All the Front-End Stuff You Need to Do: How to Jump Start ITS Projects for Small and Rural Communities

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U.S. Department of Transportation

Intelligent Transportation Systems
Joint Program Office

Disclaimer

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Workshop Objectives

- For you to take away a clearer understanding of:
  - The **role of Intelligent Transportation Systems (ITS)** in addressing transportation challenges facing **rural communities**;
  - Examples of successful rural ITS deployments in **key rural transportation challenge areas**;
  - The important role of **comprehensive ITS project planning** in setting solid foundations for successful rural ITS deployments; and
  - The wide variety of **USDOT resources available to potential deployers** at all stages of rural ITS deployment project planning.

Digital Workbook Overview

- Agenda and Presenter Bios
- Rural Challenges and ITS Solutions
- ITS Deployment Decision Support Resources
- Systems Engineering Key Concepts and Resources
- ITS Architecture Key Concepts and Resources
- USDOT Grant Opportunities
- Resources for Deploying ITS
- Breakout Worksheets
- Post Rural Workshop Survey

Agenda

1:00 – 1:15	Introduction: Workshop Objectives and ITS JPO Overview
1:15 – 2:20	Problems Worth Solving: Rural Challenges and ITS Solutions
2:20 – 2:50	Breakout Exercise #1
2:50 – 3:00	Break
3:00 – 3:40	How Do We Get Started?: Foundational Activities
3:40 – 4:05	Breakout Exercise #2
4:05 – 4:15	Break
4:15 – 4:45	Funding and Resources for Rural Communities
4:45 – 5:00	Closing Remarks/Q&A

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Today's Presenters

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Intelligent Transportation Systems Joint Program Office (ITS JPO)

*The ITS JPO's mission is to lead collaborative and innovative intelligent transportation systems (ITS) research and development (R&D), and to advance the implementation of ITS to improve the **safety** and **mobility** of people and goods.*

Source: USDOT

How We Deliver Value: Full ITS Lifecycle Leadership

Identify Emerging Technologies

- Communications/Spectrum
- Climate Change and Environment
- Artificial Intelligence
- Blockchain & Quantum Computing
- Modeling and Simulation

Coordinate and Lead Research

- V2X / Interoperable Connectivity
- Roadway Safety
- Automation
- Cybersecurity
- Data Access/Exchanges

Demonstrate Value

- ITS4US Deployments
- Benefit & Cost Data
- ATTAIN & SMART Grants
- Intersection Safety Challenge
- Decision Support & Analytics

Accelerate Implementation

- Deployment Evaluation
- Professional Capacity Building
- Architecture & Standards
- Communications & Outreach

Leverage Knowledge

- Deployment Tracking
- Smart Communities Resource Center
- Technical Assistance
- Cohort Support
- Knowledge Transfer
- Training

Source: USDOT

Let's Hear About You

- Who lives in a rural area?
- What is your role in transportation?
  - Are you a transportation engineer?
  - Are you a transportation planner?
  - Are you playing another role in transportation?
- Who is working on or has worked on an ITS deployment?

What Do We Mean By a "Rural" Community? Why is This Important?

- The definition of what is rural can vary depending on the program
  - USDOT's Rural Eligibility Tool: www.transportation.gov/rural/eligibility
- In general, rural U.S. includes:
  - Undeveloped areas and small towns
  - Rural parks and resorts
  - Mining and forestry sites
  - Native American communities
  - Exurban areas located near metro areas
  - Most of the outlying U.S. territories


Source: Colorado DOT

Rural Population Statistics

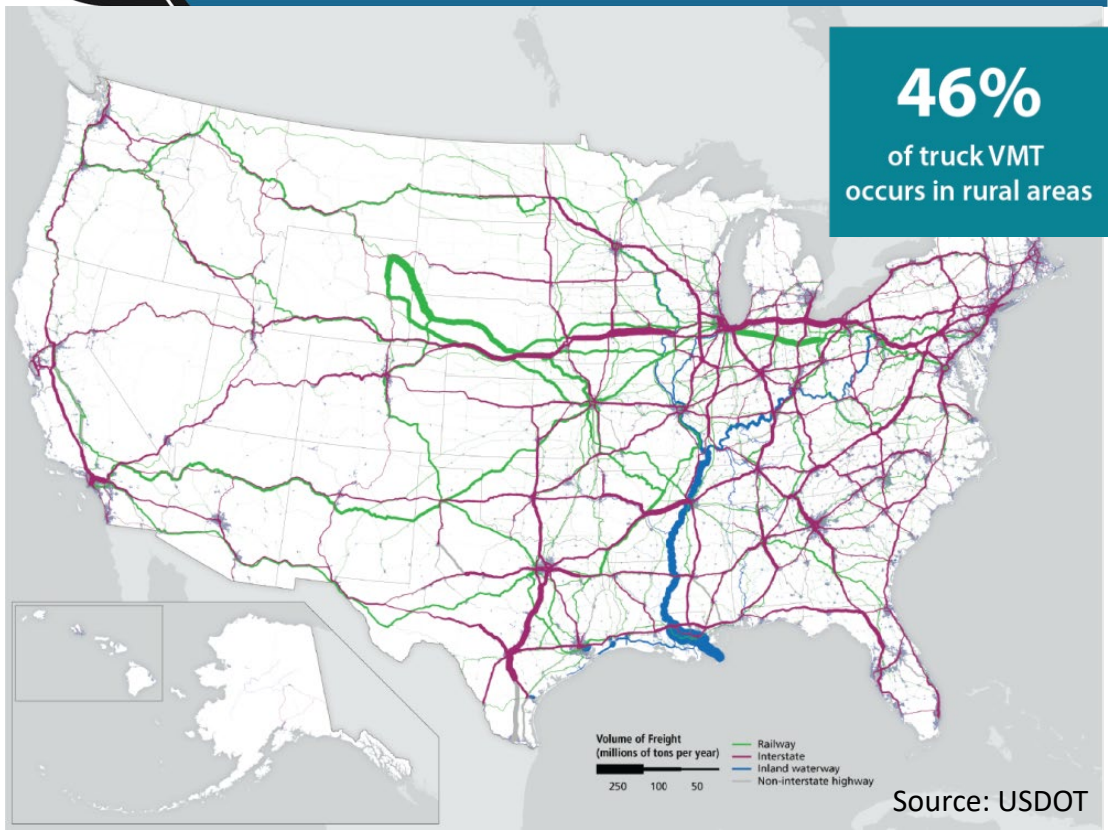
- Rural populations are **older** - More than 1 in 5 older Americans live in rural areas, with 17.5% of the rural population 65 or older compared to 13.8% in metro areas
- Rural areas have **more poverty** – The 2020 rural poverty rate was 15.4% compared to 11.9% in metro areas
- Rural employment is dominated by four industries: **government, manufacturing, retail**, and **healthcare and social assistance**
- Rural populations are **becoming more diverse** – in 2020, 24% of rural Americans are people of color (non-white)

Rural Transportation Characteristics

- Rural areas account for 97% of total U.S. land area and are home to 66 million Americans (19% of the population)
- Rural roads account for 68% of total U.S. lane miles
- 46% of all truck vehicle miles traveled occur in rural areas.

From 2000-2019, rural volume per interstate lane-mile grew 9.0% in rural areas versus 1.1% in urban areas

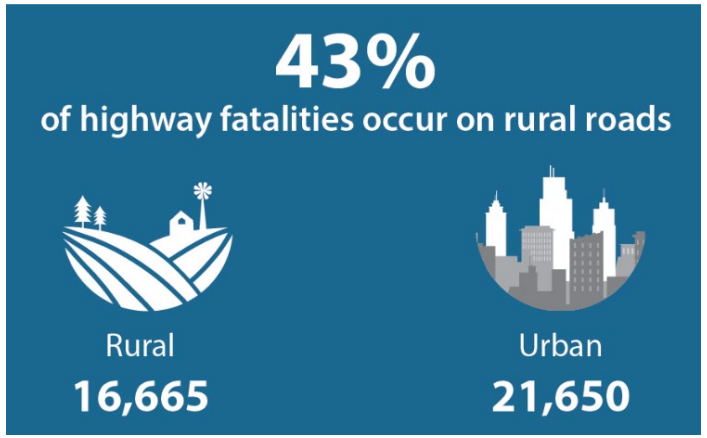
19% of Americans live in rural areas but 68% of our nation's total lane-miles are in rural areas



Source: USDOT

Examples of Challenges in Rural Transportation

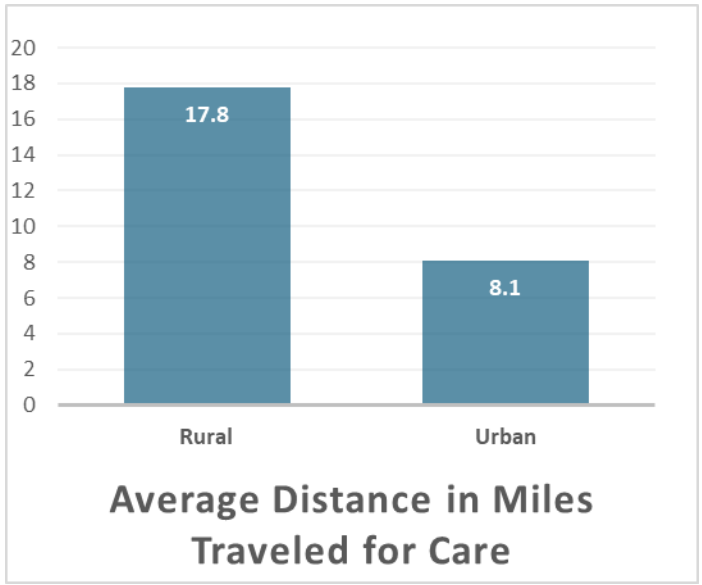
Safety



Source: USDOT

Access to Services

120% more miles traveled



Source: SW Rural Health Research Center

Infrastructure Conditions

Source: USDOT

Problems Worth Solving: Rural Challenges and ITS Solutions

- Getting Clear on What ITS Is – and Isn't
- Major Rural Transportation Operations Challenges & ITS Solutions
- Major Rural Institutional Challenges
- *Breakout Session #1*

Intelligent Transportation Systems (ITS)

Source: iStock

Source: FDOT

Intelligent Transportation Systems (ITS) apply a variety of technologies to monitor, evaluate, and manage transportation systems to enhance safety and efficiency.

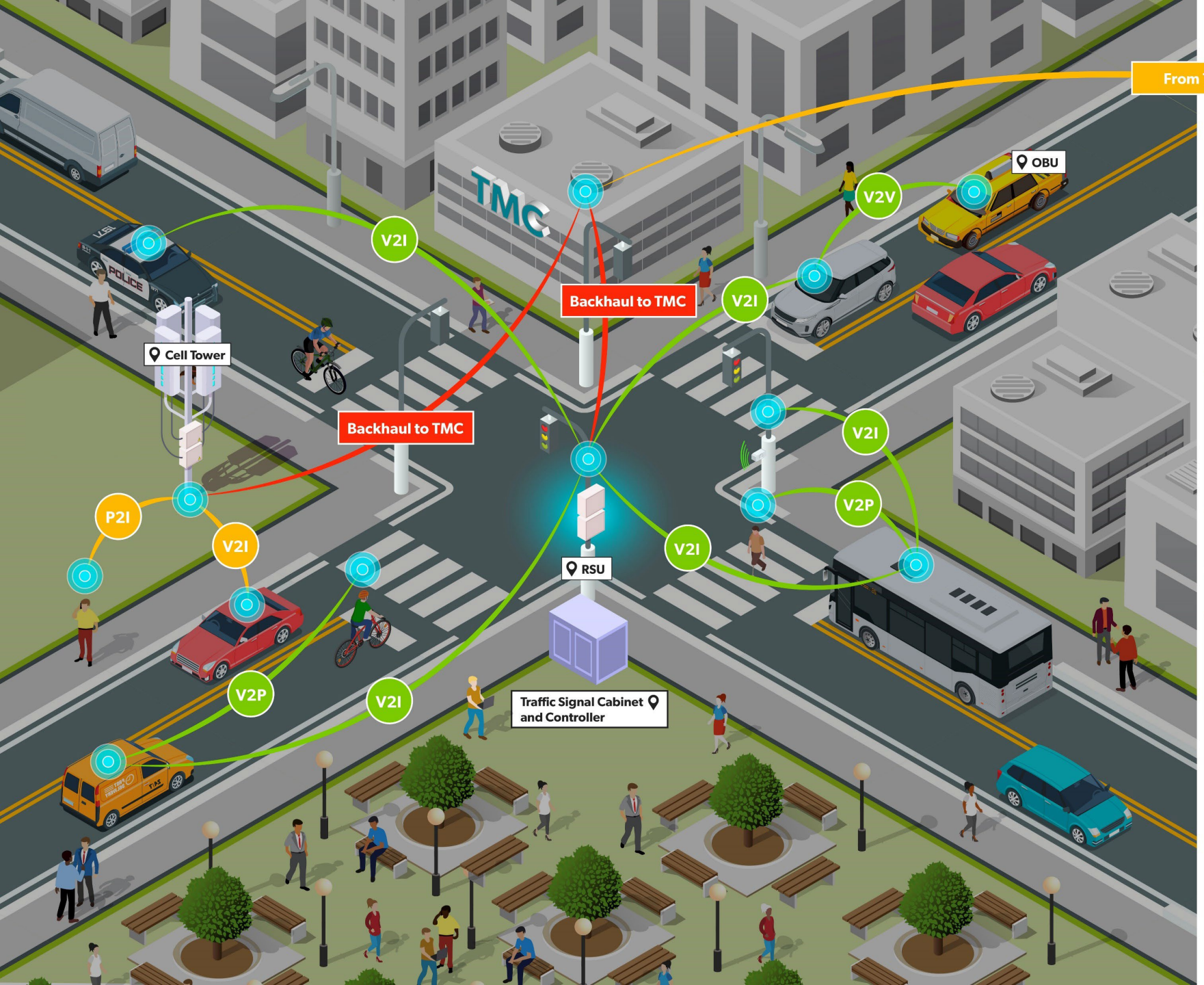
- Traffic Signal Systems and Advanced Traffic Management Systems (ATMS)
- Traffic Sensors and Probe Data Systems
- Closed-Circuit Television (CCTV) Cameras
- Dynamic Message Signs (DMS)
- Variable Speed Limits
- Ramp Metering
- Traveler Information Systems
- Electronic Toll Collection (ETC)
- Transit Signal Priority (TSP)
- Smart Parking Systems
- Road Weather Systems
- Weigh-in-Motion Systems
- Lane Use Control Systems
- Mobility as a Service (MaaS)
- Computer-Aided Dispatch (CAD)/ Automated Vehicle Location (AVL)
- Connected Vehicles
- Automated Vehicles

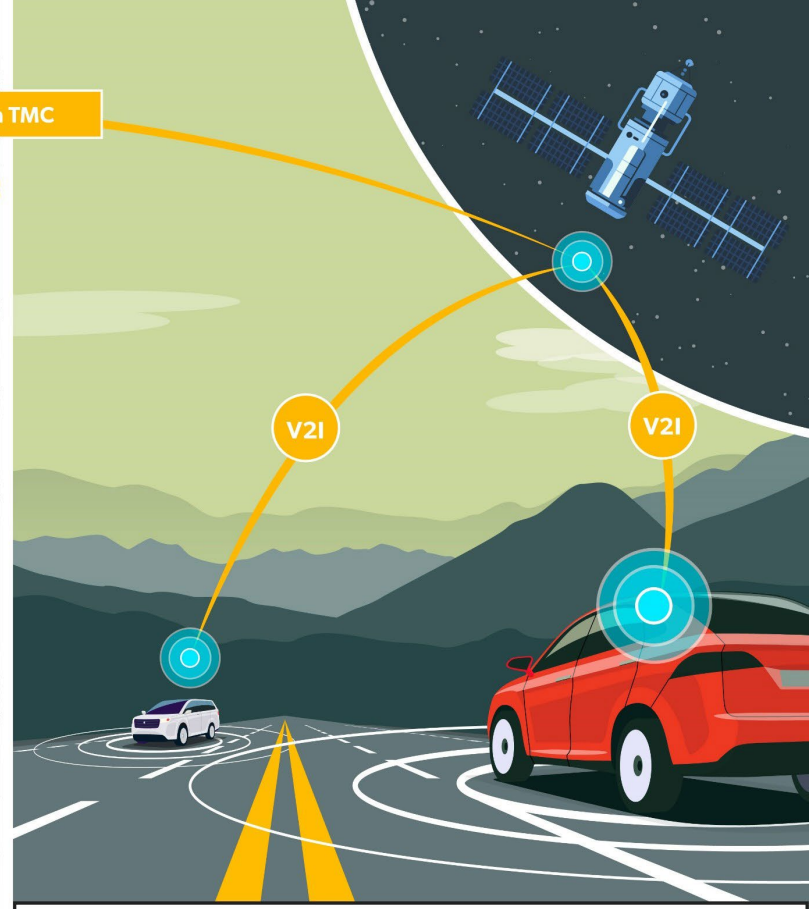
Disclaimer: ITS solutions may not be the only or best solution to every transportation challenge.

