Oregon Department of Transportation

ALL ROADS TRANSPORTATION SAFETY (ARTS)

PROGRAM SUMMARY REPORT

2027-2030 STIP CYCLE

ACKNOWLEDGMENTS

ODOT TECHNICAL SERVICES TEAM

Christina McDaniel-Wilson, State Traffic Safety Engineer

Jiguang Zhao, Traffic Safety Engineer

ODOT REGION STAFF

Region 1

Shyam Sharma, Region 1 Senior Traffic Manager

Tiffany Slauter, Region 1 Traffic Investigations and Safety Engineer

Region 2

Keith Blair, Region 2 Traffic Unit Manager

Amanda Salyer, Region 2 Traffic Investigations Engineer

Region 3

Eric Finney, Region 3 Traffic Unit Manager

Region 4

Mark Barrett, Region 4 Traffic Design and Operations Manager

Dan Serpico, Region 4 Traffic Safety Engineer

Region 5

Dan Fine, Region 5 Traffic and Roadway Manager

Marlow Stanton, Region 5 Traffic Engineer

DKS ASSOCIATES

Lacy Brown

Travis Larson

Scott Mansur

CONTENTS

LIST OF FIGURES, TABLES, & ACRONYMS

LIST OF ACRONYMS

ARTS – ALL ROADS TRANSPORTATION SAFETY

BC – BENEFIT-COST

CEI – COST EFFECTIVENESS INDEX

CRF – CRASH REDUCTION FACTOR

HSIP – HIGHWAY SAFETY IMPROVEMENT PROGRAM

MOU – MEMORANDUM OF UNDERSTANDING

OASIS – OREGON ADJUSTABLE SAFETY INDEX SYSTEM

ODOT – OREGON DEPARTMENT OF TRANSPORTATION

SHSP – STRATEGIC HIGHWAY SAFETY PLAN

SPIS – SAFETY PRIORITY INDEX SYSTEM

TSAP – TRANSPORTATION SAFETY ACTION PLAN

QA/QC – QUALITY ASSURANCE/QUALITY CONTROL

EXECUTIVE SUMMARY

The Oregon Department of Transportation (ODOT) administers the federally-funded Highway Safety Improvement Program (HSIP) to implement infrastructure projects aimed at reducing the number of fatalities and serious injuries on Oregon's roadways. ODOT established the All Roads Transportation Safety (ARTS) Program to achieve the goals of HSIP using a data-driven, jurisdictionally-blind process. Through the ARTS program, projects on all public roads in Oregon, regardless of roadway ownership, compete for HSIP funding. Selected projects are then programmed into the next Statewide Transportation Improvement Program (STIP) list. This summary report reviews the 2023-2024 ARTS grant cycle which will fund projects in the 2027-2030 STIP.

The ARTS program is a primary source of funding for safety projects in Oregon, particularly those on county roads, city streets, and tribal roads. The occurrence of fatal and serious injury crashes is relatively equal on state highways and local roads (49% state highways, 51% local roads, 2017-2021). Funding safety improvements on all roadways in Oregon, regardless of ownership, is critical to achieving the statewide goal of eliminating fatal and serious injury crashes by 2035 (per the 2021 Oregon Transportation Safety Action Plan).

For this cycle of ARTS program, a total of $128 million in HSIP money was available to fund projects on roadways in Oregon. ODOT regions and local agencies submitted 115 applications for ARTS funding in 2023 requesting $273 million, more than twice the available funding. After ranking applications based on the cost effectiveness of projects in each region, 75 potential projects were selected for the Scoping List with a combined planning- level cost estimate of approximately $160 million. The final list for implementation will be determined as part of the next STIP cycle, which is a separate process that is not yet completed.

