Benton County
OREGON

Transportation *Safety Action Plan*

March 4, 2026

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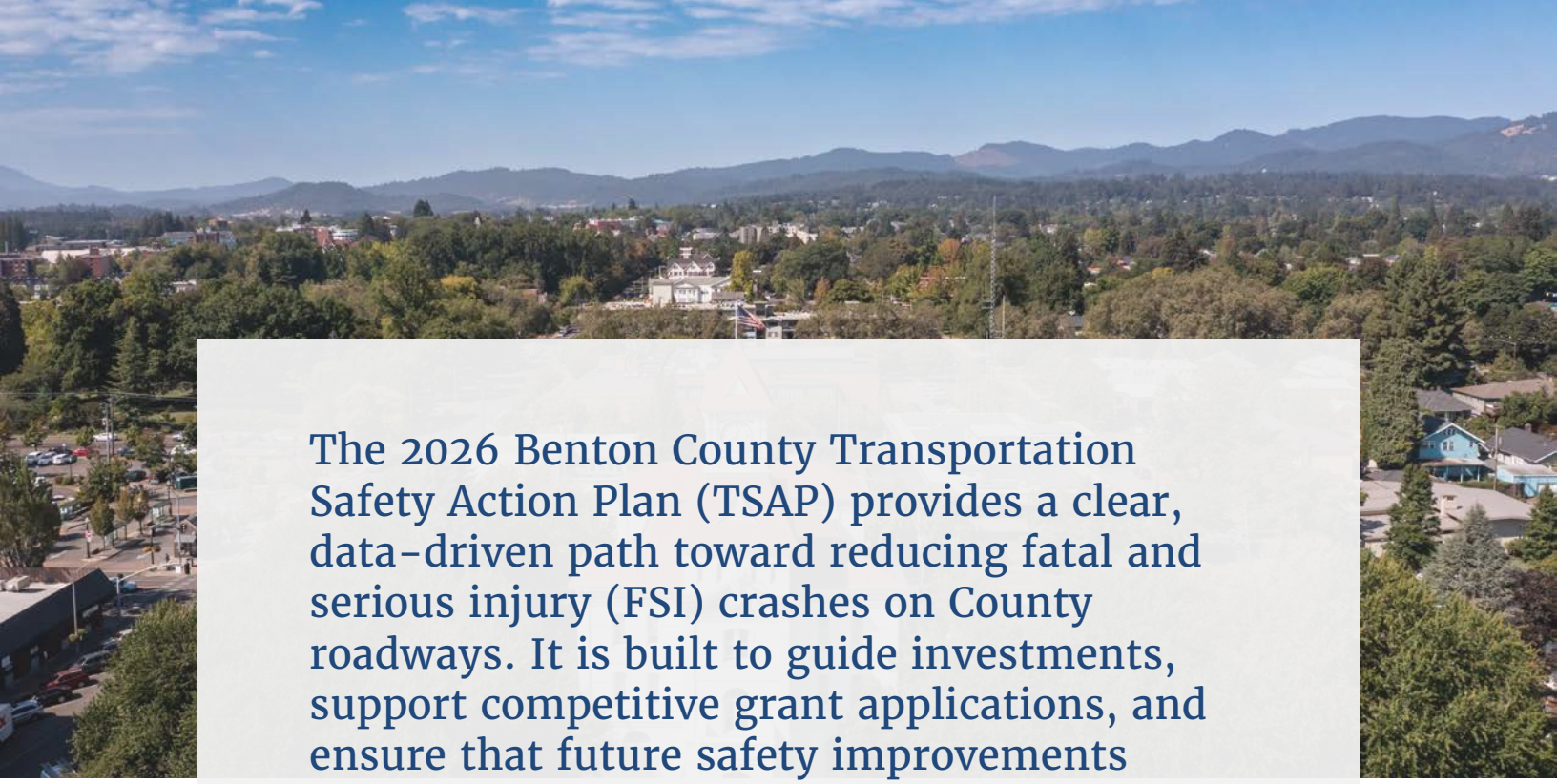
Note: *The Appendix for this report has been provided as a separate document. It includes key background memoranda that represent an iterative process in the development of the TSAP. Refinements to various plan elements occurred throughout the process as new information was obtained. In all cases, the contents of this TSAP report supersede those in the Appendix.*

List of *Figures*

Executive Summary



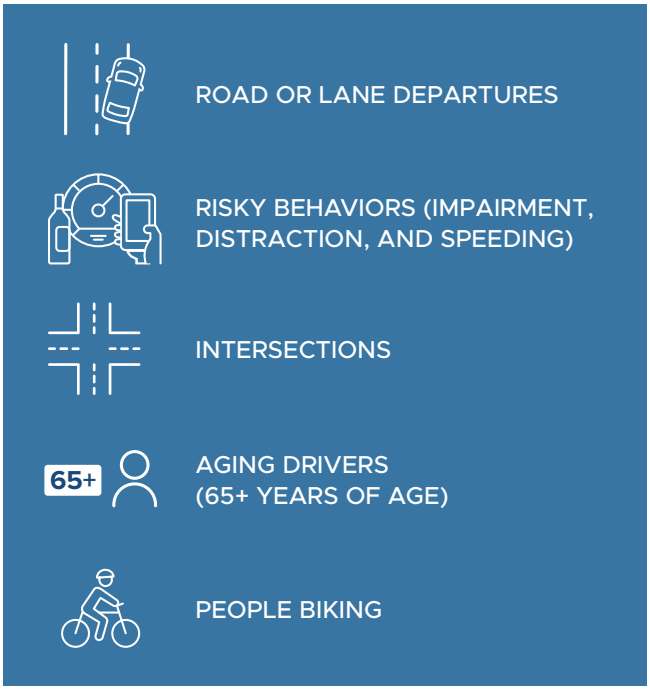
The 2026 Benton County Transportation Safety Action Plan (TSAP) provides a clear, data-driven path toward reducing fatal and serious injury (FSI) crashes on County roadways. It is built to guide investments, support competitive grant applications, and ensure that future safety improvements reflect the highest needs and priorities across Benton County.

Development of the TSAP was a collaborative effort, with active involvement from the TSAP Task Force, Stakeholders from local jurisdictions, and the Benton County Board of Commissioners at every stage, reflecting a shared commitment to creating a safer transportation system for everyone who lives, works, and travels in Benton County.

The Safe System Approach, as advanced by the Federal Highway Administration through the Safe Streets and Roads for All (SS4A) program, provides a framework for achieving zero fatal and serious injury crashes. Benton County's TSAP is aligned with the Safe System Approach and consistent with the goals of the 2021 Oregon Transportation Safety Action Plan and the federal Safe Streets and Roads for All (SS4A) program.

Benton County's goal is to eliminate serious injuries and fatalities on County roads by 2040 and achieve a 50% reduction by 2035.

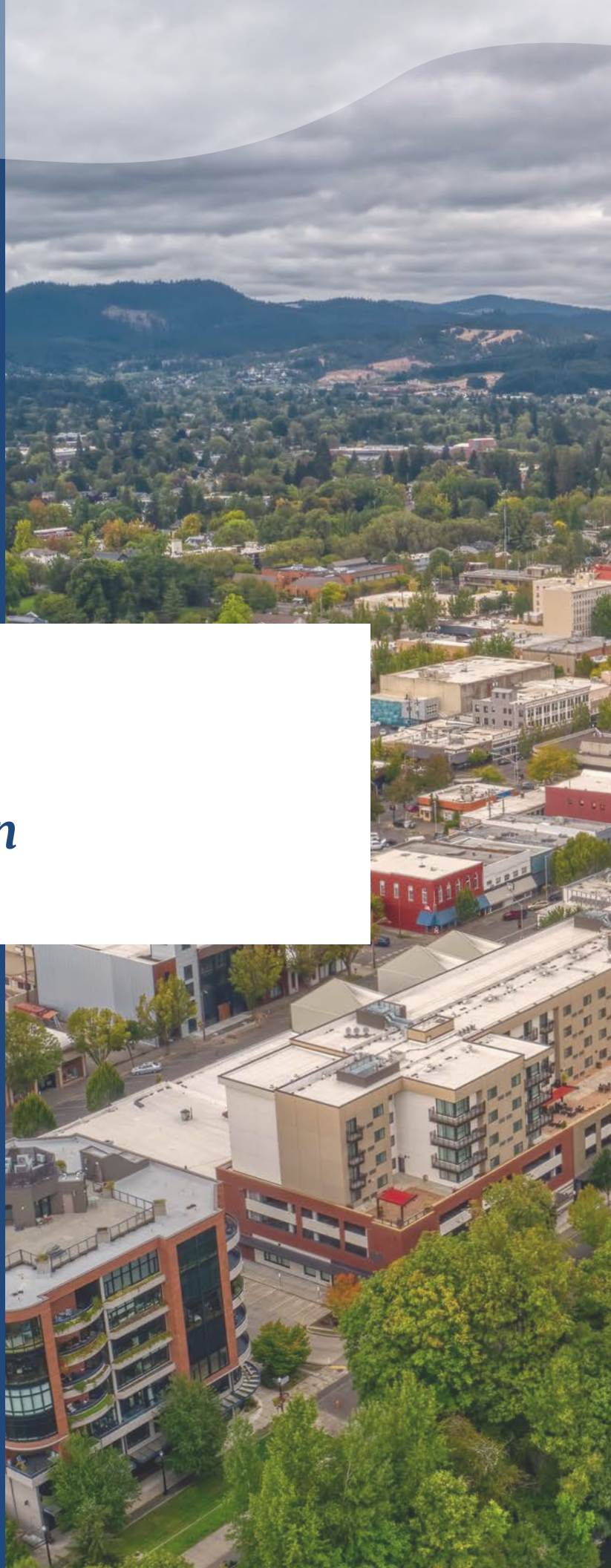
The TSAP incorporates roadway risk assessment using crash data from 2018 to 2022, and extensive community input to identify where and how the County can take action to improve safety. It focuses on five emphasis areas that contribute most significantly to high severity crashes and are repeatedly raised by community members as areas of concern:



These emphasis areas form the foundation for both systemic strategies and location-specific projects. Using a layered approach that combines crash history, roadway risk factors, demographic analysis, and public input, the TSAP identifies a High Priority Network (HPN) comprised of corridors and intersections with the greatest potential for impactful safety improvements. The HPN includes locations that are both historically dangerous and inherently high-risk. In accordance with Benton County's 2019 Transportation System Plan, which identified Independence Highway, Springhill Drive, Bellfountain Road, and Fern Road as key multimodal corridors, this TSAP evaluates existing conditions, traffic data, and community feedback to develop targeted bicycle- and freight-focused safety strategies for these locations.

The TSAP recommends targeted updates to existing County processes and design standards to strengthen the effectiveness of safety investments and support progress toward the Plan's goals. Overall, it positions Benton County well to pursue state and federal funding programs that will accelerate progress toward zero deaths.

The Plan also includes a performance monitoring framework to track implementation and results. Benton County will measure progress annually through a combination of outcome and output measures.



CHAPTER 1

Introduction

Benton County is committed to eliminating fatalities and serious injury crashes on County roads. The Benton County Transportation Safety Action Plan (TSAP) outlines strategies to achieve this goal.

Based on crash data analysis, community input, and proven safety strategies, this TSAP presents a prioritized set of projects to guide future investments in improving road safety. It identifies the key risk factors contributing to severe crashes and recommends targeted strategies to address them. The plan also establishes process and policy recommendations to support effective implementation and help achieve the TSAP's vision.

ABOUT BENTON COUNTY

Benton County sits in the heart of Oregon's Willamette Valley among agricultural areas and forest lands. Almost 100,000 people live in Benton County across five cities and several small rural communities.[1] The City of Corvallis, the county seat and primary population center, serves as the region's hub for employment, education, and transportation, with Oregon State University integrated into the community and contributing to daily travel patterns.

Benton County does not have a major interstate highway running through it. As a result, travel relies heavily on state highways and county roads that serve a wide range of users, including residents, agricultural and logging vehicles, freight traffic, people biking, and visitors traveling to outdoor and recreational destinations. This rural roadway environment characterized by higher speeds, curves, narrow shoulders, and limited lighting presents unique safety challenges that underscore the importance of targeted strategies to reduce fatal and serious injury crashes.

1 Portland State University Population Research Center. Certified Population Estimate July 2025.

WHY DOES BENTON COUNTY NEED A TSAP?

Based on five years of data (2018 to 2022) provided by the Oregon Department of Transportation (ODOT), 3,830 traffic crashes took place in the county, including 40 crashes where at least one person lost their life and 166 crashes where at least one person was seriously injured. Looking at the total number of crashes by year (**FIGURE 1**), the totals have fluctuated over time, with the lowest crash frequency in 2020 (likely reflective of the overall reduction in vehicle miles traveled during the COVID-19 pandemic). The total number of crashes in recent years have been lower than the pre-pandemic levels, yet the number and proportion of fatal and serious injury crashes has increased. The fatal and serious injury crash history shows an alarming trend: in 2022 alone, 12 fatal crashes were reported, the highest number in five years. That year, 8% of crashes resulted in fatalities or serious injuries, almost twice the proportion reported in 2018 (**FIGURE 2**).

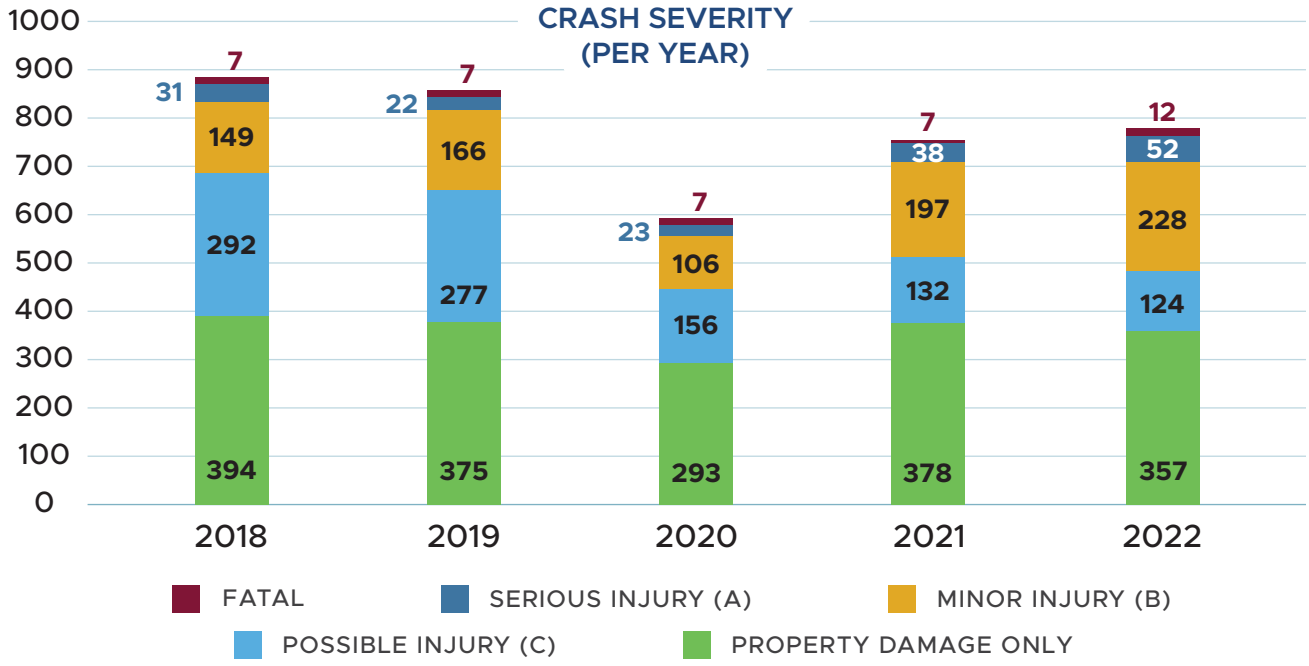


FIGURE 1. BENTON COUNTY CRASH SEVERITY BY YEAR (2018–2022)

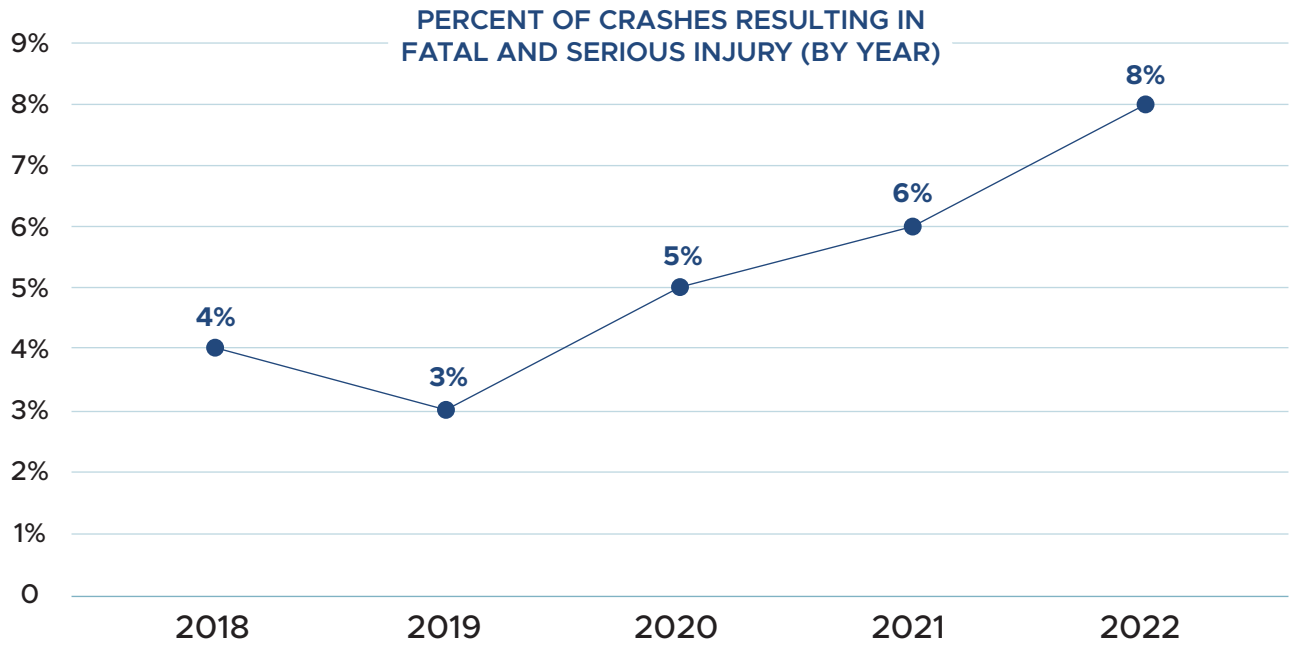


FIGURE 2. PERCENT OF CRASHES RESULTING IN FATAL OR SERIOUS INJURY BY YEAR (2018-2022)

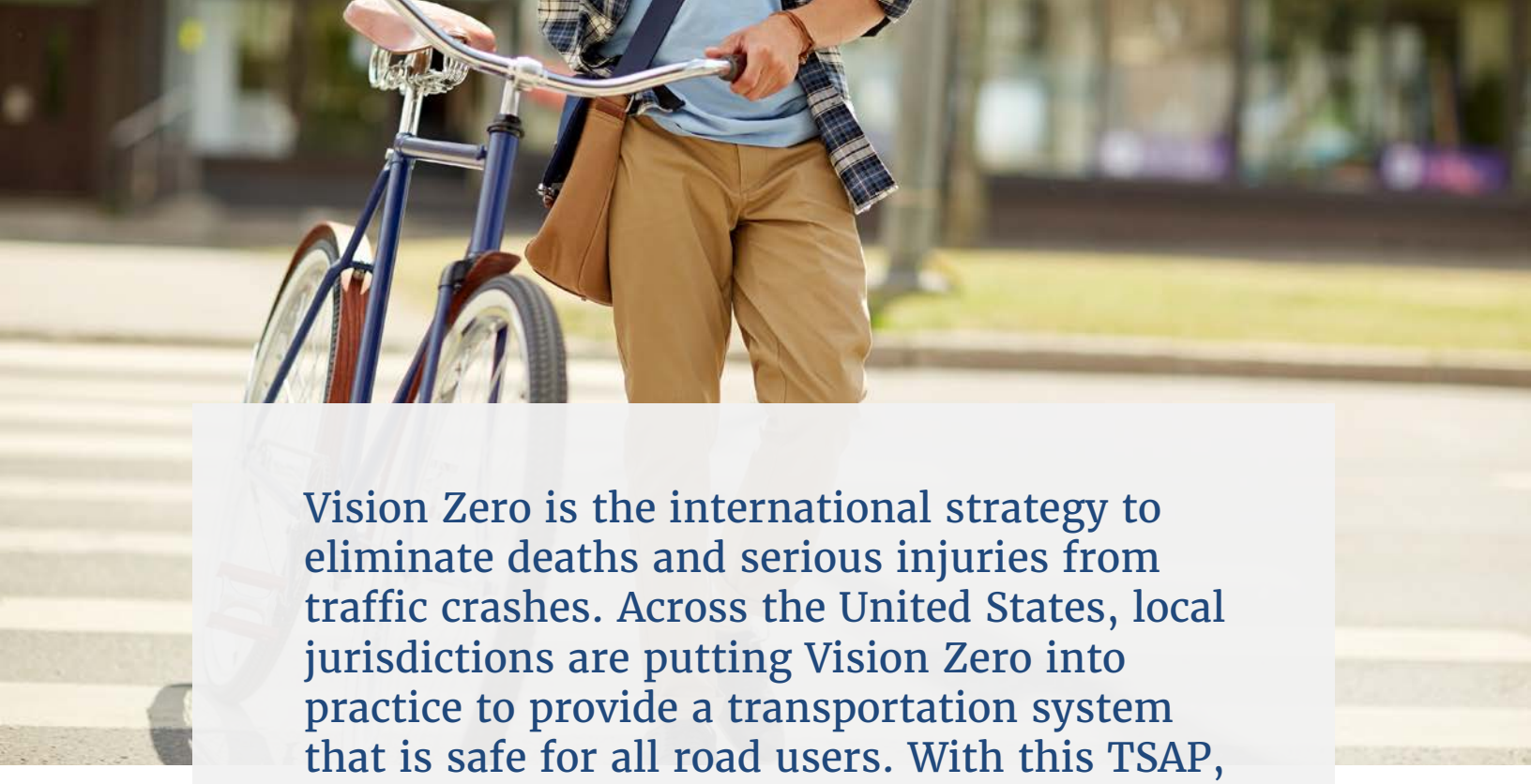
Nearly half of fatal and serious injury crashes (47%) involved a vehicle leaving the roadway. These types of crashes are especially common on rural roadways like those in Benton County, which have high travel speeds, curves, and narrow, steep shoulders with little room to recover. In many cases, drivers hit fixed objects like trees or utility poles after departing the road, leading to a high risk of severe injury.

On average, 60% of the total crashes and 37% of fatal and serious injury crashes occurred in the City of Corvalis. Benton County and the City of Corvallis worked in strong partnership throughout the TSAP development to ensure a coordinated and complementary approach to improving safety across jurisdictional boundaries. Benton County is ready to embrace the Safe System Approach, which is a framework to achieve zero fatal and serious injury crashes. The Benton County TSAP reflects our commitment to building a safer future for everyone on our roads.

Benton County's goal is to eliminate serious injuries and fatalities on County roads by 2040 and achieve a 50% reduction by 2035.

CHAPTER 2

TSAP Framework



Vision Zero is the international strategy to eliminate deaths and serious injuries from traffic crashes. Across the United States, local jurisdictions are putting Vision Zero into practice to provide a transportation system that is safe for all road users. With this TSAP, Benton County joins the effort toward zero traffic deaths.

The Safe System Approach, shown in **FIGURE 3**, is the framework for achieving Vision Zero. While traditional road safety practices focused on preventing crashes by modifying human behavior, the Safe System Approach shifts from this philosophy by acknowledging a shared responsibility for creating and maintaining a transportation system designed with built-in redundancy. This holistic, multi-faceted approach recognizes the vulnerability of road users as humans who make mistakes, focusing on anticipating error and minimizing harmful crash forces. Above all, the Safe System Approach prioritizes the protection of human life, with the ultimate goal to eliminate death and serious injury.

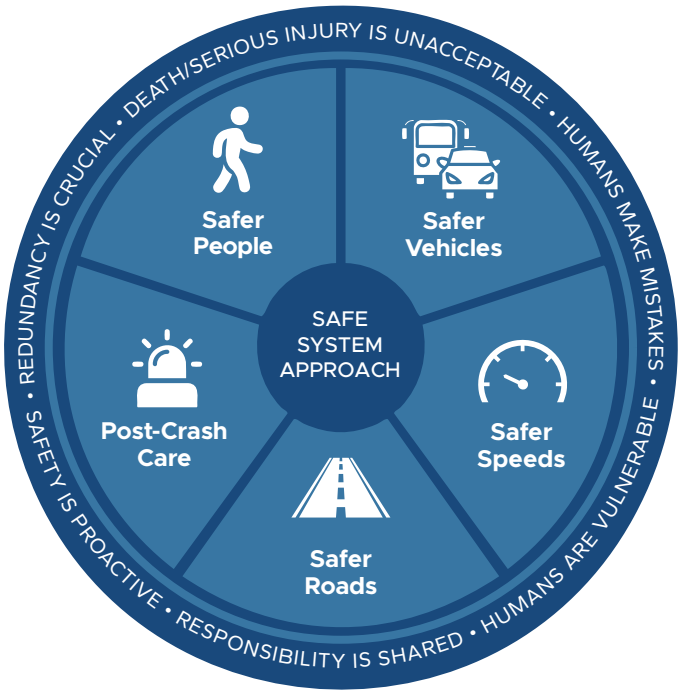


FIGURE 3. SAFE SYSTEM APPROACH

SAFE SYSTEM APPROACH PRINCIPLES

DEATH AND SERIOUS INJURY ARE UNACCEPTABLE – A Safe System Approach prioritizes eliminating crashes that result in death and serious injuries.

HUMANS MAKE MISTAKES – People will inevitably make mistakes; the transportation system should be designed to accommodate certain types and levels of human errors.

HUMANS ARE VULNERABLE – Humans can only tolerate a certain level of forces before serious injury or death occurs; the transportation system should be designed to reflect the physical limits of the human body.

RESPONSIBILITY IS SHARED – Every individual plays an important role in preventing fatalities and serious injuries.

SAFETY IS PROACTIVE – Utilize proactive tools to identify and address safety issues in the transportation system, instead of waiting for crashes to occur.

REDUNDANCY IS CRUCIAL – If one element fails, the other elements should be robust enough to protect people.

SAFE SYSTEM APPROACH OBJECTIVES

SAFER PEOPLE – Encourage safe and responsible behaviors.

SAFER VEHICLES – Expand the deployment of vehicle technologies and safety features that prevent crashes and reduce crash severity for both vehicle occupants and other road users.

SAFER SPEEDS – Promote safer speeds in all roadway environments through design, speed limit setting, education, outreach, and enforcement.

SAFER ROADS – Design the transportation system to mitigate human mistakes, account for injury intolerances, and facilitate safe travel of vulnerable road users.

POST-CRASH CARE – Enhance the quality and timeliness of emergency services, create a safe working environment for first responders, and prevent secondary crashes.

A key tenet of the Safe System Approach is the importance of building layers of redundancy to keep people safe. By investing in multiple forms of protection, we ensure that if one part of the system fails, there are more opportunities to either prevent the crash from occurring or minimize the severity of injuries that result.

This TSAP uses the Safe System Approach as the guiding framework for identifying safety needs and for matching those needs to a set of effective, holistic solutions that have the best chance of preventing death and serious injury on our roadways.

