusk	1	3	1	1	1	7	4%
Dawn	1	0	0	0	1	2	1%

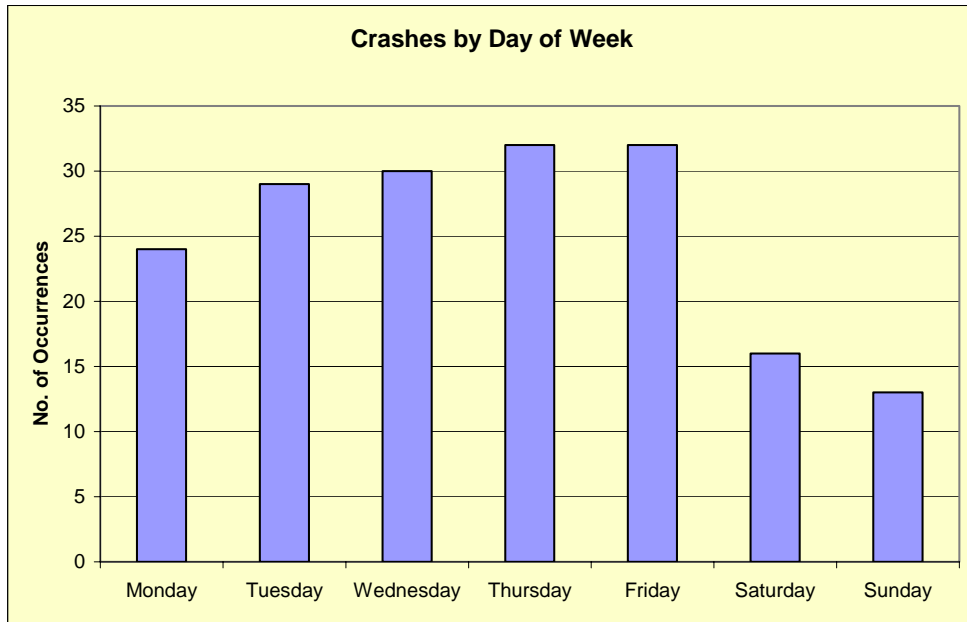


Figure 1. OR 126 Mainline Crashes by Day of Week

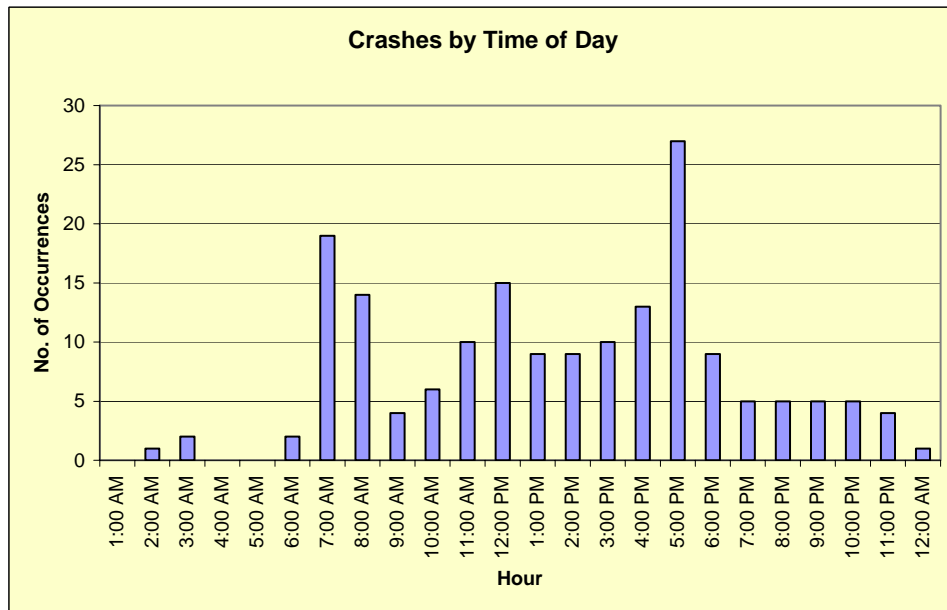


Figure 2. OR 126 Mainline Crashes by Time of Day

Existing Mainline Traffic Operations (2005)

Weekday PM peak hour volume-to-capacity (v/c) ratios were calculated for five mainline segments along OR 126 based on the methodologies outlined in the Highway Capacity Manual (HCM). The results of this analysis are shown in Table 5.

As shown in the table, the calculated v/c ratios for mainline sections of OR 126 within the study area meet OHP standards at most mainline locations with the exception of the eastbound direction between both the Interstate 5 interchange and Pioneer Parkway and between Pioneer Parkway and Mohawk Boulevard.

Table 5. Existing OR 126 Mainline Weekday PM Peak Hour V/C Ratios (2005)

Segment	Direction	OHP v/c Standard	Volume	Capacity	v/c ¹	Adequate? ²
Interstate 5 to Pioneer Parkway	Eastbound	0.80	3,335	3,800	0.88	No
	Westbound	0.80	2,445	5,700	0.43	Yes
Pioneer Parkway to Mohawk Boulevard	Eastbound	0.80	3,075	3,800	0.81	No
	Westbound	0.80	1,995	3,800	0.53	Yes
Mohawk Boulevard to 42 nd Street	Eastbound	0.80	2,375	3,800	0.63	Yes
	Westbound	0.80	1,435	3,800	0.38	Yes
42 nd Street to 52 nd Street	Eastbound	0.80	1,840	3,150	0.58	Yes
	Westbound	0.80	970	3,150	0.31	Yes
52 nd Street to Main Street	Eastbound	0.80	1,185	3,150	0.38	Yes
	Westbound	0.80	640	3,150	0.20	Yes

¹ **Bold** indicates OHP v/c standard is not met.

² Adequacy is determined by comparing the calculated v/c against OHP standards. If the standard is not met, response to “adequate?” is “no”.

Appendices G-L contain all existing (2005) and future no-build (2025) traffic operations tables, data and analysis for the OR 126 mainline and the interchanges and intersections along the corridor.

Future No-Build Mainline Traffic Operations (2025)

Adjusted future no-build weekday PM peak hour v/c ratios were calculated for five mainline segments along OR 126 based on the methodologies outlined in the HCM. The results of this analysis are shown in Table 6.

As shown in the table, the calculated v/c ratios for the majority of eastbound segments along the corridor are significantly worse than ODOT standards. Westbound traffic along the corridor is expected to meet ODOT standards for all segments.

Table 6. 2025 No-Build OR 126 Mainline Weekday PM Peak Hour V/C Ratios

Segment	Direction	OHP/HDM v/c Standard	Volume	Capacity	v/c ¹	Adequate? ²
Interstate 5 to Pioneer Pkwy	Eastbound	0.80/0.75	3,749	3,800	0.99	No
	Westbound	0.80/0.75	3,189	5,700	0.56	Yes
Pioneer Pkwy to Mohawk Blvd	Eastbound	0.80/0.75	4,054	3,800	1.07	No
	Westbound	0.80/0.75	2,717	3,800	0.72	Yes
Mohawk Blvd to 42 nd Street	Eastbound	0.80/0.75	3,649	3,800	0.96	No
	Westbound	0.80/0.75	2,444	3,800	0.64	Yes
42 nd Street to 52 nd Street	Eastbound	0.80/0.75	2,989	3,150	0.95	No
	Westbound	0.80/0.75	1,911	3,150	0.61	Yes
52 nd Street to Main Street	Eastbound	0.80/0.75	2,037	3,150	0.65	Yes
	Westbound	0.80/0.75	1,441	3,150	0.46	Yes

¹ **Bold** indicates OHP v/c standard is not met and *italics* indicate HDM standard is not met. OHP standards describe operational criteria for evaluating existing roadways. HDM standards describe operational criteria for evaluating new or planned roadways.

² Adequacy is determined by comparing the calculated v/c against OHP standards. If the standard is not met, response to “adequate?” is “no”.

Existing and Future Intersection Operations

Tables 7-11 list each intersection in the study area and existing and year 2025 no-build level of service (LOS) and v/c. Under current conditions, 7 of the 27 intersections studies do not meet accepted OHP or local LOS standards for congestion levels. Under future no-build conditions, 19 of the 27 intersections are anticipated operate worse than relevant ODOT or local LOS standards.

Table 7. P.M. Peak Hour Traffic Operations Analysis Results – Pioneer Parkway Interchange Area

Intersection Location	Existing (Year 2005)			Year 2025 No-Build			Relevant LOS and V/C Standards
	LOS	v/c	Adequate?	LOS	v/c	Adequate?	
Shelley St/Laura St.	B	0.19	Yes	B	0.25	Yes	LOS E or v/c < 0.9 (COS)
Laura St/Q St	D	0.61	Yes	F	>1.0	No	V/C 0.85 (OHP) V/C 0.75 (HDM)
Pioneer Pkwy/Hayden Bridge Rd	C	0.70	Yes	F	>1.0	No	LOS D (COS)
Pioneer Pkwy/S St	B	0.38	Yes	A	0.68	Yes	LOS D (COS)
Pioneer Pkwy/Q St	C	0.66	Yes	F	>1.0	No	V/C 0.90 (OHP)
Q St/OR 126 Westbound off-ramp	B	0.46	Yes	C	0.79	Yes*	V/C 0.85 (OHP) V/C 0.75 (HDM)
2 nd St/Q St	F	1.00	No	F	>1.0	No	LOS E or v/c < 0.9 (COS)
OR 126 Eastbound ramps/Pioneer Pkwy	D	0.90	No	D	>1.0	No	V/C 0.85 (OHP) V/C 0.75 (HDM)
Pioneer Pkwy/Centennial Blvd	E	0.93	No	E	>1.0	No	V/C 0.90 (OHP)

* Note: Meets OHP standard, but not HDM standard.