FIGURE 1. ARTS CYCLE TIMELINE

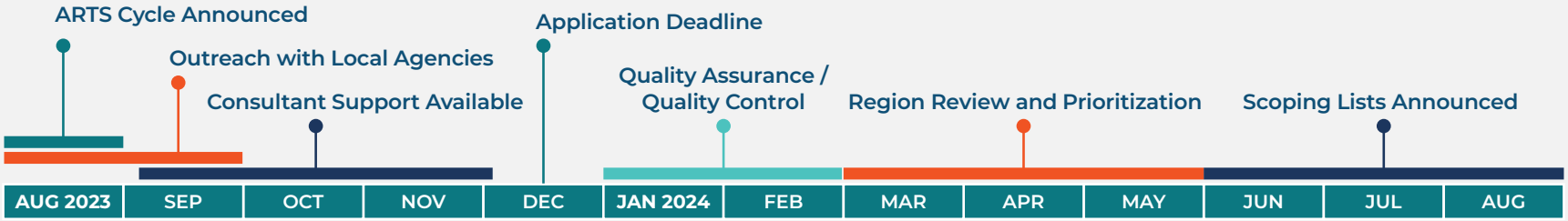
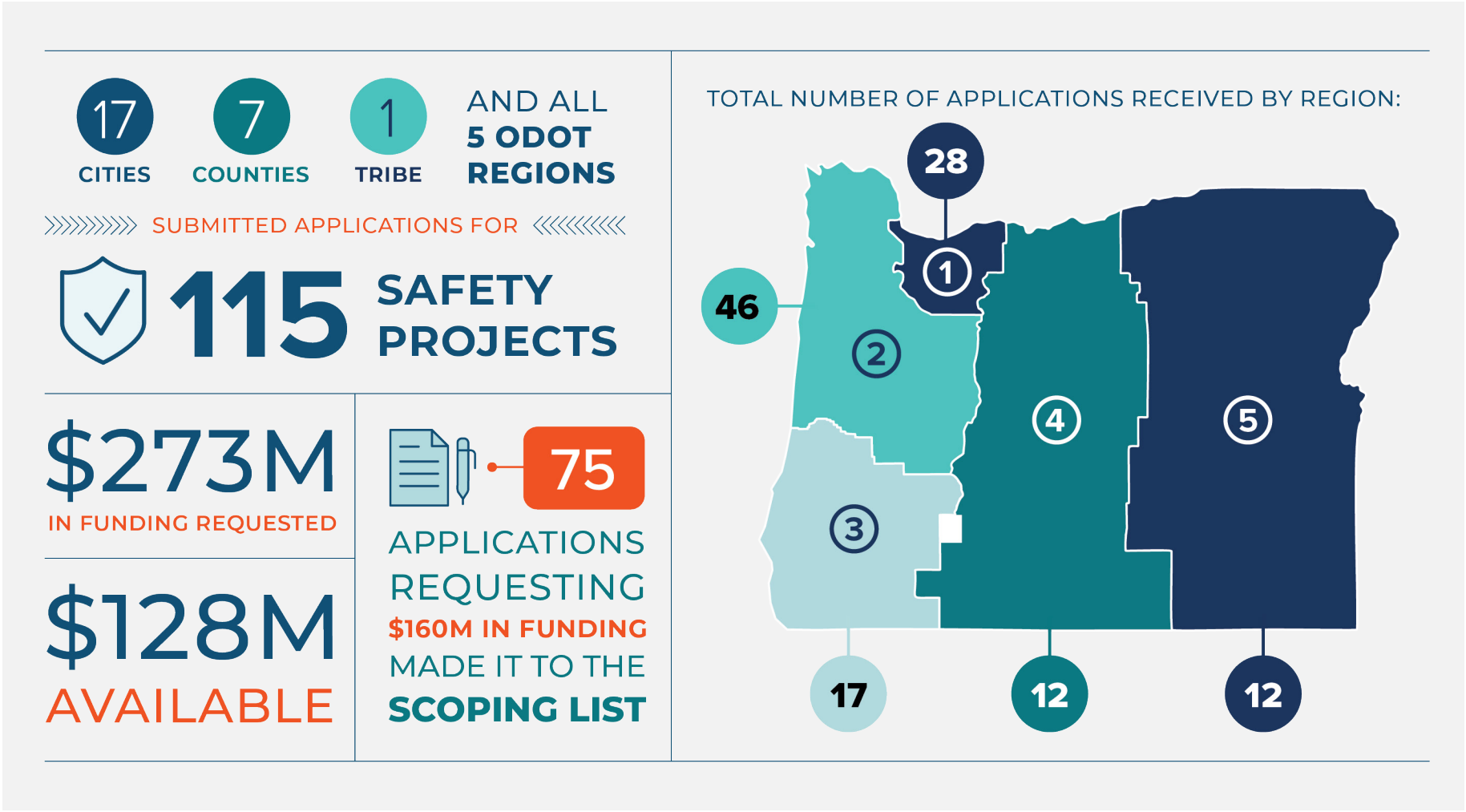


FIGURE 2. 2023-2024 ARTS PROGRAM "AT A GLANCE"



1 〉 INTRODUCTION

This summary report presents an overview of the ARTS program history and guidelines, a summary of the 2023-2024 ARTS program process and timeline including coordination with local agencies and Tribal partners, data on the types of applications received and selected for scoping, and detailed discussion on the successes and challenges experienced while administering this cycle of the ARTS program.

Additional information about the ARTS program, resources, tools, and contact information for ARTS representatives can be found on the ODOT ARTS website.[1]

1 https://www.oregon.gov/ODOT/Engineering/Pages/ARTS.aspx.

2 PROGRAM OVERVIEW AND GUIDELINES

ARTS PROGRAM HISTORY

ODOT has received federal transportation funding for decades that has helped ODOT build the state's current transportation infrastructure, including a high-hazard location program in 1973 to address transportation safety. In 2005, the HSIP was made a core program by the federal government to focus on reducing traffic fatalities and serious injuries on all roadways.

Historically, federal funding provided to ODOT was applied primarily to ODOT facilities. However, approximately half of the fatalities and serious injuries occur on other public roadways, including non-state-owned roadways and roads on Tribal lands. To ensure HSIP funding was applied to the highest safety needs across the state, ODOT expanded the HSIP to include all public roads in Oregon. In February 2013, ODOT entered a memorandum of understanding (MOU) with the Association of Oregon Counties and the League of Oregon Cities. The MOU established broader eligibility for use of HSIP funds. This led to the development of the ARTS program.

The current application-based, jurisdictionally-blind framework of the ARTS program has been in effect since 2018. The ARTS program supports statewide safety efforts and programs. The four ARTS application types (hotspot, intersections, roadway departure, and bicycle-pedestrian) are consistent with the 2021 Oregon Transportation Safety Action Plan (TSAP) emphasis areas, which identifies intersections and roadway departure as subareas under the Infrastructure Emphasis Area and pedestrians and bicyclists as subareas under the Vulnerable Users Emphasis Area.

THE GOAL OF THE ARTS PROGRAM IS TO REDUCE THE FREQUENCY OF FATALITIES AND SERIOUS INJURIES ON ALL PUBLIC ROADS THROUGH A DATA-DRIVEN PROCESS THAT IS BLIND TO JURISDICTIONAL OWNERSHIP.

ODOT intends to increase awareness of safety on local roads, promote best practices for infrastructure safety, complement behavioral safety efforts, and focus limited resources on the areas most likely to reduce the number of fatal and serious injury crashes in Oregon. The following themes form the backbone of the ARTS program.

1. FOCUS ON FATALITIES AND SERIOUS INJURIES
2. JURISDICTIONALLY-BLIND, DATA DRIVEN
3. LOCAL AGENCY OUTREACH AND SUPPORT
4. LOCAL MATCH

FOCUS ON FATAL AND SERIOUS INJURY CRASHES

While ODOT's transportation safety program is intended to reduce the risk of all crashes, it is focused on those resulting in serious injuries and fatalities, which provides the greatest societal benefit to Oregon communities.

Appropriate use of 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 reduction in such fatalities or serious injuries. Maintaining this focus is consistent with USDOT's Safe System Approach and will help the state reach its goal of eliminating fatal and serious injury crashes by 2035.

JURISDICTIONALLY-BLIND, DATA DRIVEN

ODOT's ARTS program considers safety on all roads in Oregon regardless of jurisdiction.

The program focuses on the greatest safety needs wherever they are – a state highway, city street, county road, Tribal road, or other public facility. The ARTS program uses a data-driven process to identify potential hotspot and systemic safety projects. The program relies on official ODOT crash data, established crash risk factors, and proven safety countermeasures with quantifiable safety benefits to ensure that all projects are identified, ranked, and selected equitably.

