

Oregon Department of Transportation

ODOT Highway Safety Improvement Program (HSIP) Guide

A Guide to Developing Highway Safety Projects



February 2021



Oregon Department of Transportation
Highway Division - Technical Services
Traffic-Roadway Section

http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/pages/highway_safety.aspx

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Preface

The Oregon Department of Transportation (ODOT) is responsible for administering Oregon's Highway Safety Improvement (HSIP) Program. All roads within the state of Oregon are eligible to receive HSIP funding under the All Roads Transportation Safety (ARTS) Program. The purpose of this guide is to document ODOT Safety Program philosophy and the project selection process to select safety projects.

This document replaces the August 2014 version of the guide. This document has been reviewed by the ODOT Traffic Operations Leadership Team (TOLT) and the Highway Safety Engineering Committee (HSEC).



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1 Introduction

The mission of the Highway Safety Program at the Oregon Department of Transportation (ODOT) is to carry out highway safety improvement projects to achieve a significant reduction in traffic fatalities and serious injuries. The purpose of this guidebook is to document program philosophy and the project selection process for all Highway Safety funding. **For purposes of programming Highway Safety funds in the Statewide Transportation Improvement Program (STIP), all highway safety infrastructure improvement projects shall follow these guidelines.**

The majority of the funding for the ODOT Highway Safety Program comes from the [Highway Safety Improvement Program \(HSIP\)](#), which is a core federal-aid program under the [Fixing America's Surface Transportation \(FAST\) Act](#) that went into effect in December, 2015. The primary goal of the HSIP is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-state owned roads and tribal roads. The HSIP also requires a data-driven and strategic approach to improving highway safety on all public roads that focuses on performance.

The FAST Act, which replaced the [Moving Ahead for Progress in the 21st Century Act \(MAP-21\)](#), largely maintained the program structure of the HSIP with slight increases in funding and a change that disallows HSIP funds to be transferred to and used for educational and enforcement type activities. The HSIP funds are primarily intended for infrastructure improvement projects. Non-infrastructure highway safety improvements such as education and enforcement programs are administered by the ODOT Transportation Safety Division (TSD), and are typically funded with separate funding from the National Highway Traffic Safety Administration (NHTSA), the Federal Highway Administration (FHWA), or state funds.

Following the HSIP requirements, ODOT has developed a new safety program, known as the All Roads Transportation Safety (ARTS) Program, which addresses safety on all public roads including non-state roadways. ODOT worked with the representatives from the League of Oregon Cities (LOC) and the Association of Oregon Counties (AOC) to document principles for a jurisdictionally blind safety program for Oregon to address safety on all public roads of the state, which eventually led to the development of the ARTS Program.

The ARTS Program is intended to address safety needs on all public roads in Oregon. About half of the fatal and serious injury crashes in the state occur on non-state roadways. By working collaboratively with local road jurisdictions (cities, counties, MPOs, and tribes) ODOT can expect to increase awareness of safety on all roads, promote best practices for infrastructure



safety, complement behavioral safety efforts, and focus limited resources to reduce fatal and serious injury crashes in the State of Oregon. The program is a data-driven program to achieve the greatest benefits in crash reduction and is blind to jurisdiction.

Under the inaugural round of the ARTS Program, safety projects have been selected that will be delivered between 2017 and 2021. The Oregon Transportation Commission (OTC) has allocated approximately \$31 to \$37 million dollars per year to the ODOT Highway Safety Program for these five years (for a total of \$166 million dollars) for infrastructure improvements. The majority of this funding will come from the federal HSIP. Refer to [Section 2](#) of this document for more information on the ARTS Program.

1.1 State Strategic Safety Plan

As was the case with MAP-21, the FAST Act requires each state to develop and evaluate a Strategic Highway Safety Plan (SHSP) to address engineering, management, operation, education, enforcement, and emergency services elements of highway safety. The SHSP identifies highway safety improvement opportunities by addressing engineering, education, enforcement, and emergency management in order to focus resources on areas of greatest need and coordinate between programs. The SHSP identifies Oregon's key safety needs and guides investment decisions toward strategies with the most potential to save lives and prevent serious injuries. The FAST Act continues the HSIP as a core program and the requirement for states to develop an SHSP that identifies highway safety problems and opportunities on all public roads. In response to the SHSP requirements, Oregon has adopted the [Oregon Transportation Safety Action Plan](#) in conjunction with the safety projects included in the Statewide Transportation Improvement Program (STIP) as Oregon's SHSP.

1.2 Safety and HSIP Program Management

ODOT has placed the responsibilities of Highway Safety Program management with the Traffic-Roadway Section (TRS). TRS is responsible for developing program guidance, developing the tools necessary for identifying and analyzing highway safety problems as they relate to engineering solutions, and preparing annual HSIP reports. ODOT Regions are responsible for diagnosing safety issues, selecting projects for the STIP, managing safety funds allocated to their Region, and gathering information to support the annual reporting requirements for HSIP.

For more information on project solicitation and selection refer to [Section 4](#) of this document.