Vehicle-to-Everything (V2X)

Source: USDOT

Vehicle-to-everything (V2X) technologies use a variety of wireless communications to link vehicles, mobile devices, and roadside infrastructure





V2X Communication Using the 5.9 GHz Safety Band (e.g., LTE-V2X Sidelink)

V2X Communication Outside the 5.9 GHz Safety Band (e.g., LTE Uu Link, Satellite)

Backhaul to TMC

Abbreviations:

V2X - Vehicle-to-Everything
V2V - Vehicle-to-Vehicle
V2P - Vehicle-to-Pedestrian/Bicyclist
V2I - Vehicle-to-Infrastructure
P2I - Pedestrian-to-Infrastructure
RSU - Roadside Unit
OBU - Vehicle On-board Unit
TMC - Traffic Management Center
LTE - Long-Term Evolution

SAFETY

- Emergency Electronic Brake Lights Warning
- Forward Collision Warning
- Blind Spot Warning/Lane Change Warning
- Intersection Movement Assist
- Left Turn Assist Warning
- Red Light Violation Warning ★
- Emergency Vehicle Preemption ★
- Emergency Vehicle Alert
- Distress Notification (Mayday Alert) ★
- Curve Speed Warning ★
- Reduced Speed Warning ★
- Pedestrian in Signalized Crosswalk Warning ★
- Wrong Way Entry Warning ★
- Railroad Crossing Warning ★
- Oversize Vehicle Warning ★

COMMERCIAL VEHICLE

- Commercial Vehicle Wireless Inspection
- Truck Parking and Other Information ★

MOBILITY & ENVIRONMENT

- Traffic Signal Optimal Speed Advisory (or Control)
- Intelligent Traffic Signal Systems (I-SIG)
- Signal Priority ★
- Mobile Accessible Pedestrian Signal System
- Speed Harmonization
- Queue Warning ★
- Cooperative Adaptive Cruise Control / Vehicle Platooning

TRAFFIC ADVISORIES & WARNINGS

- Incident and Road Closure Advisories and Warnings ★
- Road Weather Advisories and Warnings ★
- Work Zone Advisories and Warnings ★
- Work Zone Worker Advisories and Warnings ★

DATA COLLECTION

- Road Weather Data Collection ★
- Probe-enabled Traffic Monitoring ★
- Probe-based Pavement Maintenance ★

★ **High value for rural deployments**

Types of Transportation Challenges: Operational and Institutional

- Operational Challenges
  - Do we need to **change** how the **transportation system** operates?
- Institutional challenges
  - Do we need to **change** how **institutions** or **policies** work?
- Rural communities may have some very specific challenges in both areas

Exploring Rural Transportation Challenges and Potential ITS Solutions

Safety

Mobility and Accessibility

Incident Management and Response

Freight Operations

Road Weather Management

Work Zones

Focus on Three Rural Transportation Challenges and Potential ITS Solutions

Safety

Mobility and Accessibility

Incident Management and Response

You can find information on Freight, Road Weather, and Work Zone operational challenges in your digital workbook.

Rural Road Safety Challenges: Rural Fatalities

- While only **19 percent** of Americans live in rural areas, **43 percent** of motor vehicle fatalities occur on rural roads.

Source: USDOT

Safety Challenges in Rural Areas

- Over **11,000 people** die each year due to roadway departures in rural communities
- **28%** of rural traffic fatalities in involved speed
  - Legal speeds on collector and local roads are often higher than their urban counterparts
- The average crash rate for horizontal curves is about **three times** that of other types of highway segments.
  - **42%** of rural fatal crashes happen at curves
  - **75%** of curve-related fatal crashes involve single vehicles departing the roadway and striking a fixed object or overturning

Safety Challenges in Rural Areas (continued)

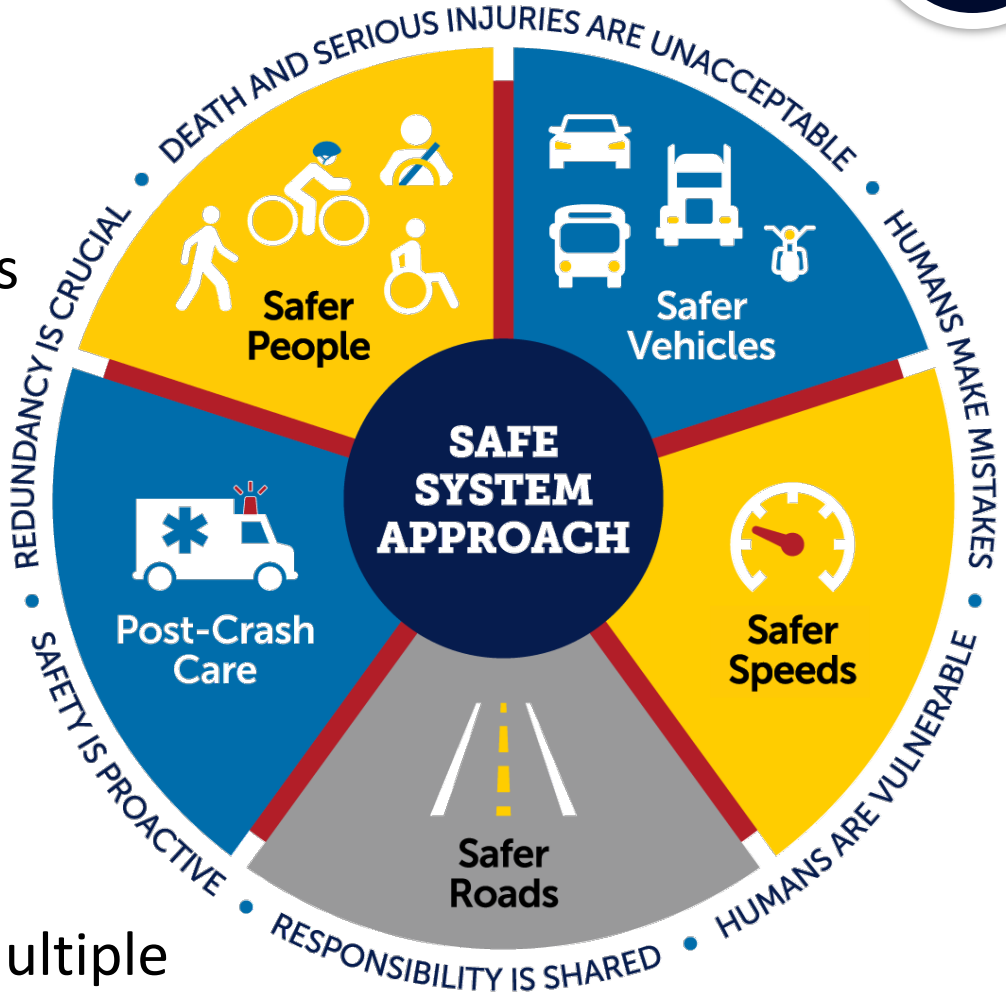
- More than 1 million **wildlife vehicle collisions** in the U.S. each year resulting in an estimated 200 human fatalities and 26,000 injuries to drivers and passengers
- 34% of all **highway-rail grade crossing fatalities** occur on rural roads
- A lack of infrastructure to protect **vulnerable road users**, such as sidewalks, crosswalks, and protected bus shelters


Source: iStock


Source: pedbikeimages.org Burden

Safe System Approach (SSA)

- USDOT adopted a Safe System Approach, through the National Roadway Safety Strategy (NRSS), as its guiding paradigm to address roadway safety.
- Guiding Principles
  - Death and Serious Injuries are Unacceptable
  - Humans Make Mistakes
  - Humans Are Vulnerable
  - Responsibility is Shared
  - Safety is Proactive
  - Redundancy is Crucial
- The Safe System Approach builds and reinforces multiple layers of protection



Speed Management

Appropriate Speed Limits for All Road Users

Speed Safety Cameras

Variable Speed Limits

Variable Speed Limit (VSL) Systems

Automated Work Zone Speed Enforcement

Curve Speed Warning Systems

Pedestrian/Bicyclist

Bicycle Lanes

Crosswalk Visibility Enhancements

Leading Pedestrian Interval

Medians and Pedestrian Refuge Islands in Urban and Suburban Areas

Pedestrian Hybrid Beacons

Rectangular Rapid Flashing Beacons (RRFB)

Pedestrian Crossing Warning Systems

Road Diets (Roadway Configuration)

Walkways

Crosscutting

Lighting

Local Road Safety Plans

Pavement Friction Management

Smart Street Lights

Road Safety Audit

Roadway Departure

Enhanced Delineation for Horizontal Curves

Longitudinal Rumble Strips and Stripes on Two-Lane Roads

Median Barriers

Roadside Design Improvements at Curves

SafetyEdge℠

Wider Edge Lines

Intersections

Backplates with Retroreflective Borders

Corridor Access Management

Dedicated Left- and Right-Turn Lanes at Intersections

Reduced Left-Turn Conflict Intersections

Roundabouts

Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections

Intersection Safety Applications

Yellow Change Intervals

There are a variety of ITS strategies that can enhance roadway safety.

ITS and Safer People

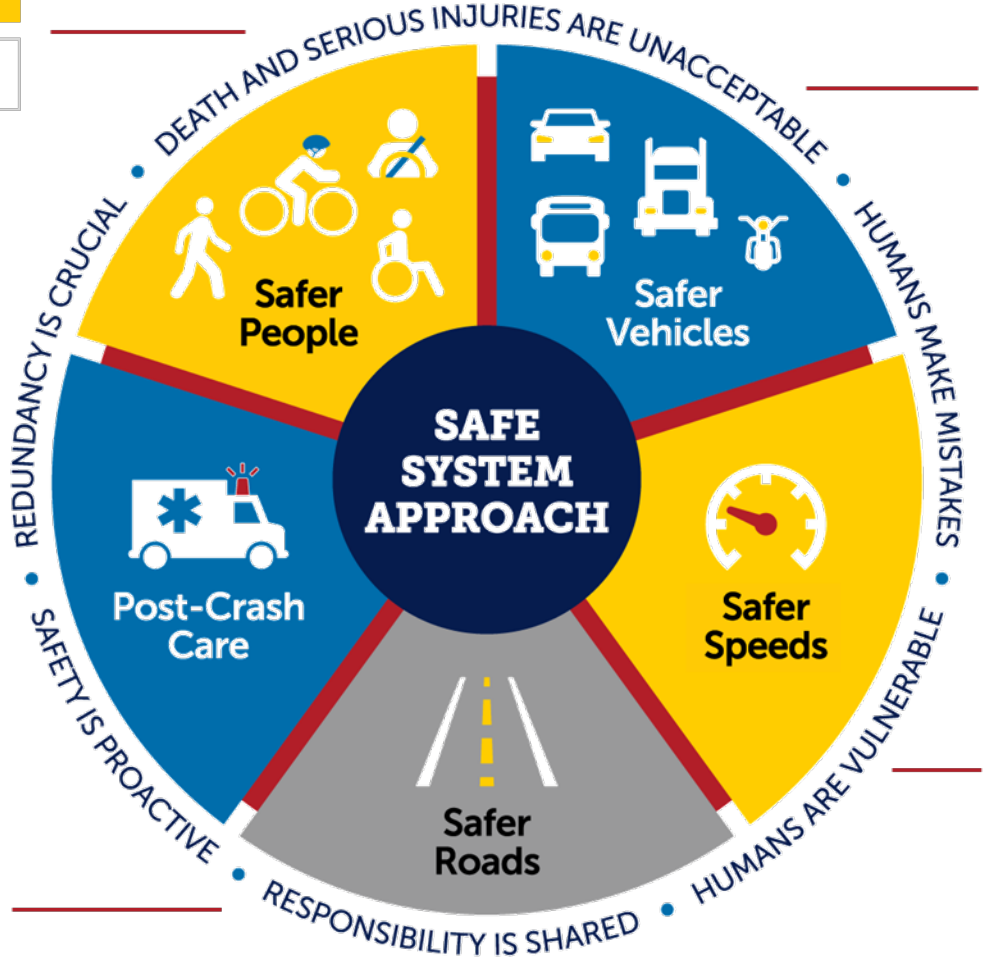
- Bike & Pedestrian Safety Systems

ITS and Post Crash Care

- Traffic Incident Management
- Emergency Vehicle Preemption
- UAS for Crash Reconstruction

ITS and Safer Roads

- Active Traffic Management (ATM)
- Smart Work Zone Technologies
- Road Geometry Warnings
- Wildlife Warning Systems
- Highway-Rail Crossing Safety Systems
- Intersection Collision Warning Systems
- Road Weather Warning Systems
- Wrong Way Driver Warning Systems



ITS and Safer Vehicles

- Connected Vehicles
- Advanced Driver Assistance Systems (ADAS)
- Automated Vehicles

ITS and Safer Speeds

- Variable Speed Limits
- Curve Speed Warnings
- Reduced Speed Warnings
- Automated Speed Enforcement

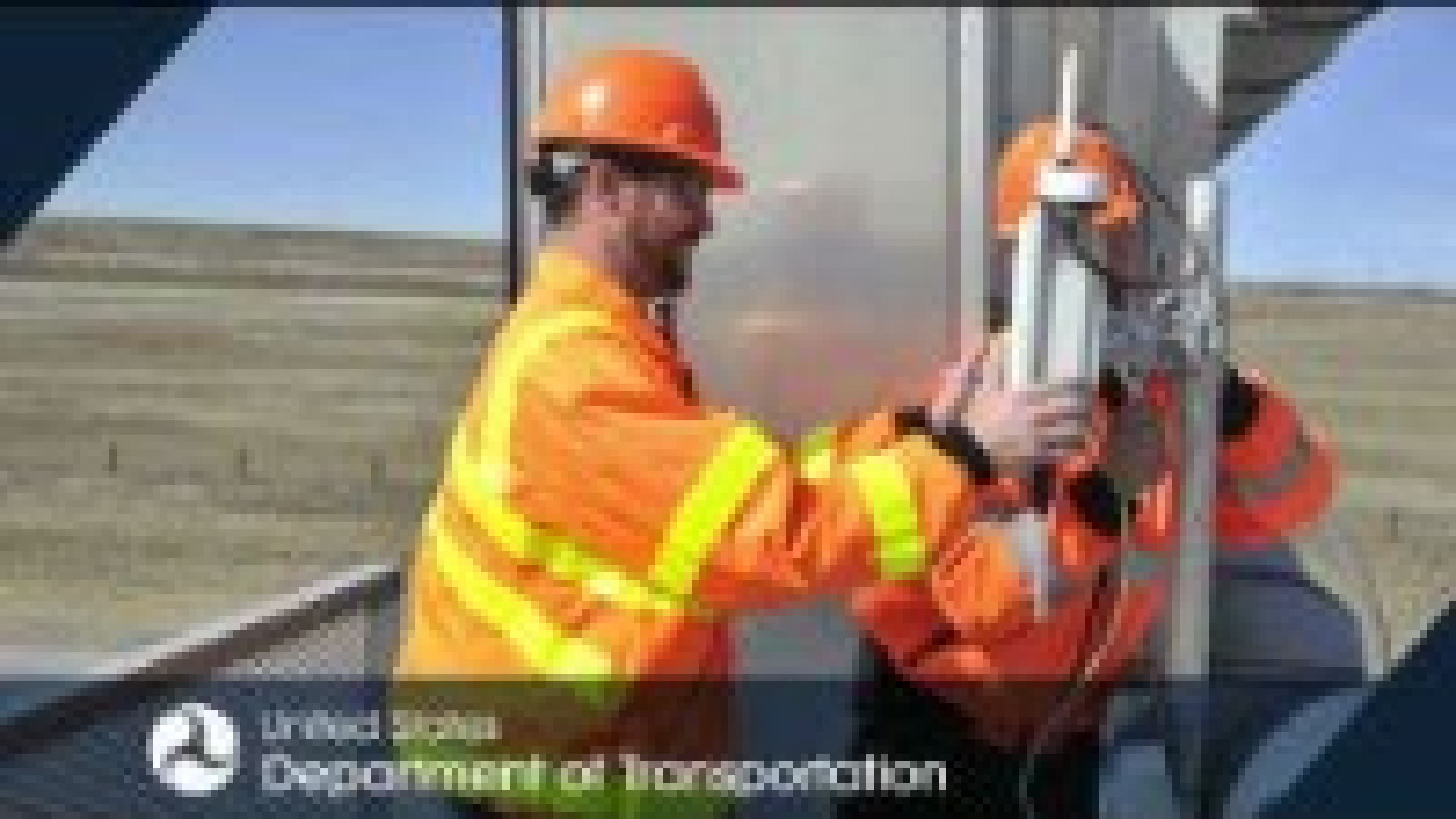
Using ITS to Address Crashes at Curves

- Curve Speed Warnings could help—the FHWA evaluated a **Sequential Dynamic Curve Warning System** installed in 5 states
- Study found that the number of vehicles exceeding the speed limit by 10 mph or more decreased by **27.8 percent**
- Sites also witnessed crash reductions ranging from **45-100 percent**

Source: FHWA

V2X Example: Utah DOT's Connected Vehicle Curve Speed Warning System

- Utah DOT (UDOT) is currently piloting Connected Vehicle Curve Speed Warning Systems at **8** locations
  - 5 in Big Cottonwood Canyon
  - 3 along interstates in Salt Lake Valley
- Customized, in-vehicle alert when approaching a curve too fast
- It is estimated these in-vehicle alerts could reduce curve-related crashes by **46 percent**


United States
Department of Transportation

Mobility and Accessibility: Challenges in Rural Areas

- **Longer Distances and Travel Times.** Rural residents must go further to jobs, education, essential services, and community events.
- **Limited and Disconnected Transit Service.** Mobility services in rural areas can be patchwork with limited hours and eligibility.
- **Reduced Options for Independent Travel.** Rural residents who cannot drive have few transportation alternatives, impacting their ability to travel freely and spontaneously to the places they want and need to go.