LOCAL AGENCY OUTREACH AND SUPPORT

ODOT provides local agencies with safety analysis and application support so that all agencies have equal access to funding. This consultant support is provided at no cost to the local agencies. The services provided to local agencies and Tribal partners is described in further detail in Chapter 4.

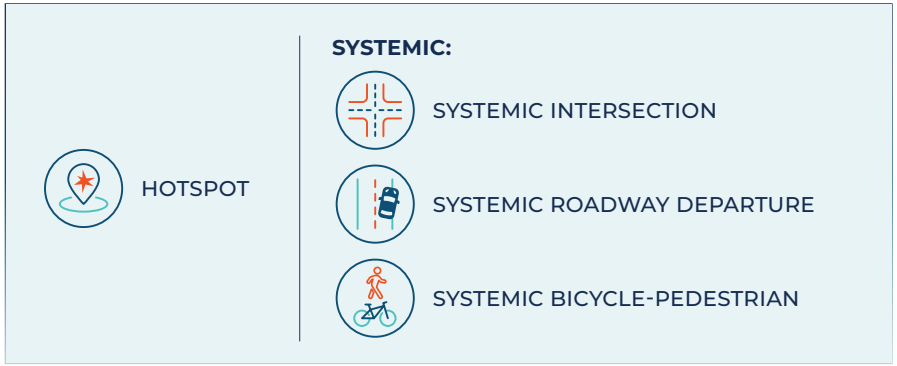
LOCAL MATCH

A 10% local agency match is required for projects on local roadways where federal funding will be used. Local agencies may request a waiver if contributing this match is a barrier to their participation in the program.

THE ARTS PROGRAM PRINCIPAL GUIDELINES INCLUDE:

- The program goal is to reduce fatal and serious injury crashes.
- The program must include all public roads.
- The program is data driven and blind to jurisdiction.
- The process will be overseen by ODOT regions.
- Both hotspot methodology and systemic methodology will be used.
- Only proven countermeasures from the ODOT Crash Reduction Factor Manual will be used.

The Strategic Highway Safety Plan (SHSP) is a requirement of HSIP. The Oregon Transportation Safety Action Plan serves as Oregon's SHSP. It is a coordinated statewide plan that provides a comprehensive framework for reducing fatalities and serious injuries in Oregon and contains strategies and actions for implementation. The ARTS sub-programs of both hotspot and systemic, including intersections, roadway departure, bicyclists and pedestrians are included as priorities within Oregon's Plan. Therefore, the ARTS program is split into four sub-programs, each of which competes separately:



HOTSPOT

Hotspot projects focus on specific locations within the roadway network - such as intersections, curves, or short segments – with a history of at least one fatal or serious injury crash within the last five years. Hotspot projects were identified using geocoordinates attached to historical crash data to identify locations where a high frequency or severity of crashes occurred. Once locations were identified, the characteristics and details about the crashes were used to select countermeasures for each location. Typical countermeasures tend to be higher costs, such as construction of left- or right-turn lanes, installation of a traffic signal, or conversion of a stop-controlled intersection to a roundabout.

SYSTEMIC

Systemic projects address safety concerns along entire corridors, roadway segments, at multiple intersections, or throughout communities. This approach attempts to address the random nature of crashes by applying the countermeasure to a larger section of roadway rather than specific locations where crashes have occurred. Systemic project applications (excluding bicycle and pedestrian) were required to treat at least one fatal or serious injury crash within the project extents.

ODOT regions and local agencies were required to submit applications for locations they concluded warranted traffic safety improvements in three systemic focus areas.

SYSTEMIC INTERSECTION: This application type was focused on low-cost treatments applied at multiple intersections in a jurisdiction. Systemic intersection applications can include bicycle and pedestrian improvements as well. Examples projects included installing reflectorized back plates at signalized intersections and installing intersection warning signs at unsignalized intersections.

SYSTEMIC ROADWAY DEPARTURE: This application type addressed run-off-road and head-on crashes, mostly in rural areas, through the application of countermeasures such as curve warning signs, rumble strips, pavement markings, and high friction surface treatments.

SYSTEMIC BICYCLE-PEDESTRIAN: This application type was focused on reducing crash risks to pedestrians and bicyclists. This application type emphasized consideration of risk factors in addition to crash history. Treatments in this application type include countermeasures such as pedestrian lighting, enhanced pedestrian crossings, bicycle lanes, and cycle tracks.

CHANGES FROM PREVIOUS YEARS:

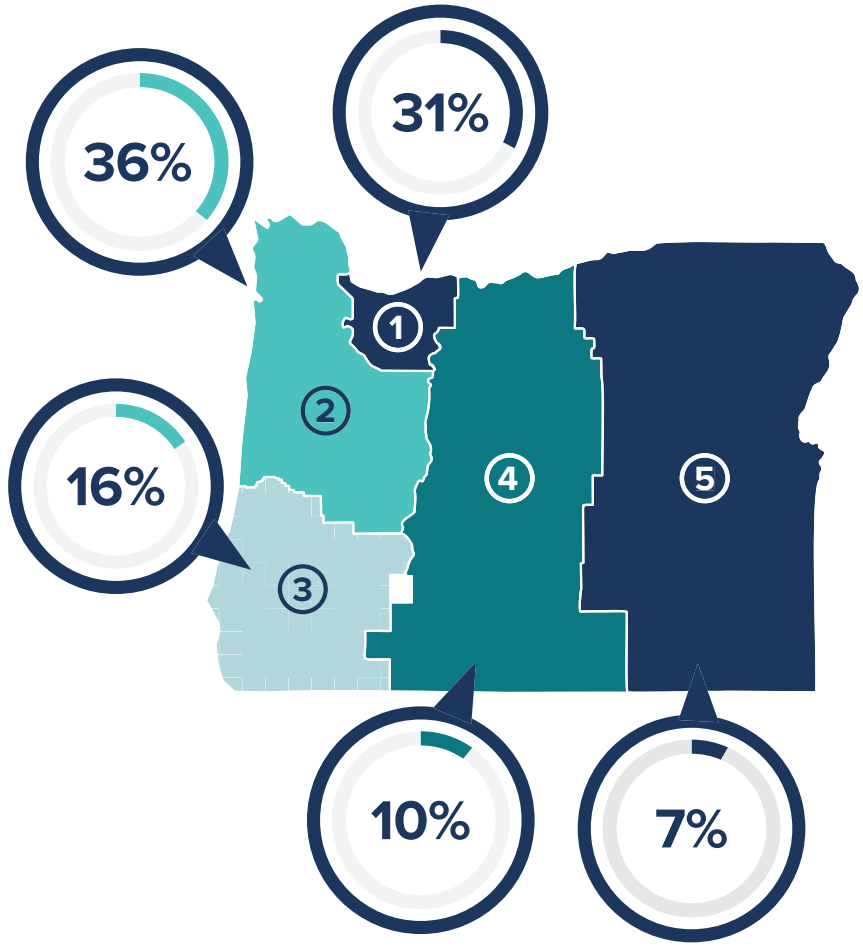
The 2023 ARTS program implemented several changes from previous rounds, some in response to feedback received and some out of necessity, which are summarized below.