2 All Roads Transportation Safety (ARTS) Program Guidelines

The objective of the ARTS Program is to select the best safety projects using a jurisdictionally blind and data-driven approach to significantly reduce the occurrence of fatalities and serious injuries on all roads in the state. A data-driven approach uses crash data, risk factors, or other data supported methods to identify the best possible locations to achieve the greatest benefits. Many highway projects incorporate design features or elements that relate to highway safety, such as updating guardrail or improving intersection channelization, signing, and pavement markings. But appropriate use of HSIP funds is only for locations or corridors where a known problem exists as indicated by location-specific data on fatalities and serious injuries, and/or where it is determined that the specific project can with confidence produce a measurable and significant reduction in such fatalities or serious injuries. To achieve the maximum benefit, the focus of the ARTS Program is on cost-effective use of the funds allocated for safety improvements addressing fatal and serious injury crashes.

The general program guidelines are as follows:

- All projects shall address specific safety problems that contribute to fatal and serious injury crashes.
- All projects shall use only countermeasures from the ODOT-approved countermeasure list.
- Only the most recent available five years of ODOT-reported crashes shall be used for crash analysis.
- Projects shall be prioritized based on ODOT-approved prioritization method such as Benefit-Cost Ratio.
- ODOT Regions will be responsible for developing and delivering projects.

2.1 Program Components

The ARTS Program has two components – a hotspot component and a systemic component, as shown in Figure 2-1. The hotspot approach is the traditional approach used in safety analysis, in which ‘hotspot’ locations are identified based on crash history and appropriate countermeasures are implemented to reduce crashes. Hotspot projects typically focus on a particular location (for example, an intersection or a short segment of a roadway) that may have multiple causes to address. *For the ARTS Program, a hotspot location is defined as a location that has at least one fatal or serious injury crash within the last five years.*



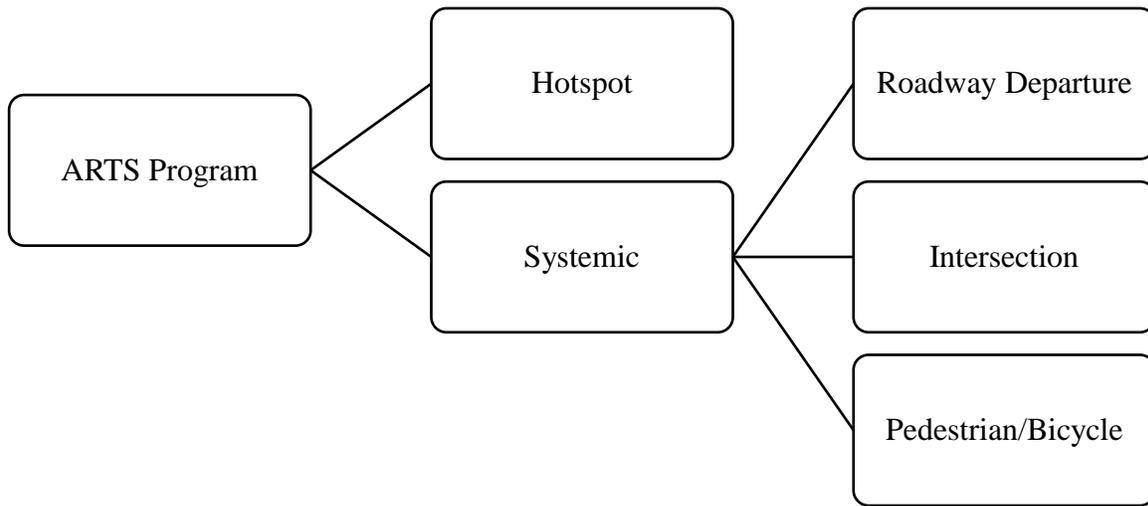


Figure 2-1: Components of the ARTS Program

The systemic approach identifies a few proven low-cost countermeasures that can be widely implemented and then applies the countermeasures where there is evidence that they would be most useful. The HSIP places a significant emphasis on the systemic approach, which has been proven to successfully reduce the occurrences of fatal and serious injury crashes. The systemic component of the ARTS Program has been further divided into three emphasis areas – roadway departure, intersection, and pedestrian/bicycle. Based on 2009 through 2013 data, these three emphasis areas accounted for approximately 85% of the fatal and serious injury crashes in the state (refer to Figure 2-2).

The systemic approach originally used Section 164 penalty funds allocated to the Safety Program, but under the ARTS Program the systemic approach has been moved into the mainstream safety program equal with the hotspot approach.

2.2 Program Funding

The ARTS Program funds will be allocated to the five ODOT Regions based on the proportion of the fatal and serious injury crashes occurred within the last five years in each Region. For a given Region, total funding should be divided equally between the hotspot and systemic components. Again, for the systemic component, it is recommended that Regions split the available funding between the emphasis areas identified in the TSAP (currently those are roadway departure, intersection, and pedestrian/bicycle) based on the proportion of the fatal and serious injury crashes occurred between these three areas within the last five years. For the

first round of the ARTS Program, based on the crash data from 2009 to 2013, the statewide proportions of fatal and serious injury crashes between roadway departure, intersection, and pedestrian/bicycle crashes were 50%, 36%, and 14%, respectively.