Table 8. P.M. Peak Hour Traffic Operations Analysis Results – Mohawk Boulevard Interchange Area

Intersection Location	Existing (Year 2005)			Year 2025 No-Build			Relevant LOS and V/C Standards
	LOS	v/c	Adequate?	LOS	v/c	Adequate?	
19 th St/Hayden Bridge Rd	C	0.55	Yes	F	>1.0	No	LOS D (COS)
19 th St/Marcola Rd	C	0.73	Yes	F	>1.0	No	LOS D (COS)
Mohawk Blvd/OR 126 Westbound ramps	B	0.63	Yes	C	>0.90	No	V/C 0.85 (OHP) V/C 0.75 (HDM)
Mohawk Blvd/OR 126 Eastbound ramps	C	0.83	Yes	E	>1.0	No	V/C 0.85 (OHP) V/C 0.75 (HDM)
18 th St/Mohawk Blvd	E	0.87	No	F	>1.0	No	LOS D (COS)
Mohawk Blvd/Olympic St	B	0.60	Yes	B	0.78	Yes	LOS D (COS)

Table 9. P.M. Peak Hour Traffic Operations Analysis Results – 42nd Street Interchange Area

Intersection Location	Existing (Year 2005)			Year 2025 No-Build			Relevant LOS and V/C Standards
	LOS	v/c	Adequate?	LOS	v/c	Adequate?	
42 nd St/OR 126 Westbound ramps	F	0.43	Yes	F	>1.0	No	V/C 0.85 (OHP) V/C 0.75 (HDM)
42 nd St/OR 126 Eastbound ramps	E	0.92	No	D	0.95	No	V/C 0.85 (OHP) V/C 0.75 (HDM)
42 nd St/Olympic St	C	0.85	Yes	F	>1.0	No	LOS D (COS)
42 nd St/Marcola Rd	E	0.60	Yes	F	>1.0	No	LOS E or v/c < 0.9 (COS)

Table 10. P.M. Peak Hour Traffic Operations Analysis Results – 52nd Street Intersection Area

Intersection Location	Existing (Year 2005)			Year 2025 No-Build			Relevant LOS and V/C Standards
	LOS	v/c	Adequate?	LOS	v/c	Adequate?	
52 nd St/Highbanks Rd	C	0.05	Yes	F	0.46	Yes	LOS E or v/c < 0.9 (COS)
OR 126/52 nd St	C	0.78	Yes*	F	>1.0	No	V/C 0.80 (OHP) V/C 0.75 (HDM)
52 nd St/G St	A	0.03	Yes	A	0.05	Yes	LOS E or v/c < 0.9 (COS)
52 nd St/F St	A	0.04	Yes	A	0.05	Yes	LOS E or v/c < 0.9 (COS)

* Note: Meets OHP standard, but not HDM standard.

Table 11. P.M. Peak Hour Traffic Operations Analysis Results – Main Street Intersection Area

Intersection Location	Existing (Year 2005)			Year 2025 No-Build			Relevant LOS and V/C Standards
	LOS	v/c	Adequate?	LOS	v/c	Adequate?	
54 th St/Main St	A	0.49	Yes	B	0.80	Yes*	V/C 0.80 (OHP) V/C 0.75 (HDM)
OR 126/Main St	D	0.93	No	F	>1.0	No	V/C 0.80 (OHP) V/C 0.75 (HDM)
Main St/58 th St	D	0.90	No	F	>1.0	No	V/C 0.80 (OHP) V/C 0.75 (HDM)
Jasper Rd/Mt. Vernon Rd	C	0.53	Yes	F	>1.0	No	V/C 0.90 (OHP)

* Note: Meets OHP standard, but not HDM standard.

Notes:

- (1) V/C = volume/capacity ratio – a measurement of how much roadway capacity is being used. A v/c of 1.0 or greater means that the roadway is filled to capacity.
- (2) LOS = level of service – a measurement of delay at an intersection.
- (3) For analysis of existing operations, adequacy is determined by comparing the calculated v/c or LOS against the Oregon Highway Plan, or where appropriate, local LOS standards. If the appropriate standard is not met, then response to “Adequate?” is “No”.
- (4) For analysis of future no-build operations, adequacy is determined by comparing the calculated v/c or LOS against the Oregon Highway Plan, or where appropriate, local LOS standards. If the appropriate standard is not met, then response to “Adequate?” is “No”.
- (5) OHP = Oregon Highway Plan – describes operational criteria for evaluating existing roadways
- (6) HDM – Highway Design Manual – describes operational criteria for evaluating new or planned roadways. Results that do not meet HDM standards are footnoted.
- (7) COS = City of Springfield local LOS standards

OR 126/Q Street/Pioneer Parkway Interchange Conditions and Deficiencies

Introduction

This report section discusses the following in relation to the OR 126/Q Street/Pioneer Parkway interchange area:

- Roadway geometrics
- Access
- Safety/crash history
- Existing traffic operations (2005)
- Future no-build traffic operations (2025)

The Pioneer Parkway interchange area, for the purpose of this report, includes all ramps near OR 126/Q Street/Pioneer Parkway, including those connecting with Laura Street and Q Street. The OR 126 mainline and other interchanges and intersections along the corridor are discussed in separate sections.

Geometric deficiencies for the Pioneer Parkway interchange include vertical stopping sight distance (SSD), acceleration and deceleration lanes, guardrails, and ramp terminal access spacing. Both westbound and eastbound on- and off-ramps are close to roadways that do not meet ODOT ramp terminal access spacing standards. Crash history analysis for intersections within the interchange area (1998-2002) shows that crash rates are well below the threshold that prompts further investigation.

Existing peak hour operations at the Pioneer Parkway/OR 126 eastbound ramps and at the Pioneer Parkway/Centennial Boulevard intersection do not meet Oregon Highway Plan (OHP) performance standards for the facilities (Pioneer Parkway is classified as a District Highway). In addition, the Q Street/2nd Street intersection does not meet applicable City of Springfield operational standards during the peak hour. Future no-build analysis shows that in addition to these three intersections, the following intersections are expected to operate worse than applicable operational standards by 2025:

- Laura Street/Q Street,
- Pioneer Parkway/Hayden Bridge Road, and
- Pioneer Parkway/Q Street.

This interchange is significant, as it is located near the planned PeaceHealth medical facility development and the bus rapid transit (BRT) corridor along Pioneer Parkway. Plans are in place as part of the PeaceHealth development to address operations failures at the interchange. These plans assume that all projects listed in the Metropolitan Planning Organization (MPO) TransPlan financial constrained list will be built within the planning horizon.

Appendix C contains the methods used to analysis geometric conditions and deficiencies, safety, and existing (2005) and future (2025) no-build traffic operations for the OR 126 mainline and interchanges/intersections.

Geometric Conditions and Deficiencies

Geometric conditions and deficiencies for the Pioneer Parkway interchange are summarized in Tables 1a and 1b. All geometric deficiency tables for the OR 126 mainline and the five interchanges and intersections along the corridor are contained in Appendix D.

Table 1a. OR 126/Q Street/Pioneer Parkway Interchange Geometric Deficiencies

Criterion	Interchange Ramps			
	Eastbound On-Ramp	Eastbound Off-Ramp	Westbound On-Ramp	Westbound Off-Ramp
Vertical SSD	1	2	A	3
Vertical Clearance	A	A	A	A
Maximum Vertical Grades	A	A	A	A
Superelevation	A	A	A	A
Horizontal SSD	A	A	A	A
Acceleration/Deceleration Lanes	4	A	A	5
Lane Widths	A	A	A	A
Shoulder Widths	A	A	A	A
Guardrails	6	N/A	A	7
Ramp Terminal Access Spacing	8	9	10	11
Pavement Condition	A	A	A	A
Crash History	A	A	A	A

Notes: Numbers reference Table 1b. A = Acceptable.

Table 1b. Pioneer Parkway Interchange Geometric Deficiencies Notes

Note #	Deficiency	Standard	Remarks
1	Inadequate vertical curve on EB on-ramp; Station 193+00; Curve is 300'	425'	
2	Inadequate vertical curve on EB off-ramp; Station 175+80; Curve is 200'	425'	
	Inadequate vertical curve on EB off-ramp; Station 183+60; Curve is 200'	425'	
	Inadequate vertical curve on EB off-ramp; Station 190+00; Curve is 200'	300'	
	Inadequate vertical curve on EB off-ramp; Station 193+10; Curve is 120'	300'	
3	Inadequate vertical curve on WB off-ramp; Station 197+30; Curve is 500'	825'	Vertical curve too short given speed at beginning of off-ramp
4	EB on-ramp has inadequate taper length of 250'	300'	
5	WB off-ramp has no taper section or spiral curve section	Deceleration length = 550'	
6	EB on-ramp guardrail inadequate at 196+30		Needs to be extended westward approx. 50' due to fill slope on right
7	WB off-ramp guardrail end section at 195+90 is buried under earthen mound		Needs to be flared or have impact attenuator installed

Note #	Deficiency	Standard	Remarks
8	EB on-ramp has deficient ramp terminal access spacing		See Table 2, Access Spacing
9	EB off-ramp has deficient ramp terminal access spacing		See Table 2, Access Spacing
10	WB off-ramp has deficient ramp terminal access spacing		See Table 2, Access Spacing
11	WB off-ramp has deficient ramp terminal access spacing		See Table 2, Access Spacing

Vertical Stopping Sight Distance. On the westbound off-ramp, the first vertical crest curve as vehicles exit the highway is too short. Driving the ramp revealed a drop down into the horizontal curve to the right (given that vehicles will typically be traveling between 50 and 60 miles per hour when exiting the highway). On the eastbound on-ramp, a short 300-foot sag curve causes drivers to lose sight of the road at the following crest curve near the top of the ramp as vehicles enter the highway. The eastbound off-ramp has a series of four vertical curves, none of which meet the criteria in Figure 5-1 of the HDM. The windshield driving survey did not reveal issues negotiating the ramp. However, a driver in a low-riding vehicle may have difficulty achieving safe stopping sight distance on the crest curves of the ramp.

Vertical Clearance. No ramps at the Pioneer Parkway interchange have vertical clearance issues. As stated in ODOT bridge inspection report dated 12/17/2002, with the OR 126 overpass over Pioneer Parkway states that clearance is “basically intolerable requiring a high degree of corrective action.”

Maximum Vertical Grades. Maximum vertical grades at all interchange ramps are less than the maximum vertical grade included in Table 8-1 of the HDM (5 percent grade).

Superelevation. No as-constructed superelevation data for interchange rampways and intersections were available. Based on a windshield survey, there are no superelevation issues.

Horizontal Stopping Sight Distance. All curves in the interchange have adequate horizontal stopping sight distance.

