ODOT ALL ROADS TRANSPORTATION SAFETY (ARTS) PROGRAM: '24-'27 STIP CYCLE

SUMMARY REPORT

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EXECUTIVE SUMMARY

The Oregon Department of Transportation (ODOT) administers the federally-funded Highway Safety Improvement Program (HSIP) to implement safety projects aimed at reducing the number of fatalities and serious injuries on Oregon's roadways. ODOT developed the All Roads Transportation Safety (ARTS) Program to achieve the goals of the 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.

In 2020, ODOT Headquarters solicited ARTS applications from ODOT Regions and local agencies for safety projects to be included in the upcoming 2024-2027 Statewide Transportation Improvement Program (STIP). In partnership with a consultant team, ODOT provided basic crash history data, ARTS Program training, and application assistance to local agencies to increase participation and make the program more equitable.

ODOT Regions and local agencies submitted 141 ARTS applications in 2020 requesting \$238 million in HSIP funding. ODOT ranked the projects based on their cost-effectiveness using two calculation tools: benefit-cost ratio analysis and the Cost Effectiveness Index. ODOT narrowed the list of selected projects, based on available HSIP funding, to a 150% List to move forward into scoping. Across all regions, 82 potential projects were selected for the 150% List with a combined planninglevel cost estimate of approximately \$127 million.¹ The final 100% list for implementation will be determined as part of the 2024-2027 STIP cycle, which is a separate process that is not yet completed.

The objective of this Summary Report is to describe the 2020 ARTS program processes and procedures, identify the projects selected this round, and share findings and recommendations for process improvements to be applied in the next round of ARTS. The consultant team identified lessons learned related to local agency support, cost and benefit estimate calculations, and program implementation.

¹ Based on draft 150% Lists as of July 2021.

CHAPTER 1: OVERVIEW OF THE ARTS PROGRAM

The Oregon Department of Transportation (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 Highway Safety Improvement Program (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 had been 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 All Roads Transportation Safety (ARTS) program.

GOALS AND GUIDELINES



To reduce the frequency of fatal and serious injuries on all public roads through a data-driven process that is blind to jurisdictional ownership.



By following the goal of the program, 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 that are most likely to reduce the number of fatal and serious injury crashes in Oregon. The following themes form the backbone of the ARTS program.

While ODOT's transportation safety program is intended to reduce all crashes, it is focused on those resulting in fatalities and serious injuries. The greatest economic benefit is realized from reducing the highest severity crashes, and more importantly, reducing fatal and serious injury crashes has the greatest societal benefit in 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. To achieve the maximum benefit, the focus of the ARTS program is on the use of funds to implement cost effective treatments addressing fatal and serious injury crashes.

DATA DRIVEN PROCESS

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 hot spot and systemic safety projects across the state. Geocoordinates tied to crash records are used to identify where the greatest number and severity of crashes occur on the roadway network. Tools, such as the Safety Priority Index System (SPIS), are utilized to identify potential project locations. Further discussion on these tools is provided in <u>Project Identification</u>.

LOCAL AGENCY OUTREACH AND SUPPORT

ODOT provided local agencies with consultant-led safety analysis and application support so that all agencies had equal access to funding. This consultant support is provided at no cost to the local agencies. In some regions, consultant support was offered to all local agencies. In other regions, consultant support was equitably reserved for non-MPO local agencies and those who did not have technical staff available to complete the necessary safety analysis. Further details on the outreach process are provided in <u>Outreach</u>.

ARTS PROGRAM GUIDELINES

- 1 The program goal is to reduce fatal and serious injury crashes.
- **2** The program must include all public roads.
- **3** The program is data driven and blind to jurisdiction.
- 4 The process will be overseen by ODOT regions.
- **5** Both "hot spot" methodology and systemic methodology will be used.
- 6 Only proven countermeasures from the ODOT Crash Reduction Factor list will be used.

APPLICATION TYPES

The ARTS program is split into the following four application types, each of which competes separately for funding.

Hot Spot

Hot spot 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. Hot spot 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 stopcontrolled 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.

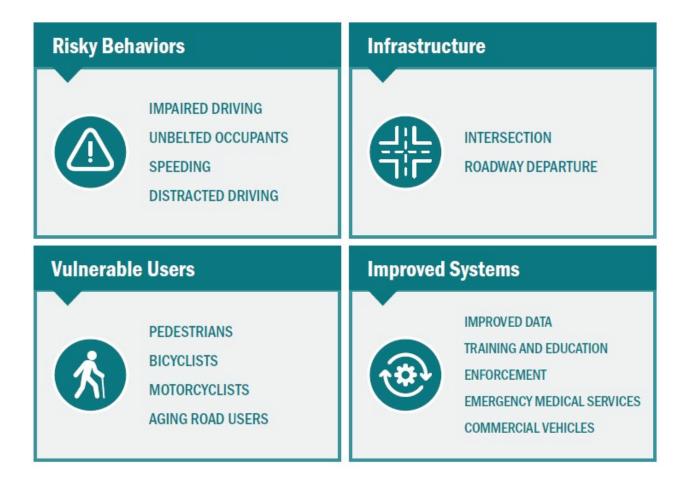


Systemic Bicycle-Pedestrian: This application type was focused on reducing crash risks to pedestrians and bicyclists. Treating bicycle and pedestrian safety is sometimes not as crash-data-focused as the others, due to the relatively low frequency and random geographic distribution of bike/ped crashes in a jurisdiction. Treatments in this application type include treatments such as pedestrian lighting, enhanced pedestrian crossings, bicycle lanes, and cycle tracks.

CONSISTENCY WITH OREGON TSAP

The Federal Highway Administration (FHWA) requires every state to have a Strategic Highway Safety Plan (SHSP). The Oregon Transportation Safety Action Plan (TSAP) 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 four emphasis areas in the 2021 TSAP are shown in Figure 1.



The Oregon TSAP also contains performance measures that help determine the value of TSAP efforts over time. Currently, Oregon is not meeting the performance measures identified in the TSAP at a statewide-level. It should be noted that the ARTS program is one of many programs that contribute to the overall goal of reducing fatalities and serious injuries.

ARTS APPLICATION TYPES

The four ARTS application types (hot spot, intersections, roadway departure, and bicyclepedestrian) are consistent with the 2021 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.

COUNTERMEASURES

Of the 158 ODOT approved countermeasures on the CRF List, 144 (91%) address safety concerns within the identified emphasis areas in the 2021 TSAP.