Source: FTA

Accessibility and Mobility: Example ITS Solutions

- Transit ITS Technologies
  - Computer Aided Dispatch/Automated Vehicle Location
  - Coordinated Rural Transit Service Enabling Software
  - On-Demand Transit Service Enabling Software
  - Multimodal Trip Planning Applications
- Pedestrian ITS Technologies
  - Wayfinding & Navigation Applications
  - Intersection Crossing Application

Source: FTA

Example of Accessibility/Mobility Challenge in Rural Communities– Lack of transit/service coverage, and Coordinated Transit Service

- Mobility providers in rural areas can be limited in how they can schedule trips
- Southeast Area Transit (SEAT) in Ohio launched CTS transit scheduling and dispatch software in 2018 to improve the scheduling of its demand-response services
- **Two years after deployment, SEAT registered a 400% increase in scheduled trips**

Source: SEAT

Source: Noble Co. OH

V2X Example: GDOT's Application for Accessibility

- Georgia Mobility and Accessibility Planner (GMAP) application in Gwinnett County enhances all users' mobility experience
  - Allows users to create customized profile for boarding and alighting vehicles.
  - Application connects users with bus vehicles that automatically receive messages with individual's travel needs.

Incident Response: Challenges in Rural Areas

- It takes **two times longer** to get responders to a crash scene in rural areas
- Rural first responders often receive no or limited incident details en-route to the scene, **increasing the time needed to assess the situation and act upon arrival**
- Detours in rural areas require significant **interagency coordination and advanced notification** for travelers


Source: UDOT

Incident Response: Example ITS Solutions

- **Traffic Management**
  - CCTV Cameras; DMS; 511
  - Coordinated Incident Response Plans
- **Connected Travelers**
  - Mayday Alerts
  - In-Vehicle / Data Feeds for Incident and Road Closure Advisories and Warnings
- **Emergency Services**
  - Smartphone Applications for First Responders
  - Emergency Vehicle Preemption
- **Post-Crash**
  - Safety Service Patrols and Emergency Clearance Towing Services
  - UAS for Crash Reconstruction


Source: Minnesota DOT

Source: Connecticut DOT

Example of Emergency/Incident Response in Rural Communities – Wait Time for Incident Response

- It can be difficult for rural first responders to receive information on the location of the incident
- Georgia DOT piloted a cloud-based emergency call-taking app to quickly locate and communicate with motorists
- The app decreased average dispatch time from 23 minutes to just 3 minutes


Source: FWHA

V2X Example: Indiana DOT's Incident Response Warning

- In-vehicle navigation alerts from onboard equipment warn drivers of slower moving traffic and the presence of emergency responders
- Hard-braking decreased 80% when queue warning trucks were used to alert motorists of impending queues

Hoosier Helper emergency response vehicle equipped with onboard transponder. Source: Indiana DOT

Unmanned Aerial Systems (UAS) for Crash Reconstruction

- The North Carolina State Highway Patrol (Asheville, NC) used drones to document and reconstruct serious accidents to unblock roads faster.
  - Drones collect visual data that can be processed using mapping software that can then be used to map out the incident scene
  - Reduced time spent mapping the accident scene from 2 hours to 25 minutes (2018-01258)

Source: istock

Institutional Challenges for Rural Communities

Coordination with MPOs/ DOTs

Partnerships

Planning

Equity

Workforce

Funding

Breakout Session – ITS Solutions – 30 minutes

- Pick an “Opportunity Card” from our deck!
- Based on your table’s Opportunity:
  - What ITS solution(s) can address this challenge?
  - Other than funding, what are the 3 biggest challenges to deploying ITS to address this transportation issue?
  - How would you overcome those challenges?
  - What are the first few steps to initiate the project?
- Quick Report Out By Table (5 minutes)

Break #1

How To Get Started: Six (6) Foundational ITS Deployment Planning Activities

1. Convene Stakeholders + Community Engagement
2. Identify and Assess Challenges and Needs
3. Assess Feasibility of ITS as an Option
4. Incorporate into Transportation Plans and ITS Plans
5. Pursue the Appropriate Funding Opportunities
6. Deliver Projects Using a Systems Engineering Process

Foundational Activities for ITS Deployments

1. Convene Stakeholders + Community Engagement

Tips for Stakeholder and Community Engagement

- Start comprehensive outreach early in the project
- Understand your audience
  - Tailor discussion and messaging
- Use multiple formats
- Use various venues for engagement
- Provide multiple opportunities for engagement

Stakeholder Engagement

Stakeholders:

- End Users and General Public
- Advocacy Groups and Organizations
- Local / Regional Government Agencies
- Transportation Service Providers
- Politicians / Decision Makers
- System Maintainers / Operators

- **Before you start:** ITS projects require a lot of coordination. Make sure to have a champion and leadership buy-in!
- Early and frequent involvement of stakeholders brings diverse viewpoints and inputs to the project and builds trust between public agencies, the public and other partners
- The more effective stakeholder engagement is, the better an agency can make informed decisions about project concepts and direction

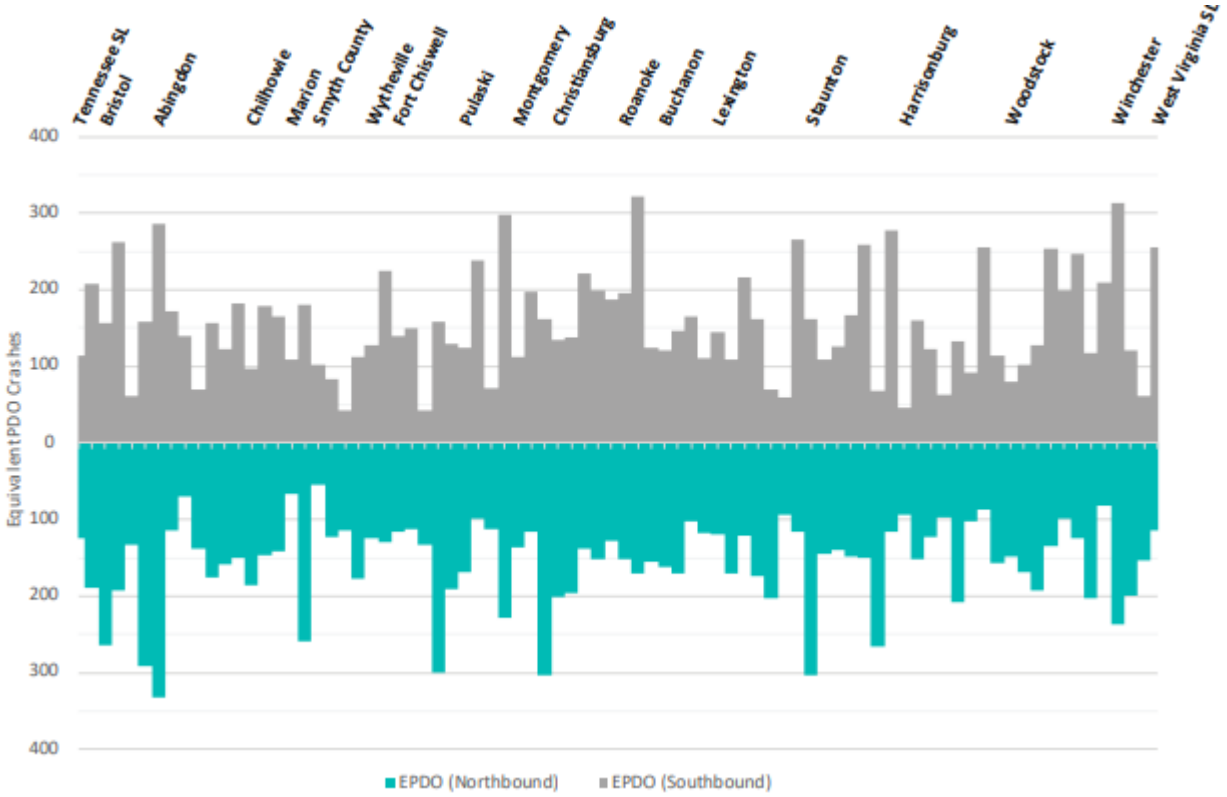
Engage early and often – and on multiple levels

2. Clearly Identify and Then Assess Challenges and Needs

- Determine the scope of the identified challenge or unmet need
  - WHAT is the issue exactly?
  - WHO is affected by the issue?
  - WHERE is it occurring?
  - WHEN is it happening?
  - HOW URGENT is the problem and how widespread is it?
- Identify current/planned projects that may have scope that overlaps with scope of current issue or problem
  - Can those projects be leveraged somehow?

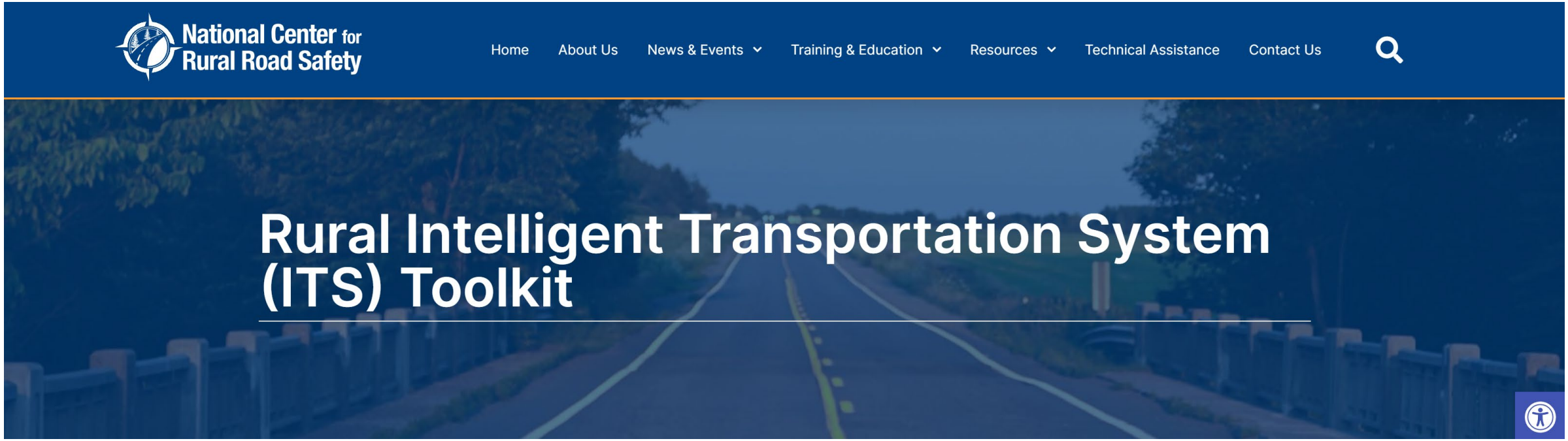
Understanding Challenges and Needs

- Soliciting input from stakeholders
  - Public Outreach
  - Infrastructure Owners and Operators (IOOs)
  - Transportation Planners
  - First Responders
  - Others
- Assessing Data and Performance Measures



Source: VDOT

Identifying Potential ITS Solutions: Rural ITS Toolkit



https://ruralsafetycenter.org/rural-intelligent-transportation-system-its-toolkit/

Categories in the Rural ITS Toolkit

Categories	Definition
Crash Countermeasures	Tools that focus on crash frequency and severity
Emergency Services	Tools that support, facilitate and expedite emergency response efforts
Operations & Maintenance	Tools that facilitate operations, enhance maintenance, or extend the longevity of the transportation assets
Rural Transit & Mobility	Tools that expand, enhance, and coordinate public transportation
Surface Transportation & Weather	Tools that monitor weather conditions on the transportation network and mitigate weather related impacts.
Traffic Management	Tools that facilitate the identification of congestion and the management of traffic
Tourism & Travel Information	Tools that expand or enhance dissemination about travel conditions and tourism opportunities in the surrounding region

RITS Toolkit: Example Technology – Animal Warning Systems

Crash Countermeasures (CC)

Tools that focus on reducing crash frequency and severity.

- CC1 Animal Warning Systems
- CC2 Automated Visibility Warning Systems
- CC3 Bicycle Safety Systems
- CC4 Connected Vehicles
- CC5 Wrong Way Driver Detection & Warning System
- CC6 Highway-Rail Crossing Safety Systems
- CC7 Intersection Collision Warning Systems (ICWS)
- CC8 Pedestrian Safety Systems
- CC9 Road Geometry Warning System
- CC10 Smart Trucks
- CC11 Speed Warning Systems
- CC12 Work Zone Safety Systems

Rural Intelligent Transportation Systems (ITS) Toolkit

Animal Warning Systems

CC 1

Photos: Courtesy of Marcel Huijser, WTI

Description: Animal Warning Systems are intended to warn motorists about the potential or actual presence of animals on the road. Animal Warning Systems utilize electronic sensors to detect animals. Once an animal is detected, signs are activated to warn drivers of the presence of an animal. These systems are different than:

1) Standard wildlife warning signs,
2) Enhanced wildlife warning signs, and
3) Temporal wildlife warning signs.

Animal Warning Systems are best used to *mitigate* large mammal/vehicle collisions; they are not intended to eliminate them.

Rural Transportation Critical Needs

- ☑ Crash Countermeasures
- ☐ Emergency Services
- ☐ Operations & Maintenance
- ☐ Rural Transit & Mobility
- ☐ Surface Transportation & Weather
- ☐ Tourism & Travel Information
- ☐ Traffic Management

Issues Addressed

- ☐ Road Geometry Warning
- ☐ Highway-Rail Crossing Warning
- ☐ Intersection Collision Warning
- ☐ Pedestrian Safety
- ☐ Bicycle Warning
- ☑ Animal Warning
- ☐ Collision Avoidance
- ☐ Collision Notification
- ☐ Weather Warning

Strategies Achieved

- ☑ Road User
- ☑ Road
- ☐ Vehicle
- ☐ Safety Culture
- ☑ Engineering
- ☐ Emergency Response
- ☐ Enforcement
- ☐ Education

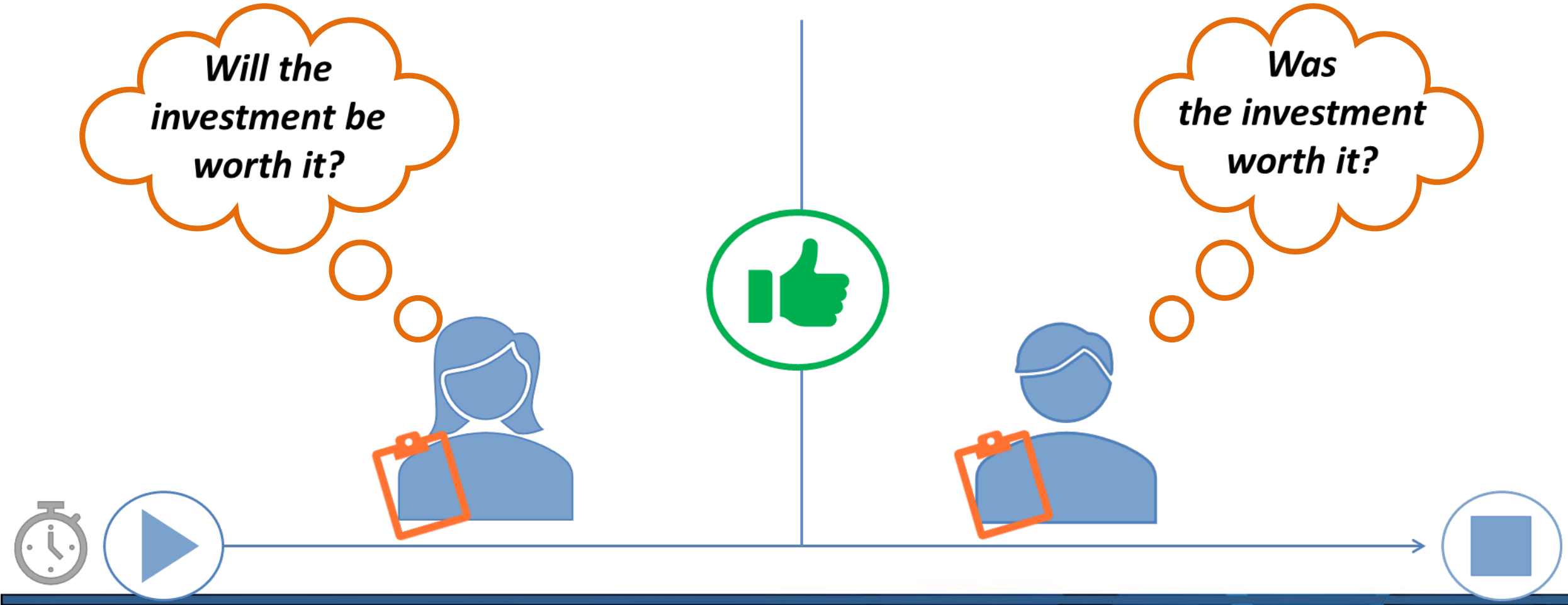
National Center for Rural Road Safety — *A Federal Highway Administration Center for Excellence*