Ramp Acceleration/Deceleration Lanes. At the Pioneer Parkway interchange, the eastbound on-ramp has an inadequate acceleration taper length. The westbound off-ramp has a sub-standard deceleration lane design. Figure 9-22 of the HDM shows that deceleration lanes have a straight tangent section coming off of the highway followed by a spiral curve section. The westbound off-ramp immediately transitions into a right horizontal curve (although it is noted that at this location, the mainline of OR 126 curves as well). This, combined with the inadequate vertical curve at the top of the ramp, followed by a sharp horizontal curve to the right means that the deceleration on this ramp may impact driver comfort. All ramps, with the exception of the westbound off-ramp to Q Street, were designed with a tangent section followed by a spiral section, leading into the simple curve, as per Figure 9-21 of the HDM.

Ramp Lane Widths. All ramp lanes meet the 16-foot requirement shown in ODOT Standard Drawings 205 and 210.

Ramp Shoulder Widths. All shoulders along the ramps at Pioneer Parkway are adequate per ODOT Standard Drawings 205 and 210.

Guardrail Sections. Two ramp guardrail sections are deficient. The westbound off-ramp at Q Street has a buried end. This should be replaced by an appropriate impact attenuator or flared end. The guardrail along the eastbound on-ramp at Pioneer Parkway should be extended westward approximately 50 feet to enhance safety due to the fill slope on the right-hand side.

Pavement Condition. The Pavement Management System (PMS) and a windshield survey did not reveal pavement deficiencies on the ramps of the Pioneer Parkway interchange.

Bridge Condition. No ramps at Pioneer Parkway cross over bridges.

Access

Ramp Terminal Access Spacing. For the purposes of this study, it is assumed that the Pioneer Parkway interchange is categorized as “Fully Developed Urban” per the OHP. Table 2 lists the approaches near the Pioneer Parkway interchange that are located within ODOT’s preferred access spacing distance from ramp terminals. Several streets and driveways are located too close to the interchange, according to ODOT’s preferred access spacing distances. Appendix E contains all access spacing tables for the OR 126 mainline and interchanges along the corridor.

Table 2. Pioneer Parkway/OR 126 Ramp Terminal Access Spacing

Roadway Segment	Distance to First Approach on the Right, Right In/Right Out Only		Distance to First Major Intersection		Distance Between Last Approach Road and Start of Taper for On-Ramp	
	Standard	# of Approaches Not Meeting Standard	Standard	# of Approaches Not Meeting Standard	Standard	# of Approaches Not Meeting Standard
Q Street east of WB off-ramp	750'	2 driveways	1320'	0	N/A	N/A
Pioneer Pkwy south of OR 126	750'	0	1320'	0	990'	0
Laura Street WB on-ramp	N/A	N/A	1320'	2 intersections	990'	6 driveways, 2 streets

Safety/Crash History

Crash rates (reported as crashes per million entering vehicles) at each of the three ramp intersections at Pioneer Parkway (1998-2002) are as follows:

- WB Off-ramp/Q Street - 0.29
- WB On-ramp/Q Street/Laura Street - 0.10
- Pioneer Parkway/EB On- & Off-ramps - adequate data not available

For the two intersections where it was possible to compute a crash rate, both crash rates are well below the threshold (1.00) that prompts further investigation. At the Q Street/Laura Street intersection, 6 of the 9 recorded crashes were rear-end collisions. The majority of these were caused by vehicles traveling southbound on Laura Street approaching the stop sign at Q Street. No recorded fatalities occurred at the intersections during the crash history period (1998-2002). The Westbound off-ramp/Q Street intersection does not have sufficient crashes from which to observe meaningful trends. Appendix F contains all safety tables and figures for the OR 126 mainline as well as all safety data for the corridor (1998-2002).

Existing Traffic Operations (2005)

On OR 126, Pioneer Parkway is the first grade-separated interchange to the east of Interstate 5. Eastbound access from OR 126 is provided via ramps on/off Pioneer Parkway in a conventional diamond form. Westbound access occurs via a modified diamond with ramps provided via the adjacent streets. The westbound off-ramp terminates at a signalized intersection with Q Street, whereas the westbound on-ramp occurs west of the Q Street/Laura Street intersection.

In addition to the ramp terminals, a number of intersections were also analyzed within the influence area of the interchange, including: Shelley Street/Laura Street, Laura Street/Q Street, Pioneer Parkway/S Street, Pioneer Parkway/Q Street, Q Street/2nd Street, and Pioneer Parkway/Centennial Boulevard.

The Pioneer Parkway/Hayden Bridge Road was also studied. Hayden Bridge Road/Harlow Road parallels OR 126 within the study area. Future concepts studied as part of this process may impact the Hayden Bridge Road corridor. It should be noted that the movements from Hayden Bridge Road to Pioneer Parkway southbound occur at an unsignalized location to the west of the signalized Pioneer Parkway/Hayden Bridge Road intersection.

The City of Springfield has proposed a five-leg, two-lane roundabout at the Pioneer Parkway/Hayden Bridge Road intersection to be constructed in 2006. The northbound approach to the intersection would consist of the extension of Pioneer Parkway, north of Hayden Bridge Road, as part of the PeaceHealth medical facility construction project. In this form, the roundabout operates at LOS “B” and meets all performance standards under existing weekday PM peak hour volumes.¹

Table 3 shows existing (2005) and future no-build (2025) level of service (LOS) and volume to capacity (v/c) ratio for each intersection associated with the OR 126/Q Street/Pioneer Parkway interchange. Three intersections currently do not meet relevant OHP or local LOS standards. Three additional intersections are expected to operate at a substandard level under no-build future conditions.

¹ Proposed roundabout analyzed using the aaSIDRA modeling software.

Table 3. OR 126/Q Street/Pioneer Parkway Interchange LOS and v/c; Existing and Future No-Build

Intersection Location	Existing (Year 2005)			Year 2025 No-Build			Relevant LOS and V/C Standards
	LOS	v/c	Adequate?	LOS	v/c	Adequate?	
Shelley St/Laura St.	B	0.19	Yes	B	0.25	Yes	LOS E or v/c < 0.9 (COS)
Laura St/Q St	D	0.61	Yes	F	>1.0	No	V/C 0.85 (OHP) V/C 0.75 (HDM)
Pioneer Pkwy/Hayden Bridge Rd	C	0.70	Yes	F	>1.0	No	LOS D (COS)
Pioneer Pkwy/S St	B	0.38	Yes	A	0.68	Yes	LOS D (COS)
Pioneer Pkwy/Q St	C	0.66	Yes	F	>1.0	No	V/C 0.90 (OHP)
Q St/OR 126 Westbound off-ramp	B	0.46	Yes	C	0.79	Yes*	V/C 0.85 (OHP) V/C 0.75 (HDM)
2 nd St/Q St	F	1.00	No	F	>1.0	No	LOS E or v/c < 0.9 (COS)
OR 126 Eastbound ramps/Pioneer Pkwy	D	0.90	No	D	>1.0	No	V/C 0.85 (OHP) V/C 0.75 (HDM)
Pioneer Pkwy/Centennial Blvd	E	0.93	No	E	>1.0	No	V/C 0.90 (OHP)

Note: Meets OHP standard, but not HDM standard

Notes:

- (1) V/C = volume/capacity ratio – a measurement of how much roadway capacity is being used. A v/c of 1.0 or greater means that the roadway is filled to capacity.
- (2) LOS = level of service – a measurement of delay at an intersection.
- (3) For analysis of existing operations, adequacy is determined by comparing the calculated v/c or LOS against the Oregon Highway Plan, or where appropriate, local LOS standards. If the appropriate standard is not met, then response to “Adequate?” is “No”.
- (4) For analysis of future no-build operations, adequacy is determined by comparing the calculated v/c or LOS against the Oregon Highway Plan, or where appropriate, local LOS standards. If the appropriate standard is not met, then response to “Adequate?” is “No”.
- (5) OHP = Oregon Highway Plan – describes operational criteria for evaluating existing roadways
- (6) HDM – Highway Design Manual – describes operational criteria for evaluating new or planned roadways. Results that do not meet HDM standards are footnoted.
- (7) COS = City of Springfield local LOS standards

Study area intersections meet the applicable performance standards, with the following exceptions:

- **Q Street/2nd Street:** the critical movement at this unsignalized intersection currently operates at LOS “F” and a v/c of 1.00. According to the procedures outlined in the Manual on Uniform Traffic Control Devices (MUTCD), a traffic signal is not warranted.
- **Pioneer Parkway/OR 126 Eastbound On- and Off-Ramps:** the v/c at this signalized intersection currently does not meet OHP standards. To restore intersection operations, PeaceHealth Hospital is conditioned with providing a second southbound left-turn lane and a third lane on the off-ramp at this location.
- **Pioneer Parkway/Centennial Boulevard:** the intersection operates at a v/c ratio of 0.93 under existing weekday PM peak hour volumes, which does not meet OHP standards. Potential mitigation at the intersection includes addition of a second eastbound left turn lane and an increase in the cycle length from 100 seconds to 110 seconds.

Appendices G-L contain all existing (2005) and future no-build (2025) traffic operations tables, data and analysis for the OR 126 mainline and the interchanges and intersections along the corridor.

Future No-Build Traffic Operations (2025)

Funded improvements to the intersections and roadways in the vicinity of the Pioneer Parkway interchange with OR 126 are being constructed as part of the PeaceHealth medical facility development. These improvements include the extension of Pioneer Parkway north of Hayden Bridge Road, the construction of a five-legged roundabout at the Pioneer Parkway/Hayden Bridge intersection, and additional turn lanes at the Pioneer Parkway/OR 126 eastbound ramp intersection.²

In addition, Lane Transit District (LTD) anticipates that Pioneer Parkway will be one of the routes used by the bus rapid transit (BRT) system. Based on review of the preliminary Bus Rapid Transit (BRT) plans, it was determined that the Pioneer Parkway BRT route will not significantly impact traffic operations at the study intersections located along Pioneer Parkway. There are five key factors of the BRT that will impact the roadway network:

- BRT will not require removal of existing travel lanes, as the BRT will be constructed along the parkway median.
- BRT will not require additional signal phases at the parkway intersections; it will travel in a separate lane with through traffic.
- Implementation of the BRT system will not modify access along Pioneer Parkway.
- The BRT system is not expected to significantly alter the travel mode split.
- Though the BRT system may incorporate traffic signal priority, with 10-minute headways between vehicles the effect on the traffic signals is expected to be minimal.

² Pioneer Parkway/Hayden Bridge Rd will be converted to a five-legged, two-lane roundabout and Pioneer Parkway will be extended between Beltline Highway and OR 126. Pioneer Parkway/Eastbound ramps improvements include two southbound through lanes on Pioneer Parkway with receiving lanes, three lanes at the OR 126 Eastbound off-ramp west of Pioneer Parkway, and signal modifications to accommodate the proposed changes.