OVERALL PROCESS

ARTS program project selection requires a multi-step process. ODOT Headquarters staff provided oversight and direction, while ODOT region transportation safety leaders both supported the local agencies and submitted their own state highway ARTS applications. Figure 2 illustrates the ARTS program 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 analysis worksheets, cost estimates, and supporting crash data.

APPLICATION SUBMISSION WINDOW

The application submission window for ARTS 24' – 27' was originally set for September 14th, 2020 – November 20th, 2020. However, due to limited participation by local agencies in several regions, the application period was extended another six weeks to December 31st, 2020.

CHANGES FROM 2018 ARTS CYCLE

The 2020 ARTS program implemented several changes from previous rounds, some in response to feedback received and some out of necessity, which are summarized below.

- In response to the COVID-19 pandemic, all outreach and technical support was completed virtually in all Regions.
- In response to the anticipated decline in fuel tax revenue and funding limitations, the State Funded Local Exchange Program (SFLP) was not offered this year. All local agency projects had to assume federal delivery (unless the agency is certified to deliver federal projects).
- Within each Region, state and local funding was split such that applications on state highways competed separately from applications on local roadways.
- While not a formal requirement, ODOT encouraged a minimum project delivery size of \$500K to maximize the efficiency of federally delivered projects. Some regions allowed smaller projects to be bundled together to reach the \$500K target.
- ODOT (with support from the Consultant) provided additional tools to assist local agencies with identifying high crash locations, selecting countermeasures, and preparing applications.

The consultant support for local agencies was expanded to include all phases of the application
process from initial crash data analysis to preparation of the application form and supporting
materials.

FUNDING

The \$87 million of 2024-2027 funds for the ARTS program (as determined by the Oregon Transportation Commission) was allocated to state and local roadways and to each ODOT region based on the relative frequency of fatal and serious injury crashes.

REGION FUNDING SPLITS

The \$87M in statewide funding for the ARTS program was allocated to each of the five ODOT regions based on the proportion of fatal and serious injury crashes that occurred in each region between 2014-2018 (Figure 3).

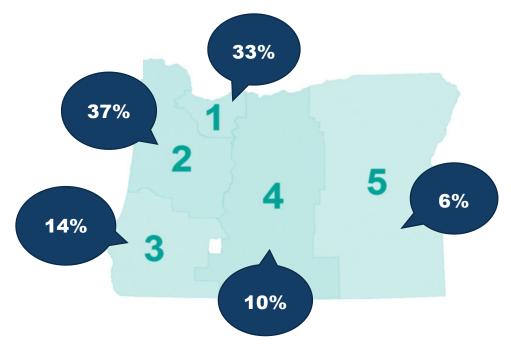


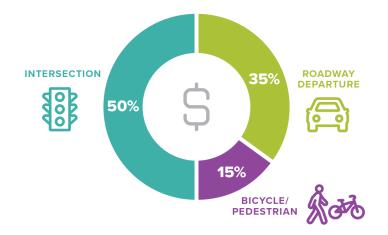
FIGURE 3. REGION FUNDING SPLITS

STATE HIGHWAY AND LOCAL AGENCY SPLIT

Historically, there has been a discrepancy in the benefit-cost ratios for projects on state highways and local roadways. In an effort to address this discrepancy, the 2020 ARTS program split the funding such that state highway projects would compete only against other state highway projects, and local agency projects would compete against other local agency projects. Within each region, 51% of funding was allocated to local agency projects and 49% was allocated to state highway projects. These percentages are consistent with the statewide proportion of 2014-2018 statewide fatal and serious injury crashes that occurred on local roads and state highways, respectively.

ARTS APPLICATION TYPE SPLIT

Within each region, half of the funding was allocated to hot spot projects and half was allocated to systemic projects. Although not an official split within each region, the statewide funding goals for each of the systemic application types are shown in Figure 4.



LOCAL MATCH

A match is required for projects where HSIP funding will be used. For the ARTS programs, this local match is 10 percent of the project cost. In some cases, local agencies offered to contribute more than the required match to a project. These additional funds were not considered in the benefit-cost (BC) analyses for project prioritization. It was decided that doing so would have artificially increased the BC ratio of a project and thereby increased its overall rank above other projects that may provide a more cost-effective safety benefit. If an agency planned to provide additional funding in support of the project, they indicated that as part of a narrative within the project application.

CHAPTER 2: AVAILABLE TOOLS AND RESOURCES

Numerous resources are provided to local agencies and ODOT region staff to assist in the identification of projects and development of applications.

APPROVED SAFETY COUNTERMEASURES

ODOT has developed a toolbox of approved countermeasures with associated approved Crash Reduction Factors (CRFs) basedon the Highway Safety Manual, FHWA's Crash Modification Factors Clearinghouse, and other research studies. The following three countermeasure resources are available.

- **CRF List** Primary list of approved countermeasures
- CRF Appendix Supplemental one-page summary of each approved countermeasure
- 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 approved countermeasure, the ODOT documentation included 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)
- Crash Reduction Factor (CRF)

Countermeasures were categorized as Hot Spot, Systemic Intersection, Systemic Roadway Departure, or Systemic Bicycle/Pedestrian, and jurisdictions were required to use the appropriate treatment type in their applications (with some exceptions made on a case-by-case basis). Hot spot 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 at multiple locations or along a corridor (e.g., rumble strips).

PROJECT IDENTIFICATION

ODOT provided numerous tools and resources that Region staff and local agency staff could utilize for identifying potential project locations.

• **Tableau Online Crash Data Dashboard** –An online data dashboard including the most recent five years of available QA/QC'd crash data (2014-2018). 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.
- **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.
- **Statewide Safety Priority Index System (SPIS)** ODOT report of statewide locations that have an unusually high occurrence of crashes.
- **Past Statewide Implementation Plans** Previously developed statewide plans which include potential projects related to Roadway Departure, Intersection, and Bicycle/Pedestrian. (Note: The Intersection Implementation Plan is more than ten years old and may not provide useful insights into current safety concerns.)
- **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.

APPLICATION PREPARATION

After the development of a potential project (including identifying a suitable location and the appropriate countermeasures), local agencies and Region staff had access to several tools and resources for completing the required analysis and submitting an application for ARTS funding.