3. Assess Feasibility of Using ITS to Address Challenge or Need

Source: iStock

- The importance of making an effective business case for your ITS project
- Identifying data and decision-making resources currently available on the ITS JPO evaluation website to help you with decision support

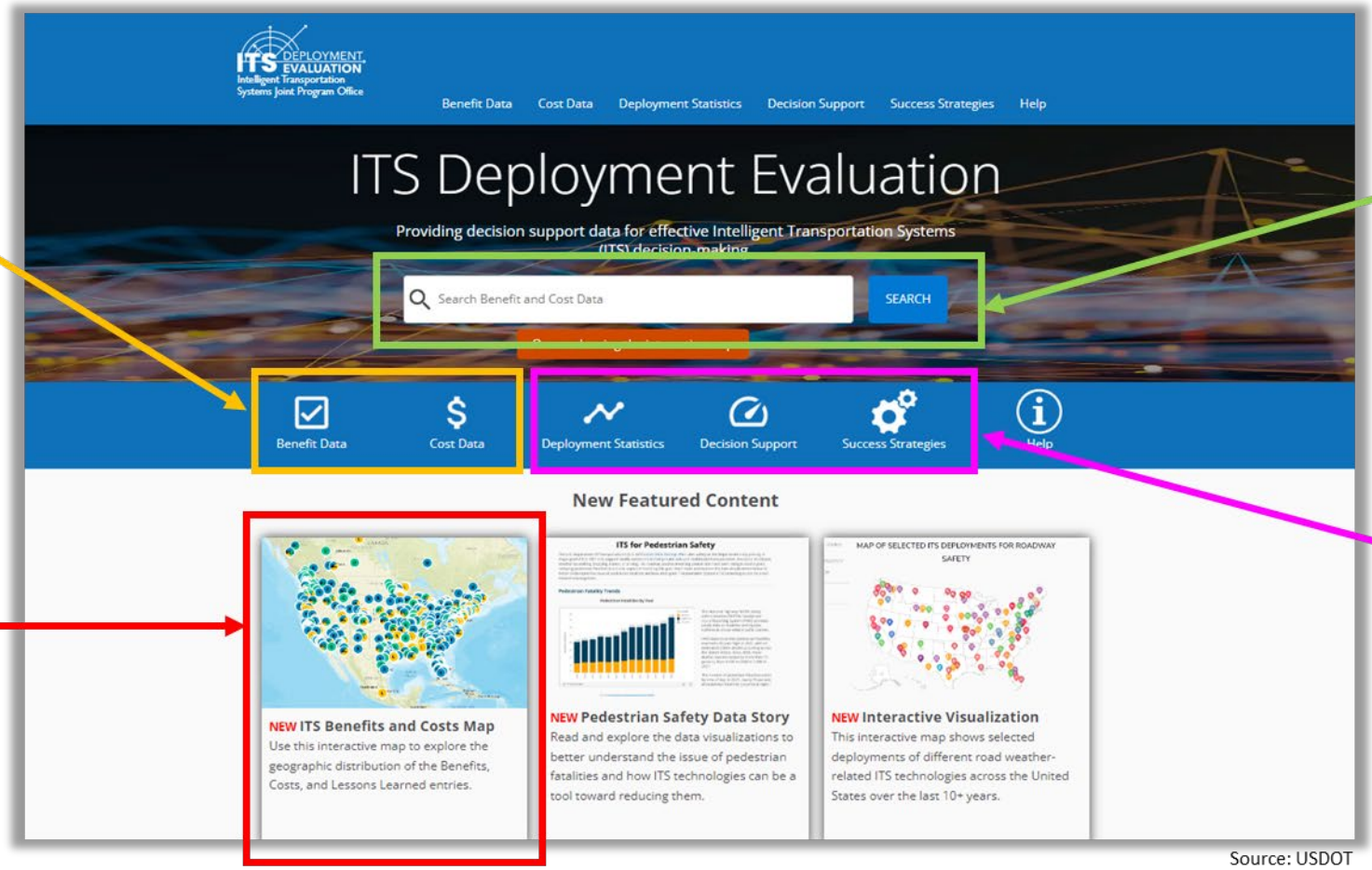
The Evaluation Lifecycle in an ITS Deployment Project



ITS Deployment Evaluation Program Website: www.itskrs.its.dot.gov

Focused Benefit and Cost Data

Searchable Benefits and Costs Map



Source: USDOT

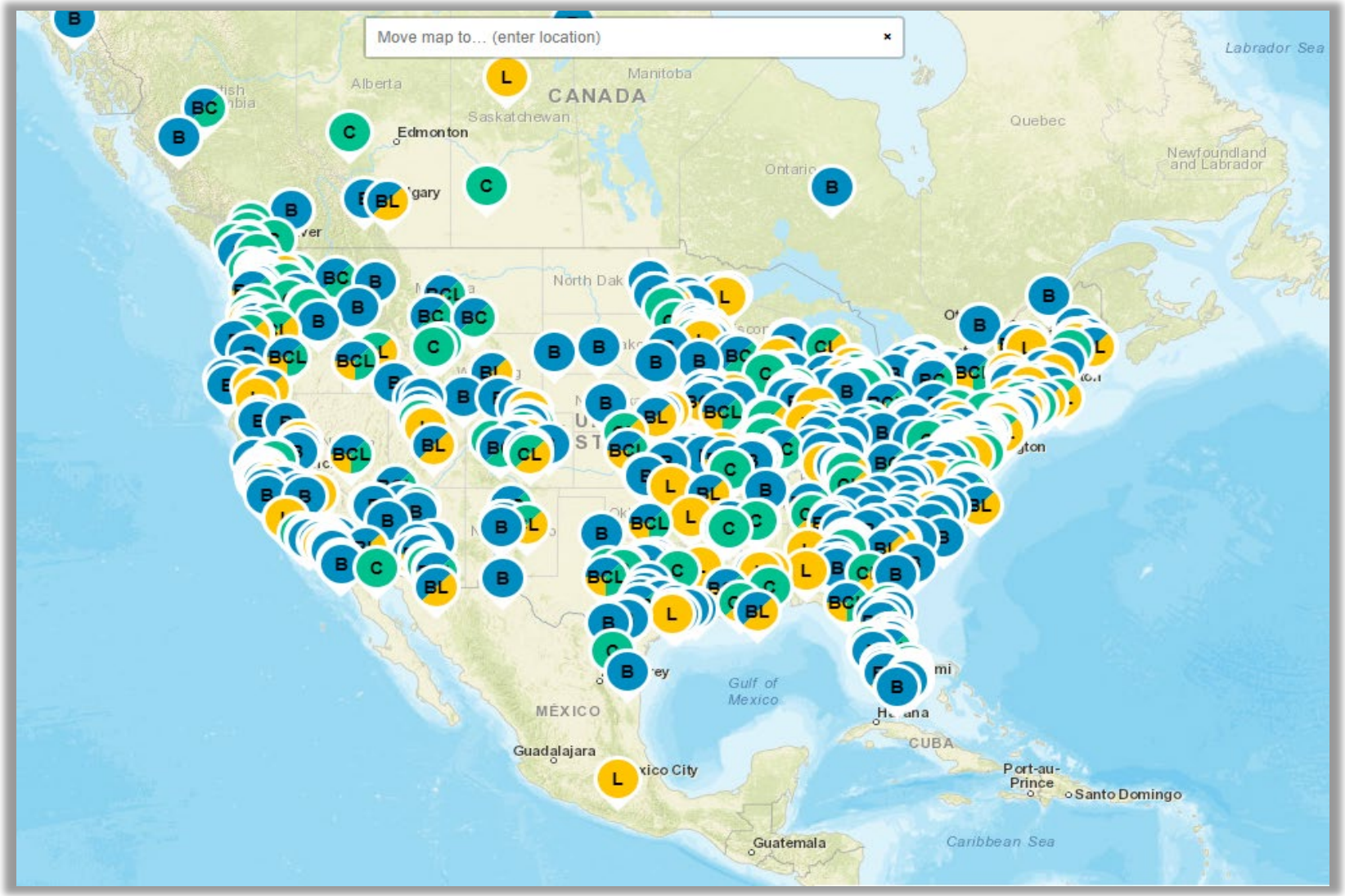
Global Keyword Search

Decision Support Resources

ITS Benefits, Costs, and Lessons Learned (BCLL) Interactive Map

Search by:

- City/state
- Technology type
- ITS Topic
- Goal Area
- CV Benefits/Costs
- Result Type (Modeled or Deployed)



Source: USDOT

Intelligent Transportation Systems
Joint Program Office

www.itskrs.its.dot.gov/its-map

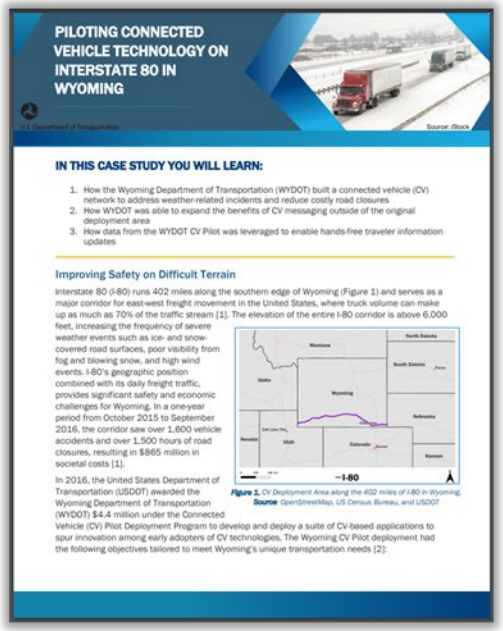
U.S. Department of Transportation

Other Evaluation Resources

- Executive Briefings
- ITS Deployment Case Studies
- Infographics
- Interactive Data Visualizations
- Deployment Survey Data
- ROI Guide and Use Cases

Intelligent Transportation Systems
Joint Program Office

Case Studies


PILOTING CONNECTED VEHICLE TECHNOLOGY ON INTERSTATE 80 IN WYOMING

IN THIS CASE STUDY YOU WILL LEARN:

1. How the Wyoming Department of Transportation (WYDOT) built a connected vehicle (CV) network to address weather-related incidents and reduce costly road closures
2. How WYDOT was able to expand the benefits of CV messaging outside of the original deployment area
3. How data from the WYDOT CV Pilot was leveraged to enable hands-free traveler information updates

Improving Safety on Difficult Terrain

Interstate 80 (I-80) runs 402 miles along the southern edge of Wyoming (Figure 1) and serves as a major corridor for east-west freight movement in the United States, where truck volume can make up as much as 70% of the traffic stream [1]. The elevation of the entire I-80 corridor is above 6,000 feet, increasing the frequency of severe weather events such as ice- and snow-covered road surfaces, poor visibility from fog and blowing snow, and high wind events. I-80's geographic position combined with its daily freight traffic, provides significant safety and economic challenges for Wyoming. In a one-year period from October 2015 to September 2016, the corridor saw over 1,600 vehicle accidents and over 1,500 hours of road closures, resulting in $865 million in societal costs [1].

In 2016, the United States Department of Transportation (USDOT) awarded the Wyoming Department of Transportation (WYDOT) $4.4 million under the Connected Vehicle (CV) Pilot Deployment Program to develop and deploy a suite of CV-based applications to spur innovation among early adopters of CV technologies. The Wyoming CV Pilot deployment had the following objectives tailored to meet Wyoming's unique transportation needs [2]:

Figure 1. CV Deployment Area along the 402 miles of I-80 in Wyoming
Source: OpenStreetMap, US Census Bureau, and USDOT

Executive Briefings


ITS Deployment Evaluation

ITS DEPLOYMENT EVALUATION
Executive Briefing

Highlights

- The USDOT's National Roadway Safety Strategy outlines the Safe System Approach with the purpose of reaching the goal of zero roadway fatalities.
- ITS technologies have the capabilities to address the objectives and purpose of the Safe System Approach.
- Federal Transit Administration (FTA) developed an enhanced version of the Transit Safety Retrofit Package (TRP) system.

This brief is based on past evaluation data contained in the ITS Databases at: www.itskrs.its.dot.gov. The databases are maintained by the U.S. DOT's ITS JPO Evaluation Program to support informed decision making regarding ITS investments. The brief presents benefits, costs and best practices from past evaluations of ITS projects.

U.S. Department of Transportation

Vision Zero and ITS

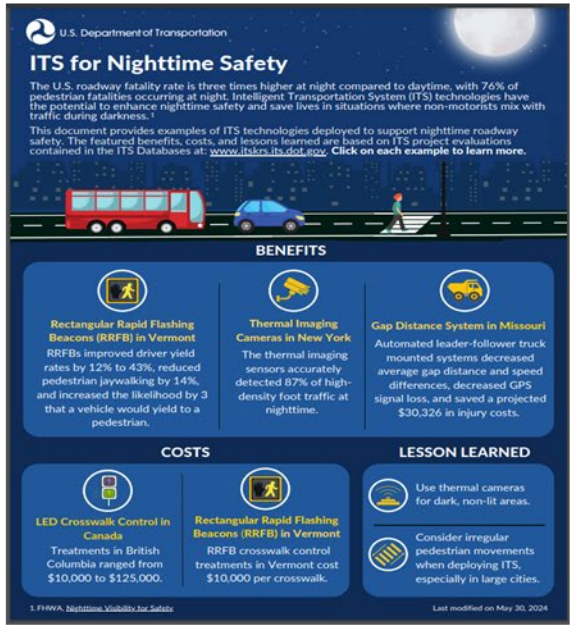
Introduction

In the United States, more than 370,000 people lost their lives in transportation incidents from 2011-2020, including more than 350,000 on U.S. roads [1]. Safety is among the top priorities of the U.S. Department of Transportation (USDOT) and reducing these numbers is of critical importance.

The 2022 USDOT's National Roadway Safety Strategy (NRSS) outlines the Safe System Approach as the guiding paradigm to reduce serious injuries and deaths on our Nation's highways, roads, and streets. The Safe System Approach works by building and reinforcing multiple layers of protection to prevent crashes from happening and mitigate the harm caused to those involved when crashes do occur. Those layers of protection include [2]:

- **Safer People** – Motivating all drivers and road users to practice safe and responsible behavior on our roads.
- **Safer Vehicles** – Deploying accessible vehicle safety technologies to help minimize crashes and their potential harm.
- **Safer Speeds** – Encouraging all roadway users to drive at safe speeds through education, enforcement, and roadway design.
- **Safer Roads** – Implementing safer roadway environments to assist in the safety of drivers and road users on our highways, roads, and streets.
- **Post-Crash Care** – Providing quicker access to medical care and safer environments for first responders in order to increase the survivability of crashes and reduce secondary crash vulnerability.

Infographics


U.S. Department of Transportation

ITS for Nighttime Safety

The U.S. roadway fatality rate is three times higher at night compared to daytime, with 76% of pedestrian fatalities occurring at night. Intelligent Transportation System (ITS) technologies have the potential to enhance nighttime safety and save lives in situations where non-motorists mix with traffic during darkness. [1]

This document provides examples of ITS technologies deployed to support nighttime roadway safety. The featured benefits, costs, and lessons learned are based on ITS project evaluations contained in the ITS Databases at: www.itskrs.its.dot.gov. **Click on each example to learn more.**

BENEFITS

Rectangular Rapid Flashing Beacons (RRFB) in Vermont
RRFBs improved driver yield rates by 12% to 43%, reduced pedestrian jaywalking by 14%, and increased the likelihood by 3 that a vehicle would yield to a pedestrian.

Thermal Imaging Cameras in New York
The thermal imaging sensors accurately detected 87% of high-density foot traffic at nighttime.