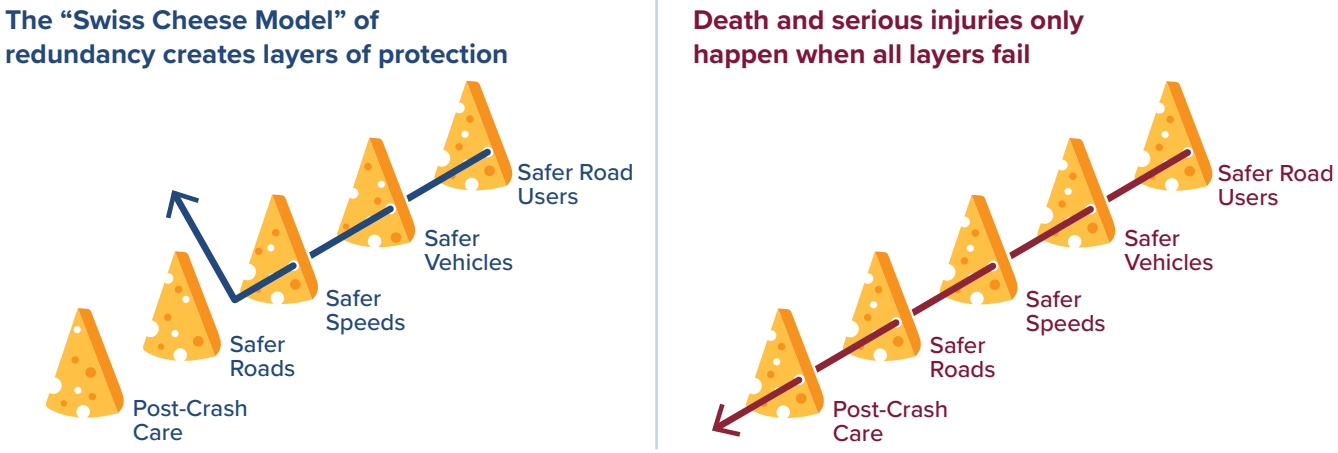


FIGURE 4. SAFE SYSTEM APPROACH DEMONSTRATION USING A SWISS CHEESE MODEL[1]

TSAP DEVELOPMENT PROCESS

The development of this TSAP took place in three primary phases, with each being informed by data, the project Task Force, and community feedback (see **FIGURE 5**). The Task Force was a group of residents consisting of both everyday commuters to professionals of the transportation industry that shared local perspectives throughout the project, guided project prioritization and safety recommendations, and promoted public engagement.

UNDERSTAND & PRIORITIZE safety challenges by analyzing crash data, identify emphasis areas and high injury network. Collect community feedback on safety concerns;

DEVELOP SOLUTIONS that target crash trends, high priority locations, and create effective safety policies and processes; and

RECOMMEND & APPROVE a performance monitoring process and obtain Board of Commissioners approval of the TSAP.

1 Source: FHWA – Vision Zero Toolkit

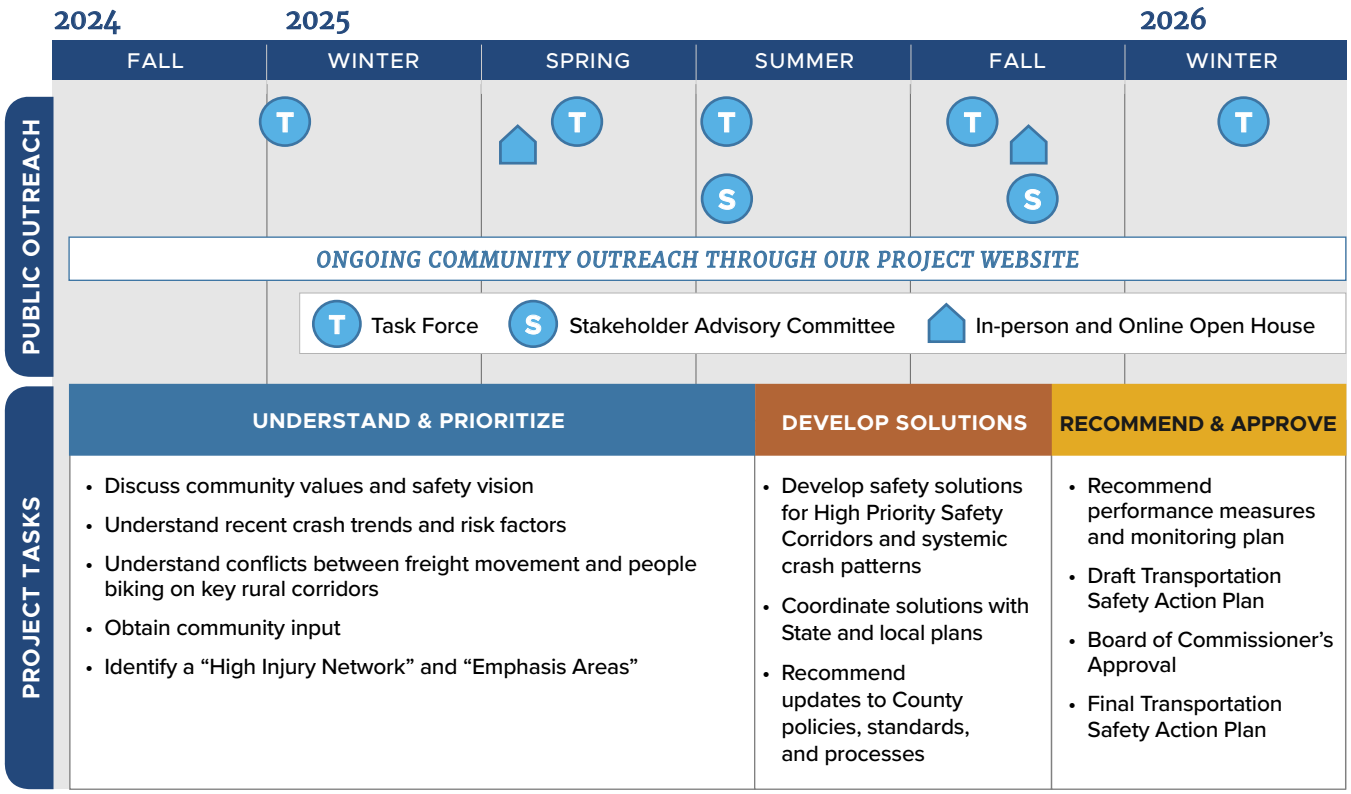


FIGURE 5. TSAP DEVELOPMENT PROCESS

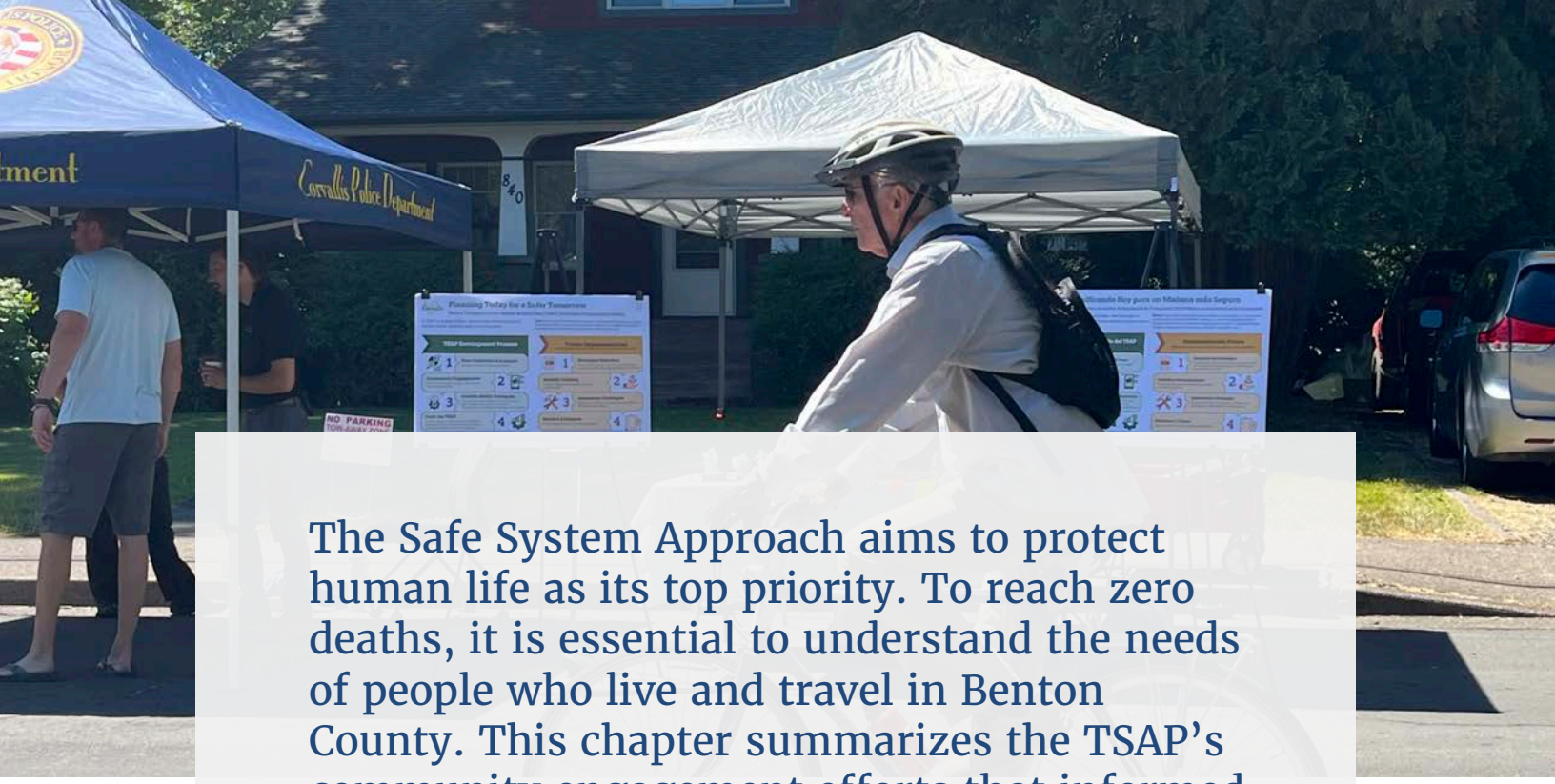
COORDINATION WITH THE CITY OF CORVALLIS TSAP

Benton County and the City of Corvallis closely coordinated throughout the development of their respective Transportation Safety Action Plans to ensure a consistent, efficient, and mutually supportive approach to improving roadway safety. The two agencies formalized their partnership through a memorandum of understanding in May 2024 that outlined shared goals, roles, and coordination protocols. This collaboration included cross-representation on project management teams and advisory committees, aligned project schedules, shared access to project management platforms, and regular coordination meetings to review findings and ensure consistency across analyses, recommendations, and deliverables.

Coordination extended beyond project management to include data analysis, community engagement, demographic analysis, and strategy development. Crash data collection and analysis were coordinated to avoid duplication and ensure comparable results, while joint public outreach activities such as combined open houses, shared online comment maps, and coordinated messaging helped present a clear and unified process to the community. This strong partnership positions both agencies to pursue coordinated implementation where feasible and joint funding opportunities as applicable while advancing a shared commitment to reducing fatal and serious injury crashes across Benton County and the City of Corvallis.

CHAPTER 3

Community Engagement



The Safe System Approach aims to protect human life as its top priority. To reach zero deaths, it is essential to understand the needs of people who live and travel in Benton County. This chapter summarizes the TSAP's community engagement efforts that informed the selection of projects and strategies.

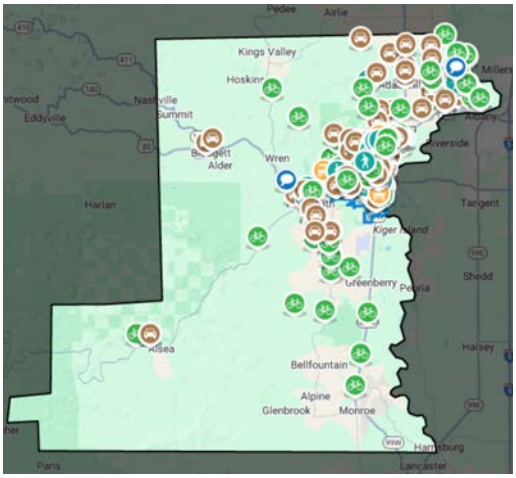
As part of this plan, interested party interviews were conducted to address the issues on multimodal corridors (Independence Highway, Springhill Drive, Bellfountain Road, and Fern Road) which were focused on bicycle- and freight-specific safety concerns.

Public Engagement In-Person Events: Philomath 'Strengthening Rural Families' Fair (left); outreach in Adair Village (right)

COMMUNITY ENGAGEMENT

Community engagement is a foundational element of the Benton County TSAP and was designed to ensure that the Plan reflects the lived experiences, safety concerns, and priorities of people who travel throughout the county. A TSAP Task Force provided ongoing input throughout plan development by providing continuous guidance and validating recommendations based on on-the-ground travel conditions. Community engagement activities were structured to offer a range of formats, including in-person and online mapping, written and online project location comments, and a project website form open for ongoing comment submission throughout the project duration. Engagement tools and methods were designed to reduce participation barriers, including fully bilingual (English/Spanish) materials, family-friendly in-person events, and outreach through trusted community channels such as food pantries and community-based organizations. Interested party interviews were also conducted to address the issues on multimodal corridors (Independence Highway, Springhill Drive, Bellfountain Road, and Fern Road) which were focused on bicycle- and freight-specific safety concerns. In addition to corridor-specific insight, these interviews also provided broader perspectives on countywide transportation safety challenges.

Benton County coordinated closely with the City of Corvallis throughout the engagement process to align outreach efforts, share tools, and make efficient use of resources. This coordinated approach reduced duplication, expanded overall reach, and helped identify shared safety challenges across jurisdictional boundaries, while also positioning both agencies for future joint implementation and funding opportunities.



Online comment map from virtual outreach session

Public engagement occurred in two primary phases (Spring 2025 and Fall 2025). The first phase focused on identifying safety concerns and high-risk locations, while the second phase centered on gathering feedback on recommendations, including high-priority projects, multimodal corridor improvements, and countywide safety strategies.

Two rounds of in-person and online open houses provided opportunities for community members to review project information and provide feedback during both engagement phases. An interactive safety comment map, integrated into the first round of engagement, allowed community members to submit location-specific safety concerns and near-miss experiences, complementing crash data analysis by capturing local knowledge and perceived risks particularly in rural areas and at locations where safety issues may not be fully represented in the crash data.

During the second round of outreach, the project team intentionally supplemented traditional engagement formats by prioritizing pop-up engagement at existing community events and gathering places to broaden awareness and expand opportunities for participation.

FIGURE 6. SUMMARY OF ENGAGEMENT ACTIVITIES

OUTREACH PHASES	ENGAGEMENT ACTIVITY	PARTICIPATION
SPRING 2025	• Oregon State University's Transportation Services Department Outreach Event • In-Person Open House in Adair Village • In-Person Open House in Corvallis (Benton County and City of Corvallis) • In-Person Open House in Monroe • Online Open House • Interactive Safety Comment Map • Corvallis Open Street Event • Interested Party Interviews (Freight, Bicycle, Neighborhood, Agricultural Representatives)	161 ATTENDEES 6,622 WEBSITE VIEWS 830 COMMENTS 7 INTERVIEWS
FALL 2025	• Philomath Fire & Rescue and Strengthening Rural Families Open and House And Health Fair • Oregon State University's Transportation Services Department Outreach Event • Albany Saturday Farmers Market • Corvallis Saturday Farmers Market • Online Open House • In-Person Open House in Corvallis (Benton County and City of Corvallis) • North Albany Neighborhood Association Meeting • Mid-Valley Bicycle Club Meeting	249 ATTENDEES 264 WEBSITE VIEWS 24 COMMENTS

Community feedback collected across both rounds of engagement consistently highlighted four primary safety concerns on Benton County roadways. The most frequently identified issue were:

Inadequate bicycle infrastructure, particularly on rural corridors with narrow or deteriorated shoulders where people biking must share space with high-speed vehicles and freight traffic.

Speeding and aggressive driving is observed on rural roads, combined with limited enforcement which significantly increase crash risk and severity.

Limited sight distance and intersection visibility issues are often observed at curves, hills, vegetation, or roadway geometry especially at rural intersections and access points.

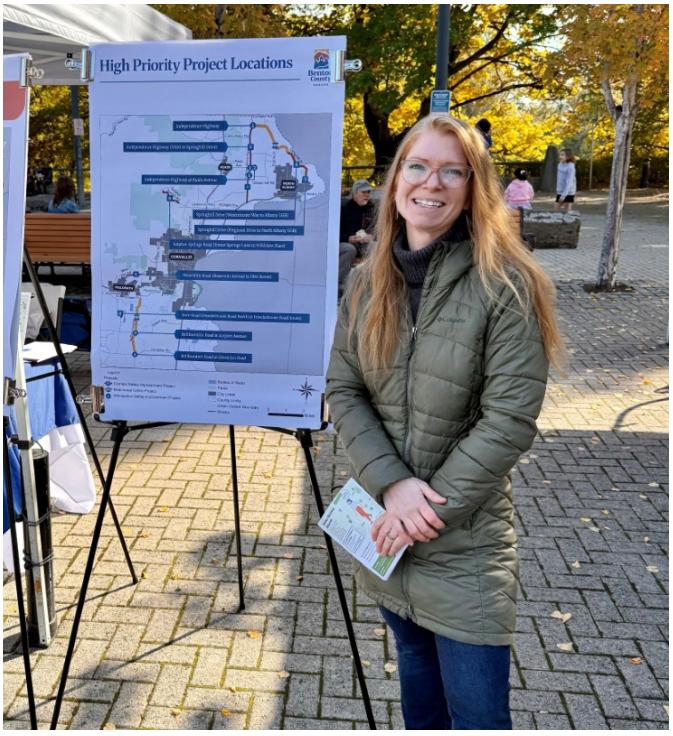
Roadway design and maintenance conditions means poor pavement quality, gravel and debris on shoulders, and abrupt pavement edges, which create hazards for all users and disproportionately affect people walking and biking.

OUTREACH EFFORT FOR MULTIMODAL CORRIDORS

As part of the TSAP, the County evaluated four rural corridors Springhill Drive, Independence Highway, Fern Road, and Bellfountain Road that play a critical role in both regional freight movement and bicycle travel.

To better understand challenges along these corridors and broader rural roadway safety concerns, the project team conducted seven interested party interviews between March and June 2025 using both virtual and in-person formats with freight operators, neighborhood representatives, agricultural and forestry interests, and bicycle advocacy groups. The interviews focused on how each corridor is used, key safety concerns related to truck–bicycle interactions, and opportunities to improve safety while maintaining the corridors' functional roles.

Across all four corridors, interview participants consistently identified narrow lanes and shoulders, limited sight distance on curves and hills, high vehicle speeds, and deteriorating pavement conditions as major contributors to safety risk. Freight operators emphasized how soft shoulders, roadway ruts, and tight intersections force large vehicles toward opposing lanes, increasing conflict potential. Bicycle interested party described frequent near-misses, unsafe passing behavior, and avoidance of certain corridors due to perceived danger particularly on Independence Highway and Fern Road.



North Albany Neighborhood Association outreach session (top); outreach event at the Corvallis Farmers' Market (bottom)

CHAPTER 4

Safety Analysis

Identifying the most effective safety strategies requires a clear understanding of the underlying causes of fatal and serious injury crashes.

This TSAP is grounded in a comprehensive, data-driven analysis of historical crash data from 2018 to 2022, combined with an inventory of the County roadway system and an assessment of known risk factors that increase the likelihood of severe crashes.

T-intersection (left) and crosswalk (right) in Monroe.

FATAL AND SERIOUS INJURY CRASH TRENDS

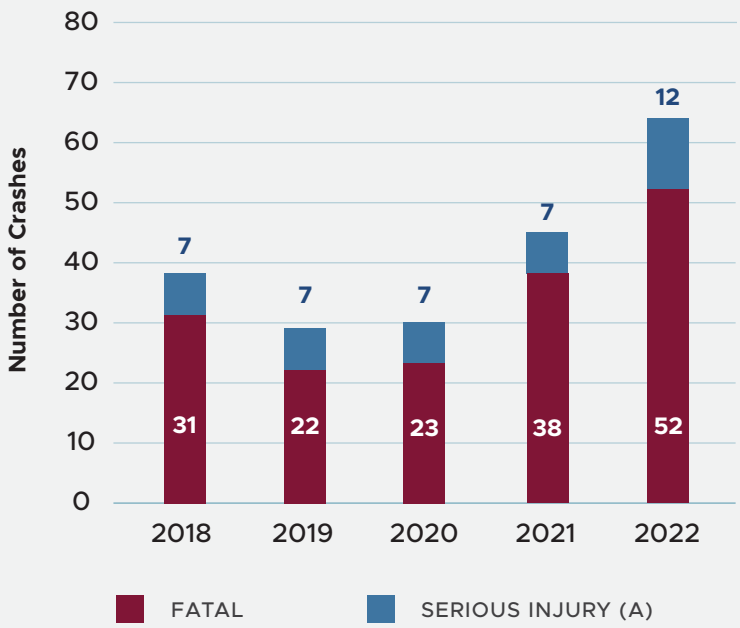
206
Fatal or serious injury crashes

42
Average fatal or serious injury crashes per year

Preliminary data indicates that another **50** fatal or serious injury crashes occured in 2023 and **8** fatal crashes occurred in 2024.

The proportion of fatal and serious injury crashes has nearly doubled from **4.4%** in 2018 to **8.3%** in 2022.

FATAL AND SERIOUS INJURY CRASHES (PER YEAR)



MOST COMMON CRASH TYPES:

33%
Road departure (Fixed object)

17%
Turning at intersections or driveways

12%
Lane departure (Head-on)

9%
Pedestrian-related

TOP CONTRIBUTING FACTORS:

21%
Failure to yield

17%
Speeding

11%
Driving too fast for conditions (not exceeding speed limit)

10%
Improper driving (e.g., failure to navigate the roadway alignment, disregarding traffic signs)

FIGURE 7 presents the location where fatal and serious injury crashes occurred from 2018 to 2022. These crash hotspots served as a key input in developing the High Injury Network (HIN).

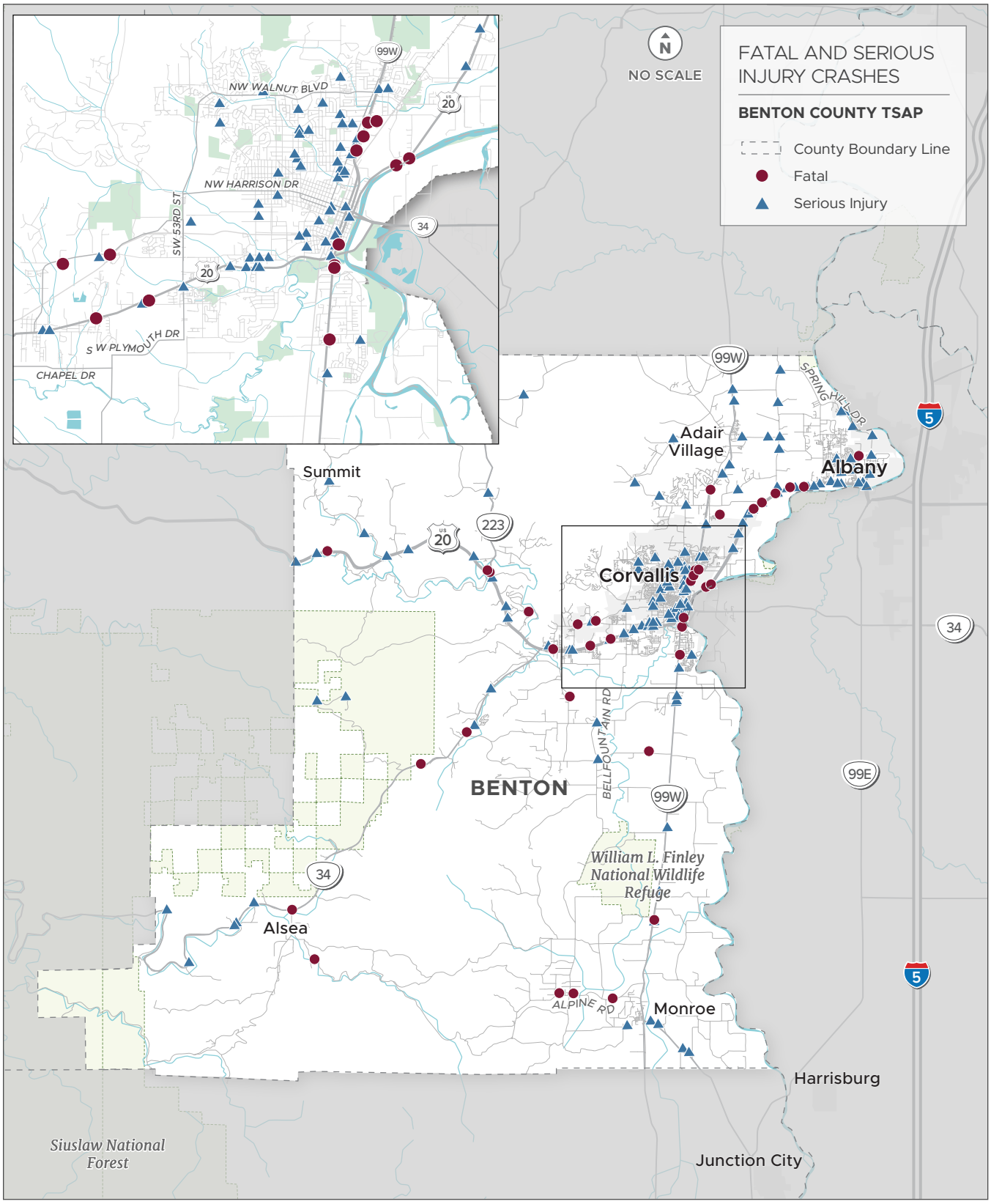


FIGURE 7. FATAL AND SERIOUS INJURY CRASHES IN BENTON COUNTY (2018-2022)

EMPHASIS AREAS

Based on the results of crash data analysis and input from the project Task Force, five Emphasis Areas were selected that reflect the community's top concerns and most frequent factors in fatal and serious injury crashes. Benton County will target these Emphasis Areas using specific strategies and projects to ensure that investments are used most effectively. The corresponding table in Chapter 5 provides a collection of systemic strategies to address the County's specific safety challenges.

ROAD OR LANE DEPARTURES

RISKY BEHAVIORS
(IMPAIRMENT, DISTRACTION, AND SPEEDING)

INTERSECTIONS

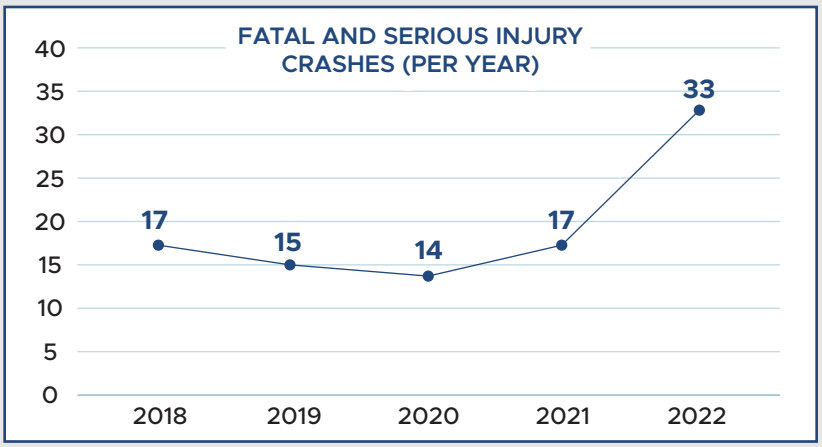
AGING DRIVERS (65+ YEARS OF AGE)

PEOPLE BIKING

ROAD OR LANE DEPARTURES

DESCRIPTION

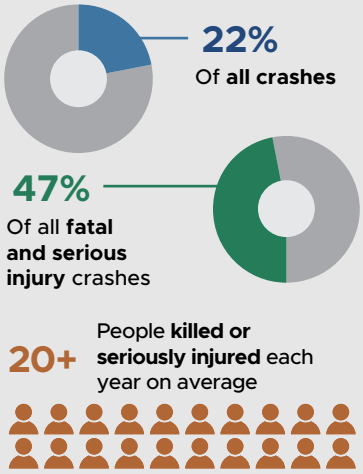
Road or lane departure crashes occur when a vehicle veers out of its travel lane and leaves the roadway or crosses into opposing lanes. These crashes often involve a single vehicle striking a fixed object or rolling over. They are especially common on rural roads with curves, steep grades, or narrow shoulders.