Based on these key factors, inclusion of the BRT system required no modifications to traffic operations at any of the study intersections.

A summary of potential mitigation measures for those intersections not expected to meet applicable performance standards in 2025 is discussed below.

- **Q Street/Laura Street:** the v/c ratio of the critical southbound left turn movement at this intersection is anticipated to operate at a substandard capacity level. Additionally, future traffic volumes are forecast to meet MUTCD signal warrants for four-hour and eight-hour traffic volumes. It is recommended that the City and ODOT monitor this intersection to determine the appropriate need for and timing of improvements at this location. Potential improvements include installation of a traffic signal or restriction of the intersection to right-in, right-out on the north leg. In addition, the actual impacts of the Pioneer Parkway extension should be monitored.
- **Pioneer Parkway/Hayden Bridge Road:** the proposed 5-leg, 2-lane roundabout at this location is projected to operate at a substandard capacity level. As part of the design, the City and County recognized that land use and geometric constraints would limit the capacity of the intersection. The new Pioneer Parkway extension provides a connection between Beltline and OR 126. The Pioneer Parkway/Hayden Bridge intersection will help meter the high volumes of traffic on Pioneer Parkway.
- **Pioneer Parkway/Q Street:** this intersection is anticipated to operate at a substandard level. Intersection improvements will be needed to provide additional capacity to the northbound left-turn and southbound through movements.
- **Q Street/2nd Street:** the critical movement for this intersection is anticipated to operate at level of service "F." Traffic signal warrants are not anticipated to be met at this intersection. It is recommended that the City monitor this intersection to determine the appropriate need for and timing of improvements.
- **Pioneer Parkway/OR 126 eastbound on- and off-ramps:** including the improvements associated with the PeaceHealth development project, this intersection is substandard with regard to OHP standards with a v/c ratio exceeding 1.0 under 2025 no-build conditions. Significant intersection improvements will be needed to mitigate the v/c ratio to standard.
- **Pioneer Parkway/Centennial Boulevard:** this intersection is anticipated to operate at a substandard level. Potential mitigation to meet standards includes adding a second left turn lane on the southbound and eastbound approaches and separate northbound and southbound right-turn lanes at the intersection.

OR 126/Mohawk Boulevard Interchange Conditions and Deficiencies

Introduction

This report section discusses the following in relation to the OR 126/Mohawk Boulevard Interchange:

- Roadway geometrics
- Access
- Safety/crash history
- Existing traffic operations (2005)
- Future no-build traffic operations (2025)

The Mohawk Boulevard interchange area, for the purpose of this report, includes all ramps and several nearby intersections. The OR 126 mainline and other interchanges and intersections along the corridor are discussed in separate sections.

Geometric deficiencies for the Mohawk Boulevard interchange include substandard spiral curves on all ramps, inadequate ramp deceleration lanes for off-ramps, excessive vertical grades on the eastbound ramps, inadequate vertical curves on the eastbound and westbound ramps, substandard shoulder widths on the eastbound on-ramp, and ramp terminal access spacing. Both westbound and eastbound on- and off-ramps are close to roadways that do not meet ODOT ramp terminal access spacing standards. Examination of crash rates (1998-2002) shows that the ramp intersections do not exhibit a crash rate (1.00) that warrants further investigation.

The Mohawk Boulevard/18th Street intersection currently operates as substandard during the peak hour period, per local City of Springfield level of service (LOS) standards for signalized intersections. Examination of future no-build operations (2025) show that in addition to Mohawk Boulevard/18th Street, the following intersections are expected to operate at substandard levels according to relevant Oregon Highway Plan (OHP) or local LOS standards:

- 19th street/Hayden Bridge Road,
- 19th Street/Marcola Road,
- Mohawk Boulevard/OR 126 westbound ramps, and
- Mohawk Boulevard/OR 126 eastbound ramps.

The Mohawk Boulevard interchange is located near the Mohawk Shopping Center, which is currently undergoing redevelopment.

Appendix C contains the methods used to analysis geometric conditions and deficiencies, safety, and existing (2005) and future (2025) no-build traffic operations for the OR 126 mainline and interchanges/intersections.

Geometric Conditions and Deficiencies

Geometric conditions and deficiencies for the Mohawk Boulevard Interchange are summarized in Tables 1a and 1b. All geometric deficiency tables for the OR 126 mainline and the five interchanges and intersections along the corridor are contained in Appendix D.

Table 1a. OR 126/Mohawk Boulevard Interchange Geometric Deficiencies

Criterion	Mohawk Boulevard Interchange Ramps			
	Eastbound On-Ramp	Eastbound Off-Ramp	Westbound On-Ramp	Westbound Off-Ramp
Vertical SSD	1	2	3	4
Vertical Clearance	A	A	A	A
Maximum Vertical Grades	5	6	A	A
Superelevation	7	A	A	A
Horizontal SSD	A	A	A	A
Acceleration/Deceleration Lanes	A	8	A	9
Ramp Spiral Curves	10	11	12	13
Lane Widths	A	A	A	A
Shoulder Widths	14	A	15	A
Guardrails	A	A	A	A
Ramp Terminal Access Spacing	16	17	18	19
Pavement Condition	A	A	A	A
Crash History	A	A	A	A

Notes: SSD = stopping sight distance. Numbers reference Table 1b. A = Acceptable.

Table 1b. Mohawk Boulevard Interchange Geometric Deficiencies Notes

Note #	Deficiency	Standard	Remarks
1	Inadequate vertical curve on EB on-ramp; Station 264+85; Curve is 100'	150'	Crest curve does not meet minimum sight distance length.
	Inadequate vertical curve on EB on-ramp; Station 265+85; Curve is 400'	625'	Curve is designed to a 35-mph design speed (which equates to a 35 mph posted speed). However, vehicles are often moving at 40 mph by the end of the curve in order to merge on the expressway.
2	Inadequate vertical curve on EB off-ramp; Station 258+75; Curve is 360'	Minimum 450'	Ramp is adequate for a 40-mph design speed, however vehicles often move faster than 40 mph on this portion of the ramp. Design speed should be at least 45 mph.
3	Inadequate vertical curve on WB on-ramp; Station 265+65; Curve is 100'	200'	
4	Inadequate vertical curve on WB off-ramp; Station 267+40; Curve is 100'	200'	
5	EB on-ramp has vertical down-grade of 6% where reverse vertical curves meet.	5%	No tangent exists between the two vertical curves of the ramp.
6	EB off-ramp has vertical grade of 5.4% for approximately 75'.	5%	

Note #	Deficiency	Standard	Remarks
7	Superelevation change at top of EB on-ramp.		Northbound right-turning vehicles from Mohawk to EB on-ramp experience back-to-back superelevation transition.
8	Inadequate deceleration lane length on EB off-ramp; Length is 285'	340'	Inadequate spiral dimensions lead to inadequate deceleration lane length.
9	Inadequate deceleration lane length on WB off-ramp; Length is 285'	340'	Inadequate spiral dimensions lead to inadequate deceleration lane length.
10	Inadequate spiral curve on EB on-ramp; Spiral is 200' long	250'	The degree of curve of this ramp places the design ramp speed at 50 mph, making the spiral curve dimensions inadequate.
11	Inadequate spiral curve on EB off-ramp; Spiral is 200' long	250'	The degree of curve of this ramp places the design ramp speed at 60 mph, making the spiral curve dimensions inadequate.
12	Inadequate spiral curve on WB on-ramp; Spiral is 200' long	250'	The degree of curve of this ramp places the design ramp speed at 50 mph, making the spiral curve dimensions inadequate.
13	Inadequate spiral curve on WB off-ramp; Spiral is 200' long	250'	The degree of curve of this ramp places the design ramp speed at 60 mph, making the spiral curve dimensions inadequate.
14	Left shoulder width at top of EB on-ramp is sub-standard for approximately 200'.	4'	Existing shoulder width varies from 2'-4'.
15	Left shoulder width at top of WB on-ramp is sub-standard for approximately 300'.	4'	Existing shoulder width varies from 2'-4'.
16	EB on-ramp has deficient access spacing.		See Table 2
17	EB off-ramp has deficient access spacing.		See Table 2
18	WB on-ramp has deficient access spacing.		See Table 2
19	WB off-ramp has deficient access spacing.		See Table 2

Vertical Stopping Sight Distance. Each of the four ramps at the interchange have substandard vertical curve lengths based upon minimum stopping sight distances or vehicle operating speeds on the ramp. Several of the curves are adequately designed; however, observation of driver behavior in the interchange vicinity showed that vehicles often operate at speeds faster than the design speed at various points on the ramps.

Vertical Clearance. No observed vertical clearance issues exist on the ramps of the Mohawk Boulevard interchange. The required vertical clearance for expressways is 17.5 feet, as shown in Table 8-1 of the Highway Design Manual (HDM). Mohawk Boulevard is the only overpass with a vertical clearance deficiency within the study corridor (16 feet). An ODOT bridge inspection dated 12/17/2002 states that the overpass clearance is tolerable (although it does not record the clearance height).

Maximum Vertical Grades. Both the eastbound on- and off-ramps have grades that exceed the maximum vertical grade of 5 percent referenced in Table 8-1 of the HDM. As-built plans of the interchange also show that the eastbound on-ramp has two back-to-back vertical curves with no tangent section between. It is currently typical practice to design tangent sections between curves to improve ride characteristics.

Superelevation. No as-constructed superelevation data for interchange rampways and intersections were available. However, a windshield survey revealed superelevation issues on the eastbound on-ramp at Mohawk Boulevard. Northbound vehicles turning right onto the on-ramp experience a rapid reversal in superelevation near the top of the ramp when making the right turn into the first curve on the ramp to the left. Based on field observation, the superelevation transition is abrupt and may result in ride discomfort or affect driver operations.

Horizontal Stopping Sight Distance. All curves in the interchange have adequate horizontal stopping sight distance based on the windshield survey.

Ramp Acceleration/Deceleration Lanes. Both off-ramp deceleration lanes at Mohawk Boulevard are substandard. Both deceleration lanes are currently 285 feet long compared to the HDM standard length of 340 feet. This problem is related to the inadequate spiral transition curves in that the length of spiral curves is a determinant of deceleration lane length. Both on-ramp acceleration lanes at the interchange are adequate.