- ODOT updated and expanded the list of approved countermeasures and developed the Crash Reduction Factor (CRF) Manual (a single resource combining the CRF List and CRF Appendix)
- ODOT (with support from the Consultant) developed a new risk-based Cost Effectiveness Index (CEI) to evaluate bicycle and pedestrian projects. The new CEI incorporated equity and aligned with the 2023 Oregon Vulnerable Road Users Safety Assessment
- ODOT (with support from the Consultant) developed a comprehensive ARTS Manual which provides detailed guidance on how to apply for ARTS funding

FUNDING BREAKDOWN

The $128 million of 2027-2030 funds for the ARTS program (as determined by the Oregon Transportation Commission) was allocated to each ODOT region based on the proportion of statewide fatalities and serious injuries occurring within each region. Within each region, the funding was split evenly to allocate to state highway and local roadway projects. Additionally, approximately half of the funding was allocated for hotspot projects and half was allocated to systemic projects.

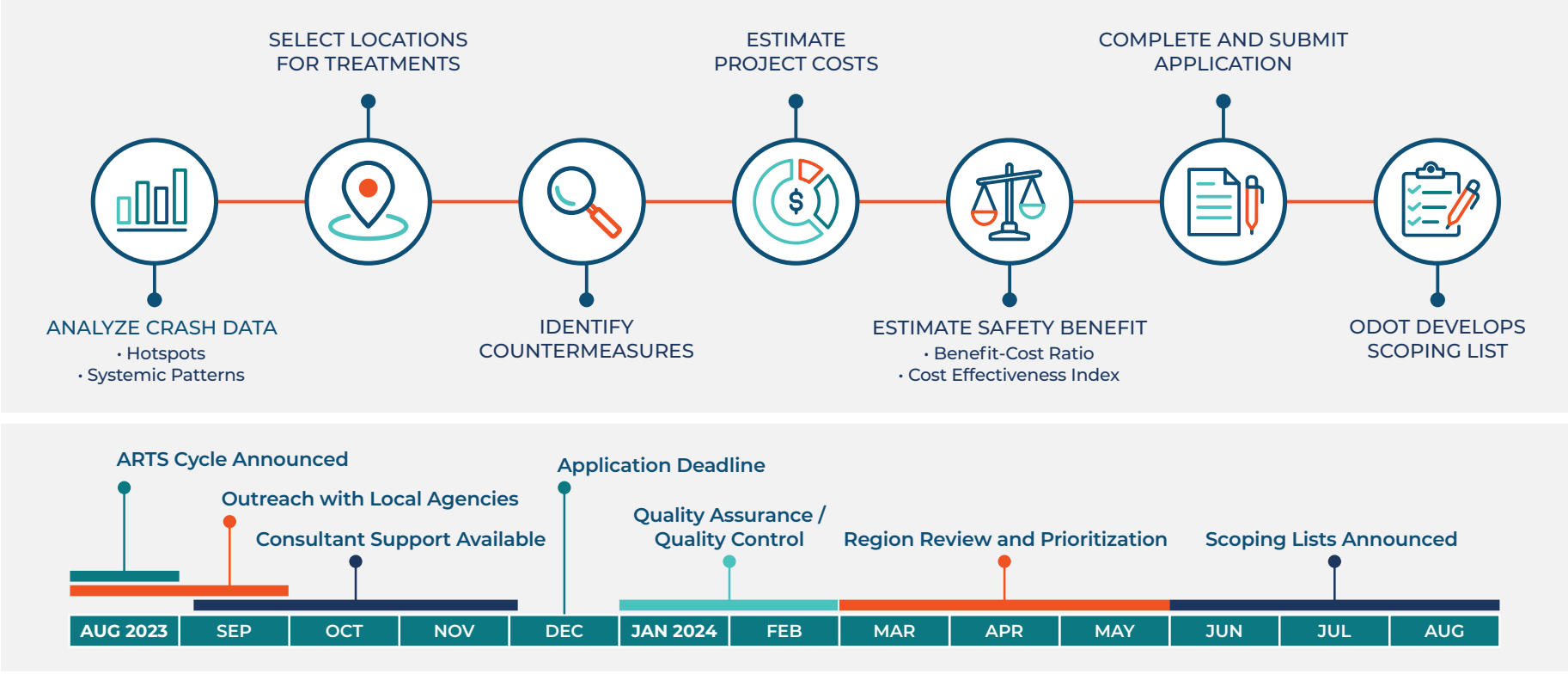
FIGURE 3. FUNDING BREAKDOWN BY REGION



3 〉 PROGRAM PROCESS & TIMELINE

ODOT Traffic Engineering Section oversees the ARTS program, but individual regions administer the program locally. Administering the ARTS program is a multi-step process that involves data analysis, identification of project locations, selection of safety countermeasures, development of cost estimates, estimation of safety benefits, and submittal of a grant application. In alignment with a jurisdictionally-blind program, anyone seeking grant funding for projects on local roadways (local agencies) or state highways (ODOT regions) must follow the same process. Consultant support is available to local agencies, at no cost, for assistance with any or all steps of the process from data analysis to preparation of grant applications. After submission of applications, the Consultant provides a detailed quality assurance/quality control (QA/QC) review of all applications to ensure accuracy and consistency, after which ODOT regions rank the applications based on cost effectiveness to develop the scoping list.