ROAD OR LANE DEPARTURE CRASH STATISTICS (FATAL AND SERIOUS INJURY ONLY)

FACTORS SHOWN BELOW ARE NOT MUTUALLY-EXCLUSIVE

ATTRIBUTED TO



22% Of **all crashes**

47% Of all **fatal and serious injury** crashes

20+ People **killed or seriously injured** each year on average

PERCENT OF ROAD OR LANE DEPARTURE CRASHES THAT ALSO INVOLVED

29%

28%

26%

65+ **24%**

OTHER NOTABLE FACTORS

61% Struck a fixed object

31% On horizontal curve

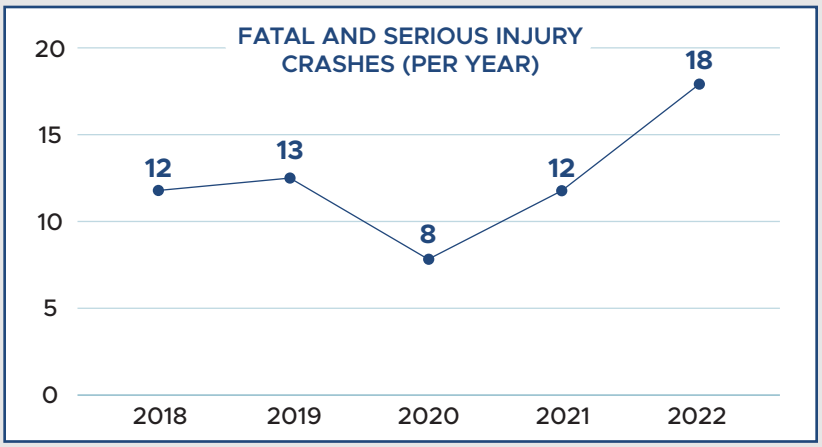
25% Struck another vehicle head-on

20% Driving too fast for conditions (not exceeding speed limit)

RISKY BEHAVIORS (IMPAIRMENT, DISTRACTION, AND SPEEDING)

DESCRIPTION

Risky behaviors include driving impaired by alcohol or drugs, distracted driving, and exceeding the posted speed limit and/or driving too fast for conditions. These contributing factors are not mutually exclusive; many crashes involve more than one of these behaviors. Risky driving behaviors reduce a driver's ability to avoid collisions and increase the severity of crashes when they occur.



RISKY BEHAVIOR CRASH STATISTICS (FATAL AND SERIOUS INJURY ONLY)

FACTORS SHOWN BELOW ARE NOT MUTUALLY-EXCLUSIVE

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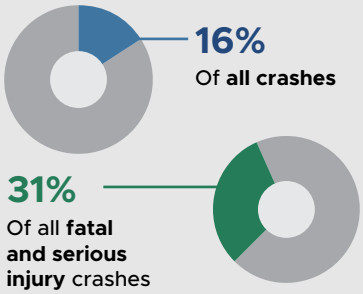


16% Of **all crashes**

31% Of all **fatal and serious injury** crashes

13+ People **killed or seriously injured** each year on average

PERCENT OF RISKY BEHAVIOR CRASHES THAT ALSO INVOLVED

57%

51%

16%

OTHER NOTABLE FACTORS

48% Struck a fixed object

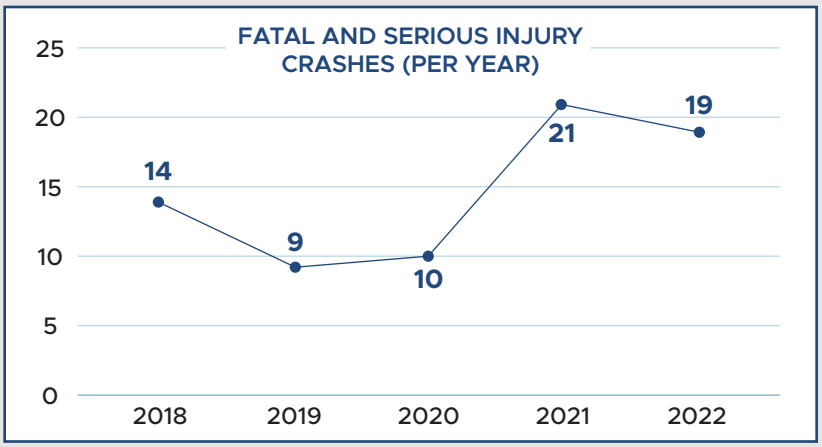
25% On horizontal curve

21% Struck another vehicle head-on

INTERSECTIONS

DESCRIPTION

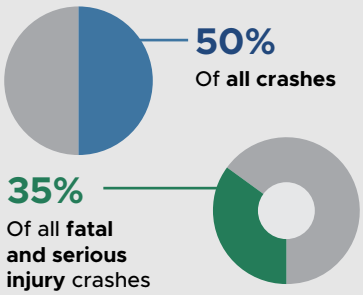
Intersections are high-conflict locations where two or more roadways meet. In rural areas, intersections commonly pose visibility challenges or lack traffic control devices. In small towns or unincorporated communities, they are a place where vehicles conflict with each other as well as bicyclists and pedestrians.



INTERSECTION CRASH STATISTICS (FATAL AND SERIOUS INJURY ONLY)

FACTORS SHOWN BELOW ARE NOT MUTUALLY-EXCLUSIVE

ATTRIBUTED TO



50% Of **all crashes**

35% Of all **fatal and serious injury** crashes

15 People **killed or seriously injured** each year on average

PERCENT OF INTERSECTION CRASHES THAT ALSO INVOLVED

65+ **27%**

<21 **18%**

11%

7%

OTHER NOTABLE FACTORS

42% Failure to yield

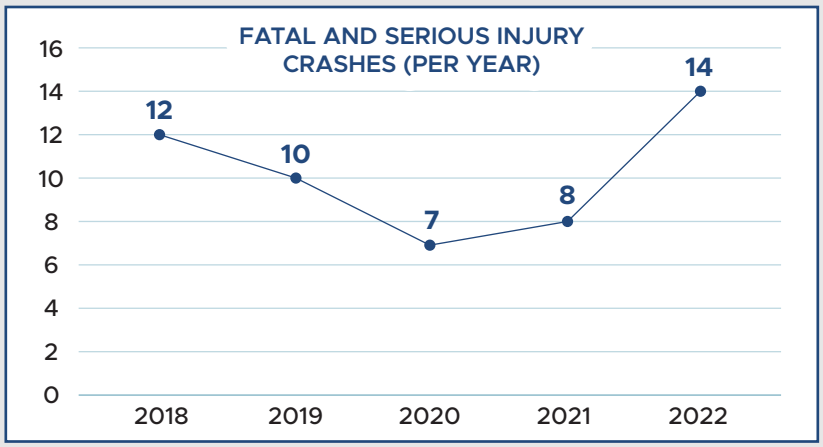
36% While turning

21% Struck another vehicle at an angle

65+ AGING DRIVERS (65+ YEARS OF AGE)

DESCRIPTION

Aging drivers may have physical or cognitive limitations that put them at greater risk for a crash to occur or make them more susceptible to serious injury.



AGING DRIVERS CRASH STATISTICS (FATAL AND SERIOUS INJURY ONLY)

FACTORS SHOWN BELOW ARE NOT MUTUALLY-EXCLUSIVE

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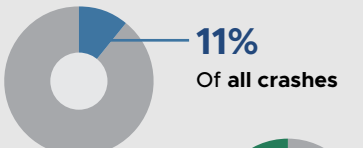


11% Of **all crashes**

25% Of all **fatal and serious injury** crashes

11+ People **killed or seriously injured** each year on average

PERCENT OF AGING DRIVER CRASHES THAT ALSO INVOLVED

45%

39%

OTHER NOTABLE FACTORS

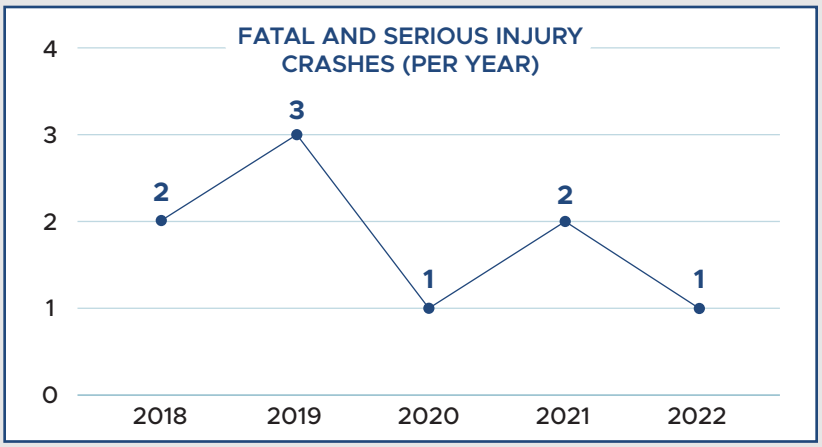
25% Failure to Yield

16% Other Improper Driving

PEOPLE BIKING

DESCRIPTION

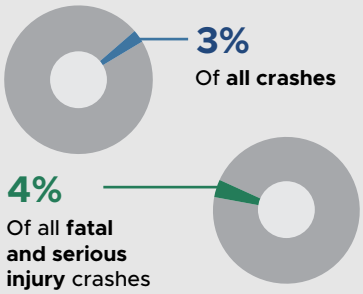
People biking are among the most vulnerable road users because they lack the protection of a vehicle frame while often traveling closest to the roadway or sharing the travel lane with vehicles. Bicycle facilities, such as bike lanes/shoulders and multiuse paths, are only available intermittently and often lack a physical barrier from vehicles.



PEOPLE BIKING CRASH STATISTICS (FATAL AND SERIOUS INJURY ONLY)

FACTORS SHOWN BELOW ARE NOT MUTUALLY-EXCLUSIVE

ATTRIBUTED TO



3%
Of **all crashes**

4%
Of all **fatal and serious injury** crashes

2+
People **killed or seriously injured** each year on average

PERCENT OF PEOPLE BIKING CRASHES THAT ALSO INVOLVED

56%

22%

OTHER NOTABLE FACTORS

44% Failure to Yield

HIGH INJURY NETWORK

The High Injury Network (HIN) is a subset of all roads in Benton County where the highest concentration of crashes took place. It is comprised of all roadway segments and intersections where fatal and serious injury crashes occurred. The number of intersections and roadway segments were refined using the Equivalent Property Damage Only (EPDO) method, which assigns numerical values to develop a location score that weighs fatal and serious injury crashes more highly. The weighting from ODOT's Safety Priority Index System (SPIS)[1] was used. Fatal and serious injury crashes were assigned a weight of 100, other injury crashes were assigned a weight of 10, and non-injury crashes were assigned a weight of 1. In other words, 1 fatal or serious injury crash is equivalent to 100 non-injury crashes for the purposes of High Injury Network identification.

The HIN forms the foundation of the High Priority Network. A map of the HIN can be found in the appendix (provided as a separate document).

Looking at the rural part of the county, excluding City of Corvallis, the SEI disadvantaged tracts include 13% of the county's area, 15% of the county's population, and 21% of the county's road miles, but experience ***28% of total crashes and 34% of the fatal and serious injury crashes****. Therefore, crashes, and specifically the crashes resulting in serious injuries and fatalities, are over-represented in SEI-disadvantaged tracts.*

Roadway and lane departure*,* ***intersections****, and* ***nighttime crashes*** *are the top three emphasis areas overrepresented in fatal and serious injury crashes in the SEI disadvantaged tract areas in Benton County.*

DEMOGRAPHIC ANALYSIS

Demographic characteristics such as age, income, and disability shape how people use the transportation network and the risks they face when traveling. Equal access to safe transportation is only possible when the system accommodates these differences. In communities where infrastructure is lacking or crashes are more frequent, people face disproportionate risks and fewer safe options to reach jobs, schools, and services.

To ensure that limited resources address the areas of greatest need, this TSAP includes a demographic-focused analysis that helps identify underserved communities where community members may face greater barriers to safe, reliable travel. This assessment used a data-driven tool, the Oregon Social Equity Index (SEI), developed by the Oregon Health Authority and ODOT, which scores each census tract based on demographic, health, and transportation indicators.

From the TSAP HIN sites, 38% of HIN intersections and 41% of HIN segments are located in SEI disadvantaged tract areas. The crashes in these areas have disproportionate impacts on residents' well-being, economic opportunity, and access to essential services; therefore, this information was used as one of three key inputs in identifying the High Priority Network (HPN). Summary of the demographic analysis is included in the appendix (provided as a separate document).

1 Safety Priority Index System (SPIS). https://www.oregon.gov/odot/Engineering/Docs_TrafficEng/SPIS-User-Guide.pdf

HIGH PRIORITY NETWORK

The High Priority Network (HPN) is comprised of roads and intersections with the greatest potential for location-specific safety improvements. To develop the HPN, important factors such crash history, emphasis area trends, demographics, and community feedback were applied to the High Injury Network to score and rank high-injury intersections and segments, resulting in a prioritized list of locations. Locations at the top of the list have a higher potential to experience a crash resulting in fatal or serious injury. This process for identifying the High Priority Network is illustrated in **FIGURE 8**.

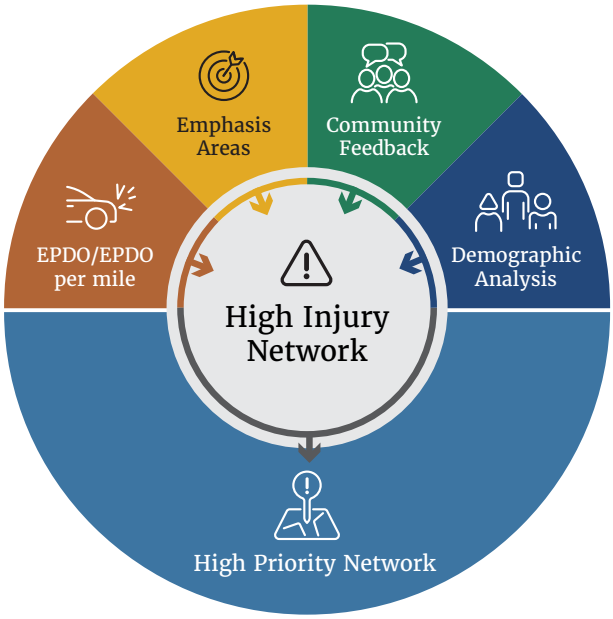


FIGURE 8. HIGH PRIORITY NETWORK DEVELOPMENT PROCESS

It is important to recognize that the HPN is not a boundary on where safety matters and where it does not. HPN is a tool to help Benton County invest in projects where safety interventions can make the greatest impact in reducing severe crashes.

Facilities owned by ODOT or the City of Corvallis were ranked as part of this analysis but removed from consideration for the HPN since the City is developing its TSAP simultaneously and implementing safety solutions on its facilities. The Top 10 ranked corridors and intersections on ODOT facilities are summarized in **FIGURE 9** to help the County engage ODOT in discussions about prioritizing State funds for safety improvement projects at these locations.

FIGURE 9. HIGH PRIORITY ODOT-OWNED CORRIDORS AND INTERSECTIONS FOR SAFETY IMPROVEMENTS

CORRIDORS

1. **OR 99W [4th St] (Western Blvd to Twin Oaks Cir South**
2. **US 20 [Philomath Blvd] (53rd St to Country Club Dr)**
3. US 20 (County Boundary to Corvallis city limits)
4. **US 20 [Philomath Blvd] (ODOT driveway to RR Overpass)**
5. **OR 99W (Walnut Blvd to Cornell Ave Overpass)**
6. OR 99W (3 Mile Ave to Barclay Ln)

INTERSECTIONS

1. US 20 & Granger Ave*
2. **US 20 [Philomath Blvd] & 35th St**
3. **OR 99W & Conifer Blvd**
4. US 20 & Independence Hwy*
5. **US 20 [Philomath Blvd] & Technology Loop**
6. **US 20 [Philomath Blvd] & Sunset Dr**

BOLD *locations are also identified by the City of Corvallis's as High Priority locations*

**These locations have recently undergone projects that may have enhanced safety*

The HPN for County-owned roadways is presented in **FIGURE 10**. The HPN locations are numbered based on their priority ranking.

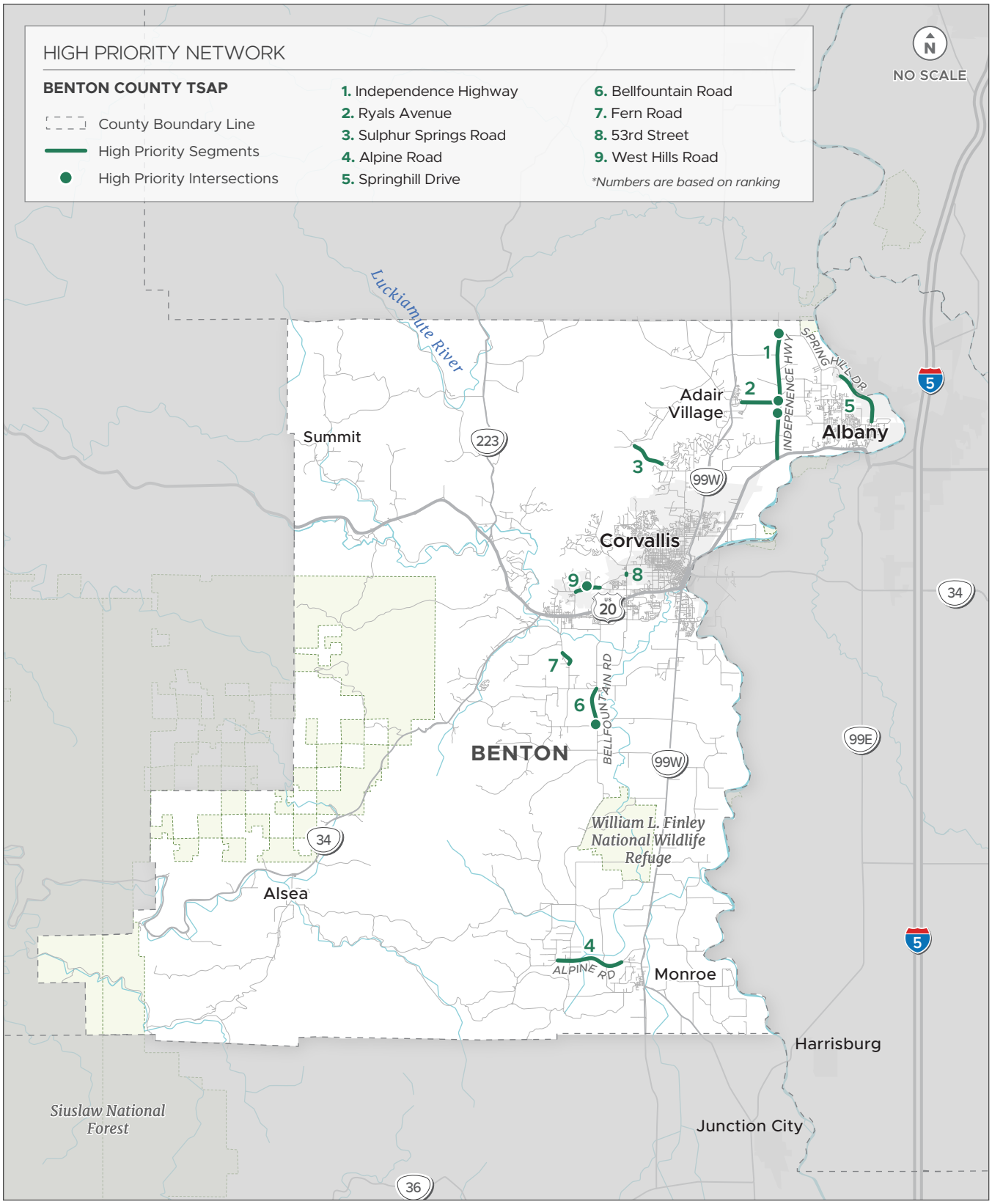


FIGURE 10. HIGH PRIORITY NETWORK

MULTIMODAL CORRIDORS

Benton County's 2019 Transportation System Plan recognized the need to improve safety on rural roadways that are shared by large trucks and people biking. This TSAP identified the four "Multimodal Corridors" of Independence Highway, Springhill Drive, Bellfountain Road, and Fern Road (shown in **FIGURE 11**), that play a critical role in both regional freight movement and bicycle travel. These corridors connect rural communities, support agricultural and timber industries, and provide access to recreational destinations, while also being used by people biking for recreation and commuting. Due to limited roadway width, high travel speeds, curves, and inconsistent shoulders, these corridors present significant safety challenges where large vehicles and people biking share space.

A summary of existing conditions, traffic data, and feedback received from community members is provided for each Multimodal Corridor. Specific strategies to improve safety in these locations are identified later in this plan.

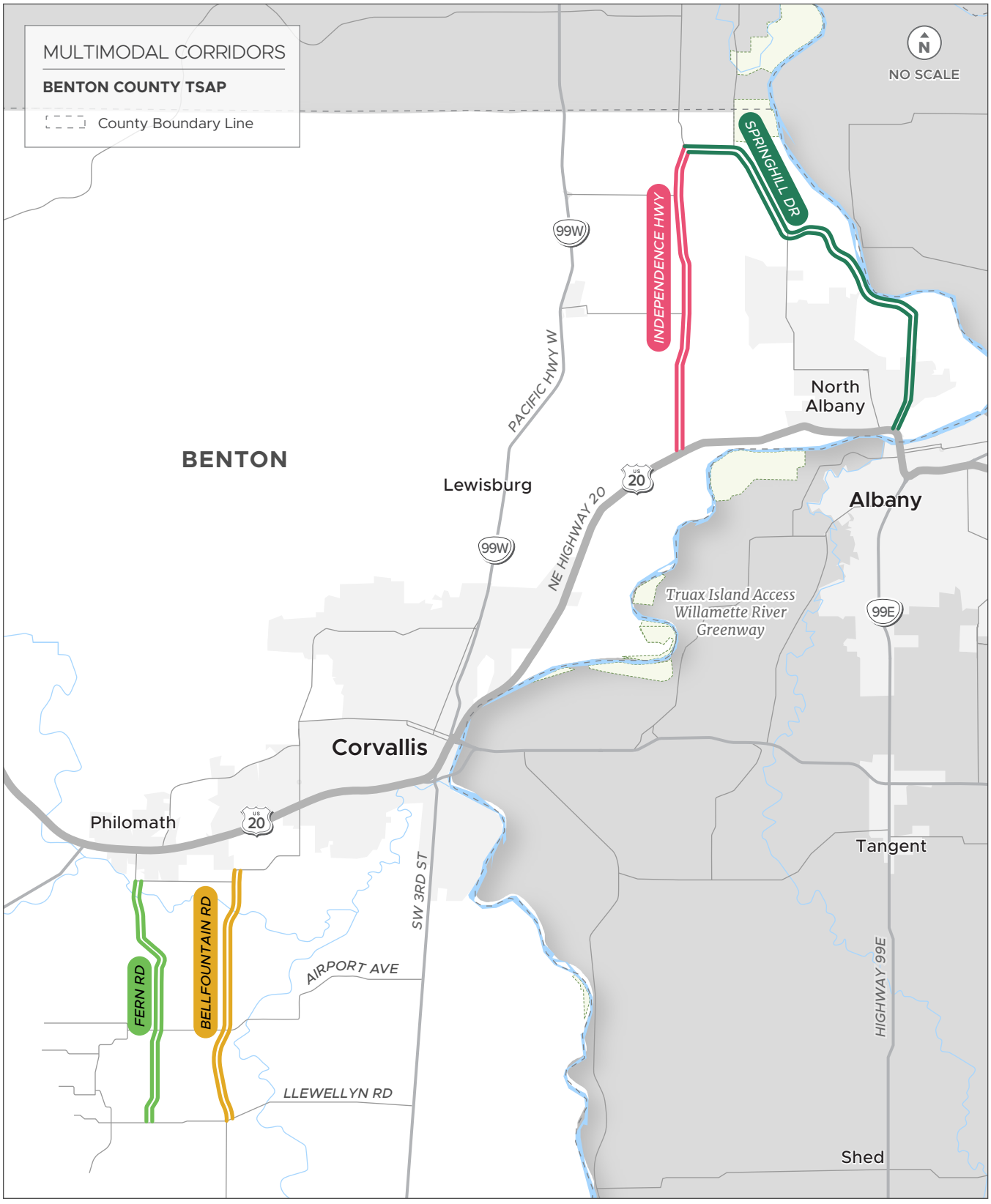


FIGURE 11. MULTIMODAL CORRIDORS

SPRINGHILL DRIVE

DESCRIPTION

Springhill Drive is a major collector and has posted speeds of 55 mph in the rural segment and 40 mph within the city limits. The rural segment from the North Albany city limits to Independence Highway is approximately six miles long and has two lanes with narrow shoulders and several horizontal curves. Unlike Independence Highway, which provides regional connectivity, Springhill Drive primarily serves the area north of Albany, though it has been used at times as an alternate route to Independence Highway.

TRAFFIC CHARACTERISTICS

TRAFFIC VOLUMES:

3,000–5,000
vehicles per day*

100
trucks per day*

85TH PERCENTILE SPEED:** **59 MPH**

CRASH CHARACTERISTICS:

63
Total Crashes

6
Serious Injury

32
(51%) Involved road or lane departure

2
Bike-related

**December 2024*

***In rural section*

COMMUNITY ENGAGEMENT FEEDBACK

FREIGHT-SPECIFIC

- Narrow lanes, limited shoulders, and curves create conflicts for larger vehicles and complicate sightlines
- Route used by garbage trucks and occasional logging trucks
- Wider shoulders needed to accommodate trucks and people biking

BIKE-SPECIFIC

- Poor sightline at curves, narrow shoulders, fast-moving vehicles
- North Albany residents' concerns for people biking and walking highlighted the need for wider shoulders, separated paths, sidewalks or buffered bike lanes to improve safety

INDEPENDENCE HIGHWAY

DESCRIPTION

Independence Highway is a minor arterial and is governed by Basic Rule.[1] Within the county, it is a nearly six-mile long, two-lane road with mostly narrow shoulders (shoulders have been widened from Metge Avenue to Ryals Avenue). It provides a parallel alternative to OR 99W west of the Willamette River, connecting US 20 and OR 22 and providing access to cities such as Adair Village and Independence, as well as to the Coffin Butte Landfill which is a major destination for truck traffic.

TRAFFIC CHARACTERISTICS

TRAFFIC VOLUMES:

3,500–4,000
vehicles per day*

900
trucks per day[2] *

85TH PERCENTILE SPEED: 63 MPH

CRASH CHARACTERISTICS:

34
Total Crashes

5
Serious Injury

21
(62%) Involved road or lane departure

8
Speed-related

3
Involved a truck

*December 2024

COMMUNITY ENGAGEMENT FEEDBACK

FREIGHT-SPECIFIC

- Republic Services report this corridor as a challenging route because of narrow lanes and shoulders, stopping for oncoming traffic and bikes due to lack of space for bikes and trucks
- Gravel spills are a recurring problem, and increased rock-hauling truck traffic in recent years
- Poor visibility at night

BIKE-SPECIFIC

- People biking avoid this corridor due to high vehicle speeds, narrow shoulders, aggressive truck drivers, lack of bike lanes

[1] *Travel on all public streets and highways in Oregon is subject to the "basic speed rule" as described under ORS 811.100. The basic speed rule states that a motorist must drive at a speed that is reasonable and prudent at all times.*

[2] *Travel on Independence Highway by Knife River rock trucks was greater than normal when the counts were obtained.*

BELLFOUNTAIN ROAD

DESCRIPTION

Bellfountain Road is a minor arterial roadway and has a posted speed of 50 mph from 0.5 miles north of Airport Road to Greenberry Road (MP 2.91 to MP 6.19), with the other segments governed by Basic Rule. It is a two-lane roadway, and north of Airport Avenue the paved shoulders are sufficiently wide for bicycle travel. However, south of that point, the shoulders are narrow (generally one-foot wide or less). Bellfountain Road is approximately 17.5 miles long, parallels OR 99W, and provides access to Monroe, Philomath, and many rural communities in between. It is also used to access recreational destinations.

TRAFFIC CHARACTERISTICS

TRAFFIC VOLUMES:

2,000–2,500
vehicles per day*

450
trucks per day*

85TH PERCENTILE SPEED: 63 MPH

CRASH CHARACTERISTICS:

40
Total Crashes

3
Serious Injury

15
(38%) Involved road or lane departure

*December 2024

COMMUNITY ENGAGEMENT FEEDBACK

FREIGHT-SPECIFIC

- Heavily used by logging trucks
- Ongoing safety concerns include narrow lanes, limited shoulders, road or lane departures
- Truck drivers noted poor visibility for people biking around curves

BIKE-SPECIFIC

- 5-foot shoulders are not consistent throughout the entire corridor—some areas have no shoulders
- Areas where there are no shoulders are uncomfortable for people biking due to truck traffic and fast-moving vehicles

FERN ROAD

DESCRIPTION

Fern Road is a major collector and is governed by Basic Rule. From Chapel Drive to Llewellyn Road, Fern Road is just under 4.5 miles long and has two lanes with narrow shoulders. Being a shorter road segment, it is primarily used for local access.