Curvature. All four ramps have inadequate spiral curve dimensions. Spiral curves occur immediately after deceleration lanes or immediately before acceleration lanes. Standard dimensions for spiral curves on ramps are included in Figures 9-21 and -22 in the HDM.

Ramp Lane Widths. All ramp lanes meet the 16-foot requirement shown in ODOT Standard Drawings 205 and 210.

Ramp Shoulder Widths. On the eastbound on-ramp at the Mohawk Boulevard interchange, approximately the first 200 feet of the left side shoulder is narrower than the required four feet. On the westbound on-ramp of the Mohawk Boulevard interchange, the left side shoulder varies between two feet and four feet for approximately 300 feet. Shoulder requirements were taken from Standard Drawings 205 and 210 (entrance and exit ramp details).

Guardrails. No deficient guardrail sections were found along the Mohawk Boulevard interchange ramps.

Access

Ramp Terminal Access Spacing. For the purposes of this study, it is assumed that the Mohawk Boulevard interchange is categorized as “Fully Developed Urban” per the OHP. Table 2 lists the approaches near the Mohawk Boulevard interchange that are located within ODOT’s preferred access spacing distance from ramp terminals. Several streets and driveways are located too close to the interchange, according to ODOT’s preferred access spacing distances. Appendix E contains all access spacing tables for the OR 126 mainline and interchanges along the corridor.

Table 2. Mohawk Boulevard/OR 126 Interchange Access Spacing

Roadway Segment	Distance to First Approach on Right, Right In/Right Out Only		Distance to First Major Intersection		Distance Between Last Approach Road and Start of Taper for the On-Ramp	
	Standard	# of Approaches Not Meeting Standard	Standard	# of Approaches Not Meeting Standard	Standard	# of Approaches Not Meeting Standard
Mohawk Boulevard north of OR 126	750'	2 streets	1320'	1 intersection	990'	1 driveway, 1 street
Mohawk Boulevard south of OR 126	750'	5 driveways	1320'	1 intersection	990'	4 driveways, 2 streets

Safety/Crash History

Crash rates (reported as crashes per million entering vehicles) for the period of 1998-2002 at the two ramp intersections at Mohawk Boulevard are as follows:

- WB On- & Off-ramps/Mohawk Boulevard – 0.09
- EB On- & Off-ramps/Mohawk Boulevard – 0.17

Neither intersection exhibits a crash rate (typically 1.00) that indicates further investigation is needed. At the westbound ramp intersection, four of the six recorded crashes involved failure to give right-of-way/disregard for traffic signals. However, there is no discernable pattern to this cause of collision. At the eastbound ramp intersection, six collisions were rear-ends and eight involved failure to give right-of-way/disregard for traffic signals. Again, no prevailing trend emerges for either type of collision. The failure to yield issue at this location may require observation for potential solutions. No fatalities were recorded at the Mohawk Boulevard interchange between 1998 and 2002. Appendix F contains all safety tables and figures for the OR 126 mainline as well as all safety data for the corridor (1998-2002).

Existing Traffic Operations (2005)

The Mohawk Boulevard interchange with OR 126 is a standard diamond with signals at the eastbound and westbound ramp termini. There are three intersections within the influence area of the interchange. In addition, as part of the analysis, the Hayden Bridge Road/19th Street intersection was studied to provide a comparison for future concepts analysis.

Table 3 shows existing (2005) and future no-build (2025) level of service (LOS) and volume-to-capacity ratio (v/c) for each intersection associated with the Mohawk Boulevard interchange. Appendices G-L contain all existing (2005) and future no-build (2025) traffic operations tables, data and analysis for the OR 126 mainline and the interchanges and intersections along the corridor.

Table 3. OR 126/Mohawk Boulevard Interchange LOS and v/c (Existing and Year 2025 No-Build)

Intersection Location	Existing (Year 2005)			Year 2025 No-Build			Relevant LOS and V/C Standards
	LOS	v/c	Adequate?	LOS	v/c	Adequate?	
19 th St/Hayden Bridge Rd	C	0.55	Yes	F	>1.0	No	LOS D (COS)
19 th St/Marcola Rd	C	0.73	Yes	F	>1.0	No	LOS D (COS)
Mohawk Blvd/OR 126 Westbound ramps	B	0.63	Yes	C	>0.90	No	V/C 0.85 (OHP) V/C 0.75 (HDM)
Mohawk Blvd/OR 126 Eastbound ramps	C	0.83	Yes	E	>1.0	No	V/C 0.85 (OHP) V/C 0.75 (HDM)
18 th St/Mohawk Blvd	E	0.87	No	F	>1.0	No	LOS D (COS)
Mohawk Blvd/Olympic St	B	0.60	Yes	B	0.78	Yes	LOS D (COS)

Notes:

- (1) V/C = volume/capacity ratio – a measurement of how much roadway capacity is being used. A v/c of 1.0 or greater means that the roadway is filled to capacity.
- (2) LOS = level of service – a measurement of delay at an intersection.
- (3) For analysis of existing operations, adequacy is determined by comparing the calculated v/c or LOS against the Oregon Highway Plan, or where appropriate, local LOS standards. If the appropriate standard is not met, then response to “Adequate?” is “No”.
- (4) For analysis of future no-build operations, adequacy is determined by comparing the calculated v/c or LOS against the Oregon Highway Plan, or where appropriate, local LOS standards. If the appropriate standard is not met, then response to “Adequate?” is “No”.
- (5) OHP = Oregon Highway Plan – describes operational criteria for evaluating existing roadways
- (6) HDM – Highway Design Manual – describes operational criteria for evaluating new or planned roadways. Results that do not meet HDM standards are footnoted.
- (7) COS = City of Springfield local LOS standards

All of the intersections currently operate in accordance with accepted standards, with the following exception:

- **Mohawk Boulevard/18th Street:** the critical westbound right turn movement at this unsignalized intersection currently operates at LOS “E.” In addition, there is a high southbound left turn movement at this intersection that occurs in close proximity to the OR 126 Eastbound ramps. Consideration may need to be given in the future to closure of the intersection or restriction to right-in, right-out movements only (currently only left-outs are prohibited).

Future No-Build Traffic Operations (2025)

With regard to future no-build operations, only the Olympic Street/Mohawk Boulevard intersection is expected to meet the relevant performance standards in the vicinity of the Mohawk Boulevard interchange. Potential mitigation measures for the other intersections are summarized below.

- **19th Street/ Hayden Bridge Road:** due to a high northbound left turn demand, this intersection is forecast to operate over capacity. Potential mitigations at this intersection would be to coordinate the signal timing with the intersections to the south along Mohawk Boulevard, add a second northbound left turn lane, and add eastbound right turn overlap phasing. With these improvements, the intersection would operate at level of service “C” with a 0.91 v/c ratio.
- **19th Street/Marcola Road:** this signalized intersection is also anticipated to operate over capacity. Increasing the cycle length, providing a separate northbound right-turn lane, and providing an additional southbound through lane would improve the LOS to “D”.
- **Mohawk Boulevard/OR 126 Westbound On- and Off-ramps:** this ramp terminal is anticipated to not meet OHP standards. Possible mitigation measures include adding a southbound right turn lane.
- **Mohawk Boulevard/ OR 126 Eastbound On- and Off-ramps:** this intersection is substandard with regard to OHP performance standards, and is anticipated to exceed capacity during the peak hour. Possible mitigations include adding a second eastbound left turn lane and a second southbound left turn lane. These mitigations would decrease the v/c to 0.78, which meets OHP standards (but not HDM standards).
- **Mohawk Boulevard/18th Street:** the critical westbound right turn movement at this intersection is forecast to operate over capacity. Due to the close proximity to the OR 126 eastbound ramps, signalization of the intersection is unlikely. Further, ample capacity is available at the adjacent Mohawk Boulevard/Olympic intersection for egress movements from 18th Street. For these reasons, no mitigation measures are recommended at the Mohawk Boulevard/18th Street intersection.

OR 126/42nd Street Interchange Conditions and Deficiencies

Introduction

This report section discusses the following in relation to the OR 126/42nd Street Interchange:

- Roadway geometrics
- Access
- Safety/crash history
- Existing traffic operations (2005)
- Future no-build traffic operations (2025)

The 42nd Street interchange area, for the purpose of this report, includes all ramps and several nearby intersections. The OR 126 mainline and other interchanges and intersections along the corridor are discussed in separate sections.

Geometric deficiencies for the 42nd Street interchange relate to vertical stopping sight distance (SSD), superelevation, acceleration and deceleration lanes, and ramp terminal access spacing. Westbound on- and off-ramps have ramp terminal access spacing that does not meet accepted standards. Taper length is also an issue. No recorded crashes occurred at the westbound ramp intersection and three collisions occurred at the eastbound ramps intersection (all of which were rear-end collisions) during the study duration (1998-2002); the crash rates are not high enough to warrant further investigation.

The 42nd Street/OR 126 eastbound ramps intersection operates at a substandard level during peak hour, according to OHP standards. Additional issues impacting this interchange area include the frequent use of the railroad tracks south of the intersection (20 movements per day). The 42nd Street interchange is located near the Hammer industrial development site, which is expected to have a significant effect on traffic levels at this interchange. Analysis of future (2025) no-build traffic operations shows that the 42nd Street/OR 126 eastbound ramps intersection continues to operate at a substandard level, along with the following intersections:

- 42nd Street/OR 126 westbound ramps,
- 42nd Street/Olympic Street, and
- 42nd Street/Marcola Road.

Appendix C contains the methods used to analysis geometric conditions and deficiencies, safety, and existing (2005) and future (2025) no-build traffic operations for the OR 126 mainline and interchanges/intersections.

Geometric Conditions and Deficiencies

Geometric conditions and deficiencies for the 42nd Street Interchange are summarized in Tables 1a and 1b. All geometric deficiency tables for the OR 126 mainline and the five interchanges and intersections along the corridor are contained in Appendix D.

Table 1a. OR 126/42nd Street Boulevard Interchange Geometric Deficiencies

Criterion	42nd Street Interchange Ramps			
	Eastbound On-Ramp	Eastbound Off-Ramp	Westbound On-Ramp	Westbound Off-Ramp
Vertical SSD	1	2	3	A
Vertical Clearance	A	A	A	A
Maximum Vertical Grades	A	A	A	A
Superelevation	4	A	A	A
Horizontal SSD	A	A	A	A
Acceleration/ Deceleration Lanes	5	A	6	7
Lane Widths	A	A	A	A
Shoulder Widths	A	A	A	A
Guardrails	A	NA	NA	NA
Ramp Terminal Access Spacing	A	A	8	9
Pavement Condition	A	A	A	A
Crash History	A	A	A	A

Notes: Numbers reference Table 1b. A = Acceptable.