ODOT has approximately \$166 million of funding for the five years between 2017 and 2021. Approximate funding splits between the ODOT Regions for the first round of the ARTS Program are shown in Table 2-1.

Table 2-1: Approximate Funding Allocation between the ODOT Regions (2017-2021)

Region	Funding Allocations
1	33%
2	34%
3	15%
4	11%
5	7%
Total	100%

The approximate recommended systemic funding splits between the three emphasis areas are shown in Figure 2-2.

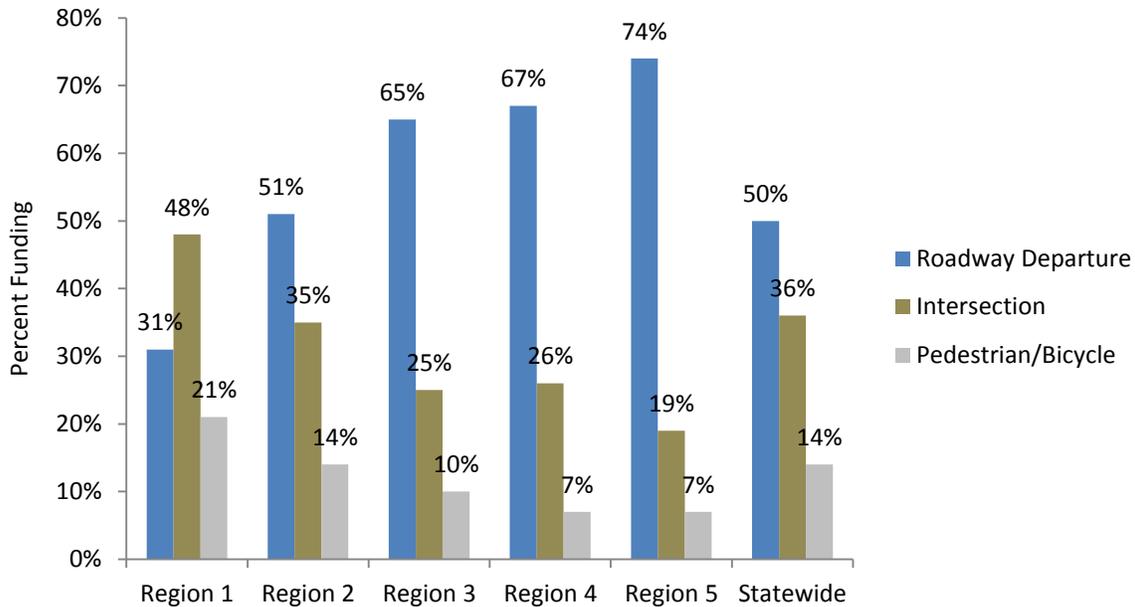


Figure 2-2: Approximate Funding Splits between the Systemic Emphasis Areas



HSIP funds may be used to fund preliminary engineering, right-of-way, and construction costs. The Federal HSIP requires non-federal matching funds, which is 7.78% for Oregon. Within the ARTS Program ODOT will require participating agencies to contribute this non-federal cash match for the projects on their roads. If the local agency fails to identify local matching funds, the local agency and ODOT Region staff may develop a funding plan for local match subject to the ODOT Highway Administrator's approval.



3 Roadway Safety Management Process

ODOT has a long history of using roadway safety management process for selecting highway safety projects. As shown in Figure 3-1, a typical roadway safety management process has six steps. These steps as related to the ODOT Safety Program are described below.