TRAFFIC CHARACTERISTICS

TRAFFIC VOLUMES:

1,500–2,000
vehicles per day*

300
trucks per day*

85TH PERCENTILE SPEED: **52 MPH**

CRASH CHARACTERISTICS:

12
Total Crashes

1
Fatal

6
(50%) Involved road or lane departure

*December 2024

COMMUNITY ENGAGEMENT FEEDBACK

FREIGHT-SPECIFIC

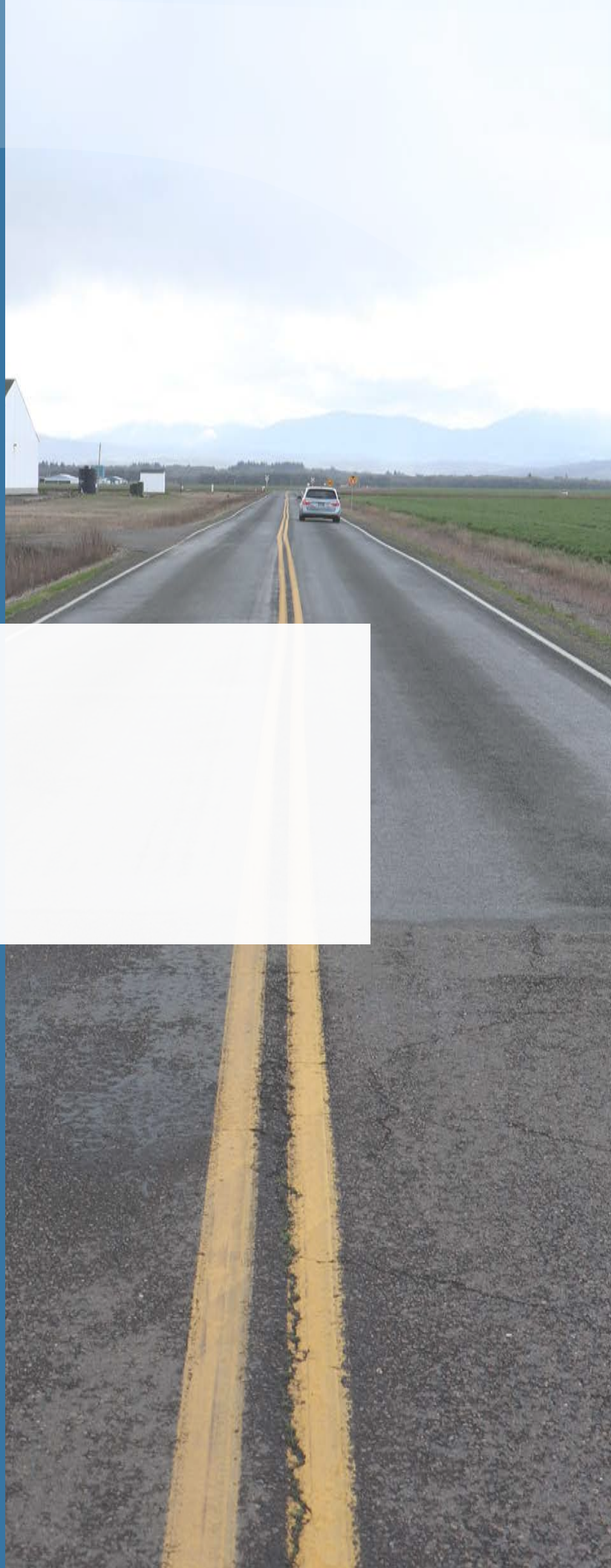
- Heavily used by logging trucks, construction vehicles, farm equipment, and heavy-haul freight
- Freight drivers report narrow lanes, soft shoulders, poor pavement conditions, street ruts that force trucks toward opposing lanes to be major concerns
- Safety concerns at intersections of Airport Avenue and Llewellyn Road

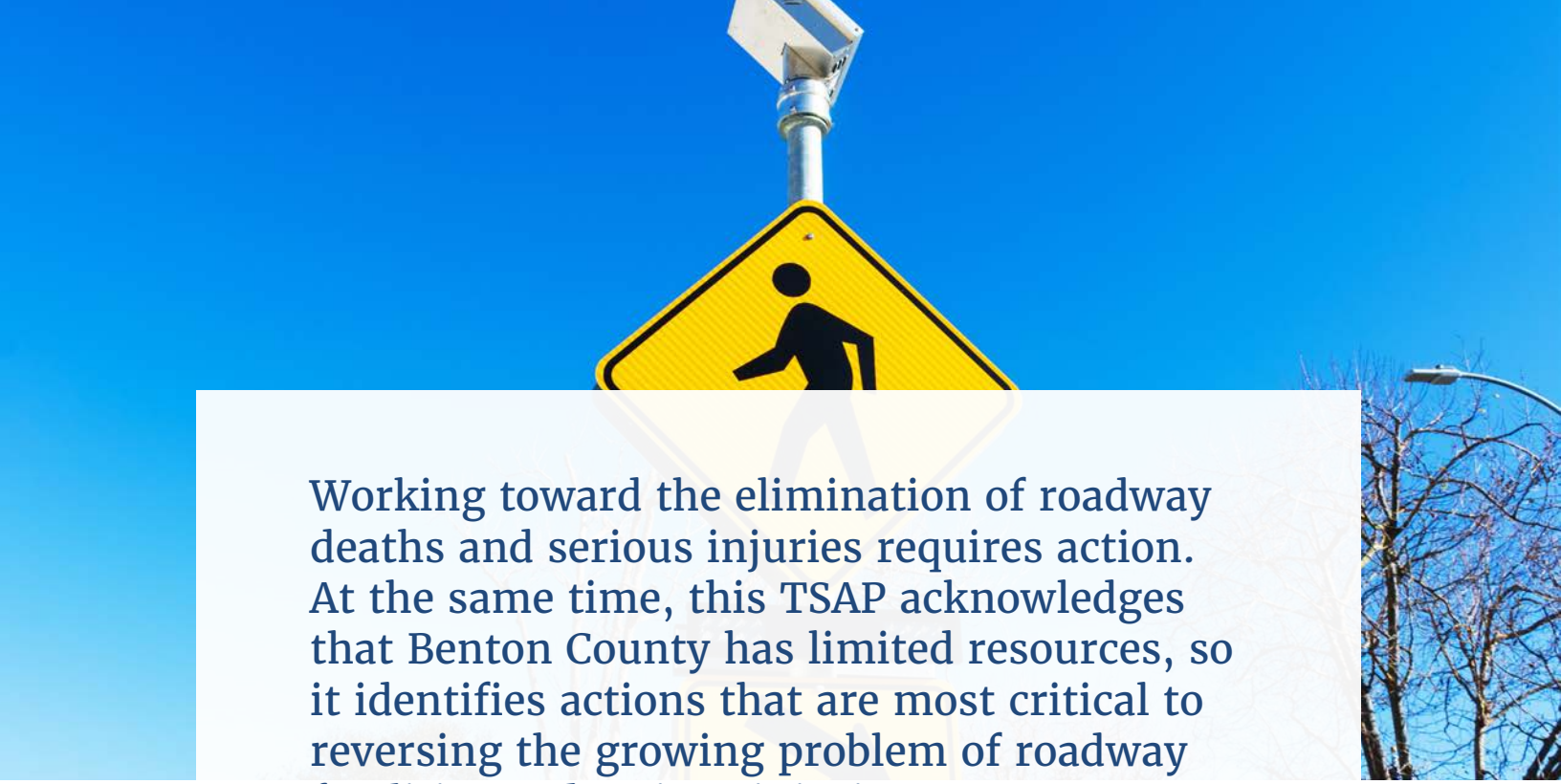
BIKE-SPECIFIC

- Frequent close calls between people biking and drivers attempting unsafe passes, particularly on curves where sightlines are poor
- Narrow roadway width, hills, blind curves, freight volumes are highly stressful for people biking

CHAPTER 5

Strategies





Working toward the elimination of roadway deaths and serious injuries requires action. At the same time, this TSAP acknowledges that Benton County has limited resources, so it identifies actions that are most critical to reversing the growing problem of roadway fatalities and serious injuries.

The following strategies will help the County focus on high-benefit efforts, track progress, and make informed decisions to improve safety in our community.

Strategies in this chapter are organized into three categories:

1. Systemic emphasis area strategies that apply broadly across the transportation network
2. High priority projects associated with High Priority Network locations
3. Projects to improve safety for people biking on multimodal corridors

The recommendations in this plan are not prescriptive or fixed. They provide a foundation for funding applications and design work, and will evolve as conditions change, new funding opportunities arise, projects are delivered, and additional community input is gathered. In that way, this TSAP is not just a snapshot of current conditions, but a tool Benton County can use to make steady, intentional progress toward safer roads.

Similarly, our understanding of safety strategies, their effectiveness, and best practices for implementation are continually evolving. The following state and federal resources may continue to be useful when identifying safety strategies for a specific location, underlying risk, or crash pattern:

- FHWA Proven Safety Countermeasures
- FHWA Proven Safety Countermeasures in Rural Communities
- NHTSA Countermeasures that Work
- USDOT National Roadway Safety Strategy
- ODOT Crash Reduction Factor Manual
- Safe System Roadway Design Hierarchy

ROADWAY DESIGN HIERARCHY

To assist agencies with prioritizing and implementing engineering and infrastructure-based safety strategies in alignment with the Safe System Approach, FHWA developed the Safe System Roadway Design Hierarchy, shown in **FIGURE 12**.

This serves as a tool that can be applied for site-specific assessment when developing new projects. To move towards a Safe System and achieve the goal of the TSAP, the County will apply the Roadway Design Hierarchy when developing projects by considering Tier 1 solutions first, and where infeasible, apply countermeasures targeting Tiers 2, 3, and 4, alone or in combination.

The application of countermeasures and strategies in alignment with the Safe System Approach is dependent on site-specific characteristics and available funding.

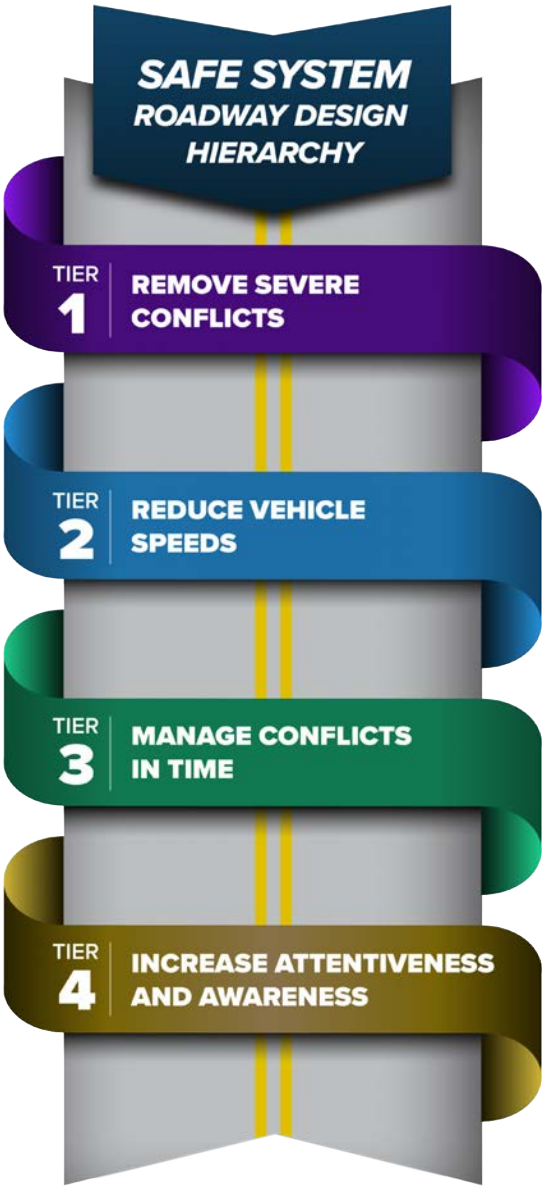


FIGURE 12. SAFE SYSTEM ROADWAY DESIGN HIERACHY (SOURCE: FHWA) ▶

EMPHASIS AREA STRATEGIES

The TSAP emphasis areas correspond to near-term, systemic safety strategies that can be implemented broadly across county roads where crashes have already happened, as well as locations that have a high risk of future crashes.

INFRASTRUCTURE STRATEGIES

Infrastructure improvements are targeted physical changes to the roadway and roadside aimed at enhancing traffic safety for all road users. These strategies address critical safety challenges identified in the County's Emphasis Areas and are scalable in cost and implementation complexity, making them practical for implementation across the county. Each countermeasure below includes a brief description, its connection to the Safe System Approach, and alignment with the Emphasis Area it may be effective at addressing.

CHEVRON SIGNS ON HORIZONTAL CURVES

Chevron signs are a sequential set of arrows posted along the road to define the horizontal alignment of a curve. Installing the required and recommended chevron signs helps to guide drivers through the curve or turn.

Image source: USDOT

EMPHASIS AREAS

ROAD AND LANE DEPARTURE

SAFE SYSTEM APPROACH ELEMENT

SAFER ROADS

POST-MOUNTED DELINEATORS ON CURVES

A flexible fiber or aluminum post retroreflective device mounted above the roadway surface and along the side of the roadway in a series to show roadway alignment. Retroreflective material, such as post-mounted delineators, can be a highly effective treatment for delineating curves, especially at nighttime.

EMPHASIS AREAS

ROAD AND LANE DEPARTURE

SAFE SYSTEM APPROACH ELEMENT

SAFER ROADS

Image source: USDOT

OVERSIZED, DOUBLED-UP, AND/OR FLUORESCENT YELLOW SHEETING FOR ADVANCE CURVE WARNING SIGNS

Enhancing curve warnings with larger signs, duplicate signs, or fluorescent yellow sheeting increases their visibility, particularly in low-light conditions or inclement weather. These enhancements make curve warning signs more noticeable to drivers approaching a curve.

EMPHASIS AREAS

ROAD AND LANE DEPARTURE

SAFE SYSTEM APPROACH ELEMENT

SAFER ROADS

Image source: USDOT

WIDEN EDGE LINES

Wider edge lines (e.g., 4 inches to 6 inches) improve visibility of the edge of the travel lane. They provide a stronger visual cue for drivers and can reduce the likelihood of road or lane departure.

Image source: USDOT

EMPHASIS AREAS

ROAD AND LANE DEPARTURE

SAFE SYSTEM APPROACH ELEMENT

SAFER ROADS

CENTERLINE RUMBLE STRIPS

Rumble strips are ground/milled in patterns on the roadway that provide both audible and vibratory feedback when driven on, which alerts drivers to realign themselves in their respective lane. Rumble strips are often discouraged in residential areas due to the noise impacts on neighboring residents.

Image source: Federal Highway Administration

EMPHASIS AREAS

ROAD AND LANE DEPARTURE

SAFE SYSTEM APPROACH ELEMENT

SAFER ROADS

UPGRADE EXISTING MARKINGS TO WET OR REFLECTIVE PAVEMENT MARKINGS

Wet and reflective pavement markings are high-visibility markings that reflect light from vehicles back to the driver's eye. This increases the visibility of lane lines, markers, and signs during dark or inclement weather.

Image source: USDOT

EMPHASIS AREAS

- ROAD AND LANE DEPARTURE
- AGING DRIVERS

SAFE SYSTEM APPROACH ELEMENT

- SAFER ROADS

SAFETY EDGE TREATMENTS

Safety edge is a pavement edge sloped at an angle (30 to 35 degrees) to make it easier for a driver to safely re-enter the roadway after inadvertently driving onto the shoulder. It minimizes the edge change in pavement elevation by providing a more manageable recovery area for drivers departing the travel lane.

Image source: Federal Highway Administration

EMPHASIS AREAS

- ROAD AND LANE DEPARTURE

SAFE SYSTEM APPROACH ELEMENT

- SAFER ROADS

DYNAMIC SPEED FEEDBACK SIGNS ON HORIZONTAL CURVES

Speed feedback signs measures the speeds of approaching vehicles and provides messages to speeding drivers to slow down to an advisory speed. The advantage of this treatment is that the device has a much greater effect on high speed vehicles than a static curve warning sign. When applied specifically on horizontal curves, they are proven to reduce the risk of speed-related crashes road or lane departure crashes.

EMPHASIS AREAS

- ROAD AND LANE DEPARTURE
- SPEEDING

SAFE SYSTEM APPROACH ELEMENT

- SAFER SPEEDS

Image source: Federal Highway Administration

ADD OR WIDEN SHOULDERS ALONG ROADWAYS OR ALONG THE OUTSIDE OF CURVES

Wider shoulders provide drivers with more recovery area to regain control of the vehicle after departing the travel lane. This can also help vehicles come to an emergency stop or drive slowly, provide increased sight distance for through vehicles and for vehicles entering the roadway, and in some cases reduce passing conflicts between motor vehicles and bicyclists.

EMPHASIS AREAS

- ROAD AND LANE DEPARTURE
- PEOPLE BIKING

SAFE SYSTEM APPROACH ELEMENT

- SAFER ROADS

Image source: USDOT

INSTALL ROADWAY MILE MARKERS

Roadway mile posts assist emergency responders in locating crash scenes more quickly and accurately, especially in rural areas. They provide access to clear and consistent location references, which supports faster response times and improves the coordination of post-crash care.

EMPHASIS AREAS

ROAD AND LANE DEPARTURE

SAFE SYSTEM APPROACH ELEMENT

POST-CRASH CARE

Image source: The Oregonian

SPEED FEEDBACK SIGNS

Speed feedback signs provide real-time information to drivers about their speed and have been shown to lower driver speeds when paired with enforcement. They may be applied in locations with a high frequency of speed-related crashes and/or risky behaviors.

EMPHASIS AREAS

RISKY BEHAVIORS

SAFE SYSTEM APPROACH ELEMENT

SAFER SPEEDS

Image source: Carmanah

INTERSECTION VISIBILITY UPGRADES

Improving intersection warnings for unsignalized intersections can be achieved through use of several proven low-cost countermeasures including:

1. Doubled-up or oversized advance intersection warning signs with street name plaques
2. Doubled-up or oversized advance "Stop ahead" signs
3. Doubled-up or oversized "Stop" signs
4. Installation of a minimum 6-foot wide raised splitter island on the stop approach (without pavement widening)
5. Properly placed stop bar
6. Double arrow warning sign at stem of T-intersections

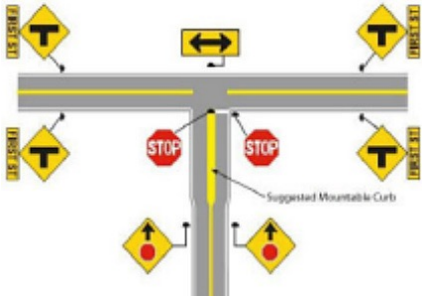


Image source: Federal Highway Administration

EMPHASIS AREAS

INTERSECTIONS

AGING DRIVERS

SAFE SYSTEM APPROACH ELEMENT

SAFER ROADS

TRANSVERSE RUMBLE STRIPS ON STOP-CONTROLLED APPROACH(ES)

On stop-controlled approaches when the need to stop may be unexpected (e.g., isolated intersection, upstream vertical or horizontal curves limiting visibility, etc.), rumble strips can be milled across the roadway to provide an audible and vibratory warning to drivers. Rumble strips are discouraged in residential areas due to the noise impacts on neighboring residents.

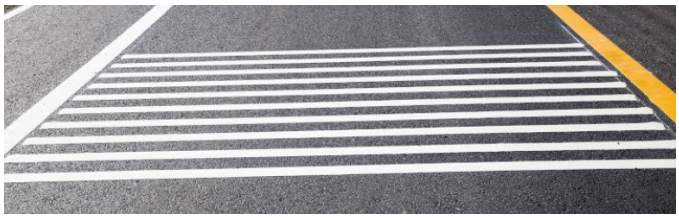


Image source: Federal Highway Administration

EMPHASIS AREAS

INTERSECTIONS

SAFE SYSTEM APPROACH ELEMENT

SAFER ROADS

"STOP AHEAD" PAVEMENT MARKINGS

Pavement markings on a roadway surface that informs drivers of an approaching unsignalized intersection. These pavement markings can be used to increase drivers' alertness to the presence of an unsignalized intersection.

Image source: Federal Highway Administration

EMPHASIS AREAS

- INTERSECTIONS
- RISKY BEHAVIORS

SAFE SYSTEM APPROACH ELEMENT

- SAFER ROADS

FLASHING BEACONS

Flashing beacons draw driver attention to signs with a flashing light. They increase sign visibility and encourage driver compliance. Flashing beacon treatments could include continuous or actuated designs. For actuated applications, the beacon flashes when a detector senses a vehicle arriving.

Image source: Carmanah

EMPHASIS AREAS

- INTERSECTIONS

SAFE SYSTEM APPROACH ELEMENT

- SAFER ROADS

INCREASE TRIANGLE SIGHT DISTANCE

Intersection sight distance can be improved by trimming vegetation, relocating signs, or restricting on-street parking to improve a driver's ability to see oncoming traffic and make safer decisions when entering or crossing a roadway.

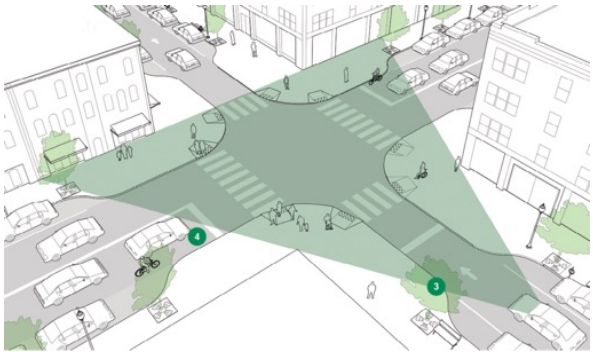


Image source: NACTO

EMPHASIS AREAS

INTERSECTIONS

SAFE SYSTEM APPROACH ELEMENT

SAFER ROADS

INTERSECTION STREET LIGHTING

Street lamps can be installed to provide a permanent source of artificial light that increases visibility at an intersection.

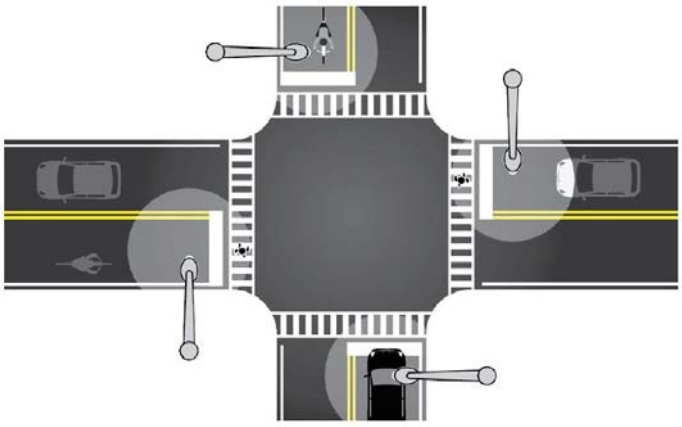


Image source: USDOT

EMPHASIS AREAS

INTERSECTIONS

SAFE SYSTEM APPROACH ELEMENT

SAFER ROADS

CONVERT STOP-CONTROLLED INTERSECTION TO ROUNDABOUT

Roundabouts improve an intersection's safety and efficiency by reducing conflict points. They naturally reduce the speed of traffic by diverting the lane of travel on all approaches. Roundabouts can also provide greater visibility for bicyclists and pedestrians. Roundabouts should always be given preference over new traffic signals unless an intersection control evaluation finds that a traffic signal is a more appropriate treatment.

Image source: USDOT

EMPHASIS AREAS

- INTERSECTIONS
- SPEEDING

SAFE SYSTEM APPROACH ELEMENT

- SAFER ROADS
- SAFER SPEEDS

BIKE LANES IN URBAN AREAS AND WIDEN SHOULDERS IN RURAL AREAS

Bike lanes are a designated portion of the roadway marked by signing and striping for exclusive use by bicyclists. In urban areas, bike lanes are typically provided on each side of the roadway and travel in the same direction as the vehicle lane. In rural areas, bicyclists typically travel on the road shoulder. Bike travel is safer and more comfortable along roads with wide shoulders.

Image source: City of Corvallis

EMPHASIS AREAS

- PEOPLE BIKING

SAFE SYSTEM APPROACH ELEMENT

- SAFER ROADS

BICYCLE WARNING SIGNS AT INTERSECTIONS AND ALONG SEGMENTS WHERE CYCLISTS SHARE THE ROAD WITH VEHICLES

Warning signs alert drivers that bicyclists may be present on a street or crossing at an intersection.

Image source: Streets.mn

EMPHASIS AREAS

PEOPLE BIKING

SAFE SYSTEM APPROACH ELEMENT

SAFER ROADS

RADAR-ACTIVATED DYNAMIC WARNING SYSTEMS

Dynamic warning systems can detect bicyclists using radar. When a bicyclist is detected, the warning system alerts drivers using a digital sign or flashing beacon. This may be most effective in high-risk areas where biking activity is relatively common, and visibility may be limited due to curves.

Image source: Montana State University – Western Transport Institute

EMPHASIS AREAS

PEOPLE BIKING

SAFE SYSTEM APPROACH ELEMENT

SAFER ROADS

NON-INFRASTRUCTURE STRATEGIES

Non-infrastructure strategies are essential components of a comprehensive approach to improving traffic safety. These strategies focus on changing behaviors, enhancing education and awareness, and promoting a cultural shift towards safety as a priority.

ALTERNATIVE TRANSPORTATION

Providing and promoting alternative transportation options, such as transit or rideshare, can reduce reliance on personal vehicles and offer safer mobility choices when attending events where alcohol will be served.

EMPHASIS AREAS

RISKY BEHAVIORS

SAFE SYSTEM APPROACH ELEMENT

SAFER PEOPLE

EDUCATION CAMPAIGNS

Public education campaigns raise awareness about risky driving behaviors such as speeding, distracted driving, and impaired driving. The campaigns encourage safer choices through messaging, media, and community outreach, gradually shifting cultural norms to work collectively toward road safety outcomes.

EMPHASIS AREAS

RISKY BEHAVIORS

SAFE SYSTEM APPROACH ELEMENT

SAFER PEOPLE

FORMAL COURSES FOR OLDER DRIVERS

Formal driver courses provide basic safe driving practices and in how to adjust driving to accommodate age related cognitive and physical changes. It is designed for older drivers to help reinforce their driving skills, knowledge of driving laws, and teach strategies to adapt to age-related changes.

EMPHASIS AREAS

AGING DRIVERS

SAFE SYSTEM APPROACH ELEMENT

SAFER PEOPLE

DRIVING RETIREMENT PLANNING

Driving retirement planning helps older adults anticipate and prepare for the eventual transition away from driving by helping them assess their driving skills, know when it is time to stop driving, and prepare for life after driving. This can also include resources to help family members and caregivers.

EMPHASIS AREAS

AGING DRIVERS

SAFE SYSTEM APPROACH ELEMENT

SAFER PEOPLE

EDUCATION AND OUTREACH REGARDING TRANSPORTATION OPTIONS

Outreach efforts that inform older adults about local transportation services, such as shuttles, transit, or volunteer driver programs, allow for continued mobility and reduce the need to drive over time.

EMPHASIS AREAS

AGING DRIVERS

SAFE SYSTEM APPROACH ELEMENT

SAFER PEOPLE

EDUCATION AND OUTREACH REGARDING SAFER VEHICLE ADAPTATIONS AND TECHNOLOGY

Education about vehicle adaptations and modern safety technologies (e.g., large mirrors, collision avoidance technology, high visibility lights, larger font dashboards, simplified interfaces, pedal extenders) can empower older adults to continue driving safely in accordance with the latest traffic safety practices.

EMPHASIS AREAS

AGING DRIVERS

SAFE SYSTEM APPROACH ELEMENT

SAFER VEHICLES

EDUCATIONAL CAMPAIGNS TO ENCOURAGE SAFE BEHAVIORS RELATED TO BIKING

Educational campaigns that promote helmet use, predictable riding, visibility, and adherence to traffic laws can improve safety for bicyclists. These campaigns also include special education for e-bike use or raise awareness among drivers of safe behaviors for driving near bicyclists. For people driving, topics could include safe passing, yielding, turn interactions, and how to share the road.