Gap Distance System in Missouri
Automated leader-follower truck mounted systems decreased average gap distance and speed differences, decreased GPS signal loss, and saved a projected $30,326 in injury costs.

COSTS

LED Crosswalk Control in Canada
Treatments in British Columbia ranged from $10,000 to $125,000.

Rectangular Rapid Flashing Beacons (RRFB) in Vermont
RRFB crosswalk control treatments in Vermont cost $10,000 per crosswalk.

LESSON LEARNED

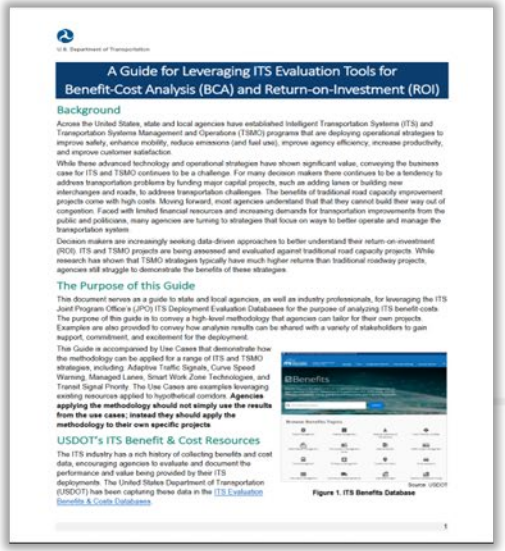
Use thermal cameras for dark, non-lit areas.

Consider irregular pedestrian movements when deploying ITS, especially in large cities.

1. FHWA, Nighttime Visibility for Safety

Last modified on May 30, 2024

ROI Sample Use Cases


A Guide for Leveraging ITS Evaluation Tools for Benefit-Cost Analysis (BCA) and Return-on-Investment (ROI)

Background

Across the United States, state and local agencies have established Intelligent Transportation Systems (ITS) and Transportation Systems Management and Operations (TSMO) programs that are deploying operational strategies to improve safety, enhance mobility, reduce emissions (and fuel use), improve agency efficiency, increase productivity, and improve customer satisfaction.

While these advanced technology and operational strategies have shown significant value, conveying the business case for ITS and TSMO continues to be a challenge. For many decision makers there continues to be a tendency to address transportation problems by funding major capital projects, such as adding lanes or building new interchanges and roads, to address transportation challenges. The benefits of traditional road capacity improvement projects come with high costs. Moving forward, most agencies understand that that they cannot build their way out of congestion. Faced with limited financial resources and increasing demands for transportation improvements from the public and politicians, many agencies are turning to strategies that focus on ways to better operate and manage the transportation system.

Decision makers are increasingly seeking data-driven approaches to better understand their return-on-investment (ROI). ITS and TSMO projects are being assessed and evaluated against traditional road capacity projects. While research has shown that TSMO strategies typically have much higher returns than traditional roadway projects, agencies still struggle to demonstrate the benefits of these strategies.

The Purpose of this Guide

This document serves as a guide to state and local agencies, as well as industry professionals, for leveraging the ITS Joint Program Office's (JPO) ITS Deployment Evaluation Databases for the purpose of analyzing ITS benefit-costs. The purpose of this guide is to convey a high-level methodology that agencies can tailor for their own projects. Examples are also provided to convey how analyses results can be shared with a variety of stakeholders to gain support, commitment, and excitement for the deployment.

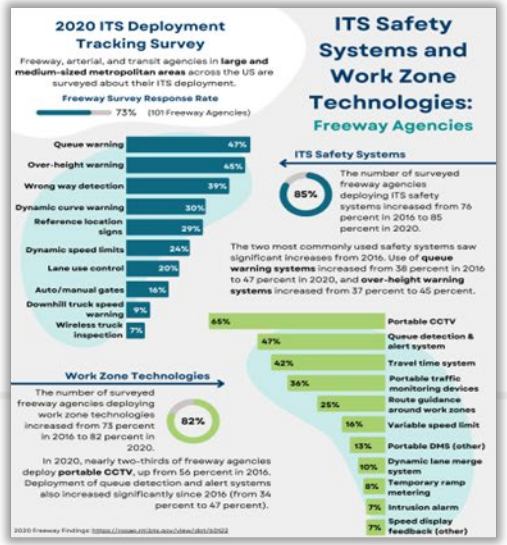
This Guide is accompanied by Use Cases that demonstrate how the methodology can be applied for a range of ITS and TSMO strategies, including: Adaptive Traffic Signals, Curve Speed Warning, Managed Lanes, Smart Work Zone Technologies, and Transit Signal Priority. The Use Cases are examples leveraging existing resources applied to hypothetical corridors. **Agencies applying the methodology should not simply use the results from the use cases; instead they should apply the methodology to their own specific projects.**

USDOT's ITS Benefit & Cost Resources

The ITS industry has a rich history of collecting benefits and cost data, encouraging agencies to evaluate and document the performance and value being provided by their ITS deployments. The United States Department of Transportation (USDOT) has been capturing these data in the ITS Evaluation Benefits & Costs Databases.

Figure 1. ITS Benefits Database

ITS Deployment Data


2020 ITS Deployment Tracking Survey

Freeway, arterial, and transit agencies in **large and medium-sized metropolitan areas** across the US are surveyed about their ITS deployment.

Freeway Survey Response Rate
73% (101 Freeway Agencies)

ITS Safety Systems and Work Zone Technologies: Freeway Agencies

Queue warning 47%
Over-height warning 45%
Wrong way detection 39%
Dynamic curve warning 30%
Reference location signs 29%
Dynamic speed limits 24%
Lane use control 20%
Auto/manual gates 16%
Downhill truck speed warning 9%
Wireless truck inspection 7%

ITS Safety Systems

85%

The number of surveyed freeway agencies deploying ITS safety systems increased from 76 percent in 2016 to 85 percent in 2020.

The two most commonly used safety systems saw significant increases from 2016. Use of **queue warning systems** increased from 38 percent in 2016 to 47 percent in 2020, and **over-height warning systems** increased from 37 percent to 45 percent.

Portable CCTV 65%
Queue detection & alert system 47%
Travel time system 42%
Portable traffic monitoring devices 36%
Route guidance around work zones 25%
Variable speed limit 16%
Portable DMS (other) 13%
Dynamic lane merge system 10%
Temporary ramp metering 8%
Intrusion alarm 7%
Speed display feedback (other) 7%

Work Zone Technologies

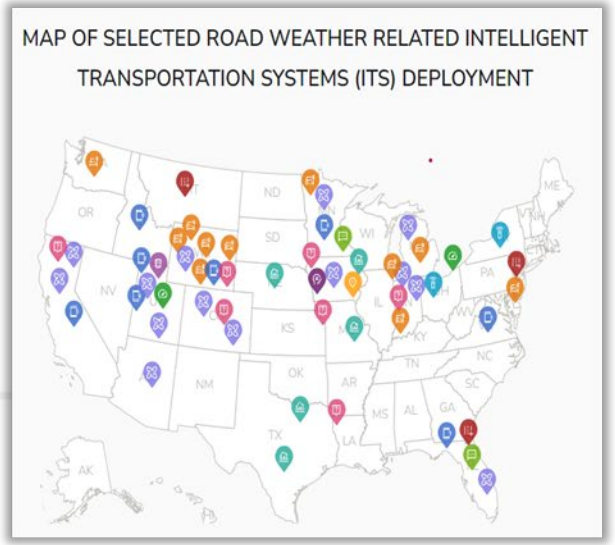
82%

The number of surveyed freeway agencies deploying work zone technologies increased from 73 percent in 2016 to 82 percent in 2020.

In 2020, nearly two-thirds of freeway agencies deploy **portable CCTV**, up from 56 percent in 2016. Deployment of queue detection and alert systems also increased significantly since 2016 (from 34 percent to 47 percent).

2020 Freeway Findings: https://rosap.ntl.bts.gov/view/dot/59023

Interactive Data Visualizations


MAP OF SELECTED ROAD WEATHER RELATED INTELLIGENT TRANSPORTATION SYSTEMS (ITS) DEPLOYMENT

4. Incorporate ITS Projects into Transportation Planning Process

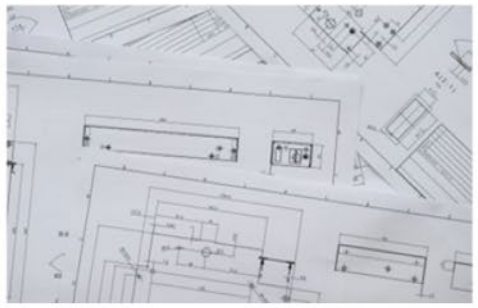
- Brief Overview of the Transportation Planning Process
- Where does ITS fit in?
  - Program Planning
  - Operations Plans
  - ITS Implementation Plans
  - Regional ITS Architectures

Source: iStock

The Transportation Planning Process

Source: Microsoft

Source: Microsoft



Source: Microsoft

Source: Microsoft

Long-Range Transportation Plan → Short-Range Corridor Plan → TIP / STIP → Project Feasibility → Environmental Requirements → Preliminary & Final Design → Construct

Where Does ITS Fit into the Planning Process?

Phase 1: PLANNING

Planning for Operations
(Goals, Objectives, Strategies)

TSMO Plan
Agency Capability

Operations Plan
Problems and Solutions, Equipment, Facilities, Corridor-by-Corridor Staffing, Capital Programs

ITS Implementation Plan
Capital Projects

ITS Architecture
(Summarizes all the above)

Phase 2: PROJECTS

NEEDS FOCUSED

Systems Engineering:
Concept of Operations

- Summary of Planning Documents
- Use Cases and User Needs
- High-Level System Concept
- Operational Environment
- Operational Scenarios

REQUIREMENTS-DRIVEN

Systems Engineering:
Requirements

Used To:
- Verify Design
- Select Providers
- Verify Implementation
- Support Acceptance Testing

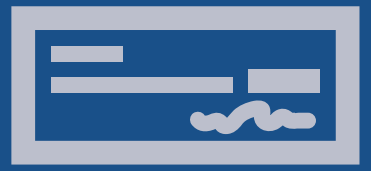
Long-Range Transportation Plan | Short-Range Corridor Plan | TIP / STIP | Project Feasibility | Environ. Req. | Prelim. Design | Design | Construct

5. Pursue Appropriate Funding Opportunities and Strategies

Do your research: Understand the funding opportunities you are eligible for, there might be more than you think!

Plan for long term project viability: leverage state/local funds for Operations & Maintenance

Think further afield: ITS funding can be bundled with funding for larger infrastructure projects



Nurture innovative approaches: consider new types of partnerships and procurement strategies

6. Deliver Projects Following a Systems Engineering Process

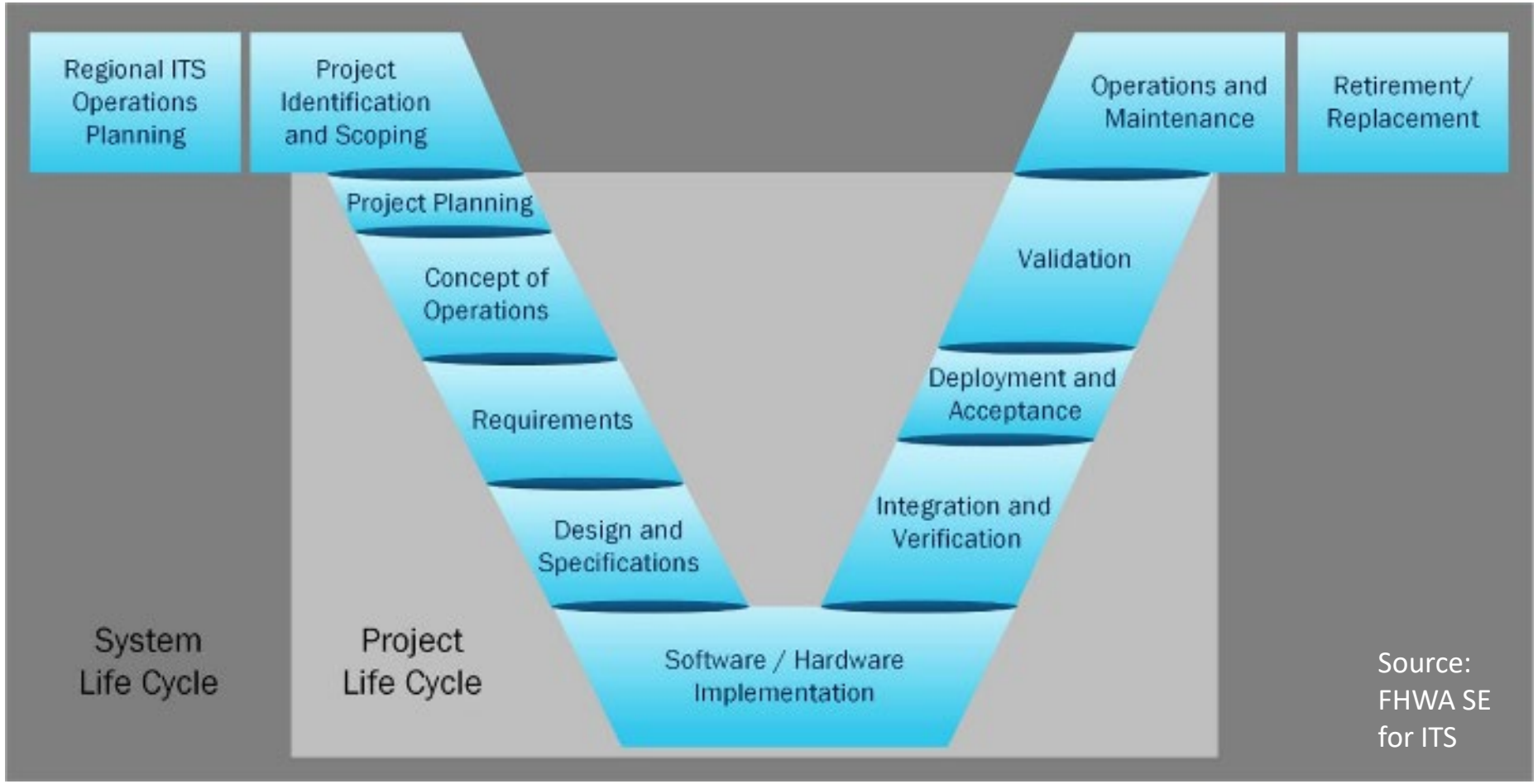
- What is the “systems engineering process”?
  - Why is it a foundational element of project planning?
- How will it help my ITS project?
- Are there any resources to help me learn about this approach and how to use it to support successful ITS project execution?

Source: iStock

Benefits of Following a Systems Engineering Process

- Applying a systems engineering process offers several benefits
  - Higher level of user engagement
  - System functionality that meets user needs
  - Better system documentation
  - Systems that can evolve with a minimum of redesign and cost
  - Higher level of system reuse
  - More predictable outcomes from projects
- The Systems Engineering Processes should be commensurate with the project scope

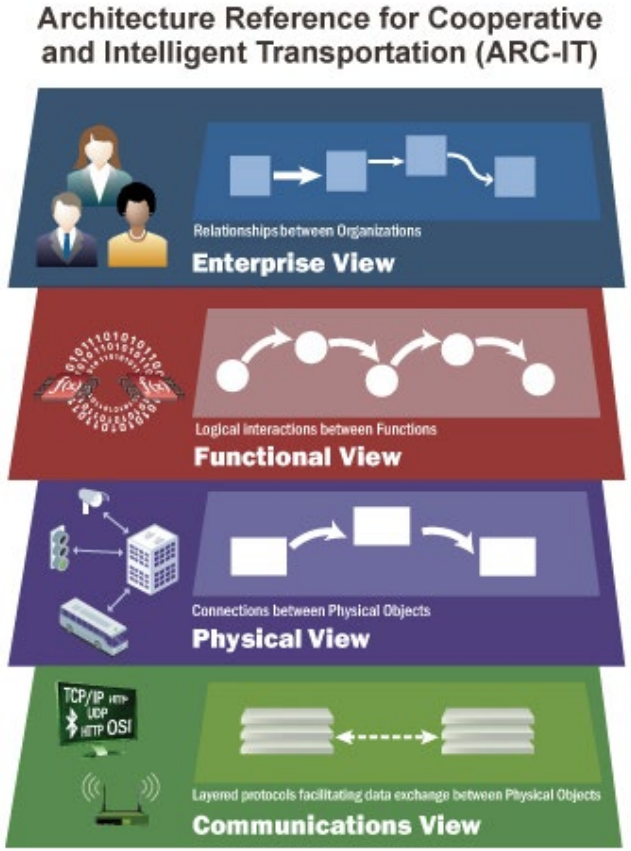
Deliver Projects following a Systems Engineering Process



Source: FHWA SE for ITS

ITS Architecture

- Supports a **common framework** for planning, defining, and integrating ITS technologies and systems
- Supports deployment of technologies and systems in similar ways and speak the same “language”
- Supports **interoperability** between and among system elements and also with other systems
  - Local and regional **compatibility**
- **Greatly reduces project risk**
- **Reduces project costs**



Source: USDOT

Key Project Planning Documents

- Systems Engineering Management Plan (SEMP)
- User Needs Identification and Requirements Plan (UNIRP)
- Concept of Operations (ConOps)
- Systems Requirements Document (SyRs)
- Data Management Plan
- Performance Measurement and Evaluation Plan
- Institutional, Partnership, and Financial Plan

Examples of SE Resources for ITS Deployments

- **FHWA's "Systems Engineering for ITS" website** – This is a one-stop shop for understanding and implementing the Systems Engineering process
- **Connected Vehicle Pilots website** – As-built documentation of complex V2X systems focused on safety and mobility
- **ITS for Underserved Communities (ITS4US) website** – Planning documentation (ConOps, System Requirements) for accessible transportation deployments are available, with more documents being published in the next year including System Architecture and Design documents

See your digital workbook for details

Deployer Spotlight – Heart of Iowa Regional Transit Agency (HIRTA)

Source: HIRTA

"All the time and energy HIRTA invested in their SE documentation over the past 3 years came through during the Operational Readiness Demonstration (ORD).