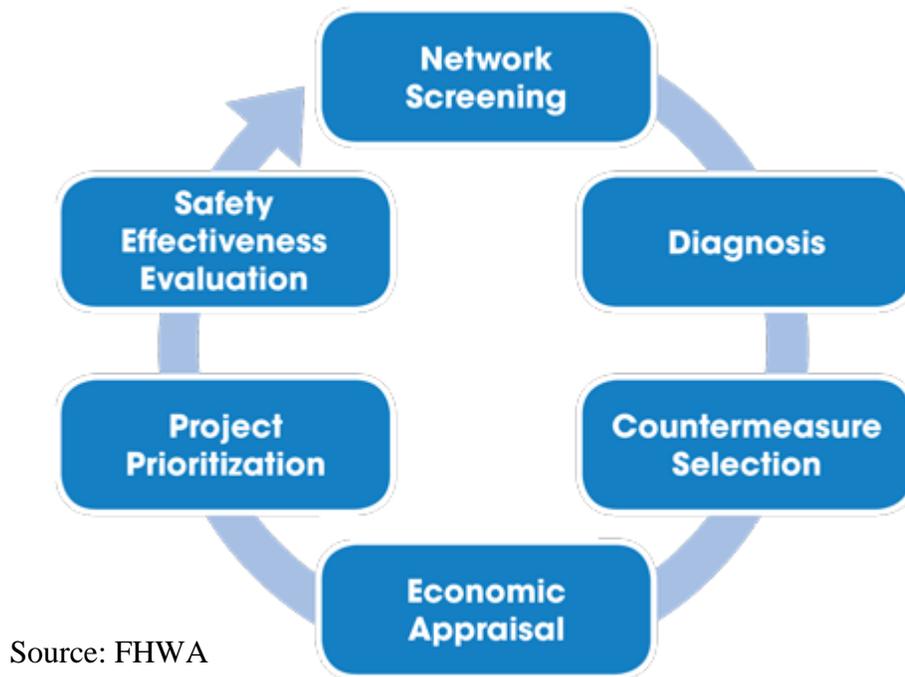


Figure 3-1: Typical Roadway Safety Management Process

3.1 Network Screening

The network screening process identifies sites with the potential to benefit from a safety improvement and involves a comprehensive review of the roadway network to identify locations with safety problems. Network screening is sometimes confused with ranking or prioritizing projects, but network screening is truly about identifying locations that might be good candidates for safety improvements. Prioritization happens after alternative measures are identified and costs can be estimated.

Several different problem identification methodologies are used. The Safety Priority Index System (SPIS) is one such method that combines crash frequency, crash rate, and crash severity to identify potential sites. Also network screening for some specific TSAP emphasis areas such as roadway departure use crash data to identify potential corridors with high numbers of

roadway departure crashes, while other emphasis areas such as pedestrian and bicycle may identify risk factors associated with those types of crashes to identify potential corridors.

3.1.1 Safety Priority Index System (SPIS)

ODOT has been using the SPIS as a network screening tool since early 1980s for identifying potential safety problems on state highways. The SPIS score is calculated for qualifying 0.10-mile segments of roadways based on the frequency, rate, and severity of crashes occurred within each segment over a three-year period. Every year ODOT Traffic-Roadway Section generates a list for each Region (the top 10 percent of statewide SPIS sites). Regions typically investigate the top five percent of these locations to identify any potential safety issues and possible corrective actions. Refer to the [Safety Priority Index System](#) website for more information on the SPIS.

3.1.2 Systemic Network Screening

Network screening for emphasis areas such as roadway departure, intersections, and pedestrian/bicycle is a developing art. While some of the emphasis areas lend themselves particularly well to analyzing crash data (such as roadway departure and intersections), others (such as pedestrian and bicycle) do not. Those that might not have sufficient crash frequency to reliably identify unusual patterns or high risk area may have to use surrogates for crash such as risk factors. These network screening processes (or implementation plans) identify potential locations where investments may yield good returns in terms of reducing fatal and serious injury crashes.

ODOT TRS has developed statewide systemic implementation plans for the three emphasis areas mentioned above. These plans can be downloaded from the [ODOT Highway Safety](#) website.

3.1.3 Other Network Screening and Sources of Potential Projects

A number of other methods now exist for network screening that use statistical methods. These newer methods require sophisticated and robust data sets but employ more accurate means of identifying potential projects. ODOT is piloting several of these methods from the American Association of State Highway and Transportation Officials' (AASHTO) Highway Safety Manual for use in network screening. These methods as well as others may be used to screen for the best candidate projects.

Potential projects can also be identified through other sources such as reported complaints, staff concerns, and previous studies or plans (such as Road Safety Audits or



Transportation System Plans) prepared by staff.

3.2 Diagnosis

The network screening identifies several potential sites that might benefit from safety improvements. The purpose of diagnosis is to have a better understanding of the crash causes and any physical constraints of the site in order to identify potential countermeasures to address the crashes. A diagnosis requires an evaluation of the contributing factors for the crashes, any past studies, and the physical characteristics before a potential countermeasure can be selected. Refer to the [ODOT Highway Safety Investigation Manual](#) for more information on diagnosis.

3.3 Countermeasure Selection

Once locations have been identified for potential safety improvements through networking screening and diagnoses, the next step is to identify potential countermeasures that can be implemented to improve safety. A countermeasure can be defined as a roadway strategy intended to decrease crash frequency and/or severity at a given site.

ODOT has compiled a list of countermeasures, known as the [ODOT Crash Reduction Factor \(CRF\) List](#), which have been proven to reduce crashes. A Crash Reduction Factor (CRF) is the percentage crash reduction that might be expected after implementing a given countermeasure(s) at a specific site. These countermeasures were primarily chosen from the Highway Safety Manual, the Crash Modification Factors (CMF) Clearinghouse, and the FHWA Desktop Reference for Crash Reduction Factors. All the countermeasures were listed as either ‘hotspot’ or ‘systemic’ countermeasures. Any countermeasures listed in the ODOT CRF List can be used for hotspot projects. However, for systemic projects only countermeasures that are listed as ‘systemic’ shall be used. The ODOT CRF List is updated periodically as new countermeasures or better studies on existing countermeasures become available. Suggestions for including new countermeasure(s) to the ODOT CRF List can be submitted to ODOT TRS Staff using the [CRF Request Form](#) provided on the ARTS website.