EMPHASIS AREAS

PEOPLE BIKING

RISKY BEHAVIORS

SAFE SYSTEM APPROACH ELEMENT

SAFER PEOPLE

CYCLING CLINICS, BIKE FAIRS, BIKE RODEOS

Public events can provide education, outreach, and training to promote safe behaviors. Events such as cycling clinics, bike fairs, and bike rodeos are specifically planned to help increase ridership and help people become a better rider.

EMPHASIS AREAS

PEOPLE BIKING

SAFE SYSTEM APPROACH ELEMENT

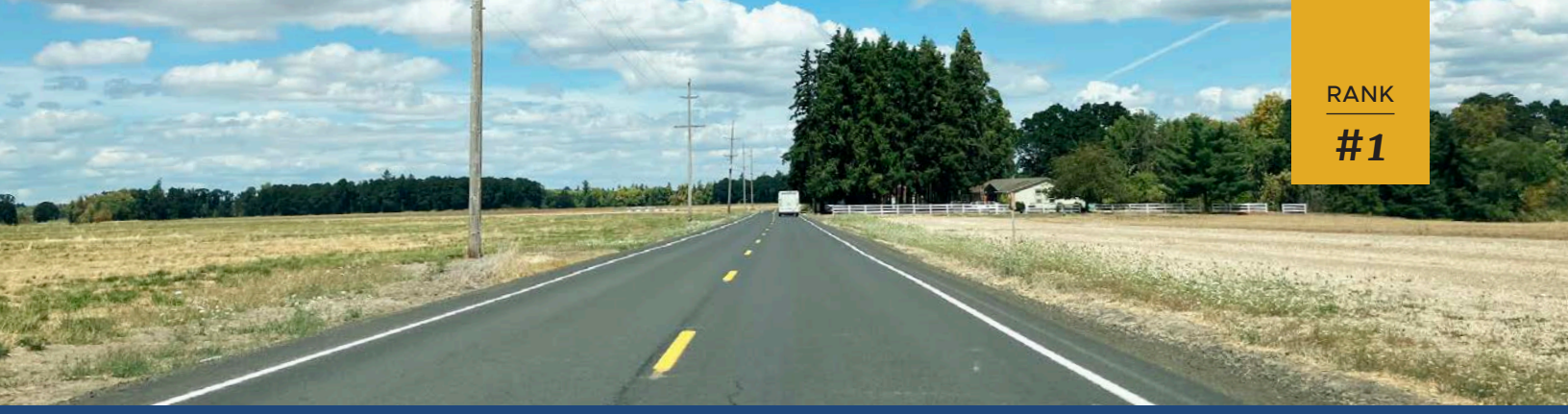
SAFER PEOPLE

HIGH PRIORITY PROJECTS

The following section provides descriptions of recommended High Priority Projects that target the elimination of fatal and serious injury crashes on Benton County roadways. The High Priority Projects were developed at High Priority Network locations by more closely reviewing trends in the crash data and selecting sets of countermeasures that have proven to be successful at mitigating the types of crashes that have been occurring. An emphasis was placed on selecting countermeasures that would be reasonably affordable considering the most readily available sources of funding to facilitate near-term implementation.

Crash trends and recommended treatments were compared with recent (2023 or later) and planned projects. If it was determined that no practical solution aligned with the pattern of crashes or that recent and planned projects may be sufficient to mitigate the pattern of crashes, recommended improvements at that High Priority Network location was deferred.

The projects are ranked in order of priority; however, the order of implementation may differ and will likely be influenced by funding opportunities. The data-driven prioritization criteria considered crash history, risk factors, community feedback, demographics, and input from the project Task Force.



RANK
#1

INDEPENDENCE HIGHWAY SYSTEMIC COUNTERMEASURES

This project includes low-cost, systemic countermeasures at the High Priority Network intersections of Springhill Drive, Ryals Avenue, and Metge Avenue, as well as along Independence Highway.

CONTEXT AND CRASH HISTORY

INDEPENDENCE HIGHWAY

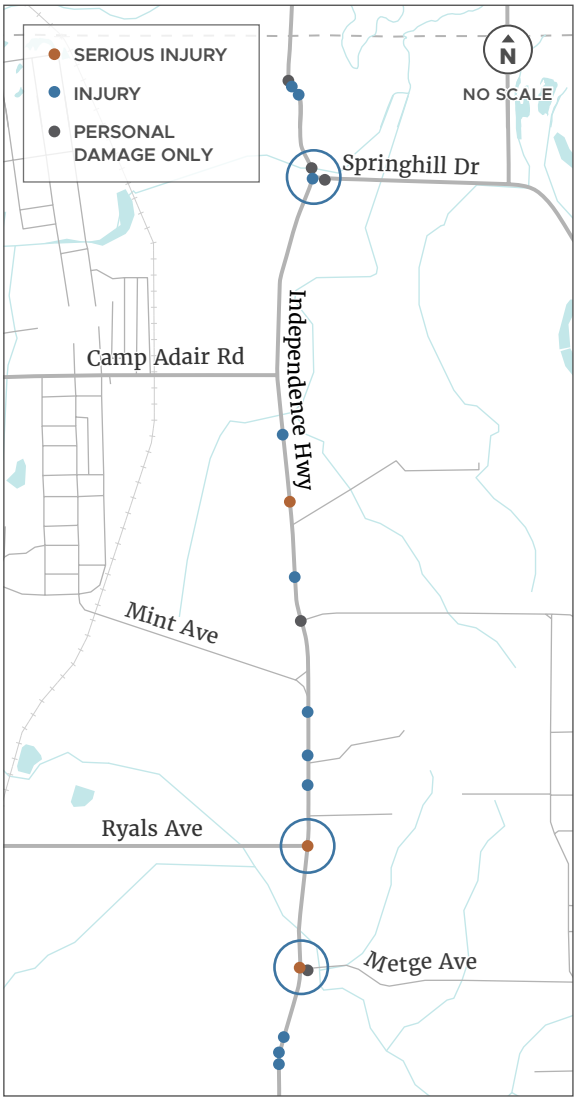
This 5.3-mile segment of Independence Highway between Springhill Drive and US 20 is a rural two-lane roadway. It experiences high speeds and serves a significant volume of truck traffic. Some shoulder widening has occurred (Metge Avenue to Ryals Avenue), but most shoulders are very narrow. Recent safety improvements were implemented at the intersection with US 20.

CRASH CHARACTERISTICS
Entire Independence Highway Segment (2018–2022)

34	*Total Crashes*
13	*Serious Injury at Intersections*
21	*Involved Roadway Departures*
9	*Speed-Related*
3	*Involved a Truck*

16
Segment Crashes, including 2 Serious Injury (not including intersection crashes)

13 of 16
Segment Crashes, involved Fixed-Object Collisions



SPRINGHILL DRIVE

Independence Highway at Springhill Drive is a three-legged intersection with a channelized right turn lane on the westbound approach (yield-controlled). The westbound approach is met by a curved section of Independence Highway. Springhill Drive has a posted speed limit of 55 mph with edgeline striping and no shoulders. There have been reports of westbound drivers experiencing limited visibility from sun shining in their face.

CRASH CHARACTERISTICS *(2018-2022)*

3	2	1
Total Crashes	*Fixed-Object*	*Rear-End*

A serious injury crash and a possible injury crash were fixed-object, both involving two westbound vehicles on Springhill Drive.

The remaining possible injury crash was a rear-end crash where a westbound vehicle approaching the intersection hit two stopped vehicles.

Springhill Drive approaching Independence Highway

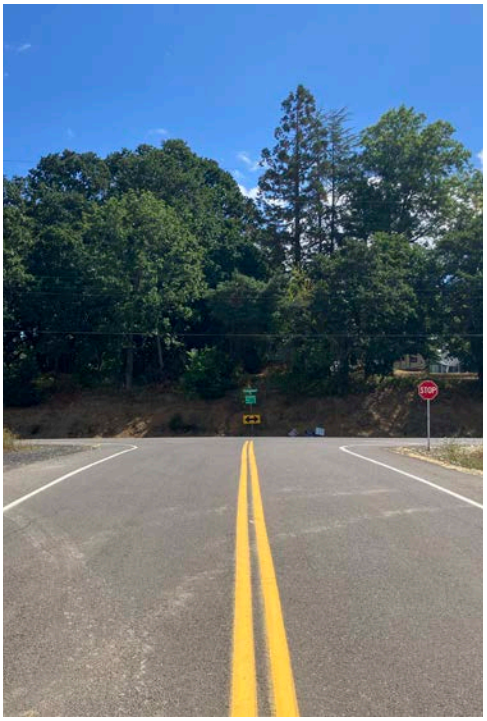
RYALS AVENUE

Independence Highway at Ryals Avenue is a three-legged intersection with stop control on Ryals Avenue. Ryals Avenue has 3-4' paved shoulders with edgelines. Ryals Avenue provides access to Adair Village and OR 99W, which results in heavy turn movements between the west and south.

CRASH CHARACTERISTICS *(2018-2022)*

6	5	4
Total Crashes (1 serious injury, fixed-object, nighttime, speed-related, alcohol-impaired)	*Minor Injury (4 crashes involving left turns, 1 angle crash)*	*Turning, involving a northbound-left turning vehicle and southbound-through movement*

The single angle crash (minor injury) involved an eastbound left turn and a truck traveling southbound.



Ryals Avenue approaching Independence Highway

METGE AVENUE

Independence Highway and Metge Avenue is a rural three-legged intersection, with a southbound left turn lane on Independence Highway and stop control on Metge Avenue.

CRASH CHARACTERISTICS *(2018–2022)*

4

Total Crashes (2 angle crashes and 2 fixed-object crashes)

1

Serious Injury (angle/turning crash where a vehicle making a westbound left made an improper turn, hitting a northbound vehicle)

One fixed-object crash involved a westbound left turn that was taken too fast (no injury); and another crash happened where a northbound vehicle struck an unidentified object in the roadway (no injury).

The remaining angle/turn crash involved a northbound right turning vehicle striking a stopped westbound vehicle (careless driving).

Metge Avenue approaching Independence Highway

EMPHASIS AREAS ADDRESSED:

Roadway and Lane Departures, Intersections

DEMOGRAPHIC ANALYSIS

This project would benefit an area of the county that serves a high percentage of disadvantaged community members.

PROPOSED COUNTERMEASURES

This project focuses on lower-cost, systemic countermeasures that could be implemented in the near-term, while Projects #2 and #3 are focused on higher-cost improvements in the corridor that may take more time to fund. A number of countermeasures are recommended to improve visibility and driver alertness of the unsignalized intersections at Springhill Drive, Ryals Avenue, and Metge Avenue, which would implement project S-164 in the Transportation System Plan. Centerline rumble strips and wider, more visible edgelines will help to reduce roadway and lane departure crashes. The use of profiled edgeline markings is recommended for consideration as they may be more bike-friendly than edgeline rumble strips; however, sufficient shoulder width may be necessary for safe application. Providing a safety edge to improve recoverability of roadway departures is also recommended, but only if these improvements are implemented as part of a paving project. Otherwise, the provision of a safety edge may need to wait until a subsequent paving project or until Project #3 is constructed. Lastly, if any obstacles (e.g., trees) can be removed from the clear zone with minimal effort and cost, those should be included in this project as well. Otherwise, removing obstacles from the clear zone may need to be addressed as part of Project #3.

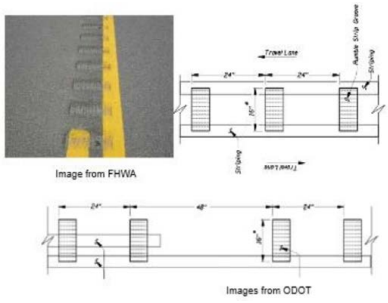
INDEPENDENCE HIGHWAY SYSTEMIC COUNTERMEASURES

ID#[A]	COUNTERMEASURE	CRASH REDUCTION FACTOR[A]	2025 COST
I21	**Improve intersection warning (applies to all three intersections):** • Doubled up (left and right), oversize advance intersection warning signs, with street name sign plaques on the through approach • Doubled up (left and right), oversize advance "Stop Ahead" signs • Doubled up (left and right), oversize STOP signs	25% (for all crash types and severities)	$10,000 per intersection ($30,000 total)
RD1	**Increase distance to rural roadside obstacle from 3' to 16'.** Increase the clear zone by removing fixed objects within 16' of the roadway. A clear zone is an unobstructed, traversable roadside area that allows a driver to stop safely or regain control of a vehicle that has left the roadway.	22% (for all crash types and severities)	$95,000 per 1,000 feet of roadway (both sides) – quantity could be variable, but 1,000 feet is assumed for cost estimating purposes
RD16	**Centerline rumble strips along Independence Highway.** Rumble strips are ground/milled in patterns on the roadway that provide both an audible warning (rumbling sound) and a physical vibration to drivers.	23% (for run-off-road crashes for all severities)	$30,000
RD24	**Install wider edgelines (from 4 inches to 6 inches).** Widen edgelines from 4 to 6 inches to improve visibility for drivers.	18% (for all crash types and severities)	$390,000
RD5	**Provide safety edge for rural pavement edge drop-off.** Safety edge is a pavement edge sloped at an angle (30-35 degrees) to make it easier for the driver to safely reenter the roadway after inadvertently driving onto the shoulder. This countermeasure can only be applied in combination with a paving project.	6% (for all crash types and severities)	$33,000
RD19	**Install profiled edge line pavement markings.** A type of pavement marking consisting of a base stripe with raised shapes located at regular and predetermined intervals. Profiled line pavement markings produces a rumble effect and enhances the visibility of the pavement markings. The countermeasure should only be applied where shoulder widths are sufficient to avoid negative impacts on people biking.	9% (for wet road and nighttime crash types)	$390,000 (for both sides of the roadway)
		TOTAL	**$578,000**

[A] *Source: ODOT Crash Reduction Factor Manual*

[B] *Total cost assumes either RD19 or RD24 is implemented, but not both.*

I21: Example of intersection warning improvements (Source: ODOT Crash Reduction Factor Manual)



RD16: Example of centerline rumble strips (Source: ODOT Crash Reduction Factor Manual)

RELATED PLANNED PROJECTS

FROM THE 2019 TRANSPORTATION SYSTEM PLAN S-164

S-164 Independence Highway/Springhill Drive Intersection Improvements
Intersection improvement: address fixed-object crash safety issues, project may include roadway departure improvements such as additional signs at intersection and rumble strips.

POTENTIAL FUNDING SOURCES

- Safe Streets and Roads for All (SS4A) Program (USDOT)
- All Roads Transportation Safety (ARTS) Program (ODOT)

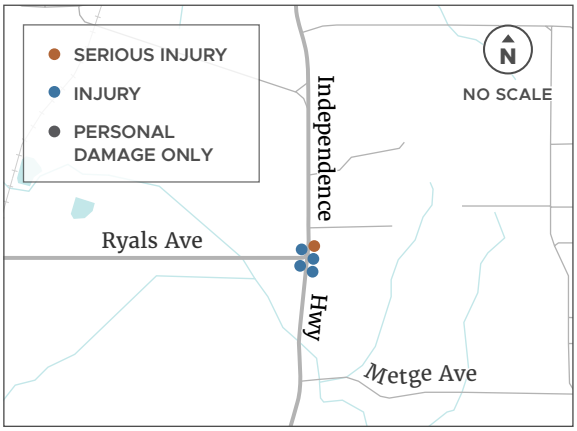
RANK
#2

INDEPENDENCE HIGHWAY AT RYALS AVENUE

This project includes safety improvements for the intersection on Independence Highway at Ryals Avenue, which could be constructed with or independent of the improvements recommended as part of Project #1.

CONTEXT AND CRASH HISTORY

Community members have noted that visibility can be limited when turning out of Ryals Avenue and onto Independence Highway, which could be contributing to the crashes experienced. A site visit to measure available sight distance was conducted in August 2025. It was found that the vertical curves on Independence Highway do limit sight distance. Based on a desktop survey using Google Earth, the change in elevation from the high point of Independence Highway (near the Ryals Avenue intersection) to the low points on the north and south approaches is about 15 feet.When looking left from the eastbound approach on Ryals Avenue, the measured intersection sight distance is 450 feet, which does not meet the 665-foot requirement by AASHTO for a 60 mph design speed. Similarly, looking right from the intersection, the intersection sight distance is 400 feet, which is short of the 575-foot requirement by AASHTO.



Independence Highway at Ryals Avenue

Source: Google Streetview

CRASH CHARACTERISTICS *(2018–2022)*

6 *Total Crashes (1 serious injury resulting from a fixed-object crash that involved speeding, alcohol, and a single eastbound vehicle at night)*

5 *Minor Injury Crashes (4 crashes involving left turns, 1 angle crash)*

4 *Turning Crashes (involved a northbound left turning vehicle and southbound-through movement*

The single angle crash (minor injury) involved an eastbound left turn and a truck traveling southbound.

INDEPENDENCE HIGHWAY AT RYALS AVENUE

RANK #2

EMPHASIS AREAS ADDRESSED:

Intersections, Aging Drivers

DEMOGRAPHIC ANALYSIS

This project would benefit an area of the county that serves a high percentage of disadvantaged community members.

PROPOSED COUNTERMEASURES

Raise the northbound and southbound approaches on Independence Highway to provide at least 700 feet of sight distance from the intersection at Ryals Avenue. Alternatively, the intersection could be lowered if that was found to be more cost-effective. This treatment could be costly, so implementing the low-cost countermeasures from Project #1 should be tried first and proven to be ineffective before advancing this project. This project would implement project CC-228 in the Transportation System Plan.

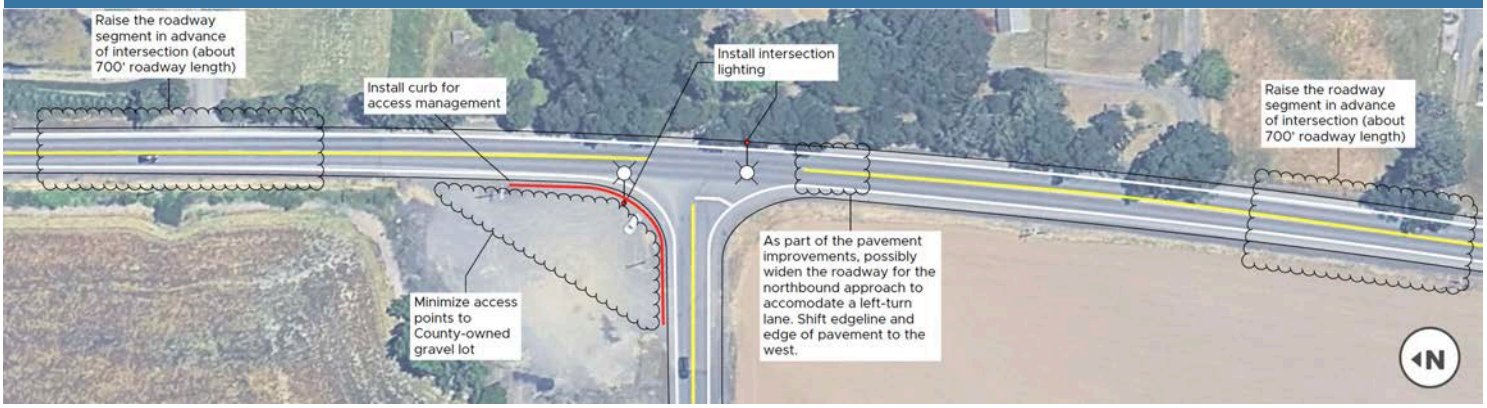
In addition, it is recommended that the construction of a northbound left turn lane on Independence Highway be considered, as well as closing the open frontage of the gravel lot in the northwest quadrant of the intersection with defined driveways. When defining driveways, access should be limited to Ryals Avenue only if feasible and driveways should be located as far from the intersection as feasible. The concept diagram on the next page illustrates the above recommendations.

ID#[A]	COUNTERMEASURE	CRASH REDUCTION FACTOR[A]	2025 COST
I1	**Install lighting at intersection.** A permanent source of artificial lighting installed at an intersection that provides greater visibility of the intersection	38%[B] (for nighttime crashes and all severities)	$80,000
H44	**Flatten crest vertical curve.** Reducing the vertical curvature of the roadway either by flattening a crest curve or reducing the grade of a sag curve. This countermeasure can improve sight distance for drivers turning to and from Ryals Avenue as well as for those traveling along Independence Highway. A more detailed description is provided below.	51%[A] (for all crash types and severities)	$3.1 million
H9	**Construct left turn lane on the northbound approach.** As part of the improvements to flatten the crest vertical curve, construct a northbound left turn lane to accommodate deceleration and storage of turning vehicles.	44%[A] (for all crash types and severities)	$2.1 million
N/A[B]	**Access management improvements.** Eliminate the open frontage of the gravel lot in the northwest quadrant of the intersection with defined driveways. When defining driveways, access should be limited to Ryals Avenue only if feasible and driveways should be located as far from the intersection as feasible.	N/A[B]	$10,500 (assumes 175' of curb)
		TOTAL	**$5.3 MILLION**

[A] *Source: ODOT Crash Reduction Factor Manual*

[B] *This countermeasure is a solution from the Crash Modification Factors Clearinghouse (CMF ID #5185). While a crash reduction factor is not shown for rural areas, decreasing accesses will decrease the conflict points at driveways along Independence Highway near the intersection.*

PROPOSED COUNTERMEASURES (CONT.)



RELATED PLANNED PROJECTS

FROM THE 2019 TRANSPORTATION SYSTEM PLAN S-164

CC-228 Ryals Ave/Independence Hwy Intersection Improvement
Evaluate potential safety sight distance issues, projects may include re-grading the intersection approach and/or improved intersection warning signs.

POTENTIAL FUNDING SOURCES

- Safe Streets and Roads for All (SS4A) Program (USDOT)
- Better Utilizing Investments to Leverage Development (BUILD) / RAISE Program (USDOT)

RANK
#3

INDEPENDENCE HIGHWAY (US20 TO SPRINGHILL DRIVE)

This project is a longer-range complement to the roadway departure countermeasures included in Project #1. In addition to reducing the number of roadway departure crashes, this project also improves the ability of large trucks to travel along Independence Highway without encroaching on the opposing lane and creates space to reduce conflicts between people biking and trucks and other high-speed traffic.

CONTEXT AND CRASH HISTORY

CRASH CHARACTERISTICS *(2018–2022)*

34 *Total Crashes*

8 *Speed-Related*

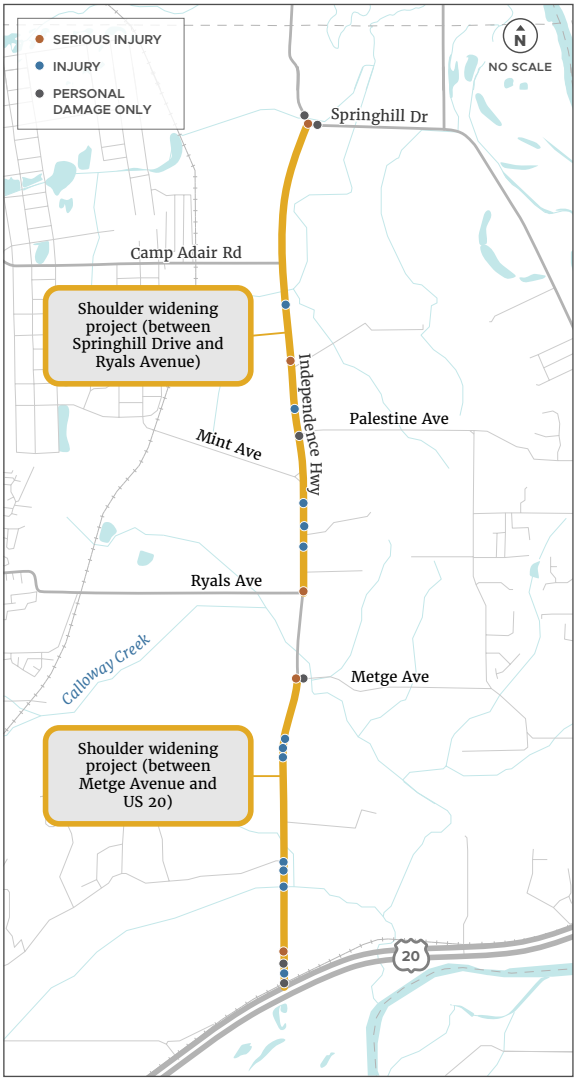
3 *Involved a Truck*

One serious injury crash took place ¼-mile north of US 20 was a turning crash that involved U-turning vehicles at a driveway.

Another serious injury crash between Palestine Ave and Camp Adair Rd involved a northbound vehicle hitting a fixed-object (inattentive driving) after leaving the roadway.

16
Segment Crashes, including 2 Serious Injury (not including intersection crashes)

13 *of* **16**
Segment Crashes, involved Fixed-Object Collisions



INDEPENDENCE HIGHWAY (US20 TO SPRINGHILL DRIVE)

RANK #3

EMPHASIS AREAS ADDRESSED:

Roadway and Lane Departure, Bicycles

DEMOGRAPHIC ANALYSIS

This project would benefit an area of the county that serves a high percentage of disadvantaged community members.

PROPOSED COUNTERMEASURES

The primary focus of this project is to complete the shoulder widening of Independence Highway between US 20 and Springhill Drive. Along with the shoulder widening, any steep side slopes should be flattened and obstacles should either be removed from the clear zone where feasible or shielded with guardrail – particularly in curves. As part of the repaving, a safety edge should be provided and edgelines replaced with profiled markings. This project would implement project CC-221 in the Transportation System Plan.

ID#[A]	COUNTERMEASURE	CRASH REDUCTION FACTOR[A]	2025 COST
RD22	**Widen shoulder on roadways with narrow shoulders.** A permanent source of artificial lighting installed at an intersection that provides greater visibility of the intersection.	18% (for all crash types and severities)	$10.6 million (applied to both sides of the roadway)
RD3	**Flatten rural side slopes to get 1V:6H.** Side slopes are flat areas adjacent to the travel way that are sloped to provide drainage. They can provide a safe recovery area for vehicles departing their lane.	12% (for all crash types and severities)	$1 million
RD2	**Increase distance to rural roadside obstacle from 16' to 30' along Independence Highway.** By increasing the clear zone area, the likelihood that a roadway departure results in a safe recovery rather than a crash will be increased.	44% (for all crash types and severities)	$95,000 per 1,000' of roadway (both sides)–quantity could be variable, but 1,000' is assumed for cost estimating purposes
RD26	**Install new guardrail.** A semi-rigid barrier typically consisting of connected segments of metal railing supported by posts and blocks. Install guardrails where there is evidence (i.e. crash history) of the need to shield motorists from a roadside fixed object that has a higher probability for fatal or serious injury crashes than the guardrail itself.	47% (for run-off-the-road crashes, and all severities, not including PDO)	$2.4 million (assumes 2,000 linear feet of guardrail at $1,200 per foot)
RD5	**Provide safety edge for rural pavement edge dropoff.** Safety edge is a pavement edge sloped at an angle (30-35 degrees) to make it easier for the driver to safely reenter the roadway after inadvertently driving onto the shoulder. This countermeasure can only be applied in combination with a paving project.	6% (for all crash types and severities)	$33,000
RD19	**Install profiled edge line pavement markings.** A type of pavement marking consisting of a base stripe with raised shapes located at regular and predetermined intervals. Profiled line pavement markings produces a rumble effect and enhances the visibility of the pavement markings. The countermeasure should only be applied where shoulder widths are sufficient to avoid negative impacts on people biking.	9% (for wet-road and nighttime crash types)	$390,000 (for both sides of the roadway)
		TOTAL	**$15 MILLION**

[A] *Source: ODOT Crash Reduction Factor Manual*

RELATED PLANNED PROJECTS

FROM THE 2019 TRANSPORTATION SYSTEM PLAN S-164

CC-221: Independence Highway Widening from US20 to Camp Adair Road
Project may widen Independence Highway to cross-section standard before designation as a freight route.

POTENTIAL FUNDING SOURCES

- Safe Streets and Roads for All (SS4A) Program (USDOT)
- Better Utilizing Investments to Leverage Development (BUILD) / RAISE Program (USDOT)

RANK
#4

BELLFOUNTAIN ROAD AT AIRPORT AVENUE AND LLEWELLYN ROAD INTERSECTIONS

These projects are intended to complement improvements the County has programmed for 2027 to add warning aids to improve intersection visibility and driver awareness.

CONTEXT AND CRASH HISTORY

AIRPORT AVENUE

Similar to Llewellyn Road, Airport Avenue is a four-legged intersection that is stop-controlled on the Airport Avenue approaches. There is an overhead flashing warning beacon at the intersection. The Airport Avenue approaches are also slightly offset from each other, and a posted stop ahead warning sign accompanied by transverse rumble strips in advance of the approaches are also present. There have been reports of westbound drivers experiencing limited visibility from sun shining in their face.