They were easily able to address issues and know whether other components needed to be retested because of the quality of their Systems Engineering documentation." – ITS JPO

Breakout Session – Foundational Planning – 25 minutes

- Based on the “Opportunity” you selected in Breakout #1, discuss:
  - What **types of core team members** and **partnerships** will you need?
  - How will you incorporate the project into **the planning process**, including TIPs and STIPs?
  - What **performance outcomes** or **benefits** do you hope to see from your ITS deployment?
  - Where might you obtain **funding** to make this ITS deployment project a reality?
- Report Out – one question per table (5 minutes)

Break #2

Please sit at your breakout tables when you return after the break.

U.S. Department of Transportation

BUILD AMERICA BUREAU

Funding and Resources for Rural Communities

ITE – NRITS: Rural ITS Workshop

July 21, 2024

U.S. Department of Transportation

Office of the Secretary

- Office of the Under Secretary for Transportation Policy
  - Build America Bureau

Operating Administrations

- Federal Highway Administration
- Federal Transit Administration
- Federal Railroad Administration
- Federal Aviation Administration
- Maritime Administration

- Regional staff, liaisons
- Grant money
- Planning, environment, construction experts

Build America Bureau Structure

Build America Bureau

Technical Assistance

- Innovative Finance & Delivery
- Community Solutions
- Grant Management

Outreach & Project Development

- Outreach
- Project Development

Credit Programs

- Risk Management
- Underwriting
- Portfolio Management

Technical Assistance Grant Programs

Thriving Communities

- $25 million in FYs 2022 and 2023 ($50 million total)
- Support disadvantaged and lower-capacity communities across project planning and scoping, development and design, and delivery

Regional Infrastructure Accelerators

- $34 million awarded to 24 recipients
- Build capacity to incubate good projects and accelerate delivery through innovative approaches
- Assistance in project planning, revenue forecasting, preliminary engineering and design, and statutory and regulatory compliance analyses

Rural and Tribal Assistance

- 5-year pilot program ($10 million total)
- $3.4 million awarded to 13 communities, including 7 Tribes
- Advance early project development by funding technical, legal and financial activities
- Additional $25 million for FY 24

Innovative Finance and Asset Concessions

- 5-year program ($100 million total)
- Help project sponsors identify underutilized assets with potential to generate economic development
- Increase capacity to utilize innovative financing and project delivery and form partnerships with private sector

U.S. Department
of Transportation

BUILD AMERICA BUREAU

Thriving Communities Program

Thriving Communities Program (TCP)

- TCP acknowledges that not all communities have the resources to access federal funding opportunities to advance transportation infrastructure, and often these are the communities who need it the most
- The Thriving Communities Program:
  - funds Capacity Builders to provide technical assistance, planning, and capacity building to individual communities based on their unique needs, goals, and challenges; and
  - directs Capacity Builder support to communities to build the tools, skills, and resources they need to identify and apply for federal funding opportunities and successfully implement transformative projects
- TCP was established via the FY22 and FY23 Congressional appropriations (not via BIL)

THRIVING COMMUNITIES PROGRAM

Thriving Communities Program (cont.)

Program Goals

- Advancing project readiness: communities that have already done some degree of planning and/or identified projects
- Accelerate and advance these into successful grant applications that support broad economic, public health, housing and environmental goals
- Leverage private, public and philanthropic investment
- Influence state and regional project lists, long range plans and investment priorities
- Identify a national set of community-driven transformative projects to inform next reauthorization

THRIVING COMMUNITIES PROGRAM

U.S. Department
of Transportation

BUILD AMERICA BUREAU

Rural and Tribal Assistance Pilot Program

Rural and Tribal Assistance Pilot Program (contd.)

$10 million over 5 years

$3.4 million available first NOFO (two fiscal years)

Additional $25 million funding in FY24 = $27 million for Round 2

No local match!

Grants for technical, financial, or legal support

Technical

- Feasibility studies
- Project planning
- Preliminary engineering/design
- Environmental review
- Property development and land use feasibility analysis
- Public outreach
- Cost estimation
- Public benefit studies

Financial

- Revenue forecasting
- Economic assessments and cost-benefit analyses
- Value for money analysis and procurement options
- Evaluating opportunities for private financing and project bundling
- Financial feasibility analysis; funding/financing options analysis
- Evaluation of costs to sustain project (such as operations and maintenance costs)

Legal

- Statutory and regulatory analysis
- Drafting and negotiation of concession agreements
- Drafting and negotiation of interagency agreements
- Procurement support

RTA grant eligibility

Eligible applicant with an eligible project

Applicant

- Local government with or State government on behalf of a project:
  - **Not** in a Census Bureau 2020 designated urban area.
  - OR – In a Census Bureau 2020 designated urban area with a population of 150,000 or less.
- Federally recognized Indian tribe
- Department of Hawaiian Home Lands

Project

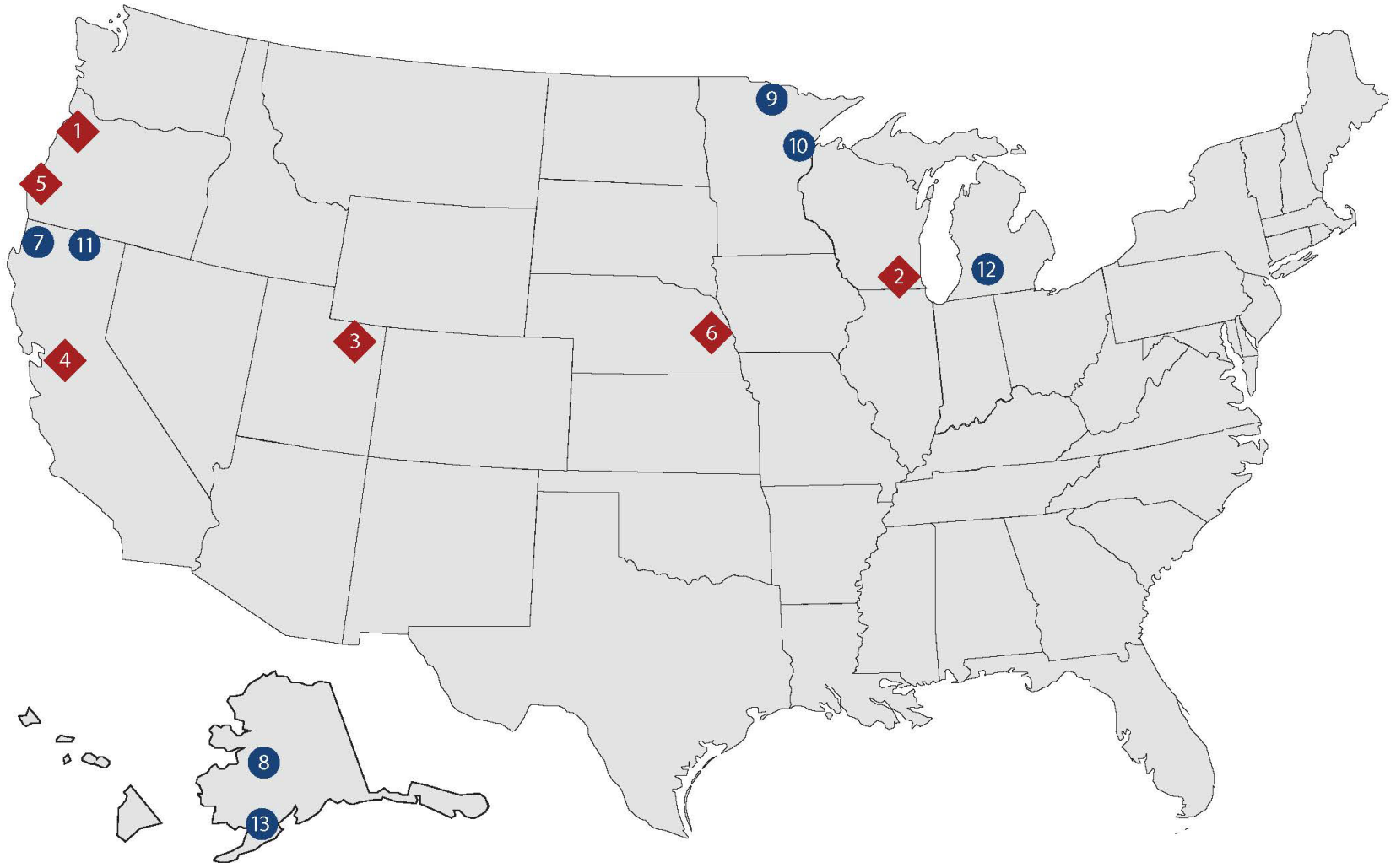
Must be reasonably expected to be eligible for one or more of the following funding programs:

- TIFIA
- RRIF
- INFRA
- Mega
- RAISE
- National Culvert Removal, Replacement & Restoration

Sample Categories of Projects

- Highway projects, bridges and tunnels
- Public transportation projects
- Freight rail projects
- Airport projects
- Wildlife crossing projects
- Highway-railway grade crossing or grade separation
- Surface transportation project within the boundaries / functionally connected to an international border crossing

Rural and Tribal Technical Assistance Pilot Program Selected Communities

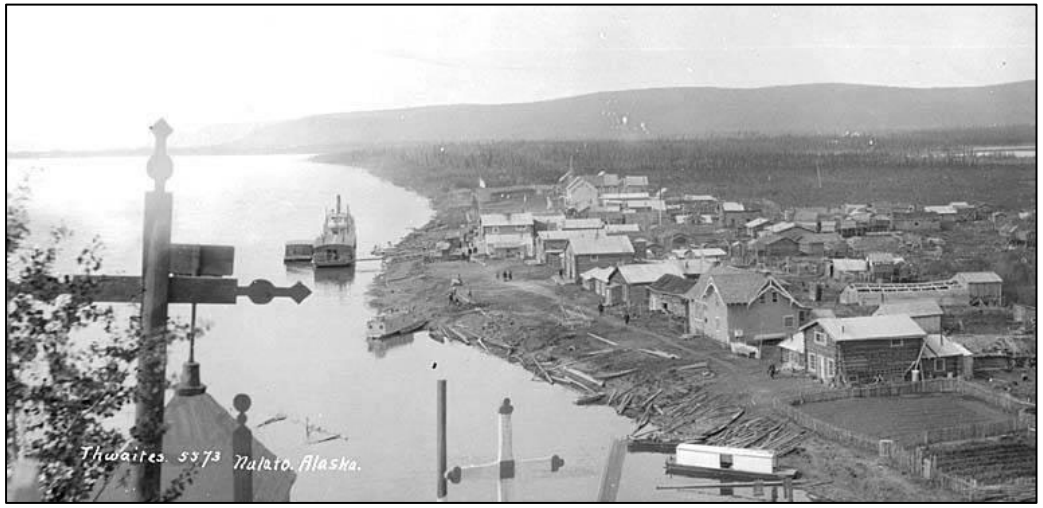


1	City of Independence, OR
2	City of Elkhorn, WI
3	Roosevelt City, UT
4	Contra Costa County, CA
5	Douglas County, OR
6	City of Blair, NE
7	Tolowa Dee-ni' Nation, CA
8	Nulato Village, AK
9	Bois Forte Reservation Tribal Government, MN
10	Fond du Lac Band of Lake Superior Chippewa, MN
11	Karuk Tribe, CA
12	Match-E-Be-Nash-She-Wish Band of Pottawatomi Indians, MI
13	Igiugig Village Council, AK

◆ RURAL SELECTED COMMUNITIES
● TRIBAL SELECTED COMMUNITIES

Examples of selected projects

- New bridge
- Street reconstruction with added bike lane
- New road
- Enhancement and expansion of an existing barge facility
- Separated Pedestrian Pathway and Lighting
- Small port development
- Secondary evacuation route
- Trail connection
- Transit Feasibility Study and Design
- Integrated Breakwater and Barge Landing



Application process

- **First come, first served**
- NOFO issue date not yet determined
- Copy of application will be viewable on program website
- Funding may be fully committed before the open period concludes
- $27 million available in 2024

https://www.transportation.gov/buildamerica/RuralandTribalGrants

U.S. Department
of Transportation

BUILD AMERICA BUREAU

Regional Infrastructure Accelerators

Regional Infrastructure Accelerators (RIA)

$34 Million in Grants to 21 entities over 3 rounds of funding

- TIFIA eligible projects

Regional Infrastructure Accelerators:

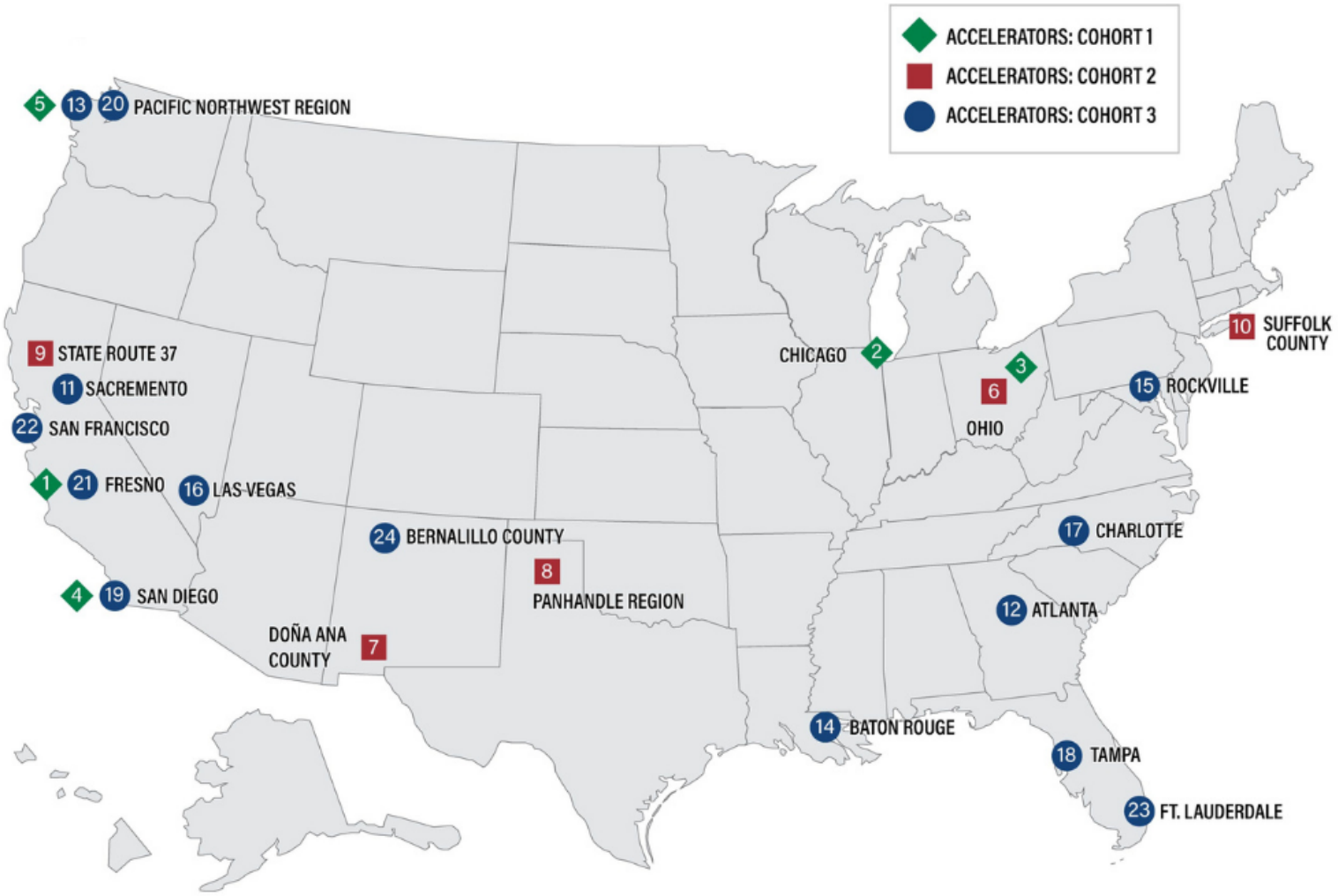
- Serve defined geographic region
- Resource to the region