BENEFIT-COST WORKSHEET

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 automates most of these calculations. The result of this form is a BC ratio in decimal form (the higher the ratio the better), with typical values in these ranges:

- Hot Spot: 1 to 10
- Systemic: 5 to 40+

CEI ANALYSIS WORKSHEET

For bicycle and pedestrian safety projects, jurisdictions used the CEI form developed by ODOT to determine the economic value of safety treatments at intersections and along segments. The CEI tool is primarily focused on pedestrian or bicyclist-involved crashes and associated safety treatments. However, due to the relative rarity of bicycle and pedestrian crashes, this tool also allows for benefits to be calculated based on the presence of risk factors including roadway geometry, traffic volume, type of existing pedestrian and bicycle facilities and driveway density, among others. The output of the CEI is a value identified as the estimated cost to reduce one pedestrian or bicycle-related crash (the lower the CEI value the better).

ENHANCED APPLICATION FORM & APPLICATION GUIDANCE

For the 2020 ARTS program, ODOT developed an enhanced application form that streamlined the application process and provided the following key features.

- Dynamic form fields that were hidden or shown depending on previously entered information (e.g., selecting "Systemic" as the application type would allow for the selection of a sub-category like Intersection or Roadway Departure; that field would be hidden if "Hot Spot" was selected for the application type).
- Restrictive form fields that only allowed ODOT-approved countermeasures to be included (Countermeasure Type, CRF ID, and Countermeasure Name are auto-populated from the approved CRF List). The total number of countermeasures was restricted to four (consistent with application requirements).
- Expandable form fields that did not limit narrative responses to questions.
- The ability to embed supporting materials of varying file types (Excel, PDF, Word, Images) into the application form itself, while retaining native format functionality.

COST ESTIMATING

For the preparation of applications and QA/QC, a planning level cost estimate (including construction, design, right-of-way, and contingency) was developed for each ODOT approved countermeasure on the CRF List. The majority of these cost estimates were developed in previous rounds of ARTS and updated to reflect 2020 values. For this round of ARTS, cost estimates varied by Region based on input and guidance from Region staff, such as a minimum dollar value for Preliminary Engineering in Region 4 or increased contingency 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 rigorous cost estimates and conceptual layouts for selected projects. Consultant support was reserved for projects with unique applications of countermeasures, right-of-way impacts, or other factors that would likely result in actual costs substantially higher or lower than the default planning level costs for each countermeasure.

CHAPTER 3: PROGRAM IMPLEMENTATION

The ODOT ARTS program includes four primary components: Outreach to local agencies, Technical Support for Local Agencies, QA/QC Review of Applications, and Project Selection. Each of these components is described in further detail below.

OUTREACH

Outreach to local agencies is one of the guiding principles of the ARTS program and is an important component of the program implementation. The following sections summarize the various types of outreach conducted to inform local agencies of the ARTS program, tools and resources available, and the requirements and deadlines for funding applications.

ARTS KICKOFF MEETINGS

In August 2020, all public agencies and tribes in all five ODOT regions were invited via email to attend a virtual ARTS kickoff meeting for their region. The contact list for each region was reviewed thoroughly to ensure a contact for each public agency was notified of the upcoming funding opportunity.

Video recordings and PowerPoint presentations for each kick-off meeting were posted to the ARTS application website (<u>www.ODOT2020ARTS.com</u>) which local agencies could download and view at a later date if they missed the meeting. The kick-off meetings covered the anticipated application deadlines, the availability of free consultant support, key changes from previous rounds of ARTS, and a review of the tools and resources available.

WORKSHOPS

The consultant facilitated one-on-one workshops with local agencies at their request to review the agency's crash data, provide training on the available tools, and brainstorm project ideas.

PRELIMINARY DATA ANALYSIS

Consultant staff prepared data summaries of crashes in each local jurisdiction in Regions 2, 3, and 5. These data summaries were emailed to <u>all</u> local agencies in these regions with qualifying Fatal or Serious Injury crashes. The email included additional encouragement to participate in the ARTS program and reiterated the availability of consultant support.

STATEWIDE EMAILS AND FLYERS

Consultant and ODOT Region Staff emailed out reminders about the ARTS program and flyers with information about the program and upcoming deadlines. The flyers are provided in the Appendix. Three separate mailings were sent out: July (announcing the program and upcoming meetings),

October (application window is open), and November (deadline reminder). Tribal contacts within each region were also contacted via phone to encourage participation in the ARTS program.

ONE-ON-ONE FOLLOW UPS

As directed by region staff, Consultant staff reached out to individual local agencies that did not participate in the ARTS 24' – '27 program but that had qualifying crashes and/or were a high-priority for the region. A total of 11 local agencies were invited to participate in one-on-one follow up meetings. Of the 11 agencies, three attended the meetings. The feedback gathered from those three agencies are discussed in <u>One-on-One Interviews</u>.

OTHER OUTREACH EFFORTS

In addition to formal outreach efforts to local agencies, Consultant and Region staff also participated in outreach to broader audiences hoping to garner interest in the ARTS program. These efforts include:

- Presentations to Area Commissions on Transportation (ACTs) in Region 2, including the Mid-Willamette Valley (MWACT), Cascades West (CWACT), and Northwest Oregon (NWACT).
- Oregon APWA Conference presentation including overview of the ARTS program, tips and tricks for identifying viable ARTS projects, and upcoming application deadlines.
- Coordination with the Association of Oregon Counties (AOC) to share information about the ARTS program. The AOC offered to contact a few "high priority" counties and encourage ARTS involvement and solicit feedback about ARTS.

TECHNICAL SUPPORT FOR LOCAL AGENCIES

Consultant staff provided the following technical support to any local agencies requesting assistance.



FIGURE 5. ARTS APPLICATION TASKS WITH CONSULTANT SUPPORT PROVIDED

- Analyzing crash data to identify hot spot locations and systemic crash trends suitable for ARTS projects
- Selection of countermeasures to treat identified safety concerns

- Developing cost-effective projects that are competitive for funding
- Preparing planning level cost estimates for selected projects
- Conducting cost-effectiveness analyses (benefit-cost ratio or cost effectiveness index)
- Preparing application materials, including narratives, study area mapping, and supporting traffic analysis

In all, outreach and support was provided to 35 local agencies in Regions 1, 2, 3, and 4. No local agencies in Region 5 participated in this round of the ARTS program, and no Tribes (in any region) participated.