Some CRFs may be applicable to all crash types and/or all severities. Some CRFs may be applicable to a particular crash type and/or severity. Correct crash types and severities should be used in the benefit-cost analysis described in [Section 3.4.1](#). Refer to the [ODOT Highway Safety Investigation Manual](#) for more information on the CRF.

3.4 Economic Appraisal and Project Prioritization

Economic appraisals are performed to compare the benefits of potential crash countermeasure(s) to its project costs. Prioritization refers to the ranking of projects based on



specific factors or project benefits and costs. Since ODOT has limited safety funding, it can't fund all the projects identified for potential safety improvements. Through the prioritization process ODOT prepares an ordered list of projects that will be funded. Benefit-cost analysis is the primary tool ODOT uses for project prioritization except for bicycle/pedestrian projects. ODOT currently uses cost-effectiveness analysis for prioritizing bicycle/pedestrian projects under the ARTS Program.

3.4.1 Benefit-Cost Analysis

Benefit-cost analysis, which compares the economic benefits of the crash reductions to the project cost, is the traditional analysis tool that is used to determine financial viability of a project and to prioritize projects. The [ODOT Benefit-Cost Workbook](#) shall be used to calculate benefit-cost ratio for the ARTS Program. ODOT requires that five years of the most recent crash data available be used for the analysis and that the project has a benefit-cost ratio of 1.0 or greater. Projects with higher benefit-cost ratios will rank higher in the prioritized list.

Table 3-1: Comprehensive Economic Value Per Crash*

Highway Type	Urban	Rural
<i>Fatal and Serious (Injury A) Injury Crashes</i>		
Interstate	\$1,150,000	\$2,330,000
Other state highways	\$1,170,000	\$1,680,000
Local Roads	\$870,000	\$1,670,000
<i>Moderate (Injury B) and Minor (Injury C) Injury Crashes</i>		
Interstate	\$69,300	\$79,200
Other state highways	\$70,600	\$81,900
Local Roads	\$72,400	\$83,900
<i>Property Damage Only (PDO) Crashes</i>		
All facilities	\$19,400	\$19,400

* Calculated using the cost (updated to 2012 dollars) and procedures shown in Appendix 4A of the Highway Safety Manual

Benefits are calculated in the form of the economic value of the expected reduction of the target crashes due to proposed improvement(s) over the service life of the countermeasures (typically a 5, 10, or 20 year period). For the ARTS Program,



countermeasures shall be chosen from the ODOT CRF List mentioned in [Section 3.3](#). As shown in Table 3-1, ODOT has developed comprehensive economic values for different crash severities and facility types following the Highway Safety Manual methodology to calculate benefits.

ODOT requires that all costs associated with installing the proposed countermeasure(s) be used to calculate the project cost for the purpose of calculating benefit-cost ratio. Costs that are not attributable to the safety improvement, but instead to rules or regulations, should also be included in the project cost. For example, a safety project may trigger environmental mitigation or additional improvements to meet ADA requirements. These additional costs, although not directly associated with the safety improvement(s), should be included in the overall project cost. For some countermeasures, annual maintenance and operation cost should also be included in the project cost. For example, a new traffic signal will incur annual maintenance cost as well as operation cost (cost of power) for the service life of the signal.

3.4.2 Cost-Effectiveness Analysis

Although not as commonly used as benefit-cost analysis mentioned above, cost-effectiveness analysis is another tool that is used for project prioritization. Rather than comparing the economic value of the crash reductions to the project cost, cost-effectiveness analysis compares the change in crash frequency due to the implementation of a countermeasure to the project cost. For the pedestrian/bicycle projects under the ARTS Program, Cost-Effectiveness Index (CEI) is used to prioritize projects. CEI estimates the cost to reduce one crash. The lower the CEI value of a project, the higher it will rank in the prioritized list.

3.5 Safety Effectiveness Evaluation

Safety effectiveness evaluation is the last step in the roadway safety management process, in which projects are evaluated to determine whether projects have been successful in achieving the primary goal of the safety program, which is to reduce the occurrences of fatal and serious injury crashes. In the past ODOT has performed limited evaluations using before/after studies as part of the requirement of the HSIP Annual Report mentioned in [Section 5.1](#). ODOT is currently developing a process to evaluate safety effectiveness of the projects built under the ARTS Program.



4 Project Selection Process

For the first round of the ARTS Program, ODOT used two different processes for selecting safety projects. The hotspot portion of the program was administered using the roadway safety management process described in [Section 3](#). The systemic portion was an application-based process. These processes are described below. ODOT may or may not use the same processes for selecting safety projects for the future rounds of the program.

4.1 Hotspot Project Selection

Hotspot project selection process is shown in Figure 4-1.