FIGURE 4. ARTS CYCLE PROCESS AND TIMELINE



PROJECT DEVELOPMENT

Crash data plays a key role in the ODOT ARTS program for the identification of safety needs, the development of safety projects, and the analysis of expected safety benefits. All applications were required to utilize the most recent five years of finalized crash data from the ODOT Crash Analysis and Reporting Unit, which included the years 2017 through 2021. More recent crash data available locally could be used as additional information to support the application narrative and selection of treatments, but could not be considered in the calculation of safety benefits.

PROJECT IDENTIFICATION

ODOT provided numerous tools and resources that applicants could utilize for identifying potential project locations.

- **Statewide Safety Priority Index System (SPIS)** – ODOT report of statewide locations that have an unusually high occurrence of crashes.
- **Oregon Adjustable Safety Index System (OASIS)** – An online safety analysis tool that is capable of performing "SPIS like" safety analysis and allows users to vary the SPIS calculations to create custom safety analyses of the data within the system.
- **Crash Data Summaries (provided in some Regions)** – Consultant-developed crash data summaries and maps, including the location and patterns of fatal and serious injury crashes.
- **Tableau Online Crash Data Dashboard** – An online data dashboard including the most recent five years of available ODOT crash data (2017-2021). The dashboard allowed for easy visualization of crash data by jurisdiction as well as the ability to download crash data elements that were pertinent to ARTS applications.
- **ODOT Crash Data TransViewer** – Official online web portal for accessing crash records directly from ODOT.
- **ODOT Crash Data Dashboard** – An online data dashboard provided by the ODOT Crash Analysis and Reporting Unit.[1]
- **Past Statewide Implementation Plans** – Previously developed statewide plans which include potential projects related to Roadway Departure, Intersection, and Bicycle/Pedestrian.

1 https://www.oregon.gov/odot/Data/Pages/Crash.aspx

APPROVED COUNTERMEASURES

ODOT has developed a toolbox of approved countermeasures with associated approved CRF values based on the Highway Safety Manual, FHWA's Crash Modification Factors Clearinghouse, and other research studies. The following three countermeasure resources are available.

- **CRF List** – Spreadsheet of approved countermeasures
- **CRF Manual** – Supplemental one-page summary of each approved countermeasure that provides additional information and considerations for installation
- **Countermeasure Search Tool** – A "smart spreadsheet" tool that allows the user to enter site characteristics and/or observed crash trends and populate a list of potential countermeasures that could be considered.

For each countermeasure, the CRF Manual includes the following information:

- Treatment description
- Applicable crash types (turning, angle, rear end, etc.)
- Applicable crash severities (injury, PDO)
- Service life (5, 10, or 20 years)
- Applicable traffic control type (signalized/unsignalized)
- Applicable Setting (urban, rural, both)
- CRF value

Countermeasures on the CRF List are categorized as Hotspot or Systemic, and applicants are required to use the appropriate treatment type in their applications (with some exceptions made on a case-by-case basis). Hotspot countermeasures are proven treatments typically ranging from medium to high cost for addressing a specific location (e.g., roundabout). Systemic countermeasures are limited to low cost, proven treatments that can be applied along a corridor (e.g., rumble strips).

COST ESTIMATES

ODOT maintains a database of planning level cost estimates (including construction, design, right-of-way, and contingency) for each ODOT approved countermeasure. The majority of these cost estimates were developed in previous rounds of ARTS and updated to reflect 2023 values. All cost estimates assumed a markup of 40% for contingency and 26% for preliminary engineering, right-of-way, and environmental/geotechnical impacts. Baseline cost estimates were developed for statewide application, however cost estimates for countermeasures in Region 1 were increased by 50% to 100% to reflect the increased cost of delivering construction projects in Region 1.

On a case-by-case basis (depending on project complexity and with Region approval), the Consultant was available to help local agencies develop more detailed cost estimates for selected projects.

SAFETY BENEFITS

BENEFIT COST (BC)

The economic benefits of each countermeasure were calculated based on the expected crash reduction and the Comprehensive Economic Value per Crash established by ODOT. When multiple countermeasures were proposed for a single location, a combined benefit was calculated consistent with ODOT and Highway Safety Manual methodology.

The expected service life of each treatment was also considered when estimating the safety benefit. For example, installing a traffic signal is expected to provide safety benefits for 20 or more years, while new pavement markings tend to wear much sooner, requiring maintenance or reapplication. Therefore, the annual benefit is multiplied by a corresponding present worth factor to address these differences.

ODOT developed and shared a Benefit-Cost Form that handles most of these calculations. The result of this form is a BC ratio in decimal form (the higher the ratio the better). The following statistics summarize the BC ratios for submitted hotspot and systemic applications this cycle.

HOTSPOT:

AVERAGE	MINIMUM	MAXIMUM
8.1	1.6	30.8

SYSTEMIC:

AVERAGE	MINIMUM	MAXIMUM
22.9	1.4	128

COST EFFECTIVENESS INDEX

Previous rounds of ARTS used a CEI tool that was based on the Highway Safety Manual predictive method. ARTS participants repeatedly shared that this tool was not user friendly, the output was not intuitive, and the results were heavily influenced by crash history. For this round of ARTS, the Consultant developed a new risk-based CEI tool that incorporates crash history, known risk factors, and equity considerations. The new tool requires less input data than the previous tool and the results are provided in units similar to benefit-cost (Risk Reduced per Cost). The updated CEI tool bases the risk assessment on the following:

- Crash history (bicycle and pedestrian involved crashes of all severities)
- Oregon Social Equity Index disparity level
- Exposure (number of lanes crossed, average daily vehicle volume, number of multi-modal attractors nearby)
- Roadway characteristics (presence of sidewalks and bicycle lanes, spacing of signalized crossings, driveway density, shoulder width, posted speed limit)
- Intersection characteristics (traffic control type, presence of existing safety enhancements)

Like the BC methodology, the CEI tool accounts for the expected service life of each treatment. The Consultant developed a smart spreadsheet that handles the CEI calculations. The result of this tool is a Total Reduced Risk per $1,000 spent (RRC), the higher the value the better.