Regional Infrastructure Accelerators

Established to assist entities in developing improved infrastructure priorities and financing strategies for the accelerated development of projects. Assistance can be in the form of:

- Project planning
- Studies and Analysis
  - Including feasibility, market analysis, project costs, value for money, public benefit, environmental reviews, etc.
- Revenue Forecasting
- Preliminary Engineering and Design Work
- Statutory and regulatory compliance analyses

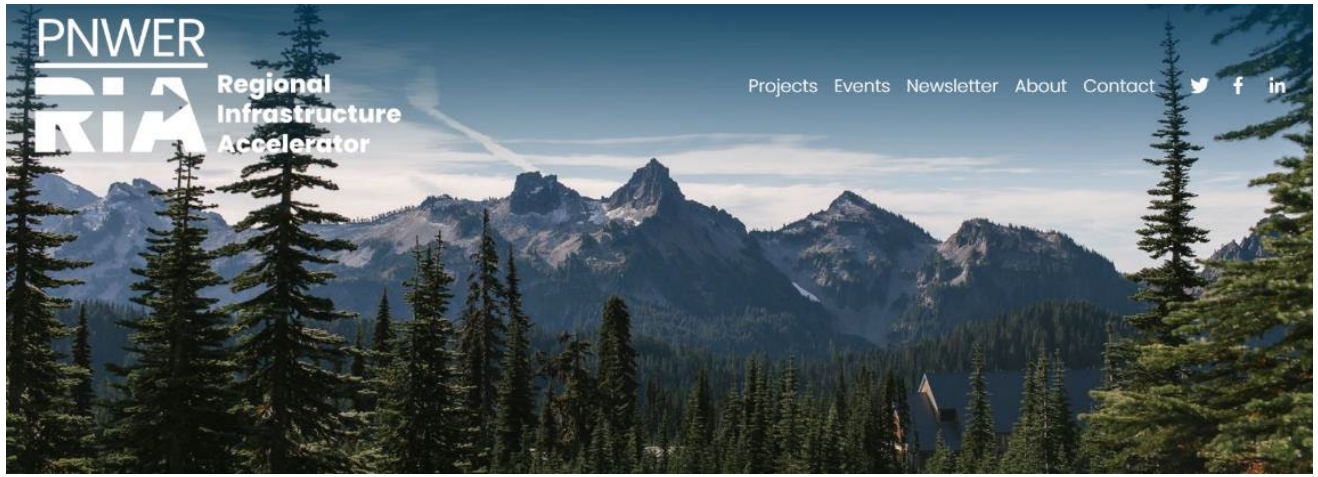
Regional Infrastructure Accelerator Recipients



1. Fresno Council of Governments
2. Chicago Metropolitan Agency for Planning
3. Northeast Ohio Areawide Coordinating Agency
4. San Diego Association of Governments
5. Pacific Northwest Economic Region
6. Central Ohio Transit Authority
7. Dona Ana County, New Mexico
8. Panhandle Regional Planning Commission, Texas
9. Resilient SR 37 Program, CA
10. Suffolk County, NY Midway Crossing Project
11. California DOT
12. Metropolitan Atlanta Rapid Transit Authority
13. Pacific Northwest Economic Region
14. State of Louisiana Executive Office
15. Montgomery County Department of Transportation
16. Regional Transportation Commission of Southern Nevada
17. Centralina Council of Governments
18. City of Tampa
19. San Diego Association of Governments
20. Central Puget Sound Regional Transit Authority
21. Fresno Council of Governments
22. Bay Area Rapid Transit District
23. City of Fort Lauderdale
24. County of Bernalillo

Example Recipient – Pacific Northwest Economic Region

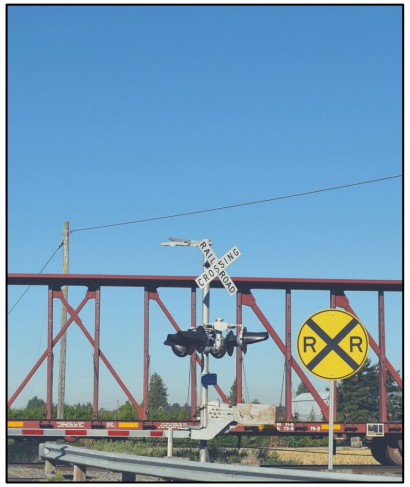
- **Awarded:**
  - $1.2 million (Round 1)
  - $2.0 million (Round 3)
- **Goal:** Convene, connect, match-make for multi-state transportation projects that:
  - Ease Supply Chain Disruptions
  - Reduce Transportation-Related Pollution
  - Increase Community Safety, Economic & Environmental Justice



rianorthwest.org

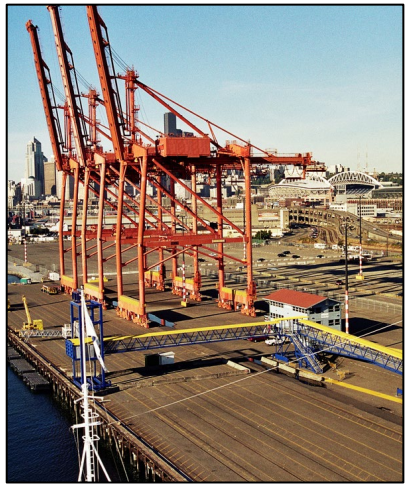
- **Infrastructure Challenges:**
  - Lack of multi-state coordination and regional transportation planning across modes, and a clear need for a region-wide, corridor-focused strategic investment plan.
  - Region not fully leveraging the potential of Public-Private Partnerships (P3s) and other innovative financing mechanisms.
  - Important projects without a clear “champion” will often go unfunded for several years

PNWER Round 1 Activities



Highway-Rail Grade Separation

Assist the rural community of Spokane Valley, WA to accelerate funding for community safety at Pines Road and along rail corridors



Drayage Emission Reduction

Establish a viable pathway for sustainable CO2 emission reduction in the Port areas of Seattle and Tacoma via drayage truck decarbonization

Center of Excellence

Develop capacity within PNWER RIA states to help states better understand and navigate federal credit & financing programs

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TIFIA

TIFIA and RRIF Eligible Project Types and Borrowers

Eligible . . .	TIFIA	RRIF
Project Types	• Roadways and bridges • Transit vehicles and facilities • Bicycle and pedestrian infrastructure • Intelligent transportation systems • Transit-oriented development • Intermodal connectors • Intercity rail and bus vehicles and facilities • Commercial seaports • Airports	• Freight rail facilities • Freight transfer facilities • Passenger rail vehicles, stations, and equipment • Transit-oriented development • Intermodal equipment or facilities
Borrowers	• State, tribal, county, municipal governments • State infrastructure banks • Private entities • Special purpose authorities • Transportation improvement districts	• Railroads • State and local governments • Government-sponsored authorities and corporations • Interstate compacts • Joint ventures

Major Federal Requirements

National Environmental Policy Act (NEPA)

- Federal environmental review and final determination (i.e., CE, FONSI, or ROD)

Uniform Relocation Assistance and Real Property Acquisition Act (URA)

- Just relocation assistance and compensation to persons displaced by Federally assisted projects

Planning & Programming

- All TIFIA projects consistent with RTP and/or STP, and included in TIP and/or STIP
- RRIF rail projects consistent with state rail plans

Buy America

- Domestic sourcing of steel, iron, manufactured goods, and construction materials

Davis-Bacon

- Prevailing wages and labor standards for contractors and subs performing on federally assisted contracts

Other Modal Requirements

- Project oversight regime of modal grant programs
- e.g., a transit project receiving a RRIF loans must comply with all FTA (Ch. 53) grant requirements

Bureau Financing Programs

General Features	**Program Type**	• Federal credit assistance	• Federal credit assistance	• Conduit-issued debt financing (*not* federal credit assistance)
	Credit Products	• Direct loans; loan guarantees; lines of credit	• Direct loans; loan guarantees	• Allocation of tax-exempt municipal bonding authority
	Eligible Projects	• Surface transportation and public infrastructure projects	• Railroad, seaport (with rail service), and economic development projects	• Highway or freight transfer projects that meet the IRS' private use test
	Interest Rate	• U.S. Treasury rates	• U.S. Treasury rates	• Market rates
Program Requirements	**Cost Parameters**	• Min. project cost: > $50 M; > $15 M for ITS; > $10 M for TOD and local • Max. project cost: none • Max. loan to value: 33-49% • Max federal assistance (grants + loans): 80%	• Min. project cost: none • Max. project cost: none • Max. loan to value: 75-100%	• Min. project cost: none • Max. project cost: none • Max. loan to value: n/a
	Credit Rating	• Senior debt and TIFIA must be rated investment grade (BBB- or higher)	• No credit rating requirement	• n/a
	Credit Subsidy	• Appropriated by Congress	• Limited appropriations; credit risk premium paid by borrower, refunded after loan is repaid	• n/a

TIFIA Rural Project Initiative (RPI)

- **Requirements:**
  - **Rural** = outside of urbanized area with a population < 150,000
  - **Project Cost** = $10 million to $100 million
- **Benefits**:
  - Max. loan to value = **49% of costs**
  - Fixed interest rate = **½ Treasury rate**
  - **Borrower advisor fees waived for project under $75 million**

RURAL PROJECT INITIATIVE

½ Treasury rate: 2.21% on 6/24/24 for 35-year loan

MST O&M Facility
Monterey-Salinas, CA

RTA O&M Facility
San Luis Obispo, CA

Example RPI Project – Library Commons, Mt. Vernon, WA)

- **Total Eligible Project Costs**: $52.1 million
- **TIFIA Loan Request**: $25.5 million (49% LTV)
- **Borrower**: City of Mount Vernon, WA
- **Scope**: Library, community kitchen, municipal parking, EV charging, bus stop, power generation
- **Public Benefits**: Modernized community facilities, EV charging
- **Lead DOT Oversight Agency**: FHWA

Example RPI Project – Oklahoma DOT

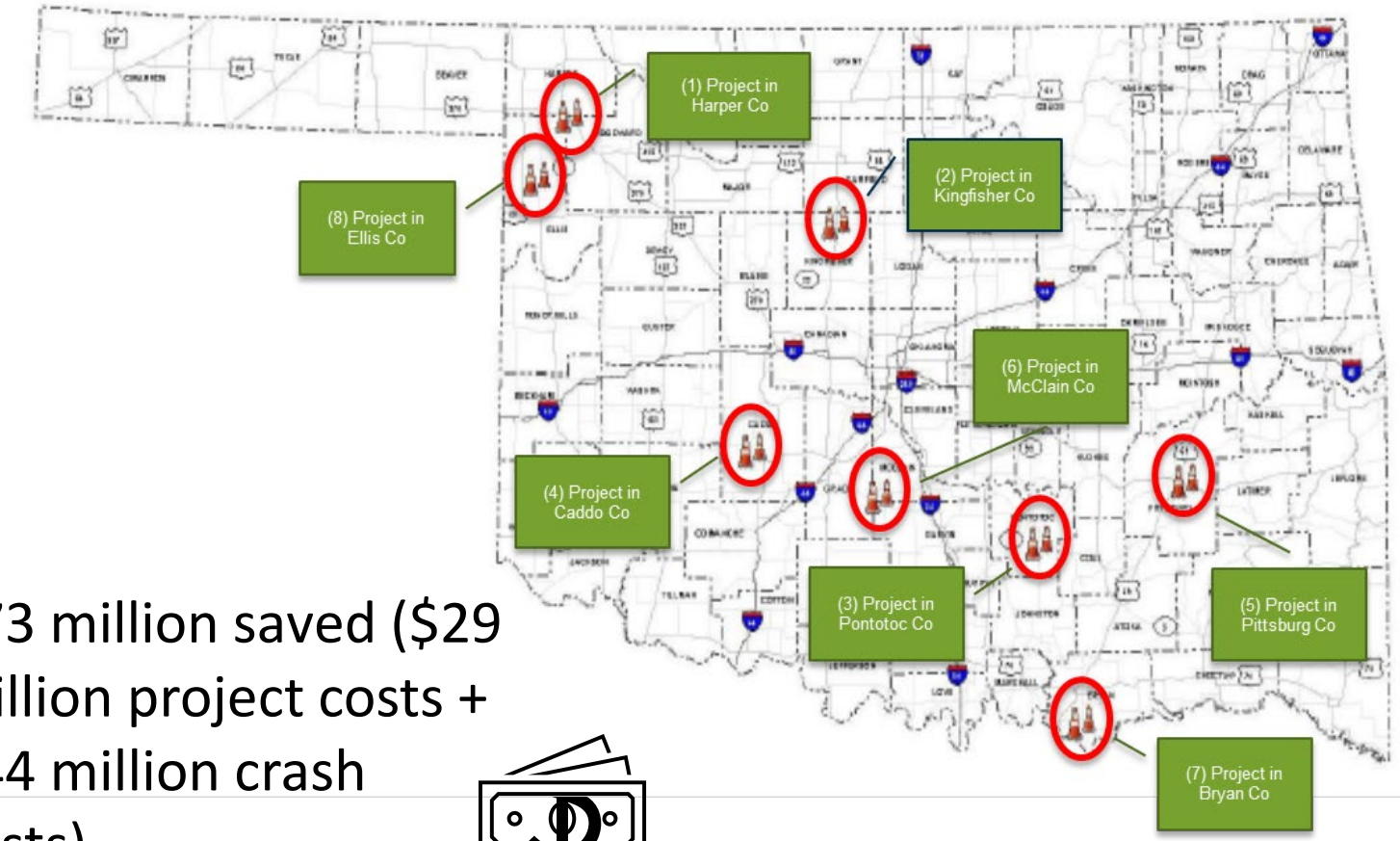
Rural Two-Lane Advancement and Management Plan

3 lives saved!
41 injuries avoided

29 miles of roads improved

57 crashes prevented

9 years saved!
Complete in 3 vs. 12 years



$73 million saved ($29 million project costs + $44 million crash costs)

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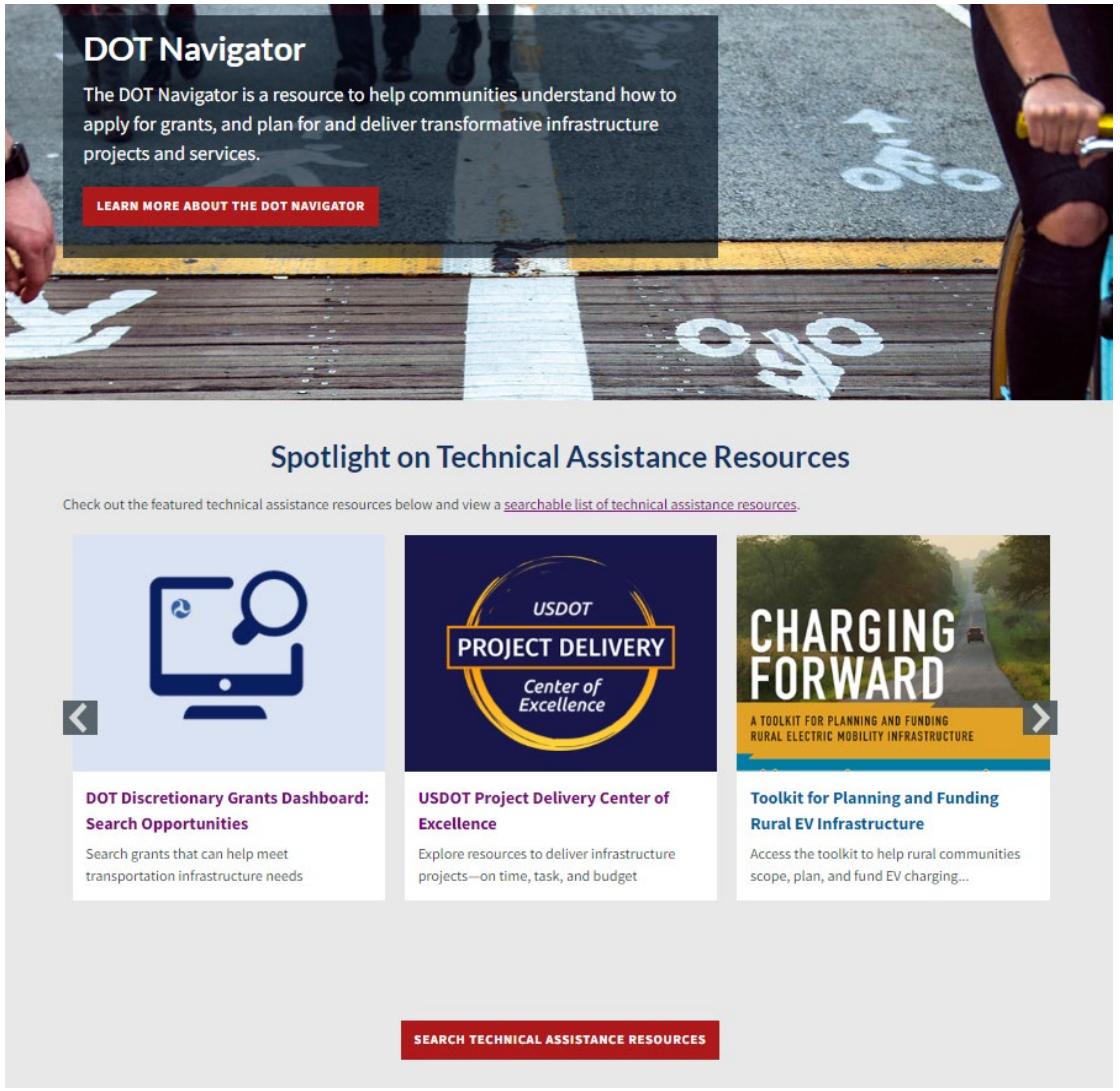
DOT Navigator

DOT Navigator (cont.)