QA/QC REVIEW

A two-tiered Quality Assurance/Quality Control (QA/QC) review of all submitted applications (state highway and local roadway) was conducted by the consultant for completeness. Applications went through a preliminary QA/QC evaluation. Applications that passed the preliminary QA/QC evaluation were then advanced to the Final QA/QC evaluation. The QA/QC checklists are provided in the Appendix.

PRELIMINARY QA/QC CHECKLIST

The preliminary QA/QC review evaluated all submitted applications for completeness. 100% of ODOT applications and 91% of local agency applications passed the preliminary QA/QC review.

- Meets minimum cost effectiveness requirements: B/C > 1.0 or CEI < \$2.62M
- Includes all required application materials
- Countermeasures match application type

For applications that did not meet one or more of the criteria listed above, the following actions were taken:

- If an application did not meet the minimum B/C or CEI requirements, it was not advance to Final QA/QC.
- If the application was missing information, the Consultant followed-up with the local agency and requested the missing information be provided.
- If the countermeasure did not match the application type, the application was sent to Region staff for guidance.

FINAL QA/QC

The final QA/QC review included a thorough assessment of all application materials including crash data, cost estimates, traffic analysis, and benefit-cost evaluations. The final QA/QC criteria are included in the Appendix. For applications that did not meet all of the criteria due to significant errors, the application did not pass and was excluded from 300% List. These applications were also sent back to Region Staff for final judgement.

Of the applications that passed the preliminary QA/QC review, 72% of ODOT applications and 84% of local agency applications passed the final QA/QC review. The primary reasons for applications failing the final QA/QC review were inaccurate cost estimates, improper use of countermeasures, inaccurate crash data, and errors in the benefit-cost analysis.

PROJECT SELECTION

All applications that passed the final QA/QC review were prioritized based on the calculated benefitto-cost ratio. Potential projects within each region were prioritized by their benefit and cost which factors in the number and severity of crashes, the crash reduction potential of the enhancement, and the project cost. Projects selected for funding and addition to the Statewide Transportation Improvement Program (STIP) are those with the highest cost effectiveness.

Of the 139 project applications submitted, 82 of 92 qualified applications were included on the 150% List and will undergo detailed scoping to confirm project feasibility and cost estimates. The 10 projects that did not make it onto the 150% List were the lowest-ranked projects based on benefit-cost ratios. After scoping, all 82 projects will be re-prioritized based on revised benefits and costs and the final list of projects to be funded will be selected in each Region.

CHAPTER 4: ARTS 2020 SUMMARY STATISTICS

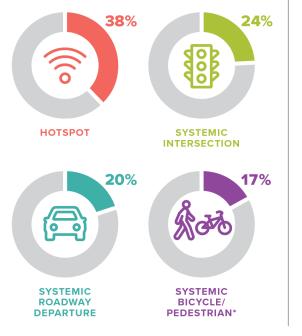
PERCENT OF LOCAL AGENCIES WITH FATAL OR SERIOUS INJURY CRASHES THAT SUBMITTED AN ARTS APPLICATION



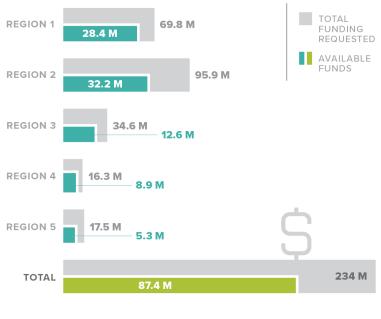
BY AGENCY TYPE, THAT ADVANCED TO THE 150% LIST **58%** CITIES COUNTIES COUNTIES NO SUBMITTED APPLICATIONS TRIBES

PERCENT OF SUBMITTED APPLICATIONS,

PERCENT OF SUBMITTED APPLICATIONS



TOTAL FUNDING REQUESTED VS. AVAILABLE FUNDS BY ODOT REGION



*26 percent of all applications included at least one bicycle/pedestrian countermeasure.

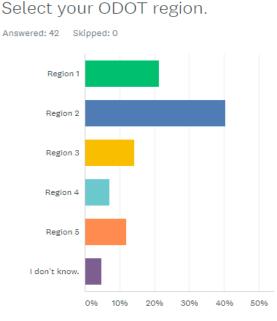
CHAPTER 5: FEEDBACK FROM LOCAL AGENCIES

ODOT, with support from the Consultant, conducted directed outreach to local agencies in the summer of 2021 (after applications had been submitted and the 150% Lists had been announced).

SURVEY OF LOCAL AGENCIES

A brief online survey was sent to all local agency contacts in all Regions. The goal of the survey was to determine what aspects of the ARTS program worked well, what resources were useful, what the primary barriers were to participating (for those that did not submit an application), and what could be improved for the next round of ARTS.

A total of 42 respondents completed the survey, representing 28 cities, 13 counties, and one tribe covering all five regions. The survey asked a different set of questions to those that did or did not submit an ARTS application in 2020. The following sections provide a summary of the key highlights from the survey. Additional detail is provided in the appendix.



OUTREACH

Of the local agencies that participated in the virtual outreach meetings, 95 percent indicated the meetings

FIGURE 6. LOCAL AGENCY SURVEY RESPONDENTS BY REGION

were useful and informative. For future rounds of ARTS, 47 percent recommend virtual outreach, 40 percent recommend both in-person and virtual outreach, and 13 percent recommend in-person only outreach.

BARRIERS

Of the 21 responding local agencies that did not submit an application in 2020, over half (12 agencies) indicated limited staff capacity as the primary barrier to participating in ARTS. Other barriers included a lack of notable safety concerns (five agencies), local agency project ideas did not meet ARTS requirements (five agencies), the local match was too high (five agencies), the \$500K minimum project size was not practical (three agencies), and the application process was too complicated (one agency).

RESOURCES AND TOOLS

Of the 15 local agencies that answered the question related to resources and tools, over half (eight agencies) utilized multiple different tools. The most commonly used tools were the ODOT Crash

Data Website (nine agencies), ODOT TransGIS (eight agencies), the CRF List (eight agencies), the Countermeasure Search Tool (eight agencies), the Online Tableau Crash Map (six agencies), and the CRF Appendix (six agencies).

CONSULTANT SUPPORT

Of the 15 local agencies that answered the question related to consultant support, 11 agencies utilized the free consultant support for one or more aspects of the application process. All comments regarding the usefulness of the consultant support were positive, with multiple respondents indicating the consultant support was vital to developing successful projects and conducting technical analysis.