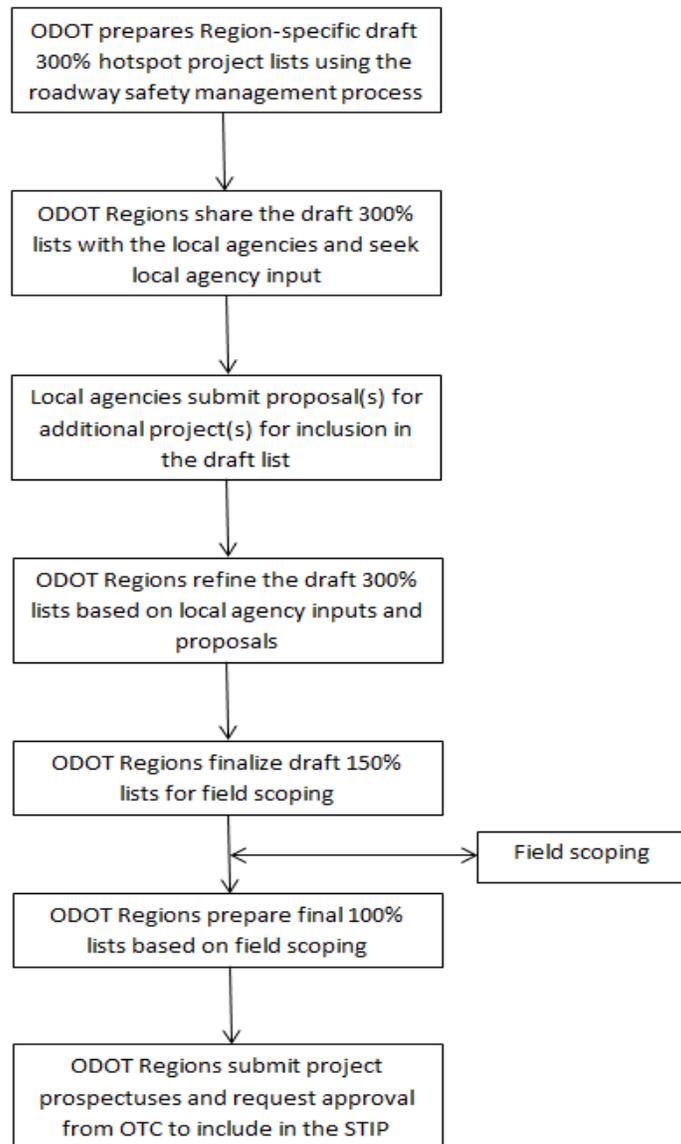


Figure 4-1: Hotspot Project Selection Process



For the hotspot component of the ARTS Program, ODOT hired a consultant to develop a Region-specific draft 300% list of potential projects for both state and non-state highways. Three hundred percent list refers to a list that contained enough projects to spend three times the available funding. These lists were created using the roadway safety management process described in [Section 3](#). As defined in [Section 2.1](#), locations with at least one reported fatal or serious injury crash within last five years were eligible to receive hotspot funding. Equivalent Property Damage Only (EPDO) Average Crash Frequency method was used for network screening. The draft list included potential project locations, recommended countermeasures from the [ODOT CRF List](#), and the corresponding benefit-cost ratio. Benefit-cost ratio was calculated using the [ODOT Benefit-Cost Workbook](#) and five most recent years of ODOT-reported crashes only.

Once the draft lists were developed, Regions shared the lists with the local agencies to engage them in the project selection process. Local agencies had the opportunities to suggest alternate countermeasures for selected projects or to submit new potential projects that were not included in the draft list. However, the number of submittals was limited (as determined by each Region) and local agencies were required to use the same methodologies used to develop the initial list. After addressing local agency inputs, each Region finalized a Region-specific draft list for field scoping (known as a 150% list). For detailed information on hotspot project selection process, refer to the [Hotspot Final Report](#).

4.2 Systemic Project Selection

For the first round of the ARTS Program, the systemic project selection process was an application-based process. The selection process is shown in Figure 4-2. For each ODOT Region, local agencies within the Region and ODOT were invited to submit applications for systemic improvements under the three emphasis areas: roadway departure, intersection, and pedestrian/bicycle. Systemic projects typically consist of more than one location (segments or intersections) where the same countermeasures can be implemented. For systemic projects, it was not required to have any fatal or serious injury crashes in the project corridor.

Roadway departure and intersection projects were prioritized based on benefit-cost ratio. Similar to the hotspot projects, applicants were required to select countermeasures from the [ODOT CRF List](#) and use only the five most recent years of ODOT-reported crashes for benefit-cost ratio calculation. Pedestrian/bicycle projects were prioritized based on the Cost-Effectiveness Index (CEI) mentioned in [Section 3.4.2](#). Reported pedestrians and bicycle crashes are very low compared to vehicular crashes. If benefit-cost ratio were to be used for project prioritization, many high risk locations would not be eligible to receive pedestrian/bicycle funding since they might not have any reported pedestrian and bicycle crashes. If there are no



reported crashes, it is not possible to calculate a benefit-cost ratio. In order to calculate CEI, pedestrian and bicycle crashes were predicted using Part C Predicted Method of the Highway Safety Manual and predicted crashes were then compared with the observed crashes, if any; the higher of the two was used in the analysis. Expected crash reduction was calculated using the CRFs for proposed countermeasures and CEI was then calculated by dividing the expected crash reduction with the project cost.