Table 1b. 42nd Street Interchange Geometric Deficiencies Notes

Note #	Deficiency	Standard	Remarks
1	Inadequate vertical curve on EB on-ramp; Station 332+90; Curve is 400'	500'	Vertical curve too short given speed at beginning of off-ramp.
2	Inadequate vertical curve on EB off-ramp; Station 329+00; Curve is 100'	375'	
3	Inadequate vertical curve on WB on-ramp; Station 324+50; Curve is 200'	375'	
	Inadequate vertical curve on WB on-ramp; Station 335+50; Curve is 100'	175'	Recommended to soften grade changes between 324+50 and 336+50.
4	Back-to-back superelevation from top of EB on-ramp extending approximately 100' down ramp		Northbound right turners experience back-to-back reverse superelevations entering on-ramp.
5	EB on-ramp taper length is inadequate; existing taper is 250'.	300'	
6	WB on-ramp taper length is inadequate; existing taper is 250'.	300'	
7	WB off-ramp deceleration lane is too short; existing length is 300'.	560'	Deceleration lane is too short for reasonable braking into horizontal and vertical curve near station "D" 332+00.
8	WB on-ramp has deficient access spacing.		See Table 2.
9	WB off-ramp has deficient access spacing.		See Table 2.

Vertical Stopping Sight Distance. The westbound on-ramp has a series of vertical curves (sag-to-crest-to-sag) near the beginning of the ramp, two of which do not meet minimum length requirements. This creates a “roller-coaster” effect for drivers. Also, the eastbound off-ramp has a vertical curve that is too short. On the westbound exit ramp, there is a crest curve that is too short given the operating speeds of vehicles exiting the highway and entering the looping off-ramp. A vertical curve in the eastbound on-ramp at the same interchange marginally meets the minimum length requirement. However, given the operating speeds of vehicles at that location on the ramp, there appear to be no issues.

Vertical Clearance. No vertical clearance issues exist with ramps in the 42nd Street interchange.

Maximum Vertical Grades. All interchange ramps are within the maximum vertical grade listed in Table 8-1 of the HDM (5 percent).

Superelevation. No as-constructed superelevation data for interchange rampways and intersections were available. However, a windshield survey did not reveal any superelevation issues.

Horizontal Stopping Sight Distance. All curves in the interchange have adequate horizontal stopping sight distance based on the windshield survey.

Ramp Acceleration/Deceleration Lanes. At the 42nd Street interchange, the westbound exit ramp deceleration length is extremely short. The short length combined with the vertical and horizontal curvature make negotiating the ramp difficult. Both eastbound and westbound on-ramps have taper sections that are shorter than the standard lengths. All four ramps at this interchange were constructed with proper tangent sections followed by spiral sections leading into simple curves, as required by Figure 9-21 of the HDM.

Ramp Lane Widths. All ramp lanes meet the 16-foot requirement shown in ODOT Standard Drawings 205 and 210.

Ramp Shoulder Widths. All ramp shoulders at the 42nd Street interchange meet HDM standard dimensions.

Guardrail Sections. No deficient guardrail sections were found along the 42nd Street interchange ramps.

Pavement Condition. The Pavement Management System (PMS) and windshield survey did not reveal any serious pavement deficiency on the ramps of the Pioneer Parkway interchange.

Bridge Condition. No ramps at 42nd Street pass over bridges.

Railroad Crossings. There are two railroad crossings near the 42nd Street interchange. One crossed 42nd Street south of the interchange. The crossing experiences 20 train movements a day due to the presence of a nearby forest products mill. The crossing was signalized in 1981 and since then, only two crashes have occurred (both in 1987). The City of Springfield has observed queuing and travel delay issues related to rail movement. There is another crossing north of the interchange on Marcola Road that experiences one train movement per day. There have been seven crashes there since 1966, with the most recent in 1999. This railroad crossing will likely have little influence over the 42nd street interchange, but should be noted due to its close proximity with the interchange.

Access

Ramp Terminal Access Spacing. For the purposes of this study, it is assumed that the 42nd Street interchange is categorized as “Urban” per the OHP. Table 2 lists the approaches near the 42nd Street interchange that are located within ODOT’s preferred access spacing distance from ramp terminals. Several streets and driveways are located too close to the interchange, according to ODOT’s preferred access spacing distances. Appendix E contains all access spacing tables for the OR 126 mainline and interchanges along the corridor.

Table 2. 42nd Street/OR 126 Interchange Access Spacing.

Roadway Segment	Distance to First Approach on Right, Right In/Right Out Only		Distance to First Major Intersection		Distance Between Last Approach Road and Start of Taper for the On-Ramp	
	Standard	# of Approaches Not Meeting Standard	Standard	# of Approaches Not Meeting Standard	Standard	# of Approaches Not Meeting Standard
42nd St North of OR 126	1320'	N/A	1320'	0	1320'	6 driveways
42nd St South of OR 126	1320'	2 driveways	1320'	0	1320'	N/A

Safety/Crash History

The crash rates (reported as crashes per million entering vehicles) at the two ramp intersections at 42nd Street are as follows (1998-2002):

- WB On- & Off-ramps/42nd Street - 0.00
- EB On- & Off-ramps/42nd Street - 0.06

No recorded crashes occurred at the westbound ramps intersection and three collisions occurred at the eastbound ramps intersection (all of which were rear-end collisions). No fatalities were recorded at the 42nd Street interchange from 1998 to 2002. Appendix F contains all safety tables and figures for the OR 126 mainline as well as all safety data for the corridor (1998-2002).

Existing Traffic Operations (2005)

The 42nd Street interchange is a partial cloverleaf interchange with ramps in the northwest and southwest quadrants. The eastbound ramp terminal is currently signalized. There are two public street intersections within the influence area of the interchange, including Marcola Road and Olympic Street. In addition, the use of the railroad tracks to the south of the interchange causes queuing during certain periods of the day. The operations of the 42nd Street interchange as well as the 42nd/Olympic intersection are affected by the 20 trains per day traversing these tracks.

Table 3 shows existing (2005) and future no-build (2025) LOS and v/c for each intersection associated with the 42nd Street interchange. Appendices G-L contain all existing (2005) and future no-build (2025) traffic operations tables, data and analysis for the OR 126 mainline and the interchanges and intersections along the corridor.

Table 3. OR 126/42nd Street Weekday PM Peak Hour Level of Service and Volume/Capacity Ratios, Existing and Year 2025 “No-Build”

Intersection Location	Existing (Year 2005)			Year 2025 No-Build			Relevant LOS and V/C Standards
	LOS	v/c	Adequate?	LOS	v/c	Adequate?	
42 nd St/OR 126 Westbound ramps	F	0.43	Yes	F	>1.0	No	V/C 0.85 (OHP) V/C 0.75 (HDM)
42 nd St/OR 126 Eastbound ramps	E	0.92	No	D	0.95	No	V/C 0.85 (OHP) V/C 0.75 (HDM)
42 nd St/Olympic St	C	0.85	Yes	F	>1.0	No	LOS D (COS)
42 nd St/Marcola Rd	E	0.60	Yes	F	>1.0	No	LOS E or v/c < 0.9 (COS)

Notes:

- (1) V/C = volume/capacity ratio – a measurement of how much roadway capacity is being used. A v/c of 1.0 or greater means that the roadway is filled to capacity.
- (2) LOS = level of service – a measurement of delay at an intersection.
- (3) For analysis of existing operations, adequacy is determined by comparing the calculated v/c or LOS against the Oregon Highway Plan, or where appropriate, local LOS standards. If the appropriate standard is not met, then response to “Adequate?” is “No”.
- (4) For analysis of future no-build operations, adequacy is determined by comparing the calculated v/c or LOS against the Oregon Highway Plan, or where appropriate, local LOS standards. If the appropriate standard is not met, then response to “Adequate?” is “No”.
- (5) OHP = Oregon Highway Plan – describes operational criteria for evaluating existing roadways
- (6) HDM – Highway Design Manual – describes operational criteria for evaluating new or planned roadways. Results that do not meet HDM standards are footnoted.
- (7) COS = City of Springfield local LOS standards

All of the intersections currently operate in accordance with OHP or City of Springfield LOS standards, with the following exception:

- **42nd Street/OR 126 eastbound ramps:** The eastbound ramps do not meet OHP standards. The Hammer Industrial Development has been conditioned to improve the eastbound ramp intersection and signalize the westbound ramp intersection.

Future Traffic Operations (2025)

For future traffic analysis, trips associated with the Hammer Industrial development were included along 42nd Street. Due to the uncertainty of proposed roadway improvements, the existing lane configurations were assumed for the no-build analysis.

- **42nd Street/Marcola Street:** the critical northbound movement at this two-way stop controlled intersection is projected to operate over capacity at LOS F, which does not meet City of Springfield performance standards. This intersection is not anticipated to warrant the installation of a traffic signal. It is recommended that the City of Springfield monitor the performance of this intersection to determine the appropriate need for and timing of improvements at this location.
- **42nd Street/OR 126 Westbound Ramps:** the 2025 no-build analysis shows that the intersection is forecast to not meet OHP standards and to operate over capacity. Significant intersection improvements are needed, including signalization, a new southbound right-turn lane, and a second northbound left-turn lane.
- **42nd Street/OR 126 Eastbound Ramps:** the future analysis shows that improvements will be needed at the eastbound ramps to meet OHP standards. Potential improvements include a new northbound through lane, a second eastbound right-turn lane with a receiving lane, and a southbound right-turn lane.
- **42nd Street/Olympic Street:** the 42nd Street/Olympic Street intersection is forecast to exceed capacity in the no-build scenario. A second southbound lane is needed to meet OHP standards.

OR 126/52nd Street Intersection Conditions and Deficiencies

Introduction

This report section discusses the following in relation to the OR 126/52nd Street intersection:

- Roadway geometrics
- Safety/crash history
- Existing traffic operations (2005)
- Future no-build traffic operations (2025)

The 52nd Street intersection area, for the purpose of this report, includes the intersection with OR 126 and several nearby intersections. The OR 126 mainline and other interchanges and intersections along the corridor are discussed in separate sections.