4 〉 PARTNERSHIP WITH LOCAL AGENCIES

The ARTS program is a primary source of funding for safety projects in Oregon, particularly those on county roads, city streets, and tribal roads. ODOT prioritizes the equitable distribution of ARTS funding by allocating 50% of the available funds to projects on local roads. Beyond sharing the funds, ODOT makes a concerted effort to engage with cities, counties, and Tribal partners across the state and provides them with significant support to encourage participation.

Regional Kick-off Meetings. The Consultant met with staff in each ODOT Region to develop a local agency outreach plan to ensure that all agencies were aware of the ARTS program and understood the requirements and schedule. The Consultant also maintained a database of local agency and Tribal contacts.

Crash Data. The Consultant developed the online ARTS Crash Data Tableau viewer that allowed local agencies and region staff to easily visualize crash locations, patterns, and contributing factors.

Local Agency Informational Meetings. ODOT Headquarters, ODOT Regions, and the Consultant partnered to deliver a virtual information meeting in each region to introduce this round of the ARTS program, review program goals, provide details about the application requirements, and share available resources and tools.

Follow-up Meetings and Support Workshops. In addition to the informational meetings described above, Region staff and the Consultants facilitated local agency support workshops to provide one-on-one assistance to agencies with any aspect of application development, including safety issue diagnosis, countermeasure selection, cost estimation, and benefit-cost analysis. In-person workshops were held in Regions 1 and 2.

Virtual Support by Phone and E-mail. The Consultant and ODOT staff provided support to local agencies as they developed applications.

- **Identifying Potential Applications.** The consultant met with cities, counties, and tribes to help them analyze their crash data, discuss the locations for potential treatments, and brainstorm potential solutions that would result in competitive applications.
- **Cost Estimating.** The Consultants were available to put together planning level cost estimates for projects.
- **Benefit Calculations.** One of the most complex steps in the process, especially for local agencies, was calculating the BC ratio or CEI correctly. The Consultant provided support for these calculations, in many cases completing the forms for the agency or reviewing their calculations.
- **Developing Draft Applications.** The Consultant was available to assist local agencies and tribal partners with preparing draft applications.

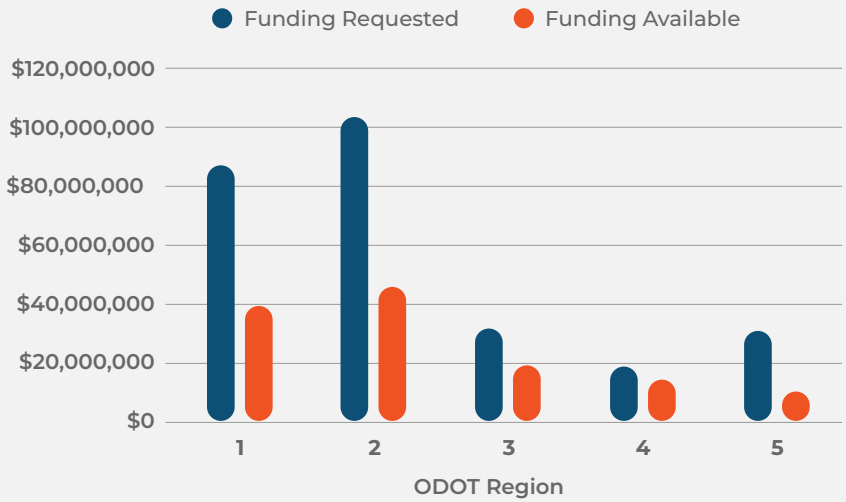
76% OF LOCAL AGENCIES USED ODOT-PROVIDED CONSULTANT TECHNICAL SUPPORT WHEN PREPARING THEIR ARTS APPLICATIONS.

APPLICATION SUBMITTAL PROCESS

Both local agencies and ODOT regions were required to submit application materials via a consultant-provided website. At a minimum, application materials were required to include an application form, benefit-cost or CEI analysis worksheets, cost estimates, and supporting crash data. Applications could be submitted any time between September 5 and December 15, 2023. Due to technical challenges with the application form, the deadline was extended by one week to December 22, 2023.

All five ODOT regions and 25 local partners (17 cities, 7 counties, and 1 Tribe) submitted a total of 115 applications for ARTS funding.

AVAILABLE AND REQUESTED ARTS FUNDING, BY REGION



POST-SUBMITTAL QA/QC REVIEWS

After ODOT Regions and local agencies submitted their ARTS applications, the Consultant conducted a thorough QA/QC review of each application for completeness and accuracy. QA/QC criteria included some critical items (e.g., accurate benefit-cost calculations) and some secondary items (e.g., cost estimates that were too low or high). Each application received one of four review results: *Pass*, *Pass after minor revisions* (made either by the agency or Consultant), *Pass with flags* (critical items were OK, one or more secondary items were not), or *Fail* (critical item was not OK and could not be corrected).

Of the 115 applications submitted, 35 passed, 70 passed with either revisions or flags, and 10 failed the QA/QC review.

LOCAL AGENCY FEEDBACK (TO CONSULTANT TEAM):

"THANKS AGAIN FOR ALL OF YOUR WORK ON THESE APPLICATIONS. YOUR TEAM'S ASSISTANCE ON THESE AND PRIOR APPLICATIONS ARE INVALUABLE!"

– DOUGLAS COUNTY PUBLIC WORKS

5 〉 APPLICATION SUMMARY & SELECTION

All applications that passed the final QA/QC review were ranked according to the project's calculated benefit-to-cost ratio or reduced risk per cost ratio. ODOT region staff made the final selection of projects to move forward into the scoping process, taking into account the distribution of projects across application types and jurisdictions. ODOT has established statewide goals for funding each of the four application types. Approximately half of the available funding is allocated to hotspot projects and half to systemic projects. Within the systemic category, the funding goals for each application type are shown on the following page, consistent with statewide proportions of fatal and serious injury crashes attributed to intersections, roadway departures, and bicyclists or pedestrians.