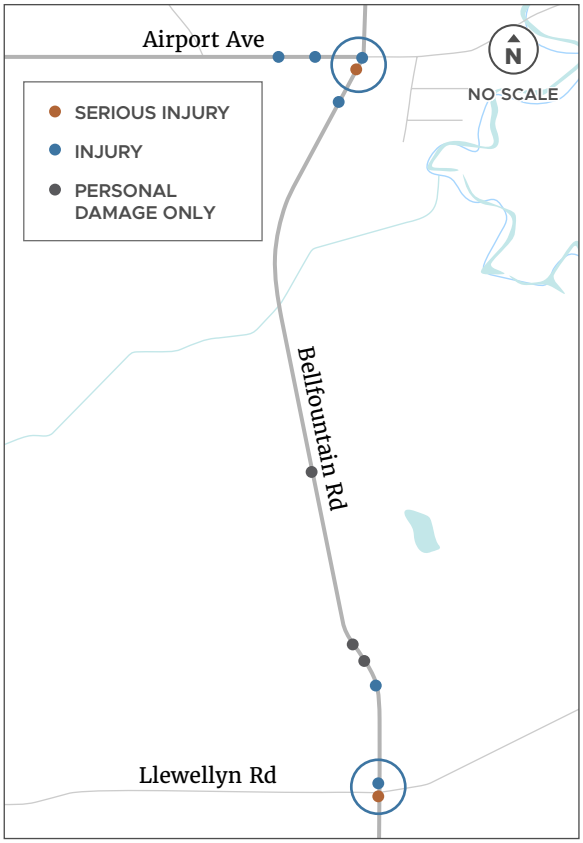
At the eastbound approach, the foliage in combination with the horizontal curve when looking left at the intersection was noted to limit sight distance during a recent field visit. The intersection sight distance was measured to be 315 feet (575 feet required per AASHTO).

Airport Avenue approaching Bellfountain Road

CRASH CHARACTERISTICS *(2018-2022)*

7 *Total Crashes (all angle crashes), no fatalities or serious injuries resulted*

Crashes either due to driver inattention, failure to yield, and passing the stop sign



LLEWELLYN ROAD

Llewellyn Road is a four-legged intersection with stop signs on the Llewellyn Road (east-west) approaches. There is an overhead flashing warning beacon at the intersection. The Llewellyn Road approaches are also slightly offset from each other. There have been reports of westbound drivers experiencing limited visibility from sun shining in their face.

CRASH CHARACTERISTICS *(2018-2022)*

5	2
Total Crashes (all angle crashes)	*Serious Injury, either due to driver failing to yield, or reckless driving*

Llewellyn Road approaching Bellfountain Road

EMPHASIS AREAS ADDRESSED:

Intersections

DEMOGRAPHIC ANALYSIS

This project would benefit an area of the county that serves a low percentage of disadvantaged community members.

PROPOSED COUNTERMEASURES

COUNTERMEASURE FOR BELLFOUNTAIN ROAD AT AIRPORT AVENUE

An August 2025 site visit to these locations found solutions that could be implemented related to the realignment of the east-west approaches for both intersections, and resolving the sight distance issue at Bellfountain Road and Airport Avenue.

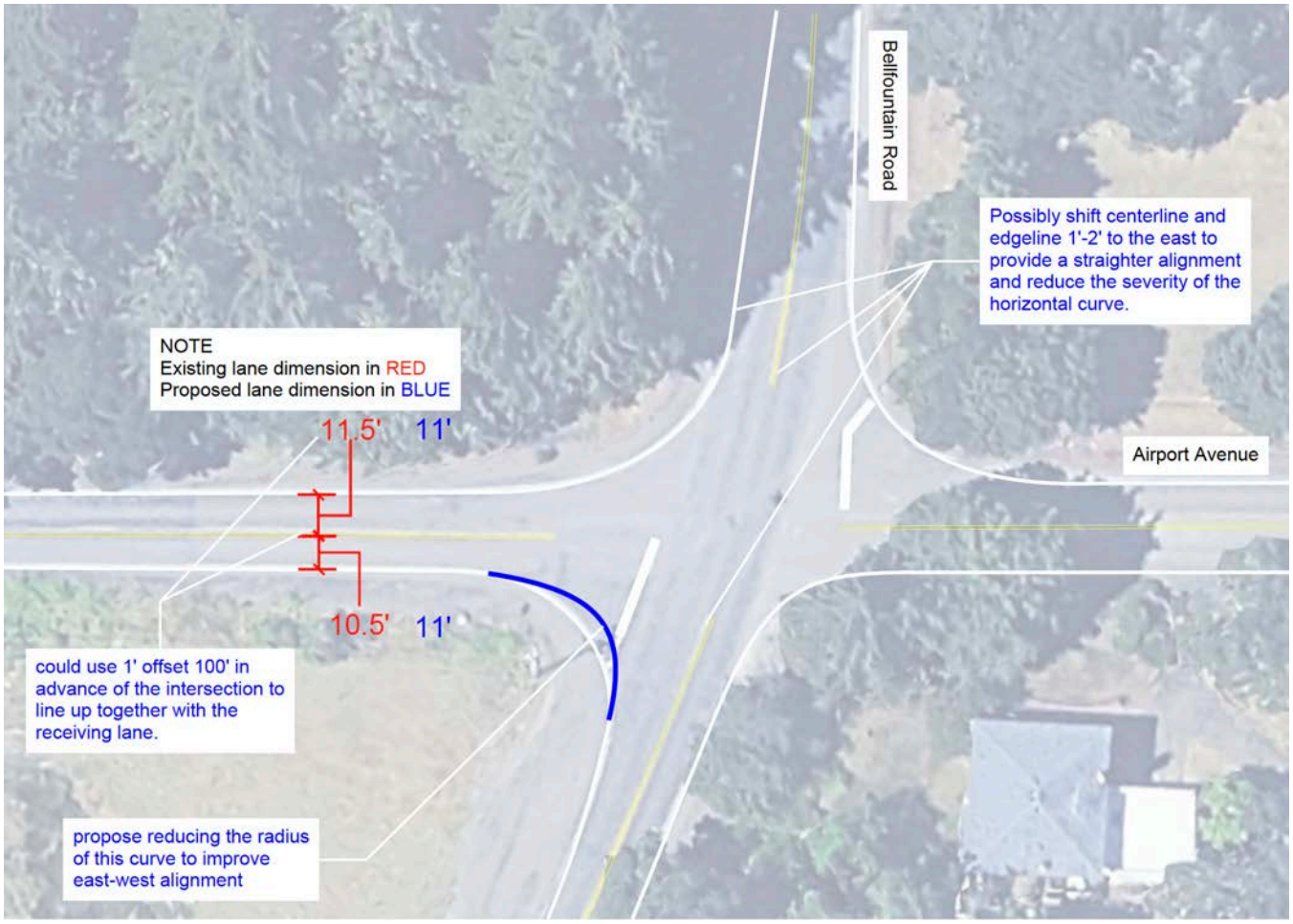
ID#[A]	COUNTERMEASURE	CRASH REDUCTION FACTOR[A]	2025 COST
I17	**Increase triangle sight distance.** Removal of sight distance restrictions (e.g. vegetation) from the sight triangles at an intersection. See section "Additional Proposed Solutions at Bellfountain Road and Airport Avenue" for detailed information.	48% (for all crash types and severities)	$40,000
		TOTAL	**$40,000**

[A] *Source: ODOT Crash Reduction Factor Manual*

ADDITIONAL PROPOSED SOLUTIONS AT BELLFOUNTAIN ROAD AND AIRPORT AVENUE

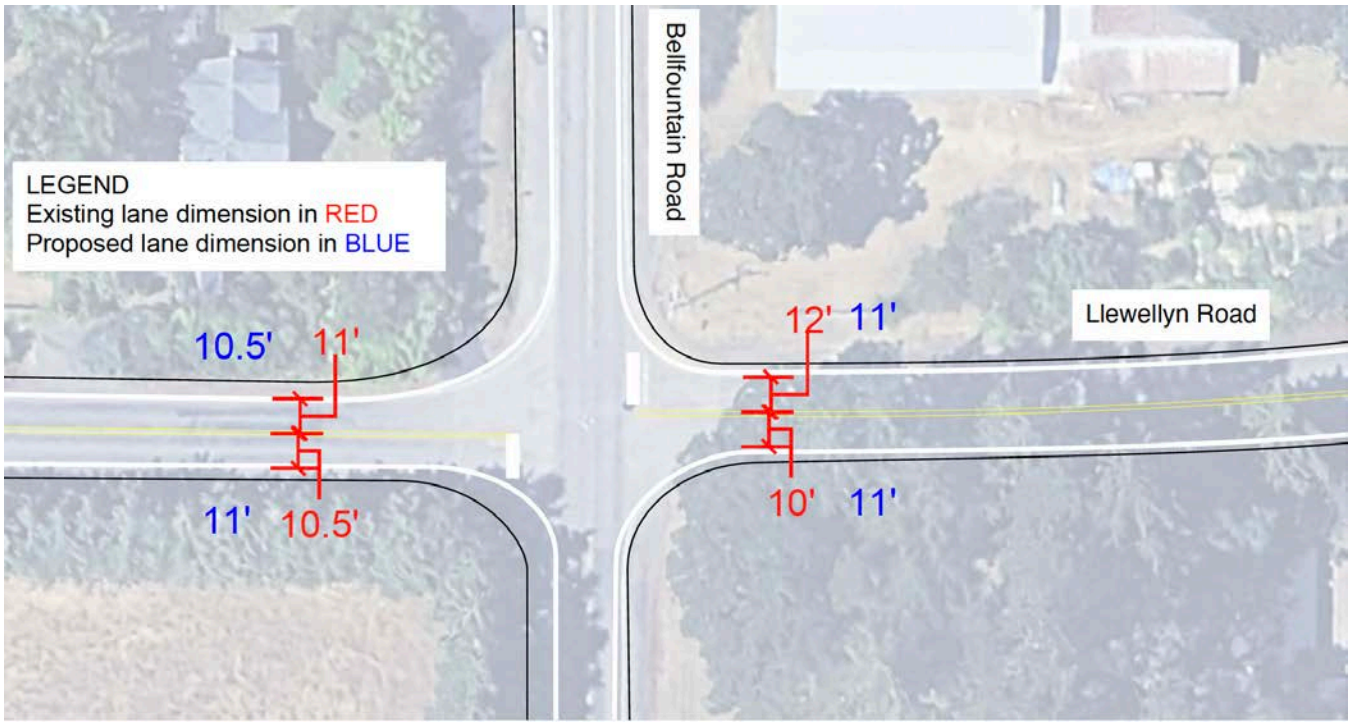
To address the offset of the east-west approaches along Airport Avenue, the lane widths along the eastbound approach can be restriped 100 feet in advance of the intersection to improve the alignment. In addition, restriping the edgeline at the southwest corner of the intersection would be beneficial to align better when continuing eastbound on Airport Avenue.

Today, when making an eastbound turn onto Bellfountain Road, the sight distance available is only 315 feet, which is about 260 feet shy of what is required by AASHTO as the determined visible distance needed for a turning driver to see oncoming southbound traffic to adequately anticipate gaps and avoid potential crashes.To improve sight distance when looking left from the eastbound approach at Airport Avenue, foliage removal in combination with reducing the height of the existing berm would be beneficial. The cost to perform this work (erosion control, clearing and grubbing) is estimated to be $40,000 (2025 dollars). Additionally, sight distance could be improved by shifting the centerline on the southbound approach 1'-2' to the east to slightly straighten the curvature of the road so that eastbound-turning vehicles could see southbound vehicles as they are approaching. This would, however, also slightly reduce the width of the northbound shoulder on the north leg. The cost of restriping would be estimated to be $10,000 (2025 dollars). A proposed concept diagram summarizing these solutions is provided (see below).



ADDITIONAL PROPOSED SOLUTIONS AT BELLFOUNTAIN ROAD AND LLEWELLYN ROAD

To address the offset of the east-west approaches along Llewellyn Road, the lane widths along these approaches can be restriped 100 feet in advance of the intersection to improve the alignment. A proposed concept diagram is provided (see below). This could be performed as part of the next paving project at this location. The project for proposed restriping alone would cost about $10,000 (2025 dollars).



Additionally, it is recommended that the driveway on the west Llewellyn Road approach in the northwest corner of the intersection be closed if feasible. This would eliminate potential turning conflicts in the intersection and create space to install a second oversized stop sign on the eastbound approach (see right).

RELATED PLANNED PROJECTS

FROM THE 2019 TRANSPORTATION SYSTEM PLAN S-164

S-20 Bellfountain Road/Llewellyn Road Intersection Improvements
Project may include rumble strips and paint stripes on pavement.

S-24 Bellfountain Road/Airport Avenue Intersection Improvements
Project may include roundabout or signal, if warranted.

AT-233 Bellfountain Road Shared-use Path
Between Alpine Road and Chapel Road

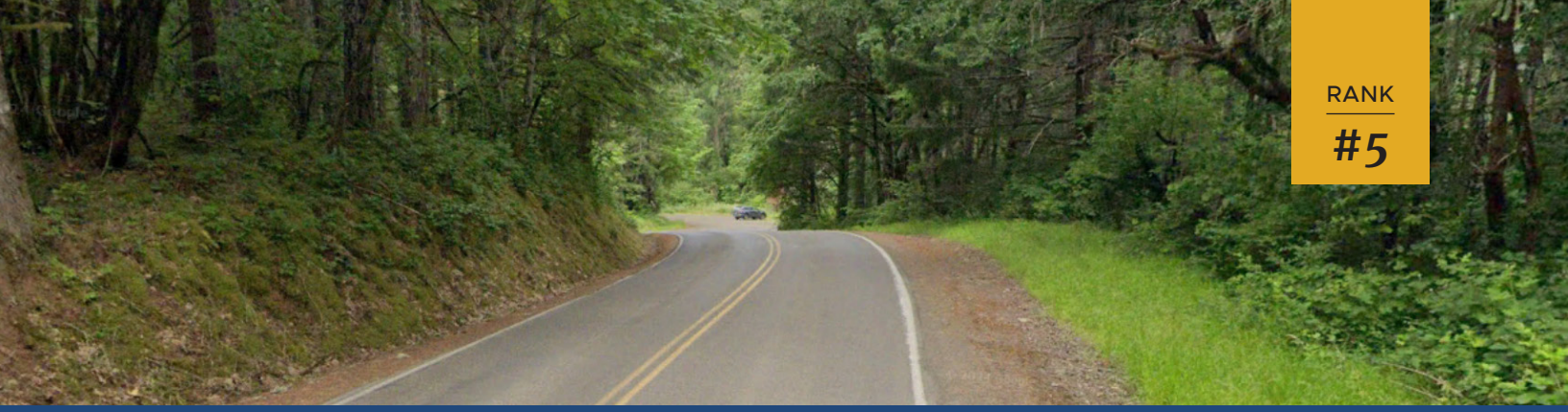
FROM THE CAPITAL IMPROVEMENT PROGRAM

In 2027, a project will install centerline rumble strips from along Bellfountain Road through this area.

In 2027, a project will add intersection warning aids along Bellfountain Road through this area. Intersection warning aids may include new street signs, larger stop signs, reflectorized sign posts, rumble strips across the lanes on Llewellyn Road, reflectorized backplates on overhead flashing beacons, post mounted flashing beacons, and installing red diamond signs at T-intersections.

POTENTIAL FUNDING SOURCES

- Safe Streets and Roads for All (SS4A) Program (USDOT)
- Better Utilizing Investments to Leverage Development (BUILD) / RAISE Program (USDOT)



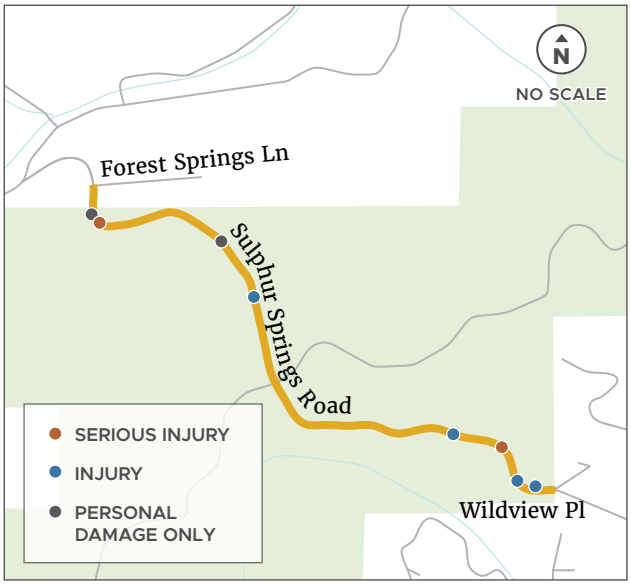
RANK
#5

SULPHUR SPRINGS ROAD (FOREST SPRINGS LANE TO WILDVIEW PLACE)

This project includes low-cost, systemic countermeasures to address a history of roadway departure crashes.

CONTEXT AND CRASH HISTORY

This 1.7-mile segment of Sulphur Springs Road is a two-lane highway with no shoulders on rolling hills with several horizontal curves. The road runs through a densely forested area and provides access to recreational destinations.



CRASH CHARACTERISTICS *(2018–2022)*

- **8** *Total Crashes*
- **7** *Occurred in Curves*
- **6** *Involved Roadway Departure and Fixed-Objects*
- **2** *Roadway Departure Crashes Involved Motorcycles*
- **1** *Involved a Turn and a Person Biking*
- **1** *Involved a Person Walking*

SULPHUR SPRINGS ROAD (FOREST SPRINGS LANE TO WILDVIEW PLACE)

RANK #5

EMPHASIS AREAS ADDRESSED:

Roadway and Lane Departure, Risky Behaviors (Speeding)

DEMOGRAPHIC ANALYSIS

This project would benefit an area of the county that serves a high percentage of disadvantaged community members.

PROPOSED COUNTERMEASURES

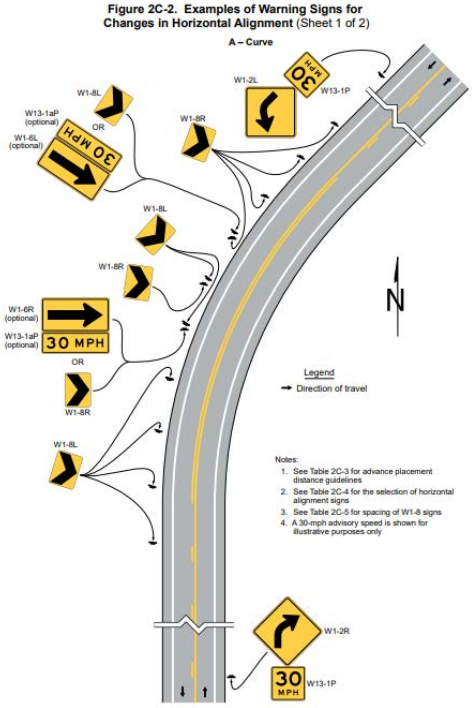
For this project, chevron signs and post-mounted delineators in curves are proposed to complement the existing horizontal alignment and advisory speed signs. Wider, more visible edgelines are recommended, and profiled edgelines should be used where feasible. Applying high friction surface treatments in curves and installing dynamic speed feedback signs in advance of the more severe curves may need to completed in subsequent phases due to higher costs.

ID#[A]	COUNTERMEASURE	CRASH REDUCTION FACTOR[A]	2025 COST
RD6	**Install recommended chevron signs on rural horizontal curves.** The chevron alignment sign (W1-8) defines a change in horizontal alignment of a roadway. The signs show the shape and degree of curvature and help guide drivers through the curve or turn.	16% (for run-off-road crashes, and all severities, not including PDO)	$60,000 installed at all horizontal curves throughout this 1.7-mile segment
RD14	**Install post-mounted delineators on curves.** A flexible fiber or aluminum post retroreflective device mounted above the roadway surface and along the side of the roadway in a series to show roadway alignment.	30% (for nighttime curve crashes, and all severities)	$12,000 applied at 4 curves
RD24	**Install wider edgelines (from 4 inches to 6 inches).** Widen edgelines from 4 to 6 inches to improve visibility for drivers.	18% (for all crash types and severities)	$125,000 throughout this 1.7-mile segment
RD19	**Install profiled edge line pavement markings.** A type of pavement marking consisting of a base stripe with raised shapes located at regular and predetermined intervals. Profiled line pavement markings produces a rumble effect and enhances the visibility of the pavement markings. The countermeasure should only be applied where shoulder widths are sufficient to avoid negative impacts on people biking.	9% (for wet-road and nighttime crash types)	$100,000 for entire 1.7-mile segment for both sides of the roadway
H48	**Increase pavement friction on curve segment by installing high friction surface treatment.** Pavement surfacing systems with exceptional skid-resistant properties not typically provided by conventional materials. Apply in areas where the road surface can become prematurely polished such as where drivers are braking frequently, when going around curves, and down hills or steep grades.	52% (for wet-road crashes and all severities)	$320,000 (assumes $80,000 per curve for 4 curves)
RD11	**Install dynamic speed feedback sign for curves.** Supplemental beacons that activate when motorists approach the curve at a high speed.	5% (for all crash types, and all severities)	$240,000 (assumes $60,000 per sign assembly and 4 total signs)
		TOTAL	**$857,000**

[A] *Source: ODOT Crash Reduction Factor Manual*

PROPOSED COUNTERMEASURES (CONT.)

RD14: Example of post-mounted curve delineators (Source: ODOT Crash Reduction Factor Manual)



RD6: Example of recommended combination horizontal alignment signs and chevron signs on horizontal curves (Source: MUTCD 11th Edition)

RELATED PLANNED PROJECTS

None

POTENTIAL FUNDING SOURCES

- Safe Streets and Roads for All (SS4A) Program (USDOT)
- All Roads Transportation Safety (ARTS) Program (ODOT)

RANK
#6

SPRINGHILL DRIVE (WESTMINSTER WAY TO ALBANY UGB)

This project includes low- to moderate-cost countermeasures focused on eliminating roadway departure crashes that would supplement the existing curve warning signs, chevrons, and centerline rumble strips.

CONTEXT AND CRASH HISTORY

This 2.7-mile segment of Springhill Drive is a two-lane roadway with narrow (approx. 1-foot) paved shoulders. The grade is relatively flat, but there are several horizontal curves where many roadway departure and fixed-object crashes have occurred. This route is also commonly traveled by people biking and concerns have been expressed about conflicts between people biking and high-speed traffic.

CRASH CHARACTERISTICS *(2018–2022)*

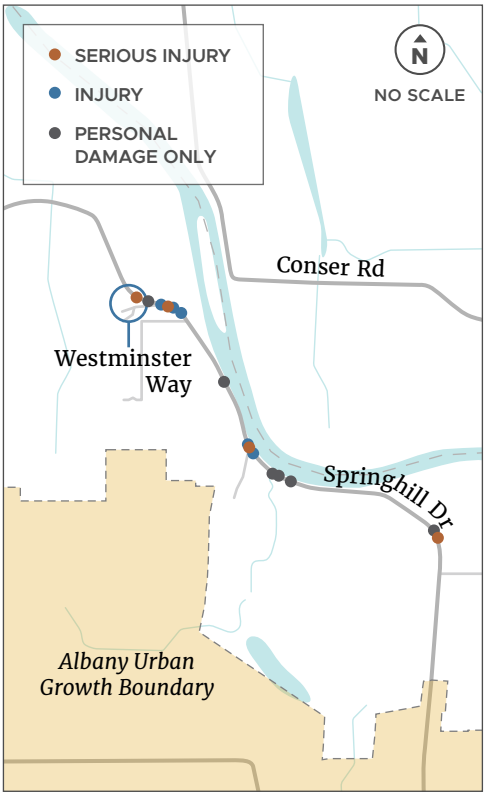
23	20	19	4
Total Crashes	*Roadway Departure*	*Fixed-Object*	*Serious Injury*

There was a cluster of 10 crashes in the curves south of Westminster Way.

There was a cluster of 7 crashes in the curve adjacent to the Willamette River.

There was a cluster of 5 crashes in the curve north of the golf course.

20 crashes occurred after the centerline rumble strips were added in 2019.



SPRINGHILL DRIVE (WESTMINSTER WAY TO ALBANY UGB)

RANK #6

EMPHASIS AREAS

Roadway and Lane Departure, Risky Behaviors (Speeding)

DEMOGRAPHIC ANALYSIS

This project would benefit an area of the county that serves a low percentage of disadvantaged community members.

PROPOSED COUNTERMEASURES

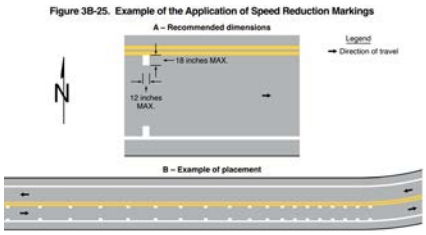
This project includes low- to moderate-cost countermeasures that would supplement the existing curve warning signs, chevrons, and centerline rumble strips to eliminate roadway departure crashes. Chevron signs and high friction surface treatments would be applied within curves. Leading into the more severe curves, optical speed bars and dynamic speed feedback signs will help slow approaching vehicles. Where fixed objects in the clear zone, especially around curves, can't be feasibly removed, strategic guardrail placement to shield them will help reduce the severity of roadway departure crashes if they do occur. Throughout the corridor, wider, more visible edgelines will also help to reduce roadway and lane departure crashes. The use of profiled edgeline markings is recommended for consideration as they may be more bike-friendly than edgline rumble strips; however, sufficient shoulder width may be necessary for safe application. This project would implement project S-210 in the Transportation System Plan.

ID#[A]	COUNTERMEASURE	CRASH REDUCTION FACTOR[A]	2025 COST
RD6	**Install recommended chevron signs on rural horizontal curves.** The chevron alignment sign (W1-8) defines a change in horizontal alignment of a roadway. The signs show the shape and degree of curvature and help guide drivers through the curve or turn.	16% (for all run-off-the-road crashes and all severities)	$25,000 for application on 2 curves
RD24	**Install wider edgelines (from 4 inches to 6 inches).** Widen edgelines from 4 to 6 inches to improve visibility for drivers.	18% (for all crash types and severities)	$200,000 for 2.7-mile segment for both sides of the roadway
RD26	**Install new guardrail next to curves and fixed objects.** A semi-rigid barrier typically consisting of connected segments of metal railing supported by posts and blocks. Because guardrail systems are designed to absorb energy during a crash, and the entire assembly is designed to move or deflect during an impact, guardrail systems usually minimize potential injuries in run-off-the-road or roadway departure crashes.	47% (for run-off-the-road crashes and all severities, not including PDO)	$2.4 million (assumes 2,000 linear feet of guardrail at $1,200 per foot)
N/A[B]	**Install optical speed bars in advance of sharper curves (35 mph advisory speed).** Transverse pavement markings placed with progressively reduced spacing on both edges of the traveled way to create the perception of increased speed. This illusion encourages drivers to slow down as they pass by the markings.	N/A[B]	$8,000 for application on 2 curves

[A] *Source: ODOT Crash Reduction Factor Manual*

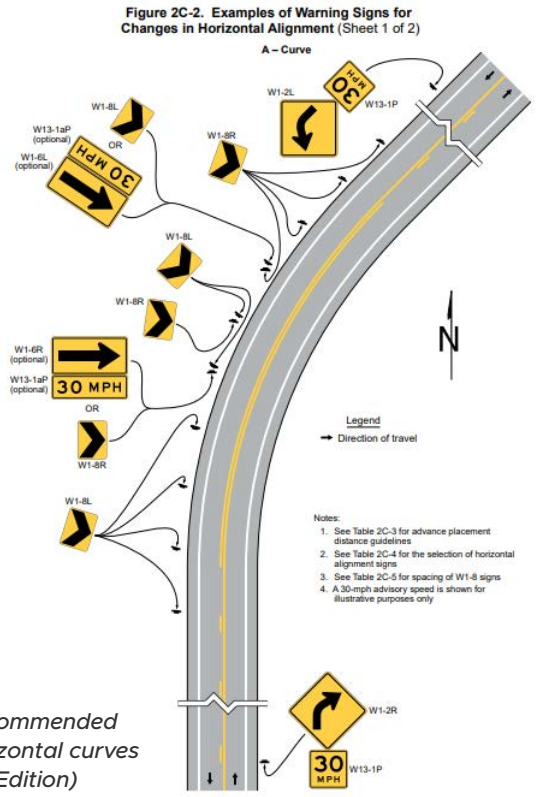
ID#[A]	COUNTERMEASURE	CRASH REDUCTION FACTOR[A]	2025 COST
RD11	**Install dynamic speed feedback sign for curves.** Supplemental beacons that activate when motorists approach the curve at a high speed.	5% (for all crash types, and all severities)	$240,000 (assumes $60,000 per sign assembly and 4 total signs)
RD19	**Install profiled edge line pavement markings.** A type of pavement marking consisting of a base stripe with raised shapes located at regular and predetermined intervals Profiled line pavement markings produces a rumble effect and enhances the visibility of the pavement markings. The countermeasure should only be applied where shoulder widths are sufficient to avoid negative impacts on people biking.	9% (for wet-road and nighttime crash types)	$160,000 for entire 2.7-mile segment for both sides of the roadway
H48	**Increase pavement friction on curve segment by installing high friction surface treatment.** Pavement surfacing systems with exceptional skid-resistant properties not typically provided by conventional materials. Apply in areas where the road surface can become prematurely polished such as where drivers are braking frequently, when going around curves, and down hills or steep grades.	52% (for wet-road crashes and all severities)	$240,000 (assumes $80,000 per curve for 3 curves)
RD14	**Install post-mounted delineators on curves.** A flexible fiber or aluminum post retroreflective device mounted above the roadway surface and along the side of the roadway in a series to show roadway alignment.	30% (for nighttime curve crashes, and all severities)	$9,000 applied at 3 curves
		TOTAL	**$3.3 MILLION**

[A] Source: ODOT Crash Reduction Factor Manual



Example of placement for optical speed bars (Source: Section 3B.22 of the MUTCD, 11th Edition)

Example of speed feedback sign (Source: ODOT Crash Reduction Factors Manual)



Right: Example of recommended chevron signs on horizontal curves (Source: MUTCD 11th Edition)

RELATED PLANNED PROJECTS

None

POTENTIAL FUNDING SOURCES

- Safe Streets and Roads for All (SS4A) Program (USDOT)
- All Roads Transportation Safety (ARTS) Program (ODOT)

RANK
#7

SPRINGHILL DRIVE (FERGUSON DRIVE TO NORTH ALBANY UGB)

This project addresses a variety of crash types that have occurred in this rural to urban transition area that is within the city limits of Albany but where the road has not yet been reconstructed to urban standards.