Route continuity and driver expectations are significant issues near the existing 52nd Street signalized at-grade intersection. Eastbound travelers experience a freeway-like setting with grade-separated interchanges, traverse a horizontal right curve, and then come to an unexpected at-grade signalized intersection at 52nd Street. The roadway cross section offers no visual cues to this abrupt transition. Some signage along the roadway warns of the upcoming intersection, but it is well documented that many drivers miss a large percentage of roadside signs. Westbound drivers interact with the 52nd Street intersection after experiencing a quick transition from a commercial arterial (Main Street) to a roadway segment that functions more like a freeway. The function of OR 126 is an expressway, and the form must take into account the context of the surrounding area. Future concepts at the 52nd Street intersection must be integrated with concepts at the Main Street intersection in order to manage speed and better match driver expectation with facility form and function.

Although the five-year crash analysis shows a crash rate that does not indicate the need for further investigation, crash trend analysis reveals that a majority of crashes at the OR 126/52nd Street intersection are rear-end, with all occurring between vehicles traveling through the intersection either eastbound or westbound on OR 126. Geometric deficiencies for the 52nd Street intersection primarily involve turning lanes. The right-turning edge of pavement does not have compound curvature.

All of the intersections in this study area currently meet relevant Oregon Highway Plan (OHP) or City of Springfield level of service (LOS) standards. With regard to no-build future operations, the OR 126/52nd Street intersection is expected to operate at a substandard level, according to ODOT OHP standards by 2025. Other intersections in the area continue to meet appropriate City of Springfield LOS standards.

Appendix C contains the methods used to analysis geometric conditions and deficiencies, safety, and existing (2005) and future (2025) no-build traffic operations for the OR 126 mainline and interchanges/intersections.

Geometric Conditions and Deficiencies

Geometric conditions and deficiencies for the 52nd Street Intersection are summarized in Table 1. All geometric deficiency tables for the OR 126 mainline and the five interchanges and intersections along the corridor are contained in Appendix D.

Table 1. OR 126/52nd Street Intersection Geometric Deficiencies.

Criterion	Acceptable?	Notes
Vertical SSD	A	
Vertical Clearance	A	
Maximum Vertical Grades	A	
Superelevation	A	
Horizontal Stopping Sight Distance (SSD)	A	
Lane Widths	A	
Shoulder Widths	A	
Guardrails	N/A	
Pavement Condition	A	
Intersection Skew	A	
Turning Lanes	No	Edge of pavement should have a 65' radius curve followed by a 250' radius curve for all intersection approaches.
Crash History	A	Trends show a pattern of rear-end collisions at the OR 126/52 nd Street intersection.

Notes: A = acceptable. N/A = not applicable.

Vertical Stopping Sight Distance. No vertical SSD issues exist within the intersection.

Vertical Clearance. No vertical clearance issues exist in the intersection.

Maximum Vertical Grades. All grades in the intersection are within the maximum vertical grade included in Table 8-1 of the HDM (5 percent).

Superelevation. A windshield survey did not reveal any superelevation issues.

Horizontal Stopping Sight Distance. All curves near the intersection have adequate horizontal stopping sight distance based on the windshield survey.

Intersection Skew. 52nd Street intersects OR 126 at approximately a 30-degree angle. Although Section 9.2.1 of the HDM recommends a 90-degree intersection angle, it does allow a 30-degree angle under certain circumstances.

Turning Lanes. Both left turn lanes from OR 126 onto 52nd Street are adequate at 12 feet wide. However, all right-turning movements at the intersection are inadequate by present design standards. Figure 9-7 of the HDM shows that right-turning movements are guided by compound curves at the edge-of-pavement (typically a 65-foot radius followed by a 250-foot radius curve). As-constructed drawings of the intersection indicated no compound curvature was incorporated in the design.

Guardrail Sections. There are no guardrails adjacent to this intersection.

Median. Figure 9-7 of the HDM requires a minimum 4-foot median between a left turn lane and the edge of the oncoming traveled way. The design of both left turn lanes on OR 126 at 52nd Street meet this requirement. However, as previously noted, the median of OR 126 between 52nd Street and Main Street is generally substandard.

Pavement Condition. The Pavement Management System (PMS) and windshield survey did not reveal any serious pavement deficiency on the ramps of the Pioneer Parkway interchange.

Bridge Condition. No bridges are present within the intersection area.

Safety/Crash Analysis

The crash rate (reported as crashes per million entering vehicles) at 52nd Street/OR 126 for the five-year data (1998-2002) is 0.27, which does not require further analysis per accepted standards (1.00). Although this is a low crash rate, several trends exist when analyzing the 21 recorded crashes. Eleven crashes were rear-end collisions and all of these occurred between vehicles traveling through the intersection either eastbound or westbound on OR 126. Of the 11 rear-end crashes, 4 caused some level of injury. There were no recorded fatalities.

There were four collisions involving disregard for the traffic signal or turning left in front of oncoming traffic. In some cases, this can indicate driver impatience with signal timing; however, in this case, no particular turning movement dominated. The remaining crashes were attributed to various causes. No fatalities were recorded between 1998 and 2002. Appendix F contains all safety tables and figures for the OR 126 mainline as well as all safety data for the corridor (1998-2002).

Existing Traffic Operations (2005)

There are four intersections within the influence area of the OR 126/52nd Street intersection. All of the intersections currently meet OHP performance standards.

The 52nd Street intersection with OR 126 is currently signalized. The signal is timed and maintained by the City of Springfield through an arrangement with ODOT. Although the 52nd Street approaches are currently striped as shared lanes, sufficient width exists for two vehicles to queue on the approach. Queues in the order of 590 feet occur on the eastbound left turn movement at the intersection during the weekday PM peak hour. Storage for this movement is approximately 300 feet.

Table 2 shows existing (2005) and future no-build (2025) LOS and v/c for each intersection associated with the OR 126/52nd Street intersection. Appendices G-L contain all existing (2005) and future no-build (2025) traffic operations tables, data and analysis for the OR 126 mainline and the interchanges and intersections along the corridor.

Table 2. OR 126/52nd Street Weekday PM Peak Hour Level of Service and Volume/Capacity Ratios, Existing and Year 2025 “No-Build”

Intersection Location	Existing (Year 2005)			Year 2025 No-Build			Relevant LOS and V/C Standards
	LOS	v/c	Adequate?	LOS	v/c	Adequate?	
52 nd St/Highbanks Rd	C	0.05	Yes	F	0.46	Yes	LOS E or v/c < 0.9 (COS)
OR 126/52 nd St	C	0.78	Yes*	F	>1.0	No	V/C 0.80 (OHP) V/C 0.75 (HDM)
52 nd St/G St	A	0.03	Yes	A	0.05	Yes	LOS E or v/c < 0.9 (COS)
52 nd St/F St	A	0.04	Yes	A	0.05	Yes	LOS E or v/c < 0.9 (COS)

* Note: Meets OHP standard, but not HDM standard.

Notes:

- (1) V/C = volume/capacity ratio – a measurement of how much roadway capacity is being used. A v/c of 1.0 or greater means that the roadway is filled to capacity.
- (2) LOS = level of service – a measurement of delay at an intersection.
- (3) For analysis of existing operations, adequacy is determined by comparing the calculated v/c or LOS against the Oregon Highway Plan, or where appropriate, local LOS standards. If the appropriate standard is not met, then response to “Adequate?” is “No”.
- (4) For analysis of future no-build operations, adequacy is determined by comparing the calculated v/c or LOS against the Oregon Highway Plan, or where appropriate, local LOS standards. If the appropriate standard is not met, then response to “Adequate?” is “No”.
- (5) OHP = Oregon Highway Plan – describes operational criteria for evaluating existing roadways
- (6) HDM – Highway Design Manual – describes operational criteria for evaluating new or planned roadways. Results that do not meet HDM standards are footnoted.
- (7) COS = City of Springfield local LOS standards

Future No-Build Traffic Operations (2025)

The 2025 OR 126/52nd Street intersection is anticipated to operate over capacity, and not meet OHP standards. An additional through lane is needed in each direction on OR 126, as is a second eastbound left-turn lane and a separate southbound right-turn lane. Alternatively, grade-separated treatments should be investigated.

Queues in the order of 590 feet occur on the eastbound left turn movement at the intersection during the weekday PM peak hour. Storage for this movement is approximately 300 feet. Dual left turn lanes would reduce this queue to approximately 200 feet per lane. This improvement would require widening of 52nd Street north of OR 126 and would improve operations slightly.

OR 126/Main Street Intersection Conditions and Deficiencies

Introduction

This report section discusses the following in relation to the OR 126/Main Street (McKenzie Highway No. 15) intersection:

- Roadway geometrics
- Safety/crash history
- Existing traffic operations (2005)
- Future no-build traffic operations (2025)

The Main Street intersection area, for the purpose of this report, includes the intersection with OR 126 and several nearby intersections. The OR 126 mainline and other interchanges and intersections along the corridor are discussed in separate sections.

Future mixed-use development at the 800+-acre Jasper-Natron site located southeast of the OR 126 & Main Street intersection is expected to increase traffic at the intersection and surrounding area, partially through a direct connection via the planned Jasper Road Extension.

Existing traffic operations analysis shows that the OR 126/Main Street intersection does not meet OHP standards during the peak period. The Main Street/58th intersection also does not meet OHP standards.

Future no-build traffic operations analysis shows that the OR 126/Main Street, Main Street/58th Street, and Jasper Road/Mount Vernon Road intersections all are expected to operate over capacity by 2025.

The Main Street/OR 126 intersection is currently signalized. There is a lack of route continuity for OR 126 expressway traffic at this location, as the road transitions from expressway immediately to urban arterial with commercial land uses and driveways immediately adjacent to Main Street.

Crash rate analysis for the intersection showed a relatively low crash rate indicating no need for in-depth crash analysis. The dominant crash type was rear-end, accounting for 15 of 20 recorded crashes. Geometric deficiencies for the Main Street intersection include substandard shoulder widths. Several private driveways and public roadways on Main Street are located within 990 feet of the terminus with OR 126, which is too close according to ODOT standards (990 feet for an urban statewide highway with posted speed of 40 miles per hour).

Appendix C contains the methods used to analysis geometric conditions and deficiencies, safety, and existing (2005) and future (2025) no-build traffic operations for the OR 126 mainline and interchanges/intersections.