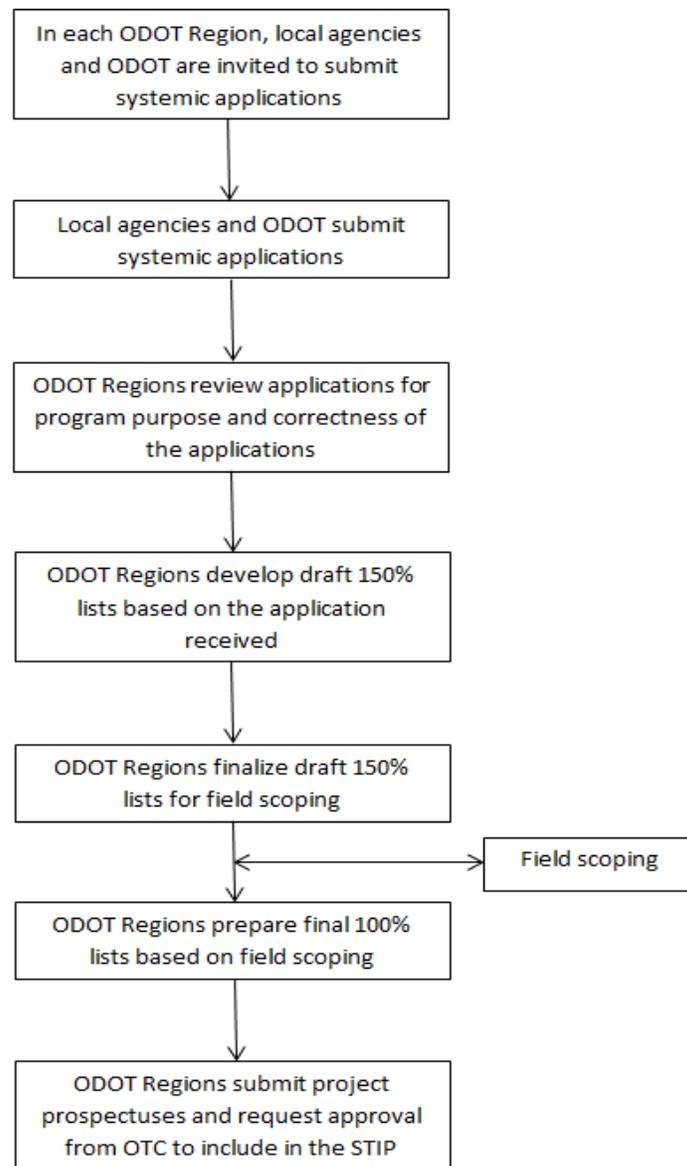


Figure 4-2: Systemic Project Selection Process

Regions checked all applications for program purpose and correctness, working with the submitting agencies when necessary, in order to develop a potential list of projects. Similar to



hotspot projects, Regions developed a Region-specific 150% list of systemic projects for field scoping.

4.3 Field Scoping

Field scoping was performed once the Regions developed 150% lists for both hotspot and systemic projects. During the field scoping, all projects went through a multi-disciplinary assessment to verify the solution. A multi-disciplinary team, including the owner of the facility, would ensure that the best countermeasure was chosen to mitigate fatal and serious injury crashes. Each project was also scoped to verify and revise the costs and identify any possible impediments to implementation. A finalized list of prioritized projects (referred to as a 100% list) was then produced with the best solution and the more accurate cost estimate.

4.4 Guidelines and Standards

Projects selected under the ARTS Program should meet all of the necessary guidelines and standards for construction. It will be the agency's responsibility to obtain necessary approvals as required. For example, ODOT Regions will obtain State Traffic Engineer approval for installing a new traffic signal on state highways or a local agency will obtain permission from FHWA for experimentation to install a bike box on their agency facility. The intent of this requirement is to ensure that projects approved for funding will be constructible. *Approval for funding of projects does not constitute approval for installation of traffic control devices.*

Projects on state highways shall be constructed following ODOT standards and specifications. Projects on local roads may follow ODOT or Local Agency standards and specifications. However, they must meet the applicable federal requirements, if any.

4.5 Project Delivery

Once the list of projects is prioritized and the final 100% list is developed, projects will be included in the STIP. For the projects selected under the first round of the ARTS Program, some projects will be amended into the 2015-2018 STIP and the rest will be incorporated into the 2019-2021 STIP. ODOT Regions will work with the appropriate local agencies to determine the delivery methods, delivering agency, and timelines (applicable funding year). Safety projects selected under the ARTS Program are typically stand-alone projects. However, these projects may be combined with other enhance or fix-it projects as deemed appropriate. For projects involving local agencies, ODOT Regions will work with local agencies to develop an Intergovernmental Agreement. The delivering agency will be accountable for timely and fiscally responsible delivery.