CONTEXT AND CRASH HISTORY

This approximately 0.2-mile segment of Springhill Drive is a straight, two-lane roadway with varying shoulder widths and no sidewalk, despite being within the Albany city limits. The posted speed is 40 mph and there is a radar-activated speed feedback sign for southbound traffic entering the urban area.

CRASH CHARACTERISTICS *(2018–2022)*

4 *Total Crashes within the Urban Segment*

There was 1 serious injury crash that involved roadway departure and a fixed-object (tree) near the Ferguson Drive intersection.

Cluster of 3 crashes occurred near the Ferguson Drive intersection.

SPRINGHILL DRIVE (FERGUSON DRIVE TO NORTH ALBANY UGB)

RANK #7

EMPHASIS AREAS ADDRESSED:

Roadway and Lane Departure,
Risky Behaviors (Speeding)

DEMOGRAPHIC ANALYSIS

This project would benefit an area of the county that serves a low percentage of disadvantaged community members.

PROPOSED COUNTERMEASURES

This segment of Springhill Drive is within the city limits of Albany, but is still built like a rural roadway with no curb or sidewalk. Constructing the roadway to an urban standard will provide a visual cue that reminds drivers they are in an urban environment, which may help reduce speeds and increase alertness. With these improvements in place, the ability to reduce the posted speed should be assessed.

ID#[A]	COUNTERMEASURE	CRASH REDUCTION FACTOR[A]	2025 COST
BP22	**Install bike lanes.** This applies to the urban segment 800' north of Country Club Lane and where applicable within this urban area.	36% (for bicycle crashes and all severities)	$310,000 (on both sides of the roadway for 800' segment)
BP29	**Add sidewalks.** This applies to the entire urban segment to the Albany city limits.	20% (for pedestrian crashes along a roadway segment and all severities)	$400,000 (on both sides of the roadway for 0.2- mile segment)
		TOTAL	**$710,000**

[A] *Source: ODOT Crash Reduction Factor Manual*

RELATED PLANNED PROJECTS

FROM THE 2019 TRANSPORTATION SYSTEM PLAN

CC-35 Springhill Drive Modernization Project
Would reconstruct Springhill Drive to City of Albany standards including sidewalk and bike lane within the urban growth boundary.

POTENTIAL FUNDING SOURCES

- Safe Streets and Roads for All (SS4A) Program (USDOT)
- City of Albany
- Albany Area Metropolitan Planning Organization (AAMPO) Regional Transportation Plan (RTP)

RANK
#8

FERN ROAD (POWDER HOUSE ROAD NORTH TO POWDER HOUSE ROAD SOUTH)

This project includes low- to moderate-cost countermeasures focused on eliminating roadway departure crashes that would supplement the existing curve warning signs and chevrons.

CONTEXT AND CRASH HISTORY

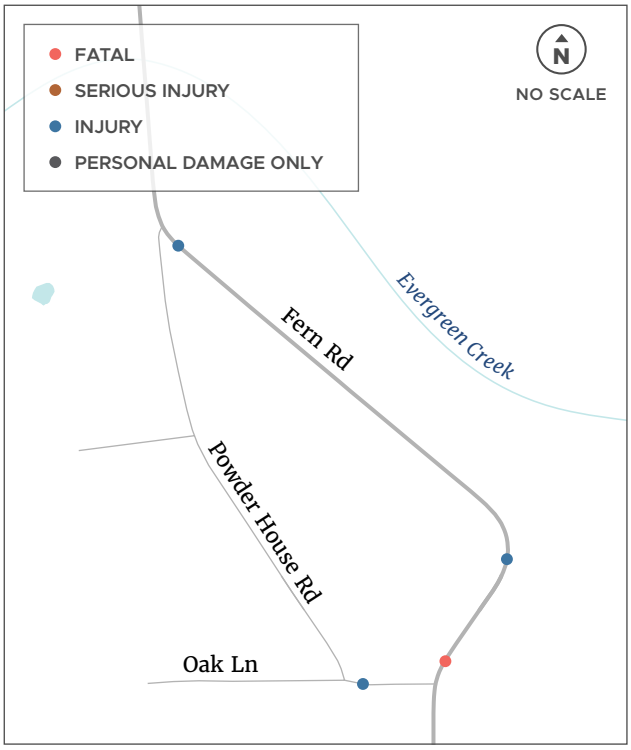
This approximately 0.6-mile segment of Fern Road is a two-lane roadway with very narrow (<1') paved shoulders. There are three horizontal curves that have all experienced roadway departure and fixed-object crashes. The grade climbs from north to south in the southern half of this corridor.

CRASH CHARACTERISTICS *(2018-2022)*

3 *Total Crashes (all crashes were single-vehicle, fixed-object, roadway departure crashes taking place in a curve).*

1 *Fatal (involved a single vehicle driving improperly during daylight, dry conditions that ran off the road and hit a tree).*

1 *Injury Crash (involved a vehicle driving too fast under icy, foggy conditions that fell into a ditch; another injury crash involved a vehicle with that experienced tire failure and hit a tree under dry, daylight conditions).*



EMPHASIS AREAS ADDRESSED:

Roadway and Lane Departure

DEMOGRAPHIC ANALYSIS

This project would benefit an area of the county that serves a low percentage of disadvantaged community members.

PROPOSED COUNTERMEASURES

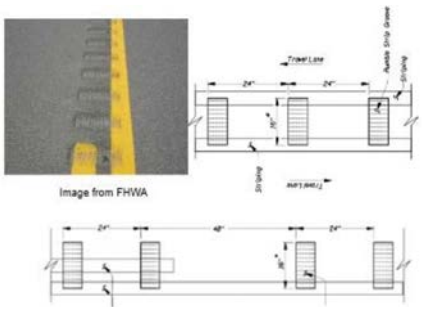
This project includes countermeasures to complement the existing curve warning and chevron signs to help eliminate roadway departure crashes. Throughout the corridor, centerline rumble strips and wider, more visible edgelines will help reduce roadway and lane departure crashes. The use of profiled edgeline markings is recommended for consideration as they may be more bike-friendly than edgeline rumble strips; however, sufficient shoulder width may be necessary for safe application. Dynamic speed feedback signs at either end of this segment would help reduce speeds as drivers enter the curves. Any steep side slopes should be flattened and obstacles should either be removed from the clear zone where feasible or shielded with guardrail – particularly in curves. Special consideration should be given to shielding fixed objects with guardrail at the northernmost curve, which experienced another roadway departure/fixed-object crash in 2023.

ID#[A]	COUNTERMEASURE	CRASH REDUCTION FACTOR[A]	2025 COST
RD16	**Centerline rumble strips.** Rumble strips are ground/milled in patterns on the roadway that provide both an audible warning (rumbling sound) and a physical vibration to drivers.	23% (for run-offroad crashes and all severities)	$30,000 for this 0.6-mile project segment
RD24	**Install wider edgelines (from 4 inches to 6 inches).** Widen edgelines from 4 to 6 inches to improve visibility for drivers.	18% (for all crash types and severities)	$45,000 for this 0.6-mile project segment
RD3	**Flatten rural side slopes.** Side slopes are flat areas adjacent to the travel way that are sloped to provide drainage. They can provide a safe recovery area for vehicles departing their lane.	12% (for all crash types and severities)	$140,000 (assumes both sides of 1,000 feet of roadway)
RD26	**Install new guardrail next to curves and fixed objects.** A semi-rigid barrier typically consisting of connected segments of metal railing supported by posts and blocks. Because guardrail systems are designed to absorb energy during a crash, and the entire assembly is designed to move or deflect during an impact, guardrail systems usually minimize potential injuries in run-off-the-road or roadway departure crashes.	47% (for run-off the-road crashes and all severities, not including PDO)	$1.2 million (for installing 500' of guardrail on both sides of the roadway at horizonal curve located north of Powder House Road (South)
RD11	**Install dynamic speed feedback sign for curves.** Supplemental beacons that activate when motorists approach the curve at a high speed.	5% (for all crash types, and all severities)	$240,000 (assumes $60,000 per sign assembly and 4 signs)

[A] *Source: ODOT Crash Reduction Factor Manual*

ID#[A]	COUNTERMEASURE	CRASH REDUCTION FACTOR[A]	2025 COST
RD19	**Install profiled edge line pavement markings.** A type of pavement marking consisting of a base stripe with raised shapes located at regular and predetermined intervals. Profiled line pavement markings produces a rumble effect and enhances the visibility of the pavement markings. The countermeasure should only be applied where shoulder widths are sufficient to avoid negative impacts on people biking.	9% (for wet-road and nighttime crash types)	$40,000 for entire 0.6-mile segment for both sides of the roadway
		TOTAL	**$1.7 MILLION**

[A] *Source: ODOT Crash Reduction Factor Manual*



RD16: Example of centerline rumble strips (Source: ODOT Crash Reduction Factor Manual)

RD26: Example of guardrail application (Source: ODOT Crash Reduction Factor Manual)

RD11: Example of a dynamic speed feedback sign (Source: ODOT Crash Reduction Factor Manual)

RELATED PLANNED PROJECTS

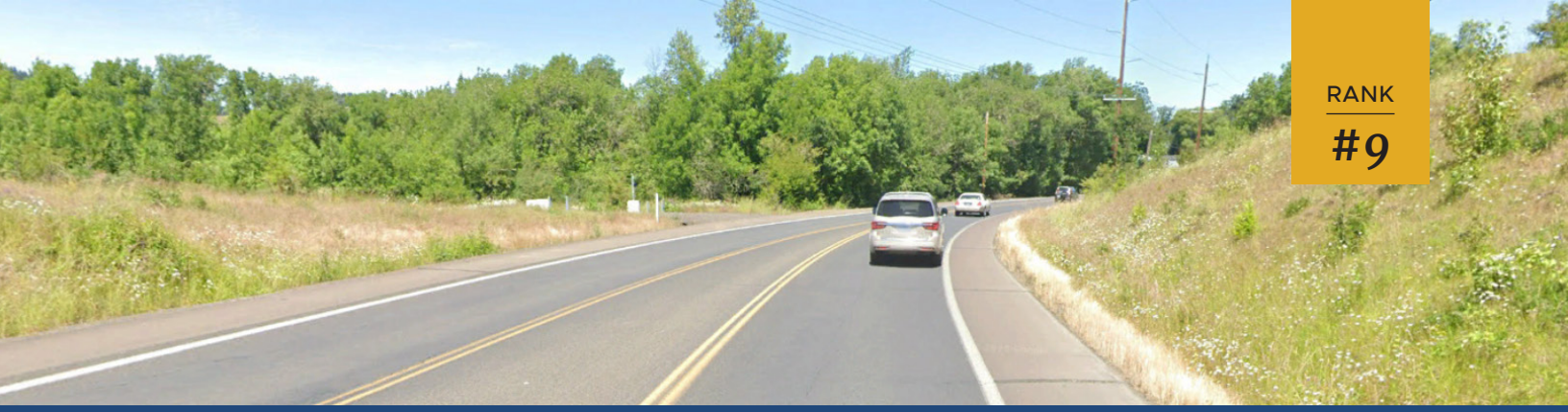
FROM THE 2019 TRANSPORTATION SYSTEM PLAN

S-169 Fern Road Widening

Project may widen shoulders to cross-section standard, this project improves safety for drivers and active transportation users.

POTENTIAL FUNDING SOURCES

- Safe Streets and Roads for All (SS4A) Program (USDOT)
- All Roads Transportation Safety (ARTS) Program (ODOT)

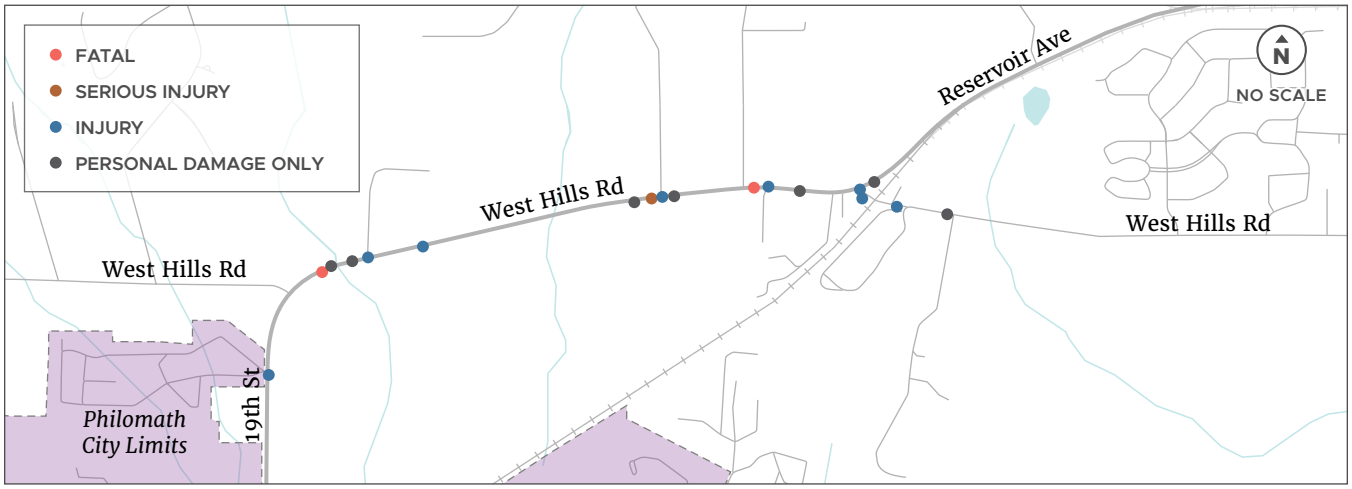


RANK
#9

WEST HILLS ROAD (RESERVOIR AVENUE TO 19TH STREET)

This project includes low-cost countermeasures to improve safety until the long-term improvements that would reconstruct this corridor to urban standards can be implemented.

CONTEXT AND CRASH HISTORY



This 0.9-mile segment of West Hills Road is a two-lane roadway with paved shoulders (with bike stencils) and a 45 mph posted speed limit. The road is relatively flat, with horizontal curves at each end of the segment. The surrounding area is sparsely developed, but this segment connects the urban areas of Corvallis and Philomath and is commonly used by commuters and others looking for an alternative to US 20-OR 34.

CRASH CHARACTERISTICS *(2018–2022)*

15 *Total Crashes (including 2 crashes resulting in fatalities and 1 resulting in serious injury).*

The 2 fatal crashes involved head-on collisions and roadway departure under wet conditions.

The serious injury crash involved a rear-end collision with a stopped vehicle waiting to make a turn at Rosecrest Drive.

Collision types varied: rear-end (4 crashes), fixed-object (3 crashes), animal (3 crashes), turning (3 crashes), head-on (2 crashes).

WEST HILLS ROAD (RESERVOIR AVENUE TO 19TH STREET)

RANK #9

EMPHASIS AREAS ADDRESSED:

Roadway and Lane Departure,
Risky Behaviors (Speeding)

DEMOGRAPHIC ANALYSIS

This project would benefit an area of the county that serves a low percentage of disadvantaged community members.

PROPOSED COUNTERMEASURES

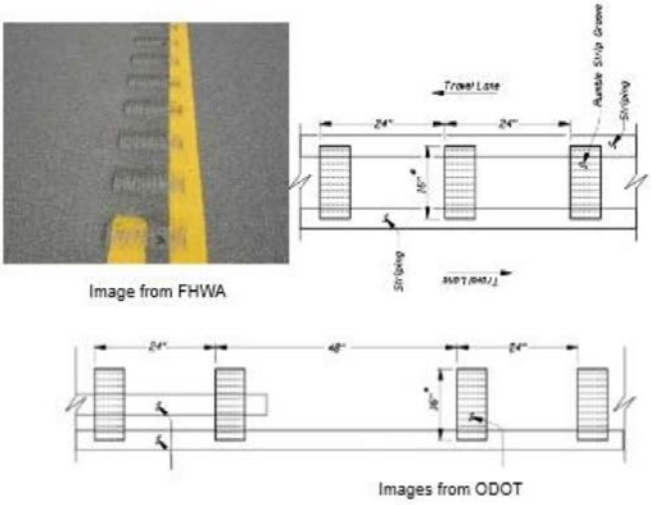
Countermeasures for this project are focused on speed reduction, roadway/lane departure crashes, and recurring rear-end crashes at the Rosecrest Drive intersection. Wider, more visible edgelines and centerline rumble strips will help reduce roadway and lane departure crashes. Speed feedback signs will help reduce speeding. A eastbound left turn lane on West Hills Road at the intersection with Rosecrest Drive should be considered to address recurring rear-end crashes. However, a left turn lane warrant analysis should be completed to determine if traffic volumes are high enough to justify this. Considering the higher cost of constructing a left turn lane, this countermeasure may need to be deferred to a second phase.

ID#[A]	COUNTERMEASURE	CRASH REDUCTION FACTOR[A]	2025 COST
RD24	**Install wider edgelines (from 4 inches to 6 inches).** Widen edgelines from 4 to 6 inches to improve visibility for drivers.	18% (for all crash types and all severities)[A]	$70,000 for 0.9-mile project segment on both sides of the roadway
RD16	**Centerline rumble strips.** Rumble strips are ground/milled in patterns on the roadway that provide both an audible warning (rumbling sound) and a physical vibration to drivers.	23% (for run-off-the-road crashes and all severities) [A]	$5,000 for 0.9-mile project segment
RD12	**Install speed feedback signs.** Speed feedback signs provide drivers with real-time information about their speed as they pass the sign.	10% (for all crash types and all severities)[A]	$120,000 (assumes $60,000 per sign assembly and 2 signs)
H9	**Construct eastbound left turn lane at Rosecrest Drive.** A left turn lane would accommodate deceleration and storage of turning vehicles apart from the through lane, potentially reducing rear-end crashes.	44%[A] (for all crash types and all severities)	$2.3 million
		TOTAL	**$2.5 MILLION**

[A] *Source: ODOT Crash Reduction Factor Manual*

PROPOSED COUNTERMEASURES (CONT.)

RD12: Example of speed feedback sign
(Source: ODOT Crash Reduction Factors Manual)



RD16: Example of centerline rumble strips
(Source: ODOT Crash Reduction Factors Manual)

RELATED PLANNED PROJECTS

FROM THE 2019 TRANSPORTATION SYSTEM PLAN S-164

CC-15 West Hills Road Modernization Between 9th Street and Reservoir Avenue
Project may upgrade to cross-section standard per Philomath TSP.

CC-137 West Hills Road/Reservoir Road Intersection Improvements
Project may construct a traffic signal or roundabout, if feasible, when warranted.

AT-04 19th Street Shared-Use Path
Project may construct a new shared-use path along the east side of N 19th Street and West Hills Road to the intersection at Reservoir Avenue.

POTENTIAL FUNDING SOURCES

- Safe Streets and Roads for All (SS4A) Program (USDOT)
- All Roads Transportation Safety (ARTS) Program (ODOT)
- Corvallis Area Metropolitan Planning Organization (CAMPO) Regional Transportation Plan (RTP)

MULTIMODAL CORRIDOR STRATEGIES

This section documents recommended projects and strategies to improve safety for people biking along select "multimodal corridors" in north and south Benton County. These recommendations are intended to complement the High Priority Projects previously discussed.

Springhill Road (top), Bellfountain Road (bottom)

One corridor was selected in each of the two areas to focus improvements on to make the most of limited resources. The selection of these corridors was informed by usage characteristics, affected party feedback, and the ability to leverage other planned projects or existing infrastructure. In the north area, Springhill Drive was chosen, and in the south area, Bellfountain Road was chosen.

SPRINGHILL DRIVE

A High Priority Project that would widen the shoulders on Independence Highway is recommended as part of this TSAP, which would improve comfort and safety for all users. Therefore, Springhill Drive is the recommended corridor for multimodal safety improvements, which would be compatible with High Priority Project recommendations targeting speeding and roadway/lane departure crashes.

The recommendations to improve biking safety on Springhill Drive include shoulder widening and improving driver awareness that people may be biking on the road. Full shoulder widening for the entire six-mile corridor would be costly and would take a longer time to fund and construct. Therefore, as an alternative or interim measure, targeted shoulder widening is recommended to provide intermittent areas where people biking can move out of the travel lane. When prioritizing locations for shoulder widening, the following conditions should be considered:

- Where obtaining needed right-of-way is feasible
- Where environmental and geographic constraints are not prohibitive
- In curves, where sight lines are most limited and lane departures are more common
- Where crashes have been more common (i.e., in curves)
- Opportunities to construct longer, continuous segments rather than many short sections to minimize transitions and surprises

When widening shoulders, consideration should also be given to improving the ability to enforce traffic laws by providing spaces wide enough to pull over vehicles or pads where enforcement vehicles can park to monitor conditions.

As a lower-cost solution that could be implemented sooner, it is also recommended that a radar-activated bicycle warning system be implemented. Similar systems have been used for bridges and tunnels that detect when a bicycle enters the area and activates a warning system (e.g., flashing beacons, messages) to alert drivers that a bicycle may be in the roadway ahead. The warning stays activated for a time that is determined to be sufficient for the cyclist to have passed through the designated area. Such a warning system may be of particular benefit for the curved areas where sightlines are limited and a driver may come upon a cyclist in the lane unexpectedly.

Both of these recommendations complement the countermeasures included in the High Priority Project for Springhill Drive, though the locations of dynamic speed feedback signs in curves, which are intended to address speeding and roadway/lane departure crashes, will need to be coordinated with a plan for installing the radar-activated bicycle warning system to avoid conflicts. It also possible that these two countermeasures could be installed at the same time.

SPRINGHILL DRIVE MULTIMODAL IMPROVEMENTS (INDEPENDENCE HIGHWAY TO ALBANY UGB)

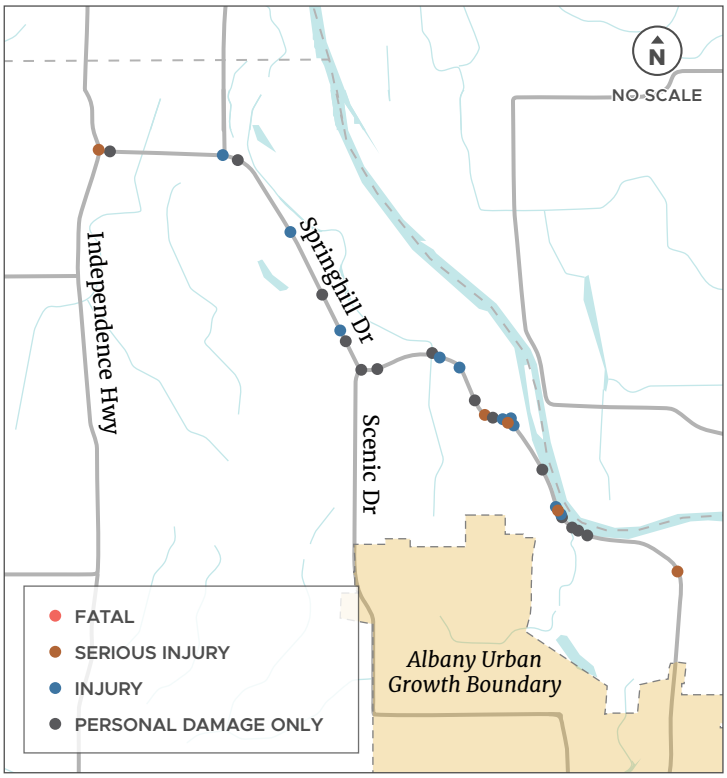
This multimodal corridor project improves safety for people biking through a combination of targeted shoulder widening and a dynamic warning system to alert drivers that bicycles may be in the roadway. This allows for a two-phased approach, where the lower-cost warning system could be implemented in the near term and the shoulder widening could be implemented as funding allows.

CONTEXT AND CRASH HISTORY

This 6-mile segment of Springhill Drive is a two-lane roadway that is relatively flat throughout with several curves and a posted speed of 55mph. Sight lines through the curves can be limited, which can create hazardous situations for people biking.

CRASH CHARACTERISTICS *(2018–2022)*

- **63** *Total Crashes*
- **6** *Resulted in Serious Injury*
- **32** *Involved a Vehicle Leaving the Roadway*
- **2** *Involved People Biking*



HIGHLIGHTS OF FEEDBACK RECEIVED

Freight-specific:

- Narrow lanes, limited shoulders, and curves create conflicts for larger vehicles and complicate sightlines.
- Freight use on Springhill Drive is limited compared to other corridors but present, including garbage trucks and occasional logging trucks.
- Some log trucks may use Springhill Drive when traveling between Polk County and Eugene.
- Republic Services uses Springhill Drive; drivers noted the need for wider shoulders to safely accommodate both trucks and cyclists.

Bike-specific:

- Mid-Valley Bicycle Club members described Springhill Drive as dangerous for biking due to narrow shoulders, poor sightline at curves, truck traffic, and fast-moving vehicles.
- Some riders prefer to avoid Springhill Drive entirely, or only ride certain segments during off-peak hours, though one rider suggested it has potential as a future multimodal corridor if improved.
- Riders emphasized the need for wider shoulders, separated paths, or buffered bike lanes to improve safety.
- North Albany residents also expressed concerns for pedestrians and cyclists due to increased development, lack of sidewalks, and speeding.

EMPHASIS AREAS ADDRESSED:

Roadway and Lane Departure, Risky Behaviors (Speeding), Bicycles

DEMOGRAPHIC ANALYSIS

This project would benefit an area of the county that serves a low percentage of disadvantaged community members.