ONE-ON-ONE INTERVIEWS

ODOT Region staff identified two high-priority local agencies (those with a relatively high number of fatal and serious injury crashes) in each Region that did not submit an ARTS application in 2020. These agencies were invited to participate in a one-on-one interview with ODOT Headquarters and the Consultant to share their personal experiences, challenges, and recommendations for the ARTS program. Three local agencies agreed to participate in the interviews (one each in Region 1, Region 2, and Region 5).

Many of the barriers identified in the survey were reiterated in the interviews. Additional barriers and challenges faced by the local agencies interviewed are described below.

- Significant distractions in 2020 including COVID-19 pandemic (affecting staffing levels and revenue streams) and wildfires throughout the region.
- Many of the low-cost systemic solutions have been implemented, and the remaining projects are high-dollar solutions that don't compete well.
- In some cases, the 2015 2019 crash data was out of alignment with the highest local safety concerns, which are based on more recent crash events (particularly in rural areas with much lower overall frequency of fatal and severe injury crashes).
- The need to assume federal delivery resulted in over-inflated cost estimates, which also increased the required local match beyond what is feasible (in some cases, the local match exceeded the total available budget for improvement projects).
- In rural areas, the inability to apply low-cost (systemic) solutions at spot locations eliminates projects that have high potential to improve safety.
- Additional advanced notice and outreach is needed for local agencies to allocate staff resources for preparing applications and to reserve funds for the local match.
- Some agencies indicated that the minimum project size of \$500K was impractical because the relatively low frequency of fatal and severe injury crashes in their jurisdiction would only result in competitive applications with smaller scale projects.
- Some agencies indicated that managing a federal delivery project was impractical at a small scale and they likely wouldn't pursue future applications for less than \$1M.

• Many high priority safety projects are focused on equity and involve bicycle and pedestrian improvements in traditionally underserved communities where reported crashes are low and the solutions are expensive; As a result, these projects are not competitive for ARTS funding.

CHAPTER 6: LESSONS LEARNED

Based on feedback from local agencies, Region staff, and the Consultant support team, the following topics should be considered in future rounds of ARTS.

FUNDING SPLITS

The 51 percent/49 percent local/state funding split did appear to improve the competitiveness of local agency applications. However, splitting the available funding into smaller buckets (local/state and by systemic subgroup) also makes it more difficult to fund larger scale projects, especially in regions with lesser allocations of funding. As a result, some of the most effective safety treatments (e.g., roundabouts) cannot feasibly be funded through ARTS. For example, in Region 3, there was approximately \$6.2M in funding for local agency projects, and approximately \$3.1M (50 percent) was available for hotspot projects; The planning level cost estimate for a roundabout in Region 3 was \$5M, which exceeds the total amount of funding available for hotspot local agency projects in Region 3 (as well as Regions 4 and 5).

KEY TAKEAWAY

In future rounds of ARTS, the benefits of funding splits (improving competitiveness of certain application types) should be carefully weighed against the unintentional consequences (insufficient funding in each category to fund high-priority safety countermeasures).

MINIMUM PROJECT SIZE

During local agency outreach, ODOT encouraged a minimum project size of \$500,000 to allow for efficient federal delivery of funded projects. Each region handled this target project size differently, with some regions requiring each application to be a minimum of \$500,000 and other regions requiring the cost of all applications submitted by a single agency to total at least \$500,000. Other regions elected to not apply the minimum project size during the application phase and instead intended to combine applications into STIP projects of at least \$500,000. During both the application phase and the survey of local agencies, several agencies indicated the \$500,000 minimum was a challenge or deterrent to participating, particularly for smaller agencies that may only have one or two qualifying fatal or severe injury crashes. Additionally, applying a minimum project size of \$500,000 means there is a minimum local match of \$50,000, which some agencies indicated is not practical.

KEY TAKEAWAY

In future rounds of ARTS, applying the minimum project size at the time the STIP projects are developed may be the best way to maximize federal delivery and not introduce additional barriers for local agencies to participate.

OTHER FUNDING CONSIDERATIONS

Through the survey and interviews with local agencies, several respondents noted that having to assume federal delivery was a challenge, both due the logistics of managing the project and the associated higher cost estimates, which also influenced the local match requirement. For some agencies, the required local match for a project is larger than their entire annual budget for capital improvement projects.

KEY TAKEAWAY In future rounds of ARTS, ODOT should explore the feasibility of alternative funding opportunities, such as the State Funded Local Projects (SFLP) fund exchange, reduced (or zero) local match for smaller agencies, and the possibility of funding setasides that target specific countermeasures or crash patterns and require a simpler application and funding process.

RESOURCES AND TOOLS

All of the resources and tools provided by ODOT were well utilized by local agencies, the Consultant team, and Region staff. No local agency staff noted the need for additional tools.

KEY TAKEAWAY

In future rounds of ARTS, ODOT should continue to provide user-friendly access to crash data, documentation on approved countermeasures, and tools to analyze the cost effectiveness of projects.

AVAILABLE COUNTERMEASURES & CRFS

Overall, the list of available countermeasures and CRFs is sufficient to cover the majority of projects desired by local agencies and ODOT region staff. The consultant team received very few requests to use countermeasures not available on the approved ODOT CRF List; Typically, requests for additional countermeasures were associated with locations where crash patterns persisted after the installation of safety treatments, and "outside of the box" solutions were needed.

KEY TAKEAWAY

In future rounds of ARTS, ODOT should continue to update the approved list of countermeasures and CRF values as new research becomes available. Additionally, the CRF list should be updated to include additional guidance on which crash types are treated by each countermeasure to improve consistency in applications.

As an example, the CRF List indicates that RD10, "Install Dynamic Speed Feedback Sign on Curves", applies to "All" crash types. In some applications where RD10 was applied along a segment, the BC analysis applied the CRF to all crashes in the segment (including roadway departure crashes, intersection crashes, curve crashes, and non-curve crashes). In other applications, the BC analysis applied the CRF only to crashes on curves where the treatment would apply.

APPLICATION GUIDANCE & TRAINING NEEDS

Many of the applications received had errors with the cost effectiveness analysis (benefit-cost and cost effectiveness index). Of the roughly 30 applications with BC or CEI analysis errors, approximately half were ODOT and half were local agency applications. The most common errors were double-counting benefits of countermeasures, applying countermeasures to the wrong crash types, and mixing countermeasure types (applying both hotspot and systemic countermeasures). There was also general confusion on how to complete the CEI analysis and how to interpret the results.