Regions are responsible for managing the safety funds within the Regions. Sometimes a project estimate increases or decreases during the project development phase. In this case, the Project Leader shall coordinate with the Region Safety Program Manager (typically the Region Traffic Manager) to determine how to proceed. Project overruns and underruns will be the responsibility of the Regions and will typically need to be managed carefully since all highway safety funds are allocated to the projects within the STIP. Any funding available due to a decrease in the project cost estimate or construction cost under-runs will be available for other eligible projects within the Region. A project may need to be delayed into future years if the projects overruns become excessive.



5 Federal Reporting Requirements

5.1 Annual Evaluation Report

Pursuant to [23 CFR 924.15](#), ODOT is required to submit annual HSIP report to the FHWA Division Administrator by August 31st of each year. This report describes the progress being made to implement safety projects, assesses the effectiveness of these projects, and describes the extent to which the improvements have contributed to reducing fatalities and serious injuries. Traffic-Roadway Section is responsible for generating this report and submitting it to the FHWA. Region Traffic staff assists in compiling the information necessary to complete the report. Recent reports can be accessed from [FHWA HSIP Reports](#) website.

The ODOT Rail Division also submits the Rail Crossing Safety Program report to the FHWA by August 31st of each year.

5.2 Annual Transparency Report

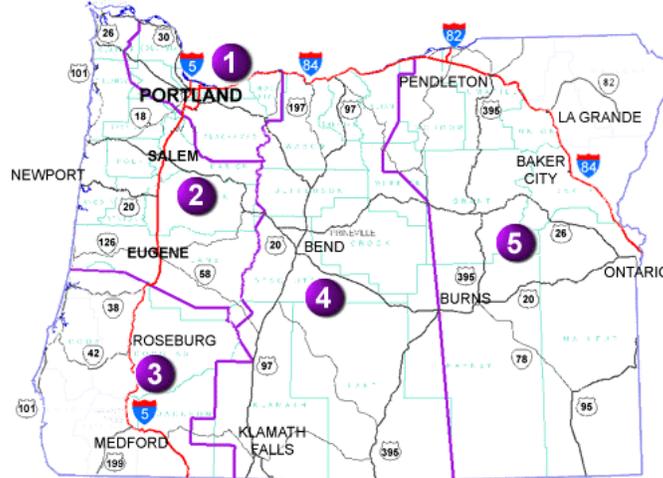
Even though not required by FAST Act, every year ODOT prepares the Transparency (SPIS) Report, which was required under SAFETEA-LU legislation. This report lists not less than five percent of locations identified by the State as possible hazardous locations and recommended countermeasures for these locations. Currently ODOT uses the SPIS to identify potential hazardous locations on state highways and local roads.



Appendix A Contacts

A.1 Region Contacts

Region contacts for ODOT Safety Program are as follows:



Region	Headquarter	Contact	Title	Telephone
1	Portland	Shyam Sharma	Region Traffic Manager	503-731-3427
2	Salem	Keith Blair	Region Traffic Manager	503-986-2656
3	White City	Jared Carpenter	Region Traffic Manager	541-957-3693
4	Bend	Mark Barrett	Region Traffic Manager	541-388-6120
5	La Grande	Jeff Wise	Region Traffic Engineer	541-963-1902

A.2 Traffic-Roadway Section Contact

Questions or comments about the Safety or ARTS Program can be directed to:

Christina McDaniel-Wilson
 State Traffic Safety Engineer
 Oregon Department of Transportation
 4040 Fairview Industrial Ave SE, MS#5
 Salem, OR 97302
 (503) 986-3573

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A.3 Crash Analysis and Reporting Contact

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Appendix B Resources

All Roads Transportation Safety Program: <https://www.oregon.gov/odot/Engineering/Pages/ARTS.aspx>

ODOT Crash Reduction Factors (CRF) List:
<https://www.oregon.gov/odot/Engineering/Pages/ARTS.aspx>

Statewide ODOT Reported Crashes:
<https://tvc.odot.state.or.us/tvc/>

Crash Analysis and Reporting Publications:
http://www.oregon.gov/ODOT/TD/TDATA/pages/car/CAR_Publications.aspx

Trans Data Portal:
<https://www.oregon.gov/odot/Data/Pages/TransData-Portal.aspx>

Safety Priority Index System:
<https://www.oregon.gov/odot/Engineering/Pages/SPIS-Reports-On-State.aspx>

Benefit-Cost Analysis Worksheet:
<https://www.oregon.gov/odot/Engineering/Pages/ARTS.aspx>

Cost Estimation Workbook:
<https://www.oregon.gov/odot/Engineering/Pages/ARTS.aspx>

ODOT Transportation Safety Division:
<http://www.oregon.gov/odot/ts/Pages/index.aspx>

Federal Highway Administration (FHWA) Safety Webpage:
<http://safety.fhwa.dot.gov/>

National Highway Traffic Safety Administration Website:
<http://www.nhtsa.gov/>

Highway Safety Manual Related Links:
<https://www.oregon.gov/ODOT/Engineering/Pages/HSM.aspx>

Crash Modification Factors (CMF) Clearinghouse:
<http://www.cmfclearinghouse.org/>