In previous rounds of the ARTS program, the scoping list included projects totaling upwards of 150% of the available funding. Due to limited resources for the scoping effort, regions were encouraged to select a scoping list much closer to 100% of the available funding.

Of the 105 applications that passed QA/QC, 70 were selected for the scoping list, including 43 on local roadways and 27 on state highways. After field scoping is complete, project scopes and cost estimates will be updated and the 70 projects will be re-prioritized based on revised benefits and costs.

ARTS APPLICATIONS SUMMARY

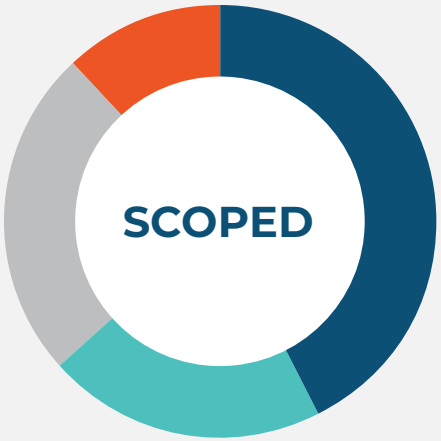
STATEWIDE FUNDING SPLIT GOALS ($128M AVAILABLE)

- 50% HOTSPOT
- 25% INTERSECTION
- 17.5% ROADWAY DEPARTURE
- 7.5% BICYCLE / PEDESTRIAN

BREAKDOWN OF APPLICATIONS RECEIVED, BY AMOUNT OF FUNDING REQUESTED (115 PROJECTS, $273M)

- 45% HOTSPOT
- 21% INTERSECTION
- 21% ROADWAY DEPARTURE
- 14% BICYCLE / PEDESTRIAN

BREAKDOWN OF SCOPING LIST PROJECTS, BY INITIAL APPLICATION FUNDING REQUEST (75 PROJECTS, $160M)



- 43% HOTSPOT
- 21% INTERSECTION
- 25% ROADWAY DEPARTURE
- 12% BICYCLE / PEDESTRIAN

TABLE 1. MOST COMMON COUNTERMEASURES, BY APPLICATION TYPE

HOTSPOT	SYSTEMIC INTERSECTION	SYSTEMIC ROADWAY DEPARTURE	SYSTEMIC BICYCLE/PEDESTRIAN
H18 – Roundabout	I21 – Intersection Visibility (Stop Controlled)	RD12 – Speed Feedback Signs	BP2 – Intersection Lighting
H29 – Intersection Lighting	I2– Intersection Visibility (Signal)	RD26 – Guardrail	BP12 – RRFB on 3+ Lane Roads
H9 – Rural Major Left-Turn Lane	I1 – Intersection Lighting	RD13 – Pavement Markers	BP29 – Sidewalks
H30 – Segment Lighting	I26 – Through-Route Activated Warning System	RD18 – Shoulder Rumble Strips	BP16 – Crosswalk w/ Curb Extensions

6 〉 LESSONS LEARNED & RECOMMENDATIONS

This is the fourth cycle of the statewide safety program that encompasses all public roads. With each subsequent cycle, ODOT strives to improve the program to increase participation and make the program as effective as possible. This presents some of the success, challenges, and questions to consider in the future.

LOCAL PARTICIPATION

This was the first round of ARTS in which local agencies in all five regions and at least one Tribal partner submitted an application for funding. There were also multiple agencies participating for the first time. There is still opportunity to further invest in outreach and partnerships to increase local agency participation, particularly with Tribal partners and agencies in Regions 3, 4, and 5. How can we better spread the word to local agencies and inform them of this funding opportunity? What are the barriers to participation? Can we connect with them in different ways? It is important to keep in mind that local agency staff wear many hats and are intentionally choosing not to participate. We heard multiple stories of staff feeling overwhelmed with the delivery the projects that they already have programmed, and they didn't have capacity to work on grant applications, much less think of delivering more projects.

APPLICATION SCHEDULE

Unlike many other state and federal grant programs, the ARTS program does not have a consistent schedule. The program runs on a roughly 3-year cycle, but within each active program year, the timeline for outreach and applications varies. Some local agencies noted that it can be challenging to secure local match funding after the city or county budget has already been set for the fiscal year. Even though local match funds are not provided at the time of application, most local agencies require approval from the city council or board of commissioners to apply for grants above a certain dollar amount.

FUNDING SET ASIDES

Some Regions expressed a desire for separate funding or increased prioritization for a subset of treatments, perhaps lower cost or highly effective countermeasures (e.g., FHWA's Proven Safety Countermeasures). Many other states have set aside programs, some of which eliminate or reduce the application process for set aside projects, which may help to increase participation from local agencies.

COMMUNICATION OF ARTS FUNDING DECISIONS

There is not a calendar or set timeline for notifying applicants of the selection results, and participants are often surprised and disappointed with the length of time between submitting an application and the announcement of awards. The announcement of Scoping List selections came 6-9 months after the application deadline, and the final notice of awards comes much later.

DATA ANALYSIS

The provision of user-friendly crash data for local agencies via the Tableau dashboard has been hugely successful. Even if agency staff are not adept at reviewing crash data, the Consultant team was able to use the dashboard to interactively view the data during workshops and one-

on-one meetings, allowing for much more effective brainstorming and project development. Often times, an agency has a specific location or project in mind, but it may not be a competitive or qualifying ARTS project. With just a few mouse clicks, the crash data for a specific location can be visualized to confirm that the location has qualifying crashes, or to identify other locations that may be a better fit.

QUALITY CONTROL

Having a third-party conduct the QA/QC review of applications after the deadline allows for consistency across regions (and within regions), and also reduces the time and effort for Region staff to administer the program. The QA/QC process was very effective at flagging applications with missing information, identifying errors, and even correcting applications (in coordination with applicants and Region staff). However, some Regions have requested more involvement in local agency project development or an initial review of applications earlier in the process. This would allow them more opportunity to engage with local agencies that may be proposing infeasible projects, or identify conflicts with other planned regional projects.