KEY TAKEAWAY In future rounds of ARTS, ODOT should provide additional training and examples to both ODOT and local agency staff on the technical analysis required for applications. Additionally, ODOT should investigate ways to make the CEI analysis tool more user-friendly and minimize the opportunities for analysis errors.

CONSULTANT SUPPORT

Based on the survey results and informal feedback from local agencies, the free consultant support was well received and made it possible for understaffed local agencies to submit applications when they otherwise wouldn't have.

KEY TAKEAWAY

In future rounds of ARTS, ODOT should continue to provide free consultant support to local agencies for data analysis, project identification, cost estimating, and application preparation.

APPLICATION QA/QC

This round of ARTS involved a consultant-led enhanced QA/QC review of both state and local applications. This ensured that all applications, regardless of region or jurisdiction, were evaluated using the same criteria. The consultant team noted that the most time-consuming part of the QA/QC process was reviewing crash data, which was submitted in multiple different formats. Encouraging the use of consistent data sources and formats would allow for a more efficient QA/QC process.

KEY TAKEAWAY In future rounds of ARTS, ODOT should continue to facilitate an independent review process of all state and local applications to ensure consistency.

COST ESTIMATING

Over the last several rounds of ARTS, ODOT and the consultant team developed planning level cost estimates for many of the approved countermeasures; these estimates were utilized in the preparation of applications and also served as baseline comparisons during the QA/QC process. However, the database of cost estimates was not directly shared with local agencies during the outreach process or as a resource for preparing applications. As a result, local agencies that solicited Consultant support were often surprised at the high costs for countermeasures (cost of federal delivery is higher than local agency delivery), and most cost estimates that were not prepared by the Consultant were very low. During the application process and through the online survey, several local agencies expressed concern that the cost estimates were overly inflated, which not only decreases the ultimate competitiveness of the project but, also, increases the local match required.

KEY TAKEAWAY

In future rounds of ARTS, ODOT should consider sharing the planning level cost estimates for each countermeasure with local agencies prior to applications being completed.

Local agencies that elect to use the default planning level cost estimates could be required to include minimal documentation of project costs, while additional justification (certification to deliver federal projects, field scoping notes, bid costs for similar local projects, etc.) could be required only for cost estimates inconsistent with the provided planning level estimates. This would not only ease the burden on local agencies preparing applications but would also increase the accuracy and consistency of applications.

OUTREACH

Due to COVID-19 pandemic restrictions, all local agency outreach was conducted virtually in 2020. This resulted in a significant cost savings in each Region and allowed for multiple one-on-one virtual meetings with interested local agencies for the same cost as a single in-person meeting (including travel and lodging for Consultant and ODOT staff). The survey of local agencies also indicated a clear preference for virtual outreach in the future, with 87 percent of respondents in favor of virtual-only or combined virtual and in-person outreach.

KEY TAKEAWAY

In future rounds of ARTS, conducting local agency outreach virtually, with strategic in-person events where desired, will likely allow for the greatest participation while reducing overall cost.

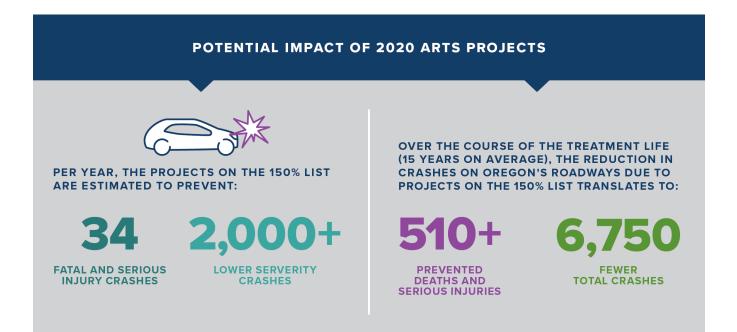
CONSISTENCY WITH TSAP

While much of the ARTS framework is consistent with the Oregon TSAP, there are opportunities for the ARTS program to better address key emphasis areas and topics, such as equity. The ARTS program relies on the use of a data-driven, jurisdictionally-blind process to ensure an unbiased process.

KEY TAKEAWAY

In future rounds of ARTS, ODOT should explore opportunities to incorporate Equity into the ARTS program in a manner that is consistent with how it defines Social Equity.

CONCLUSION



APPENDIX



117 COMMERCIAL STREET NE, SUITE 310, SALEM, OR 97301 · 503.391.8773 · DKSASSOCIATES.COM

CONTENTS

SECTION 1. FLYERS

SECTION 2. QA/QC CHECKLISTS

SECTION 3. LOCAL AGENCY SURVEY RESULTS

SECTION 1. FLYERS

LOCAL AGENCY & TRIBE OUTREACH

ODOT ARTS PROGRAM IS STARTING!

WHAT is happening?

The ODOT All Roads Transportation Safety (ARTS) Program's purpose is to achieve a significant reduction in fatalities and serious injuries through a data-driven strategic approach to improving safety on all public roads, with a focus on implementation of cost-effective and proven measures.

The <u>ARTS Program</u> is a statewide application based competitive process. Projects are ranked or prioritized based on an ODOT-approved prioritization method such as Benefit-Cost Ratio. Through the ARTS program, projects on **all public roads** in Oregon, regardless of roadway ownership, compete for Highway Safety Improvement Program funding.

The ARTS Program 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 "hot spot" and systemic methodology will be used
- Only proven countermeasures from the ODOT Crash Reduction Factor list will be used

ODOT is providing consultant support for data analysis, diagnosis, cost estimating, and application assistance at **NO COST TO LOCAL AGENCIES!**



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Consultant Support

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Oregon Department

f Transportation

503.313.1880



Apply for ODOT ARTS Funding Today!

HOW to apply?

1) If you missed the ARTS kick-off meeting for local

2) Reach out to your region representative to request

3) Download the application form and submit it here:

FREE consultant support with data analysis,

project identification, and applications.

www.odot2020arts.com/applications

We are

agencies, watch a recording here:

www.odot2020arts.com/meetings

WHAT is happening?

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Through the ARTS program, projects on **all public roads** in Oregon, regardless of roadway ownership, compete for Highway Safety Improvement Program funding. Project applications are ranked based on cost effectiveness (as determined through ODOT-approved benefit-cost analysis). **Applications are now being accepted through December 11, 2020!**

WHAT is new this year?