Geometric Conditions and Deficiencies

Geometric conditions and deficiencies for the OR 126/Main Street Intersection, as assessed during construction, are summarized in Table 1. All geometric deficiency tables for the OR 126 mainline and the five interchanges and intersections along the corridor are contained in Appendix D.

Table 1. OR 126/Main Street Intersection Geometric Deficiencies

Criterion	Acceptable?	Notes
Vertical SSD	A	
Vertical Clearance	A	
Maximum Vertical Grades	A	
Superelevation	A	
Horizontal Stopping Sight Distance (SSD)	A	
Lane Widths	A	
Shoulder Widths	No	Substandard shoulder widths on the right turn lanes and in the vicinity of these lanes.
Guardrails	A	
Pavement Condition	A	
Intersection Skew	A	
Turning Lanes	A	
Crash History	A	Primarily rear-end; both directions of travel

Notes: A = Acceptable.

Vertical Stopping Sight Distance. No vertical SSD issues exist within the intersection.

Vertical Clearance. No vertical clearance issues exist in the intersection.

Maximum Vertical Grades. All grades in the intersection are within the maximum vertical grade included in Table 8-1 of the HDM (5 percent).

Superelevation. A windshield survey of the intersection, which is at-grade and flat, did not reveal any superelevation issues.

Horizontal Stopping Sight Distance. All curves in the intersection have adequate horizontal stopping sight distance based on the windshield survey.

Lane Widths. All travel lane widths meet the meet the 12-foot minimum standard.

Shoulder Widths. Shoulder widths on the OR 126 expressway meet the 8-foot minimum width standard, except for approximately 50 feet immediately before the separated right turn lane to Main Street. The shoulder width in this section is only 4 feet because a raised curb protrudes out into the shoulder. Shoulder widths on the OR 126 right turn lane from Main Street are 2 feet on the right side and 3 feet on the left side, less than the minimum standard width of 4 feet. Shoulder widths on the exit from the OR 126 expressway to westbound Main Street are 3 feet on the right side and 4 feet on the left side. Everywhere else, shoulder width standards appear to be adequate.

Guardrail Sections. There is a concrete barrier in the median of the OR 126 expressway at Main Street. The concrete barrier and the width between the barriers and travel lanes meet HDM standards. A short guardrail section is located at the north end of the concrete barrier on the OR 126 expressway and meets HDM standards.

Pavement Condition. The Pavement Management System and windshield survey did not reveal any serious pavement deficiency at the Main Street intersection. The north side of the intersection (OR 126 expressway) was recently improved and repaved. The south side of the intersection (Jasper Extension Road) was recently constructed. The pavement condition for the Main Street approaches is fair.

Bridge Condition. No bridges exist within the intersection.

Intersection Skew. Intersection skew is within accepted standards at the OR 126/Main Street intersection.

Turning Lanes. All turn lanes at the OR 126/Main Street intersection meet the 12-foot minimum standard width.

Median. The HDM requires a minimum 4-foot median between a left turn lane and the edge of the oncoming travel lane. The Main Street approaches have no median between the left turn lane (to Jasper Extension Road and OR 126 expressway) and the oncoming travel lane.

Safety/Crash History

The crash rate (reported as crashes per million entering vehicles) at Main Street/OR 126 for the five-year (1998-2002) data is 0.24. This is a relatively low crash rate indicating no need for in-depth crash analysis (compared to a generally accepted rate of 1.0). The dominant crash type is rear-end, accounting for 15 of 20 recorded crashes. Nine of these occurred east- and westbound on Main Street and the other 6 were vehicles traveling north to south on OR 126. All of the rear-end collisions involved either no injury or "Class C" injuries, which is the least serious injury classification. The lack of serious crash severity indicates that these collisions most likely happened at low speeds. The remaining collisions were attributed to various causes. No fatalities were recorded between 1998 and 2002. Appendix F contains all safety tables and figures for the OR 126 mainline as well as all safety data for the corridor (1998-2002).

Crash trends are expected to change where there have been modifications to the facilities, and it will take another three years to reestablish a trend line following the recently constructed improvements at the intersection related to the Jasper Road Extension project. Within the first few months after modifications, there is a learning curve for local drivers to adapt to the new conditions and changes in traffic control.

Existing Traffic Operations (2005)

At the OR 126/Main Street intersection, eastbound OR 126 traffic must turn left at the signal; westbound traffic requires a right turn. The westbound and southbound right turns at this intersection are “free” (i.e., channelized and not operated through the traffic signal).¹ Given the existing imbalance between traffic volumes on the northbound and southbound approaches, the intersection runs a split phasing in the north-south direction and is protected in the east-west direction.

The northbound approach to the OR 126/Main Street intersection is a Lane County facility that currently terminates south of the intersection. There are plans to provide a future connection between this intersection and Jasper Road to the south. Today, the connection occurs via 57th and Mount Vernon Road. The 54th Street/Main Street and 58th Street/Main Street intersections are located within the influence area of the OR 126/Main Street intersection.

The OR 126/Main Street intersection operates worse than ODOT OHP standards, with a v/c ratio of 0.93. To meet OHP (and Highway Design Manual) standards, the intersection would need to be grade-separated or include significant geometric improvements. With an additional through lane eastbound and westbound, the resultant volume-to-capacity ratio would be 0.77.

The Main Street/58th Street intersection also does not meet OHP standards. The Jasper Road extension may provide some relief to this intersection in the future. The potential diversion of traffic as part of the Jasper Road project will be investigated in later phases of the OR 126 EMP.

The Jasper Road/Mount Vernon Road intersection is a three-leg unsignalized intersection with stop control on the westbound Mount Vernon Road approach. The Union Pacific rail line runs parallel with Jasper Road, and crosses Mount Vernon Road at grade adjacent to the Jasper Road/Mount Vernon Road intersection. The crossing is boom gate controlled on either side of the track and there is sufficient storage length between the boom gate and Jasper Road to accommodate approximately one vehicle. On the Mount Vernon Road approach, there is a stop bar prior to the tracks as well as at the intersection. “Do Not Stop on Tracks” warning signs are posted prior to the track as well as opposite the intersection, the latter accompanied by a flashing red light.

The southbound left turn is a fairly significant movement and it appears that there is insufficient lane width for a southbound through vehicle to pass a vehicle queued to turn left. This could become an issue when the level crossing is in use, as the southbound left turn would need to queue for a significant amount of time, blocking the southbound through movement. The impact of the crossing has not been included in analysis of this intersection. Further observation and review of the train schedule may need to be undertaken to investigate if this is a problem at this location. Level of service results for the study intersections during the existing weekday PM peak hour show that the critical approach at the Jasper Road/Mount Vernon Road intersection currently operates at LOS C, with a volume to capacity ratio of 0.53.

¹ Free right turns were disregarded for operations analysis purposes.

Table 2 shows existing (2005) and future no-build (2025) LOS and v/c for each intersection associated with the OR 126/Main Street intersection. Appendices G-L contain all existing (2005) and future no-build (2025) traffic operations tables, data and analysis for the OR 126 mainline and the interchanges and intersections along the corridor.

Table 2. OR 126/Main Street Weekday PM Peak Hour Level of Service and Volume/Capacity Ratios, Existing and Year 2025 “No-Build”

Intersection Location	Existing (Year 2005)			Year 2025 No-Build			Relevant LOS and V/C Standards
	LOS	v/c	Adequate?	LOS	v/c	Adequate?	
54 th St/Main St	A	0.49	Yes	B	0.80	Yes*	V/C 0.80 (OHP) V/C 0.75 (HDM)
OR 126/Main St	D	0.93	No	F	>1.0	No	V/C 0.80 (OHP) V/C 0.75 (HDM)
Main St/58 th St	D	0.90	No	F	>1.0	No	V/C 0.80 (OHP) V/C 0.75 (HDM)
Jasper Rd/Mt. Vernon Rd	C	0.53	Yes	F	>1.0	No	V/C 0.90 (OHP)

* Note: Meets OHP standard, but not HDM standard.

Notes:

- (1) V/C = volume/capacity ratio – a measurement of how much roadway capacity is being used. A v/c of 1.0 or greater means that the roadway is filled to capacity.
- (2) LOS = level of service – a measurement of delay at an intersection.
- (3) For analysis of existing operations, adequacy is determined by comparing the calculated v/c or LOS against the Oregon Highway Plan, or where appropriate, local LOS standards. If the appropriate standard is not met, then response to “Adequate?” is “No”.
- (4) For analysis of future no-build operations, adequacy is determined by comparing the calculated v/c or LOS against the Oregon Highway Plan, or where appropriate, local LOS standards. If the appropriate standard is not met, then response to “Adequate?” is “No”.
- (5) OHP = Oregon Highway Plan – describes operational criteria for evaluating existing roadways
- (6) HDM – Highway Design Manual – describes operational criteria for evaluating new or planned roadways. Results that do not meet HDM standards are footnoted.
- (7) COS = City of Springfield local LOS standards

Future No-Build Traffic Operations (2025)

Planned improvements to the Main Street study area include the construction of a new roadway from the Main Street/OR 126 intersection to Jasper Road. This extension provides a more direct access to the south than the existing route via 57th Street/Mount Vernon Street and is intended to link with future development. The following mitigation measures need to be investigated in the vicinity of Main Street:

- **Main Street/OR 126:** the Main Street/OR 126 intersection is anticipated to operate over capacity during the peak hour under the no-build scenario. To meet OHP (or HDM) standards, the intersection would need to be grade-separated or include significant geometric improvements.
- **Main Street/58th Street:** Despite the diversion of traffic with the Jasper Road extension, this intersection is anticipated to not meet OHP (or HDM) standards, with a v/c ratio greater than 1.0 by 2025 under no-build conditions. An additional through lane in each direction is needed on Main Street as well as dual turn lanes on the northbound and westbound approaches to operate below capacity. Additional improvements will be needed to meet OHP (and HDM) standards.
- **Jasper Road/Mount Vernon Road:** This two-way stop controlled intersection is expected to operate at Level of Service “F” with a v/c ratio greater than 1.0 in 2025 No Build conditions. Signal warrants are not anticipated to be met at this location. It is recommended that ODOT and the County monitor the appropriate need for and timing of improvements at this location.
- **Main Street/54th Street:** The intersection is forecast to meet OHP standards, but operate worse than HDM standards. Potential mitigation could include a dedicated eastbound right-turn lane.