COUNTERMEASURE SELECTION

Now that several rounds of ARTS have been completed, many local agencies have completed or programmed projects for their most effective, straightforward solutions, like traffic control changes and low-cost systemic treatments. The remaining safety needs are becoming more complex to solve. Additionally, many agencies are wanting to address multimodal safety needs on their high injury networks. It is challenging to develop ARTS projects for these types of scenarios because the application categories do not allow for a “corridor” approach treating intersections and segments or a combination of hotspot and systemic countermeasures. How can we allow for more creative solutions, and foster more holistic safety solutions that better reflect the Safe System Approach? Would modifying the application types or eliminating the categories assigned to countermeasures help? Are there unintended consequences of that?

COST ESTIMATES AND SCOPING COSTS

Since the inception of the ARTS program, cost estimating has continued to pose a significant challenge. Applications require only planning-level cost estimates and ODOT regions develop more detailed estimates after the field scoping of selected projects. There are many trade-offs to this approach.

Benefits:

- Reduced burden on local agencies
- No wasted effort developing estimates for projects that do not get funded
- Ability to establish a unit-cost estimate for each countermeasure which allows for apples-to-apples comparisons of safety benefits across projects

Challenges

- Planning level cost estimates are not accurate
- ODOT carries the burden of scoping state and local projects
- As fewer projects make the scoping list (because of limited resources for the scoping effort), inaccurate estimates have a huge influence on the final project selection list. For example, if only two Ped-Bike projects can move forward into scoping, and both top-ranked projects have cost estimates that are drastically low, those two projects will be selected for the Scoping List. Once the cost estimates are refined after scoping, their cost effectiveness will drop significantly and may end up being much lower than other applications that had more realistic cost estimates. But, only projects that have been scoped can be selected for funding, so it is not possible to fund the other projects, even if they are more cost effective.

Considerations:

- How can the time and budget for scoping be reduced? Can we reduce the number of local agency projects that ODOT delivers? One way to do this is to reduce the number of local agency projects ODOT delivers. This could be achieved by using state funds for local projects, or by increasing the number of local agencies that are certified to deliver federal projects. Then, those local agencies could be responsible for scoping and refining their own cost estimates to deliver the projects.
- Is there a maximum number of countermeasures or treatment locations that can be reasonably scoped? Consider new application guidelines that result in simpler projects.
- Are there certain countermeasures or project types that have more variable costs than others? Is there a way to account for that at the start?
- How can we reduce the influence of planning level cost estimates on the project selection process?

BC AND CEI TOOLS

By nature, benefit-cost analysis is complicated and prone to error. The BC tool automates many of the calculations and simplifies the user-required effort as much as possible. Even so, many applicants still struggle to complete the analysis accurately. The most common errors are applying too many countermeasures, not using the correct "By Type" or "By Severity" tabs, and not discounting crashes when multiple countermeasures apply. The "Instructions" tab of the BC form provides clear examples, but it is still not intuitive for many users.

On the other hand, the new risk-based CEI tool is very intuitive and easy to use. However, as this was the first time using the tool, several opportunities for improvement were identified. Because of its ease of use and limited guidance/restrictions, it seemed that some applicants quickly figured out how to "game the system" by strategically selecting the study area to maximize the risk calculations. For example, if the project was to install RRFBs at two unsignalized crossings along a segment, the Risk Reduced per Cost score could be very different if the user entered it as one segment with two crossings, or two individual unsignalized intersections. Additional guidance could be developed to cover the different analysis scenarios considered. There are also opportunities to refine the underlying calculations and spreadsheet coding to remove some of these unintentional results, like restricting the application of certain countermeasures.

Another option is to consider having ODOT staff or Consultants conduct all of the benefit-cost analysis after applications for projects are submitted. WSDOT takes this approach to ensure the analysis is correct and consistent.

LOCAL OUTREACH

Local outreach was provided through a mix of region-wide virtual meetings, in-person small-group workshops, and one-on-one virtual meetings. In-person workshops were well-attended in Regions 1 and 2, and virtual meetings proved effective for coordinating with local agencies in all five regions. Providing both in-person and virtual opportunities for outreach should be considered in future program years.

As with years past, outreach with local agencies and Tribes was primarily conducted via direct emails from the Consultant and/or ODOT Region staff. However, there is significant staff turnover at local agencies each year, and developing a current contact list of names, emails, and phone numbers proved very time consuming. Even with the effort to develop a comprehensive contact list, some agencies informed ODOT that they did not receive the initial announcements advertising the ARTS program and application deadlines. Other opportunities to inform local agencies should be considered in the future, such as established ODOT mailing lists, the ODOT Weekly Digest Bulletin (Transportation Safety Newsletter), and partnering with League of Oregon Cities and the Association of Oregon Counties to help spread the word.

APPLICATION FORM

The Smart PDF application form includes enhanced functionality, such as drop-down menus and embedded files, that are intended to make it easier for applicants to submit the required information. However, it was discovered late in the process that the form was only compatible with the full license of Adobe Acrobat. Many applicants were unable to fill in or save the form using Adobe Reader or other free PDF editing tools. The application form should be updated or recreated to ensure it can be used without specialized software.

7 〉 CONCLUSION

In 2022, **603 people lost their lives** and **3,308 people were seriously injured** while travelling on Oregon roadways, numbers that have continued to increase over the last decade.

The state of Oregon has a goal of eliminating fatal and serious injury crashes by 2035. Achieving this goal requires significant investment in all facets of transportation safety, and the ARTS program is a critical conduit for ensuring we are investing in the right places and projects to curb the increases in traffic related deaths and injuries.

70 PROJECTS MADE IT TO THE ARTS '27-'30 SCOPING LIST

Within just 5 years of being constructed, those 70 projects could **potentially result in 41 lives saved and 161 life-altering injuries avoided**.

If all 105 qualifying ARTS projects were funded, **23 more lives could be saved** and **90 more life-altering injuries could be avoided**.[1]

1 Calculation based on the BC form annual estimated fatal + serious injury crash reductions, totaled for all applications (excluding ped/bike). Distinction of fatal and serious injury estimates is based on the average relative percentages of fatal crashes (21%) and serious injury crashes (79%) from 2018-2022, as well as the average number of fatalities per fatal crash (1.1) and serious injuries per serious crash (1.2).