PROPOSED COUNTERMEASURES

ID#[A]	COUNTERMEASURE	CRASH REDUCTION FACTOR[A]	2025 COST
7754[A]	**Widen shoulder on roadways with narrow shoulders.** Increase the shoulder to 6', consistent with the County standard cross-section for minor arterials. As an alternative to full shoulder widening, targeted widening may be applied at segments where feasible. This can provide turnouts for cyclists.	18% (for all crash types and severities) [A]	$2.9 million (targeted shoulder widening assumes 25% of all shoulders)
N/A[B]	**Radar-activated dynamic warning system for bicycles in roadway.** Install radar devices or inductive loop system to detect cyclists riding along the segment near/on horizontal curves. This triggers a flashing sign, making this system dynamic, and is lit when a cyclist is detected to alert drivers of the presence of cyclists actively using the road.	N/A[B]	$140,000 per dynamic warning system assembly
		TOTAL	**$3.1 MILLION**

[A] *This countermeasure is a solution from the Crash Modification Factors Clearinghouse (CMF ID #7754)*

[B] *This countermeasure is a solution used in a rural area with active cyclists and is used to enhance safety for cyclists and vehicles sharing the same roadways. This solution does not yet have a crash reduction factor according to the Crash Modification Factors Clearinghouse. Source: https://ruraltransportation.org/dynamic-warning-systems-enhance-safety-for-cyclists-and-vehicles-on-scenic-roadways/*

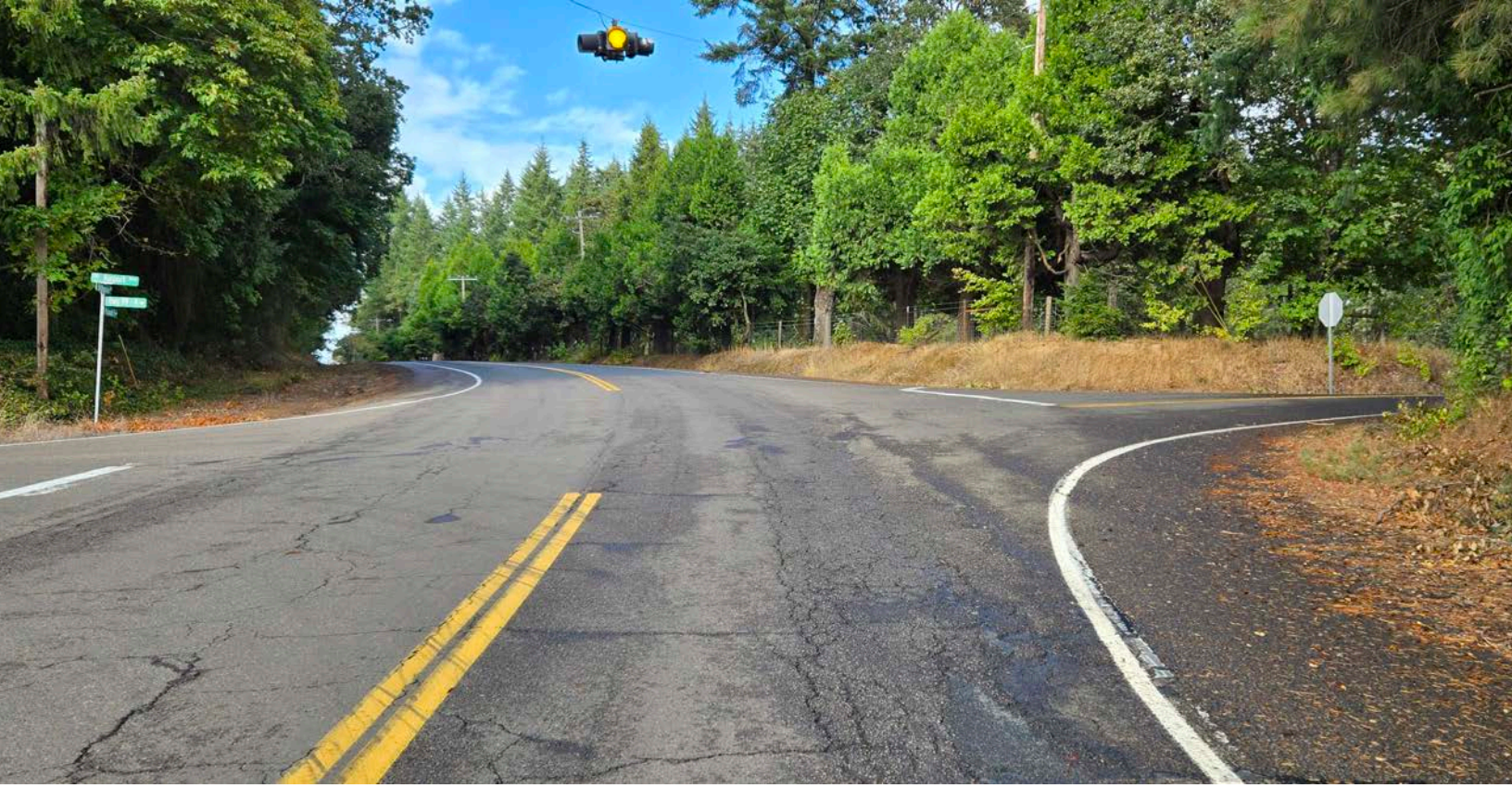
Example of dynamic warning system (Source: Dynamic Warning System to Alert Motorists to the Presence of Bicyclists)

RELATED PLANNED PROJECTS

None

POTENTIAL FUNDING SOURCES

- Safe Streets and Roads for All (SS4A) Program (USDOT)
- All Roads Transportation Safety (ARTS) Program (ODOT)

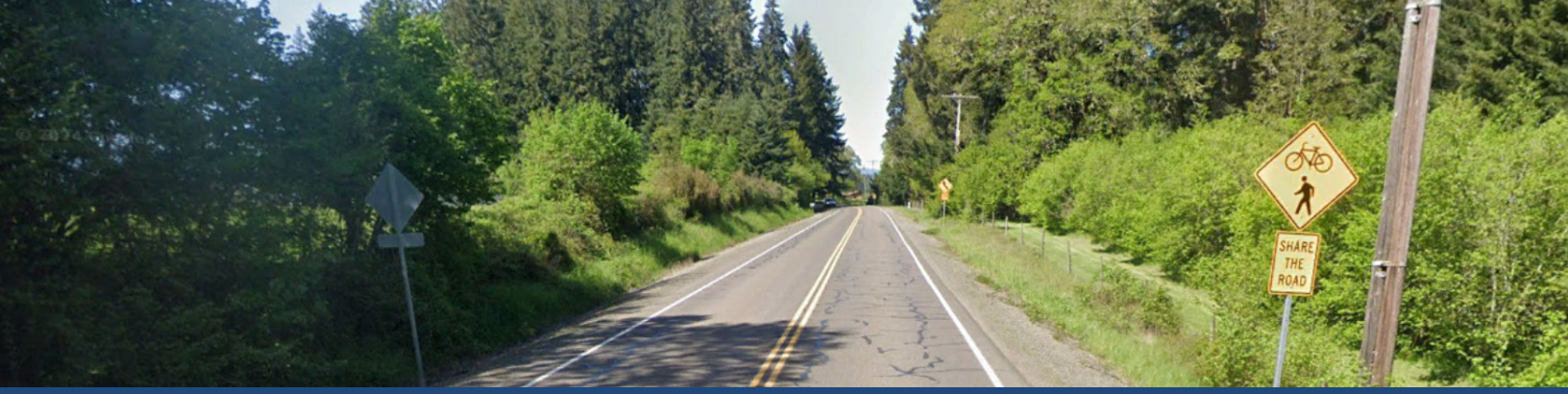


BELLFOUNTAIN ROAD

The section of Bellfountain Road north of Airport Avenue has wider shoulders, which are appreciated by all users, and the TSP includes a future project to construct a shared-use path along Bellfountain Road from Chapel Drive to Alpine Road. Therefore, it is recommended that the County continue to invest in Bellfountain Road as a multimodal corridor.

The recommendations to improve biking safety on Bellfountain Road include continuation of the shoulder widening from Airport Avenue to Llewellyn Road and construction of the shared-use path proposed in the TSP from Chapel Drive down to Llewellyn Road as a first phase. However, considering the cost of the shared-use path, this may need to be constructed in two phases to reach Llewellyn Road.

As an alternative to constructing the shared-use path on Bellfountain Road, consideration could be given to relocating this planned path to the former Bailey Branch rail line to the east, where the County purchased the right-of-way with the intent to maintain it for future rail use. While some circumstances may have changed that could warrant reconsideration of the future use of this right-of-way for a shared-use path, County Commissioners would still need to weigh that option against other potential uses and legal issues regarding the use of the land may need to be resolved.



BELLFOUNTAIN ROAD MULTIMODAL IMPROVEMENTS (PLYMOUTH DRIVE TO LLEWELLYN ROAD)

This multimodal corridor project improves safety for people biking by extending the wider shoulders north of Airport Avenue down to Llewellyn Road and implementing the planned shared-use path from the Transportation System Plan.

CONTEXT AND CRASH HISTORY

The section of Bellfountain Road from Plymouth Drive to Llewellyn Road is approximately 4.5 miles long. It is a two-lane roadway that is relatively flat throughout and has a posted speed of 50 mph. Shoulders of sufficient width for biking are present north of Airport Avenue, but they are very narrow south of that.

CRASH CHARACTERISTICS *(2018–2022)*

- **40** *Total Crashes*
- **3** *Serious Injury*
- **15** *Involved a Vehicle Leaving the Roadway*

HIGHLIGHTS OF FEEDBACK RECEIVED

Freight-specific:

- Bellfountain Road is heavily used by the timber industry for log truck hauling.
- Preferred over OR 99 for direct access to mills and forest sites west of Philomath.
- Drivers reported limited shoulders, narrow lanes, and roadway departures as ongoing safety concerns.
- Truck drivers noted poor visibility for cyclists around curves.

Bike-specific:

- Mid-Valley Bicycle Club riders described Bellfountain Road as a mixed experience: some sections have 5-foot shoulders, but others have none.
- Riders prefer sections with shoulders but often avoid areas with no shoulders due to truck traffic and high speeds.
- Log trucks passing at high speeds create dangerous air drafts that destabilize cyclists.
- Several riders recommended Bellfountain Road as a high priority for shoulder widening or buffered bike lanes.
- Some suggested diverting cyclists to alternate routes like Chapel Drive or potential rail-to-trail conversions. Chapel Drive was noted as a good example of safety improvements for cyclists.

EMPHASIS AREAS ADDRESSED:

Roadway and Lane Departures, Bicycles

DEMOGRAPHIC ANALYSIS

This project would benefit an area of the county that serves a low percentage of disadvantaged community members.

PROPOSED COUNTERMEASURES

ID#[A]	COUNTERMEASURE	CRASH REDUCTION FACTOR[A]	2025 COST
N/A	**Install shared-use path.** Shared-use paths allow the separation of bicycles and pedestrians from the roadway along rural facilities.	N/A	$8.8 million
7754[A]	**Widen shoulder on roadways with narrow shoulders.** Increase the shoulder to 6', consistent with the County standard cross-section for minor arterials. As an alternative to full shoulder widening, targeted widening may be applied at segments where feasible. This can provide turnouts for cyclists.	18% (for all crash types and severities)[A]	$9 million (applied to both sides of the roadway)
		TOTAL	**$17.8 MILLION**

[A] *This countermeasure is a solution from the Crash Modification Factors Clearinghouse (CMF ID #7754)*

Example of shared used path.
(Source: https://www.txdot.gov/content/txdotoms/us/en/manuals/des/rdw/chapter-18-bicycle-facilities-/18-4-bikeway-types/18-4-8-rural-bikeway-types-.html)

RELATED PLANNED PROJECTS

FROM THE 2019 TRANSPORTATION SYSTEM PLAN

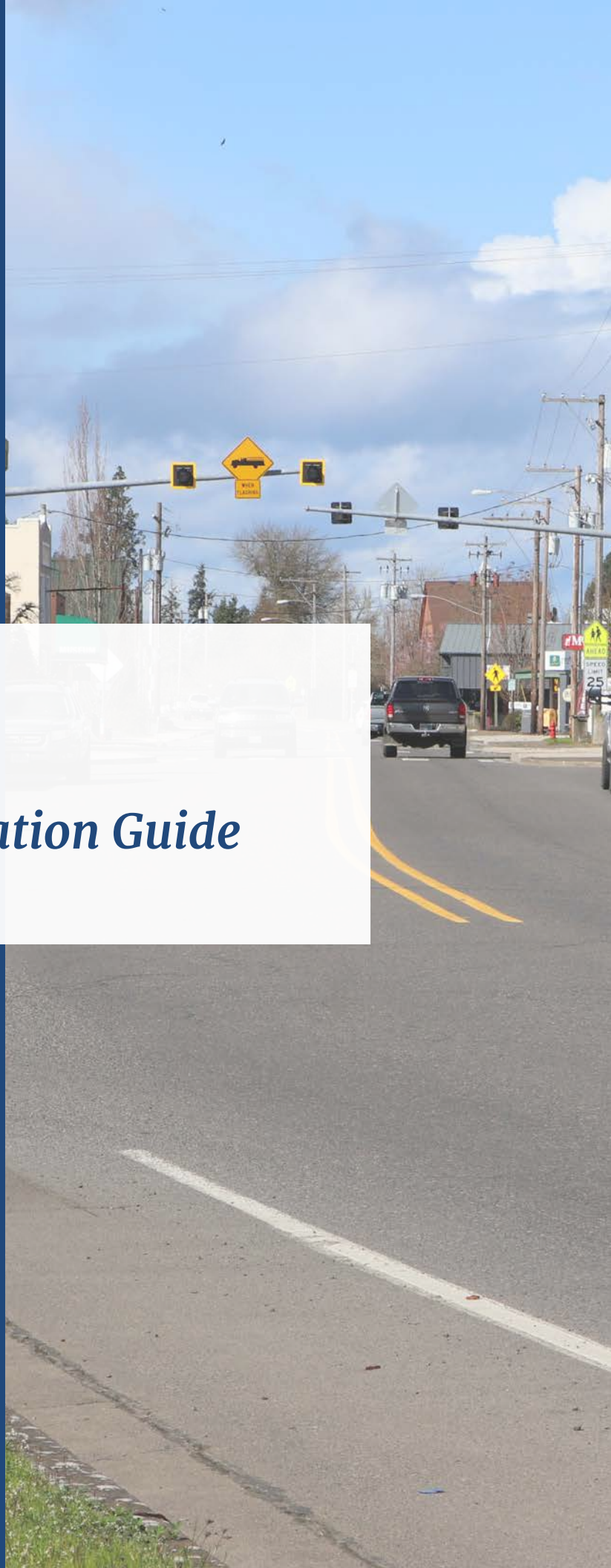
AT-233 Bellfountain Road Shared-use Path
Between Alpine Road and Chapel Drive

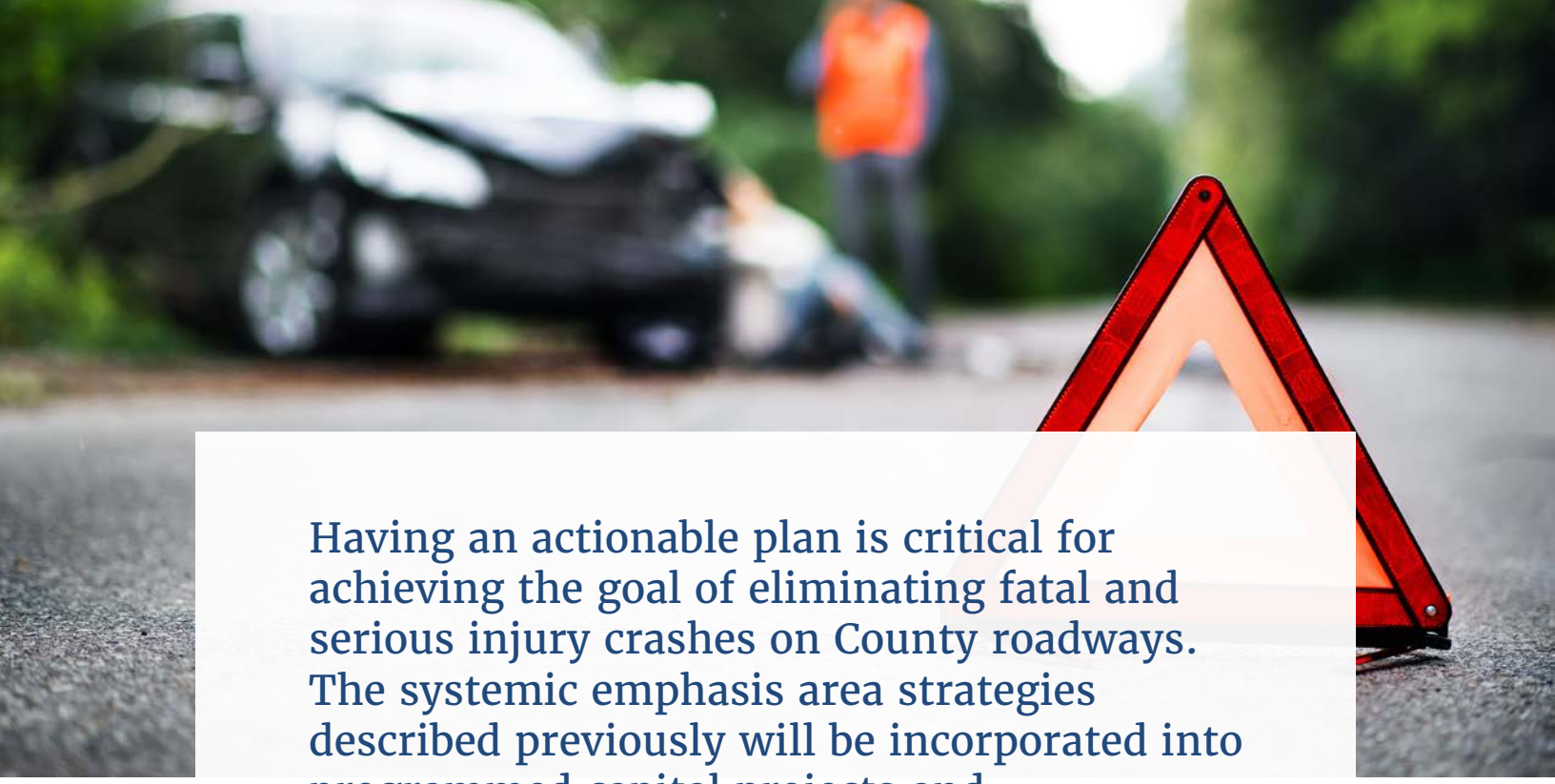
POTENTIAL FUNDING SOURCES

- Safe Streets and Roads for All (SS4A) Program (USDOT)
- Better Utilizing Investments to Leverage Development (BUILD) / RAISE Program (USDOT)
- Community Paths Program (ODOT)

CHAPTER 6

Implementation Guide





Having an actionable plan is critical for achieving the goal of eliminating fatal and serious injury crashes on County roadways. The systemic emphasis area strategies described previously will be incorporated into programmed capital projects and maintenance activities as they occur.

Implementing larger infrastructure projects, however, may require partnerships and the pursuit of competitive grants to fund most of the High Priority and Multimodal Corridor projects.

This chapter includes recommendations and guidance to help the County continue to make decisions that elevate transportation safety, pursue the funding needed for implementation, and establish an environment of accountability and continuous improvement.

PROCESS AND STANDARD RECOMMENDATIONS

Benton County's operating policies, standards, and processes drive how decisions are made and the information that guides those decisions. The County has many such procedures that support the improvement of transportation safety and provide a foundation for advancing TSAP implementation. The recommended changes outlined on the following pages continue to build upon the safety processes and standards the County currently has in place to more effectively achieve the TSAP's goal.

OPERATING PROCEDURES

- Modify Traffic Impact Study guidelines to require safety evaluations and establish provisions for private developers to mitigate for safety deficiencies in addition to capacity/mobility deficiencies.
- Modify land use and zoning code to encourage mixed-use development and align pedestrian and bicycle generators with roadways that are designed to accommodate those modes.
- Establish an Intersection Control Evaluation process to identify the most effective intersection treatment from a safety perspective.
- Identify a road safety audit program to do an assessment of the facilities with the highest crash risk.
- Institute a "safety review" of all capital and private development projects to identify low-cost safety enhancements that can be incorporated into designs prior to construction.
- Ensure safety is considered in one or more criteria for prioritizing transportation projects of all types.
- Establish an annual budget for the construction of traffic calming countermeasures.
- Ensure at least one staff person is knowledgeable in safety analyses and best practices, including the Safe System Approach, the Highway Safety Manual, and FHWA's Proven Safety Countermeasures.
- Collaborate with the cities to ensure that rural to urban transitions are treated consistently in the Cities' and County TSPs.
- Update fleet vehicle purchasing procedures to prioritize in-vehicle safety technologies such as speed moderators, collision avoidance, back-up cameras, etc.
- Budget for and update the High-Priority Network every five years.

STANDARDS

- Modify roadway design standards to make the construction of sidewalks and bike lanes required in rural communities unless an exception is approved.
- Modify roadway design standards to provide wider shoulders, wider clear zones, edgeline and/or centerline rumble strips, safety edge treatments, etc.
- Modify roadway design standards to allow for narrowed travel lanes, on-street parking, chicanes, curb extensions and other speed management design strategies.
- Modify roadway design standards to require sight distance standards (e.g., removing visual obstructions like vegetation, utilities, street furniture, and on-street parking) near intersections, driveways, and mid-block crossings.
- Establish street standards to provide adequate street lighting and pedestrian-level lighting at intersections and along segments.
- Develop standard design details and specifications for safety enhancements such as safety edge on shoulders, high-visibility signing and striping at unsignalized intersections, bicycle signals, RRFBs, curb extensions, pedestrian refuge islands, bike boxes, green conflict markings, etc.

OUTREACH

- Partner with agencies/organizations such as CAMPO, AAMPO, AARP, and senior centers to promote travel options programs and training for older adults.
- Partner with ODOT to advance safety training in driver education with focuses on safe driving around freight and over-size vehicles and how to pull over to the right when approached by emergency response vehicles.
- Create "How do I get there?" info tab for each County event and promote forms of transportation (e.g., transit, designated driver).
- Partner with neighboring jurisdictions on safety campaigns to develop regional campaigns that are coordinated, not duplicative, and share resources.

MAINTENANCE

- Update maintenance policy to include policies/processes for maintenance of facilities like bike lanes, crosswalk enhancements, and other safety treatments.

FUNDING

- Dedicate a portion of capital funding to fund safety projects.
- Ensure at least one staff person is regularly monitoring safety grant funding opportunities and is knowledgeable in grant writing.
- Continue to coordinate with partner jurisdictions to jointly apply for grants that bundle projects for systemic application across the greater area.

MONITORING AND EVALUATION

- Establish an inter-agency, multi-discipline team (e.g., City and County representatives from public works, fire, law enforcement, etc.) that meets twice a year to discuss lessons learned from responses to significant crashes, contributing factors, approaches for improvement, and opportunities for data sharing and joint training exercises.
- Establish an annual budget to fund before/after evaluations of safety projects. Include before/after evaluations in project scopes.

FUNDING SOURCES

Securing funding is a critical component of implementing safety improvements, and grants offer an effective means to support these efforts. The County should develop a process for identifying grant opportunities and obtaining grant funding to supplement existing revenue and funding sources. The following competitive grant opportunities are available to help achieve the goal of the TSAP.

FEDERAL

Safe Streets and Roads for All (SS4A):

SS4A is a limited duration discretionary grant program administered by the USDOT for a period of five years (2022-2026). It provides funding to cities, counties, and tribes for safety planning and demonstration activities, as well as construction of safety projects. This TSAP is funded by an SS4A planning grant and, upon adoption of this TSAP, the County will be eligible to apply for SS4A implementation funding to construct high-priority safety projects.

Better Utilizing Investments to Leverage Development (BUILD):

BUILD funds a wide range of transportation projects that address safety, reduce congestion and support economic growth. Urban projects require a minimum of $5 million, rural projects require 1 million with no minimum funding request for planning grant applications. The program requires a 20% match for projects in urban areas, and 0% for rural project locations. Past awards in Oregon have supported multimodal corridors, freight safety improvements, and pedestrian/bicycle connections in high-crash areas.

Reconnecting Communities Pilot (RCP) Program:

The RCP Program supports community-centered transportation projects that improve connectivity and address harms caused by past infrastructure decisions, with a focus on benefiting low-capacity communities. The program prioritizes improving access to daily needs such as jobs, education, healthcare, food, nature, and recreation while fostering equitable development and restoration. RCP provides funding through two grant types: Planning Grants, which support studies, public engagement, and planning activities to restore connectivity, and Capital Construction Grants, which fund the implementation of projects that remove, retrofit, mitigate, or replace existing transportation facilities to reconnect communities.

Active Transportation Infrastructure Investment Program (ATIIP):

ATIIP is a competitive grant program that funds the construction of safe, connected active transportation facilities within regional networks and active transportation spines. ATIIP investments aim to improve safety, efficiency, and reliability for people walking and biking; strengthen connections between active transportation and public transit; enhance infrastructure resiliency; support environmental sustainability; and expand equitable mobility and quality-of-life benefits, particularly in disadvantaged communities.

Behavioral Safety Grants:

These federal funds from the National Highway Safety Administration and administered by the ODOT Transportation Safety Division support behavioral approaches to reduce crashes through education, enforcement, and outreach.

STATE

ODOT All Roads Transportation Safety (ARTS):

In 2013, ODOT made federal Highway Safety Improvement Program (HSIP) funds more available to local jurisdictions by creating the All Road Transportation Safety (ARTS) Program. There are four ARTS application types (hot spot, systemic intersections, systemic road or lane departure, and systemic bicycle-pedestrian), which is consistent with the Emphasis Areas of Oregon's Transportation Safety Action Plan. Projects are selected based on a cost effective use of the funds for safety improvements addressing fatal and serious injury crashes.

Safe Routes to School (SRTS):

The Oregon Department of Transportation (ODOT) administers a competitive grant program for construction and rapid response safety projects near primary and secondary schools. Eligible projects should be within two miles of a school or within a school's walking boundary, within the public road right-of-way, consistent with other jurisdiction plans, and positively affect the ability for children to walk and bike to school safely. Grants are also available for education programs to support varied levels of SRTS outreach and engagement.

Oregon Community Paths Program (OCP):

This program funds the development and improvement of multi-use paths that enhance safety and access for pedestrians and bicyclists. Projects that fill critical gaps in the active transportation network are prioritized.

LOCAL

Albany Area Metropolitan Planning Organization (AAMPO) Regional Transportation Plan (RTP):

The AAMPO RTP is a 20-year strategic blueprint for the Albany area's travel infrastructure. It coordinates regional investments in roads, public transit, and bicycle or pedestrian pathways to create a multimodal network. Member jurisdictions submit proposals for funding, which are evaluated by the Technical Advisory Committee and commented on by the public. Awards are approved by the Policy Board.

Corvallis Area Metropolitan Planning Organization (CAMPO) Regional Transportation Plan (RTP):

The CAMPO RTP is a 20-year strategic roadmap for the Corvallis, Philomath, and Adair Village areas. It coordinates investments across regionally significant corridors to enhance highways, transit, and bicycle/pedestrian networks. Member jurisdictions submit proposals for funding, which are evaluated by the Technical Advisory Committee and commented on by the public. Awards are approved by the Policy Board.

PERFORMANCE MEASURES AND MONITORING

As safety strategies and projects are implemented, ongoing monitoring of countywide safety performance is essential to evaluate effectiveness and inform adjustments to future investments and priorities. Moving forward, Benton County will track the performance measures identified below using the most current crash data and project implementation records. Performance measures will be updated each year as finalized crash data becomes available and will be made publicly accessible on the County's website to ensure transparency and accountability.

In addition, the County will convene an implementation-focused Task Force annually to review outcomes, discuss progress toward safety targets, and recommend adjustments to strategies, funding priorities, and future actions to support continuous improvement towards eliminating crashes that result in serious injuries and fatalities on County roadways.

OUTCOME MEASURES

Outcome measures can quantify the effect of safety activities, however, the data for these measures is often lagging and it is not always possible to make a one-to-one comparison between an activity and output. However, it is important to measure and monitor outcomes to confirm the effectiveness of outputs and the County's overall progress in reaching a goal of zero fatalities and serious injuries.

- Number of fatal and serious injury crashes (fatal and serious injury crashes could also be tracked separately)
- Number of fatal and serious injury crashes by emphasis area
  - » Roadway and Lane Departure
  - » Risky Behaviors (e.g., Drug and Alcohol Impairment, Distracted Driving, and Speeding)
  - » Intersections
  - » Aging Drivers (65+ years of age)
  - » People Biking
- Number of fatal and serious injury crashes on the High Priority Network

OUTPUT MEASURES

Output measures are focused on effort and often include the number of installations or activities completed. These measures are often easy to quantify through data collection; however, the result is not measured directly.

- Number of intersections receiving safety treatments
- Miles of roadway and lane departure countermeasures installed
- Number of outreach and education efforts to encourage safe road user behavior
- Number of warning signs installed or upgraded