Coordinating and Improving Access to the range of DOT Technical Assistance Resources

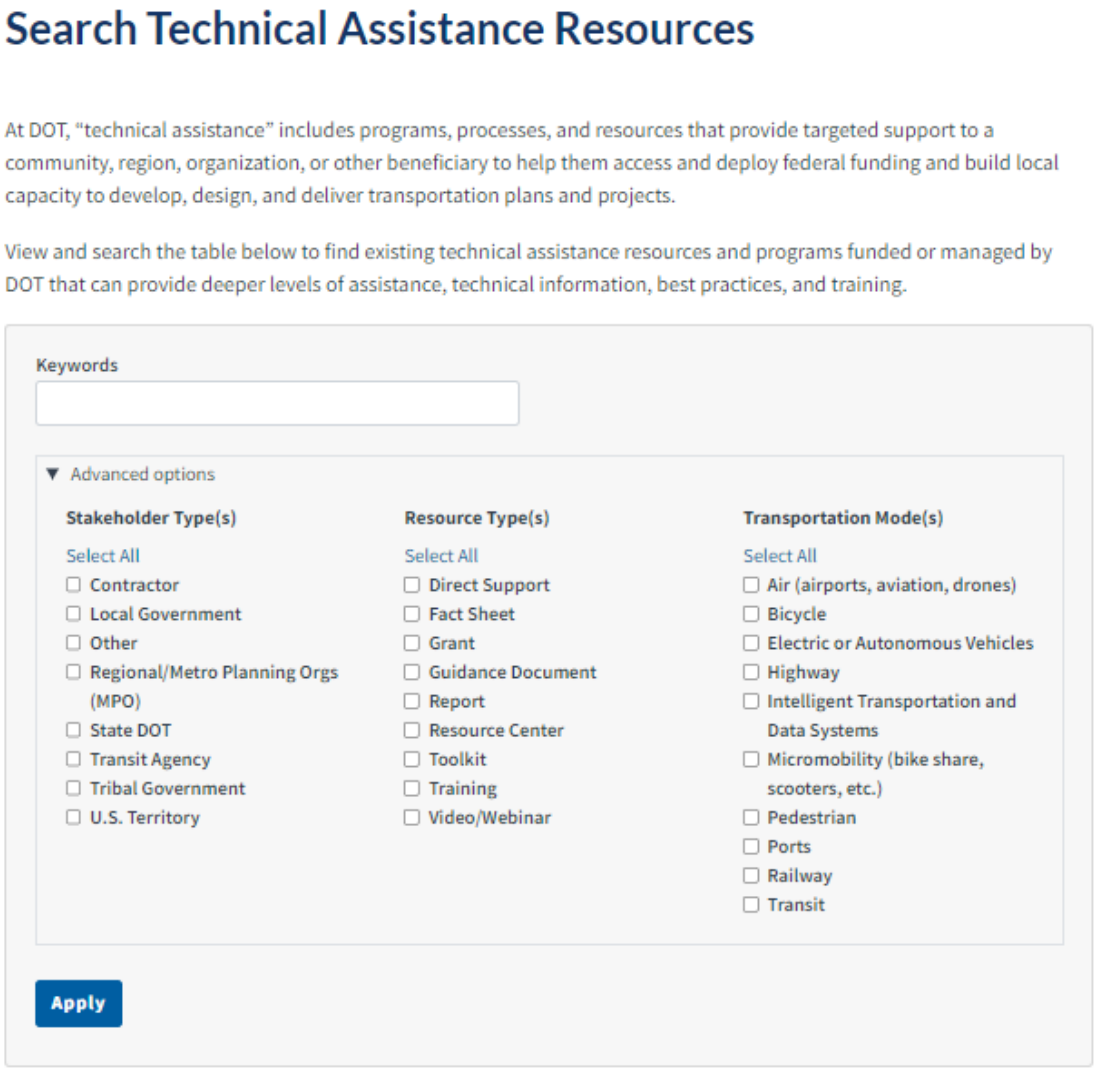
https://transportation.gov/dot-navigator



Sample Grant Application Resources

- Overview of DOT Funding and Financing
- USDOT Discretionary Grant Process
- Maximizing Award Success
- Is Federal Funding the Right Fit for My Organization?

DOT Navigator (cont. 2)



DOT Navigator (cont. 3)

Focus on Helping to Develop Strong Discretionary Grant Applications

What Do You Want to Do?

PREPARE A SUCCESSFUL GRANT APPLICATION

Get planning tips, checklists, and information on applying for federal grants

Funding

FIND FUNDING OPPORTUNITIES

Search grant opportunities to meet your community's transportation needs

GET TECHNICAL ASSISTANCE RESOURCES

Find resources to get funding and build capacity to do transportation projects

LEARN ABOUT FUNDING AND MATCH

Learn about USDOT grant funding, including match requirements and flexibilities

ACCESS DATA AND MAPPING TOOLS

Access data and mapping tools to help write a strong grant application

LEARN ABOUT THE BIPARTISAN INFRASTRUCTURE LAW

Get information to help access BIL funding programs

Spanish

- Solicitud de subvenciones del USDOT
- Visión general de fondos del DOT y financiamiento
- Comprendiendo los requisitos no federales de pareo
- Herramientas federales para identificar comunidades desfavorecidas
- Financiamiento federal para transporte: Lista de cotejo de preparación de subvenciones "grants" discrecionales para posibles solicitantes durante el año fiscal 2023
- Lista de cotejo para solicitudes de subvención que alcancen una fuerza laboral de transporte sólida y un plan laboral
- Uso de Fondos del DOT para la Participación Pública
- ¿Es el financiamiento federal el adecuado para mi organización?

Sign Up to Get Bi-Weekly DOT Navigator Email Bulletins to Stay in the Know about new technical assistance resources, trainings and funding opportunities across a range of transportation topics!

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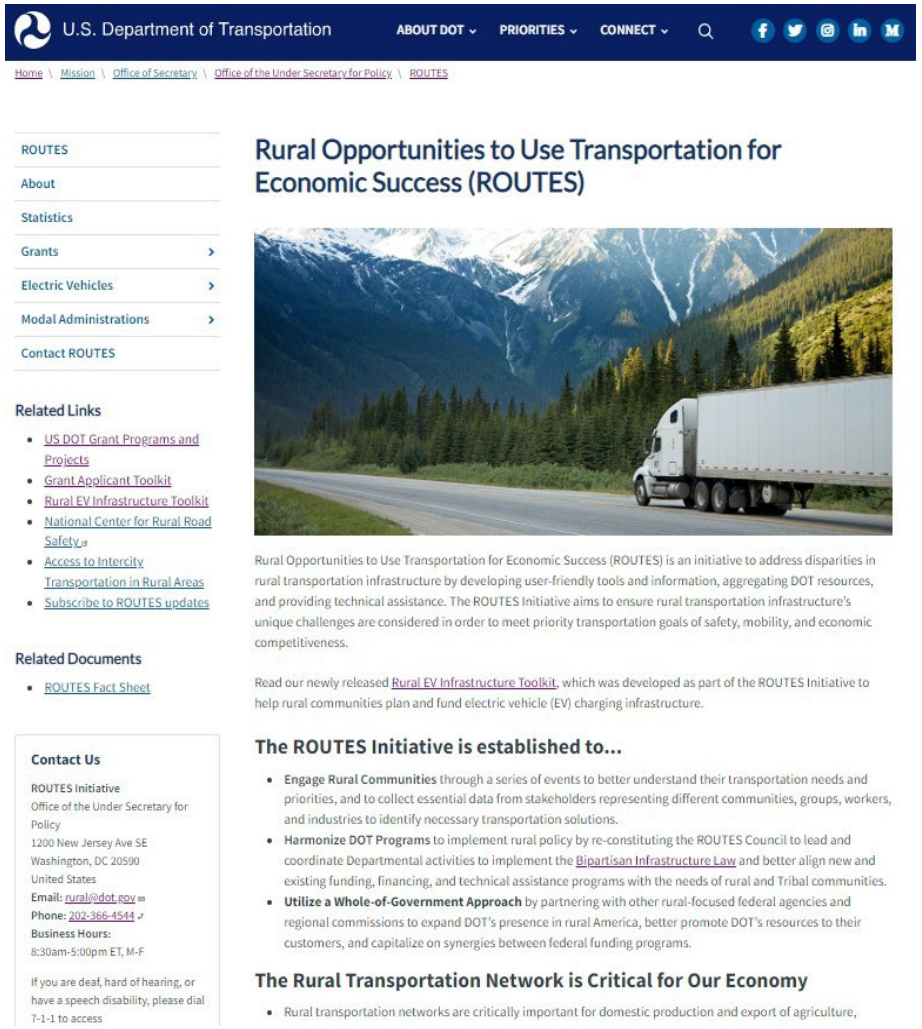
ROUTES Initiative

USDOT ROUTES Initiative



Webinars

- Benefit Cost Analyses for Rural Projects
- TIFIA Rural Projects Initiative
- Transit Resources
- National Roadway Safety Strategy

Tools and Toolkits

- Rural Eligibility Map
- Point of Contact Map
- Grant Applicant Toolkit
- Rural EV Infrastructure Toolkit

Funding Opportunities

- Active & Upcoming NOFOs
- Links to Past Awards

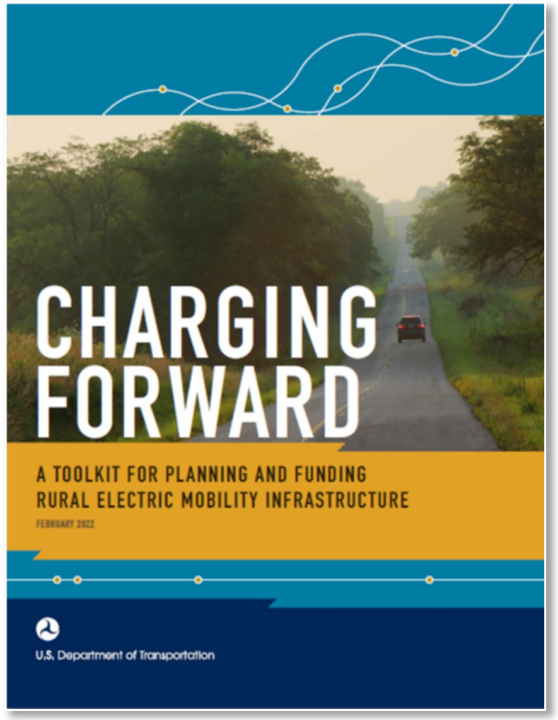
Modal Specific Landing Pages

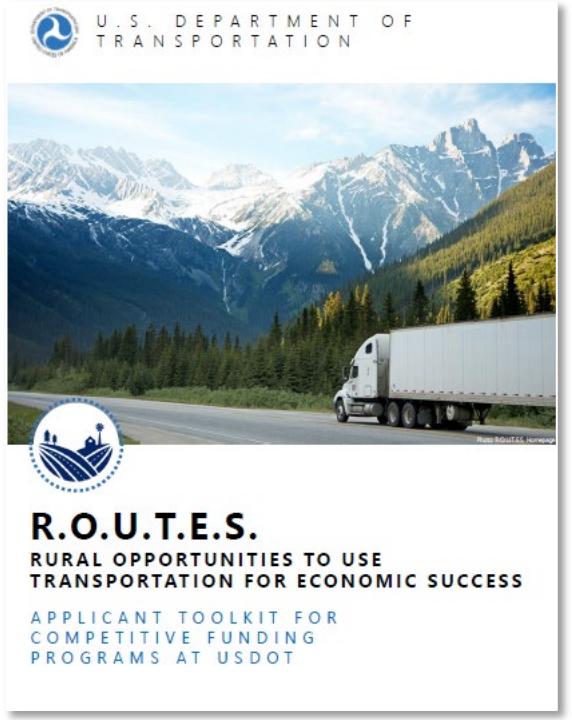
Monthly Newsletters

ROUTES Toolkits

INTERESTED IN EV INFRASTRUCTURE?

This toolkit helps rural communities scope, plan, and fund electric vehicle charging infrastructure. Rural entities can use the toolkit to identify key project partners and available funding or financing to help make their project a reality.





APPLYING FOR A GRANT FROM USDOT?

This toolkit provides user-friendly information and resources to support rural applicants' understanding of USDOT discretionary grant programs and the funding process.

Also, check out the accompanying DOT Discretionary Grants Dashboard.

Check out these toolkits and more at www.transportation.gov/rural.
Contact us at rural@dot.gov.

Key Active & Upcoming NOFOs

Key Active and Upcoming NOFOs			
Program	**NOFO Close Date**	**Available Funding**	**OA**
Pilot Program for Transit-Oriented Development Planning	July 22, 2024	$10,500,000	FTA
Small Community Air Service Development Program (SCASDP)	July 25, 2024	$12,000,000	OST
Bridge Investment Program (BIP) Large Bridge Projects	August 1, 2024	$2,450,000,000	FHWA
Charging & Fueling Infrastructure (CFI) Community and Corridor Grants	August 28, 2024	$1,321,200,000	FHWA
Safe Streets and Roads for All (SS4A) Grant Program (Third and Final Deadline for Planning and Demonstration Grants)	August 29, 2024	$1,256,687,000	OST
Wildlife Crossings Pilot Program	September 4, 2024	$100,000,000	FHWA
National Culvert Removal, Replacement, & Restoration Program	Opens Summer 2024	TBD	FHWA
Airport Terminals Program	Opens Summer 2024	TBD	FAA
Railroad Crossing Elimination (RCE)	Opens Summer 2024	TBD	FRA
Rural and Tribal Assistance Pilot Program	Opens Summer 2024	TBD	BAB
Reconnecting Communities and Neighborhoods Grant Program	Opens Summer 2024	TBD	OST
Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation Discretionary (PROTECT)	Opens Summer 2024	TBD	FHWA
Strengthening Mobility & Revolutionizing Transportation (SMART) Program Stage 2 Grants	Opens Summer 2024	TBD	OST

Contact us

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https://www.transportation.gov/BuildAmerica

ITS Grant Opportunities

- The Advanced Transportation Technology and Innovation (ATTAIN) program, provides funding to deploy, install, and operate advanced transportation technologies to improve safety, mobility, efficiency, system performance, intermodal connectivity, and infrastructure return on investment.
  - $120 million ($60 million for FY 2023 and $60 million for FY 2024)
- The Bipartisan Infrastructure Law (BIL) established the Strengthening Mobility and Revolutionizing Transportation (SMART) discretionary grant program with $100 million appropriated annually for fiscal years (FY) 2022-2026.

Safe Streets for All (SS4A)

- **$5 billion** discretionary grant program, with ~$1 billion/year over 5 years.
- Prevent deaths and serious injuries on our roadways.
- Focus on comprehensive safety action planning and implementing those plans.
- Inclusive of all types of roadway safety interventions across the Safe System Approach (SSA).
- http://www.transportation.gov/SS4A

Workshop Objectives (wrap-up)

- For you to take away a clearer understanding of:

The **role of Intelligent Transportation Systems (ITS)** in addressing transportation challenges facing **rural communities**;

Examples of successful rural ITS deployments in **key rural transportation challenge areas**;

The important role of **comprehensive ITS project planning** in setting solid foundations for successful rural ITS deployments; and

The wide variety of **USDOT resources available to potential deployers** at all stages of rural ITS deployment project planning.

Key Takeaways/Observations from Workshop and Breakouts + Q&A

- Workshop leaders' observations and comments on what they have been hearing and what they learned this afternoon
- Workshop participants' observations, learning, takeaways
- Q&A
- Don't forget to fill out your post-workshop survey!

Contact Information

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