- Funding is split between state (49%) and local (51%) projects
- A revised list of approved safety countermeasures (CRF List)
- An Excel-based countermeasure search tool
- Online dashboard to easily view crash data in your jurisdiction

www.oregon.gov/ODOT/Engineering/Pages/ARTS.aspx

WHEN is this happening? $\overline{\mathbb{O}}$



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SECTION 2. QA/QC CHECKLISTS

PRELIMINARY AND FINAL QA/QC REVIEW

ODOT ARTS 24'-27' • SUMMARY REPORT • DECEMBER 2021

ARTS Preliminary Review Criteria

| Jurisdiction | Region | DKS App # | Project Location | Application Type | Countermeasures | Date Submitted | B/C or CEI Score | Meets Preliminary Criteria (Pass/Fail) | Date Reviewed |
|--------------|----------|-----------|------------------|-------------------------|-----------------|----------------|------------------|---|---------------|
| City of ARTS | Region A | 5 | Main Street | Systemic - Intersection | H29, H30 | 12/31/2020 | 4 | Fail | 1/8/2021 |

| Included in Application: | Y/N |
|------------------------------|-----|
| Cost Estimate | Y |
| Benefit-Cost Analysis | Y |
| CEI Analysis (bike/ped only) | |
| Crash Data | Y |
| Vicinity Map | Y |
| Traffic Analysis* | |

*Note: Traffic analysis required for any application that includes a Traffic Signal, Roundabout, or Pedestrian Signal (PHB/HAWK)

| Additional Criteria | Y/N |
|---|-----|
| Is the application signed? | Y |
| Is the B/C > 1.0? | Y |
| Is the CEI < \$2.26M? | |
| Is all contact information provided? | Y |
| Does at least 50% of the benefits come from a countermeasure that matches the application type? | N |

DKS

ARTS Final Review Criteria

| Jurisdiction | Region | DKS App # | Project Location | Application Type | Countermeasures | Date Submitted | B/C or CEI Score | Meets Final Criteria (Pass/Fail) | Date Reviewed |
|--------------|----------|-----------|------------------|---------------------------|---------------------|----------------|------------------|----------------------------------|---------------|
| ARTS County | Region R | 58 | County Road | Systemic - Road Departure | H38, H30, RD9, RD14 | 12/31/2020 | 7.60 | Pass w/Flags | 1/11/2021 |

Crash Data Validity

| Check for: | Y/N | Notes |
|--|-----|-------|
| Is the crash data from the ODOT official database or the DKS ARTS Tableau Website? | Y | |
| Are all crashes between 1/1/2014 and 12/31/2018? | Y | |
| "Intersection Fiag" = Yes for any crashes counted for intersection countermeasures? | | |
| Do the crash types applied in the B/C or CEI form match the crash types treated by the countermeasure (pedestrian, pedestrian & bicycle, roadway departure, angle, etc.) | Y | |
| For all non-bike/ped applications, does the crash data include at least one fatal or serious injury crash? | Y | |

Benefit-Cost Analysis

| Criteria | Y/N | Notes |
|---|-----|--|
| Are the correct countermeasures selected? | Y | |
| Are there 4 or fewer countermeasures applied? | Y | |
| Is the correct tab ("by Severity" or "by Type") being used? | Y | Only by type is selected |
| If there are multiple countermeasures, are the crashes reduced appropriately for each subsequent countermeasure? | Y | PDOs are listed in countermeasures that don't reduce PDOs |
| Does the number of months = 60? (calculated based on dates on Cover sheet, which should be 1/1/2014-12/31/2018) | Y | |
| Does the project cost equal the cost identified in the application AND cost estimator form? | Y | Application and B/C round up to nearest \$100,000 |
| Is an annual maintenance and operation cost included? | Y | O&M Cost included in detailed cost estimate |
| Is the B/C > 1.0? | Y | |

Traffic Analysis

| Criteria | Y/N | Notes |
|---|-----|-------|
| Is traffic analysis required for the countermeasures? | N | |
| Is traffic analysis provided? | | |
| Does the traffic analysis show the project is feasible? | | |

Cost Estimate Validity

| Check for: | Y/N | Notes |
|---|------|--|
| Is the official cost estimate form provided? | Ν | |
| Is a more detailed cost estimate breakdown provided? | Y | |
| If a detailed cost estimate is provided instead of the official form, does it include a minimum 40% contingency? | FLAG | 25% Contingency |
| Is the cost per countermeasure installation more than 10% below what is listed in the ODOT Countermeasure Cost Estimation Spreadsheet? (note that there are different values for Region 1 and Region 4). | FLAG | Lighting cost is lower than ARTS estimate, but individual bid item costs are consistent with recent region bids. TP/DT estimate is low (4%). |
| Is the cost per countermeasure installation more than 50% above what is listed in the ODDT Countermeasure Cost Estimation Spreadsheel? (note that there are different values for Region 1 and Region 4). | Ν | |

Cost Effectiveness Index Analysis

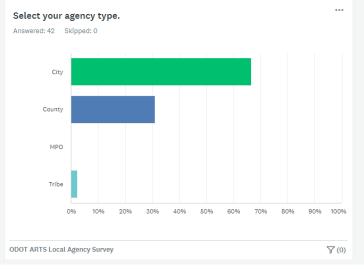
| Criteria | Y/N | Notes |
|--|-----|-------|
| Is the correct tab (IntersectionInput vs SegmentInput) filled out for the type of countermeasure? | | |
| Check the user-provided inputs for reasonableness. | | |
| Is the total number of observed crashed divided by 5 (number of years)? | | |
| Are there 4 or fewer unqlue countermeasures applied in the entire form? | | |
| Do the CRF percentages match the CRFs in the ODOT Countermeasure List? (numbers are manually entered) | | |
| Are the countermeasures correctly applied to the bike and/or pedestrian crashes? | | |
| On the Corridor Analysis tab, does the project cost estimate match the cost estimate in the application AND cost estimator form? | | |
| Is the CEI < \$2.26M? | | |

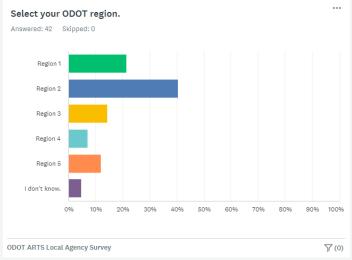
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SECTION 3. LOCAL AGENCY SURVEY RESULTS

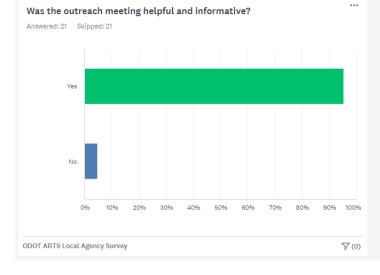
RESPONSE SUMMARIES FOR SURVEY QUESTIONS

All Survey Results

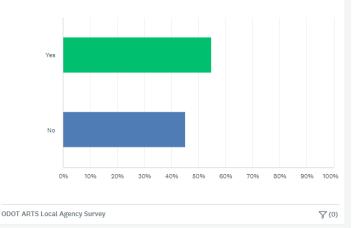




Did you receive outreach emails and notifications about the 2020 ART... Answered: 42 Skipped: 0 Yes No 80% 90% 100% 0% 10% 20% 30% 40% 50% 60% 70% ODOT ARTS Local Agency Survey **丫(0)**







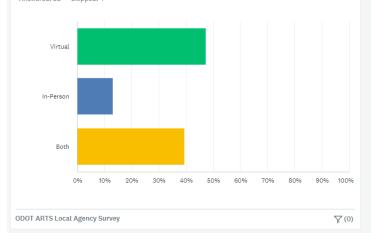
Answered: 16 Skipped: 26
Continue to provide timely and informative material
I do like the one-on-one meetings. That's very helpful.
The ARTS program being driven by data has its challenges -- places with smaller populations often
struggle to achieve adequate levels of reporting. As such, a smaller share of ARTS funding reaches
smaller, rural places in the state. Smaller, rural places likely need support for better reporting. This would
be an excellent way to do better outreach for the ARTS program -- identify how to reach small places and
increase eligibility for those funds.
If I recall correctly, the project cost had to be over something like 1/2 million dollars (maybe less as I am
none
I'd say giving as much advanced notice as possible before the grant application period opens up. This is
helpful for reserving staff time to work on generating project ideas and working on applications.
no

ODOT ARTS Local Agency Survey

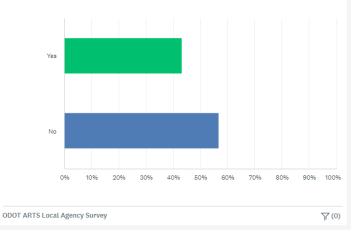
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Would you recommend virtual or in-person ARTS outreach in the futur...



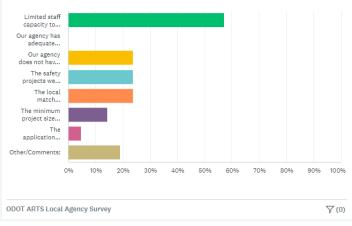
Did your agency submit one or more applications for ARTS funding? Answered: 37 Skipped: 5



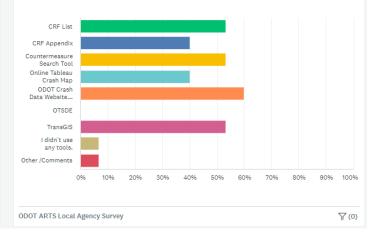
What was the primary barrier to participating in ARTS? (If it was the C... Answered: 21 Skipped: 21

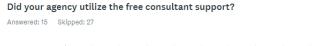
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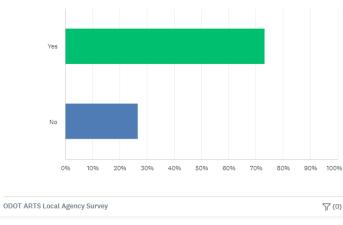
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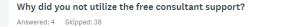


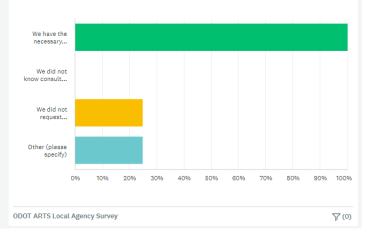
Did you utilize any of the tools made available to help with analysis a... *** Answered: 15 Skipped: 27







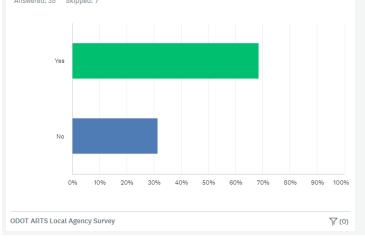




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Do you expect your agency to submit an application for funding in the...



Why or why not? Answered: 29 Skipped: 13 No projects at this time. There are areas that our agency believe that are related to ARTS and are critical with regards to safety Too high of a threshold to meet qualification for smaller cities. small staff , scope and size of projects do not align with program We continue to have a high number of fatalities on our roads and depend on ARTS funding to implement infrastructure improvements to make the roads safer It will depend upon whether or not the hot spot projects we are interested in pursuing meet eligibility requirements. This program is a good way to address some of our worst crash locations that require higher cost treatments. We're always looking to maximize our local dollars with grant funding ODOT ARTS Local Agency Survey \$\frac{\trit}\frac{\fra

Please share any feedback regarding the overall ARTS program, consultant support, data availability, available countermeasures, communication, the ap...

Answered: 16 Skipped: 26

The consultant support, data availability and communication provided were awesomel Please continue to provide these supports in much the same manner. Looking to the next round, the systemic projects we have installed seem to be meeting goals and improving crash rates on curves. However, we are now seeing an increase in crashes on straight sections of rural roads. We suspect this is due to distracted driving but do not have confirming data on the cause. Although I don't have a suggestion for how to attack this problem, I think attempting to attack it would be good. I have talked with other counties via OACES virtual meetings and we are seeing this as a common problem.

l always support reviewing and expanding countermeasures based on new technology and methods. There wasn't a lot of detail provided on the additional information requested for locations that made the 150% list (scoping notes, detailed estimate, etc.). The information provided was very ODOT specific and hard to adapt/interpret for local agencies and local roads.

Consultant support is great. They really work hard for the local agency in order to submit the best possible project.

The consultant support was of great benefit to our organization.

Please provide mapped reporting of incidents, consider lowering the severity of incidents to increase eligibility for funding, and facilitating outreach to communities with safety problems that have not yet applied -- and provide them with capacity/support to apply, so that they can be successful!

None

Consultant support is great! DKS staff did a great job assisting in the application and make the entire application process very easy. Highly commended DKS for their work.

Good program. However requiring match for safety seems wrong.

Great program and consultant support. Thank you!

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