Building Capacity for Intelligent Transportation Systems in Rural and Small Metropolitan Areas

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Overview

- Intelligent Transportation Systems in Rural Areas
- Why Rural ITS?
- Rural ITS Challenges
- ITS Case Studies Report
- Lessons Learned and Opportunities

National Association of Development Organizations

- National association that supports 540 regional development organizations, including emerging network of Rural Transportation Planning Organizations (RTPOs)

- Promote public policies that strengthen local governments, communities and economies through the regional strategies, coordination efforts and program expertise of the nation's regional development organizations

NADO Research Foundation

- Nonprofit research affiliate of NADO established in 1988 to identify, study, and promote regional solutions for community development, planning, transportation, and economic resilience.

- Shares best practices, offers professional development training, technical assistance, and examines trends in small metropolitan and rural America.

RURAL AND SMALL METROPOLITAN
INTELLIGENT TRANSPORTATION SYSTEMS CASE STUDIES PROJECT

What is ITS?

A definition:

"...the integration of advanced communication technologies into the transportation technologies and vehicles. Intelligent transportation systems encompass a broad range of wireless and wire line communications-based information and electronics technologies."

U.S. Department of Transportation ITS Joint Program Office, Intelligent Transportation Systems Benefits, Costs and Lessons Learned: 2018 Update Report

Why Rural and Small Metro ITS?

Rural areas experience:

- Extreme weather across seasons
- High speed traffic
- Higher traffic fatality rates
- Terrain and topography
- Wildlife crossings

Image: fhwa.dot.gov

Challenges and Concerns

Image courtesy @RockyNPS

Conditions

- Lower traffic volumes

- Short-lived congestion

- Traveler behavior and preferences

Resources

- Less political clout

- Limited staff sizes and resources

- Lower tax base

Technology

- Broadband connections

- Digital capabilities of customers and smartphone access

Rural ITS Application Categories

- **Travel Information:** emergency conditions, weather, tourism
- **Operations:** dynamic message signs, flood gates
- **Safety and Health:** railroad and trail crossings, bike & pedestrian
- **Transit and Mobility:** scheduling, dispatch, volunteer software
- **Vehicle Connectivity:** weather response, Vehicle-to-Vehicle (V2V), Vehicle-to-Infrastructure (V2I)

Case Study Locations

Colorado (Estes Park, Mesa County, Rocky Mountain Natl. Park)

Florida (Pinellas County)

Georgia (Tybee Island, statewide, Union County)

Iowa (Region XII - Denison, Carroll)

Massachusetts (Belmont)

Missouri (St. Joseph, Trenton, and Maryville regions)

Nevada (I-580 corridor Reno/Carson City)

Minnesota Department of Transportation

New York and New Hampshire (Volunteer Transportation Network)

Ohio (Guernsey, Muskingum, and Noble counties; Marysville)

Oregon (Washington County)

Pennsylvania (Allentown)

South Dakota (Bon Homme, Spink counties)

Western States (national parks)

Wyoming (I-80 corridor statewide)

Travel Information

Neels Gap, Georgia: Traffic camera and weather system improved through broadband. Drone used to pull fiber line up the mountain. Part of GA statewide ITS network.

National Park Service: Western parks and Rocky Mountain NP are using dynamic message signs, traffic cameras, smart website features, and social media to alert visitors before and during visits.

Neels Gap, Georgia Image: Byron McCombs

Minnie Cline Elementary School staff and students paint crosswalks and stop bars along with SJATSO and Mo-Kan transportation staff.
Image courtesy Mo-Kan/SJATSO.

Management and Operations

Missouri RDOs: Shared dynamic message signs, speed radar trailer, traffic counters, and Safety and Innovation Mobile Lab

Washington County, Oregon: Floodgates use automated water depth sensors and remote cameras to decrease field visits to assess flood-prone roads.

Transportation Safety and Health

Colorado National Monument: Bicyclist and vehicle dynamic warning sign on Rimrock Drive.

MBTA RR Crossing in Belmont, Mass.: Flashing lights on Do Not Stop on Tracks sign to deter vehicles in track zone.

South Dakota Intersection Warnings: Vehicle detector loops trigger a flashing light to indicate traffic is approaching on a side road.

Colorado National Monument Rim Rock Drive.
Image: National Park Service

Transportation Safety and Health

Pinellas Trail in Dunedin, Florida: Florida DOT District 7 pilot to use passive pedestrian and cyclist detection at Skinner Boulevard crossing.

Allentown, PA Million Hearts: Non-traditional technology using job time clocks to record miles walked as part of CDC and Pennsylvania public health program.

Pinellas Trail at Skinner Boulevard in Dunedin, Florida. Image: Whit Blanton

Western Iowa Transit staff use tablets to check schedules.
Image: Region XII COG

Transit and Mobility

Region XII COG and Western Iowa Transit: 60-vehicle commuter and demand response system moved from two-way radios to using cellular-based tablets and on-board software.
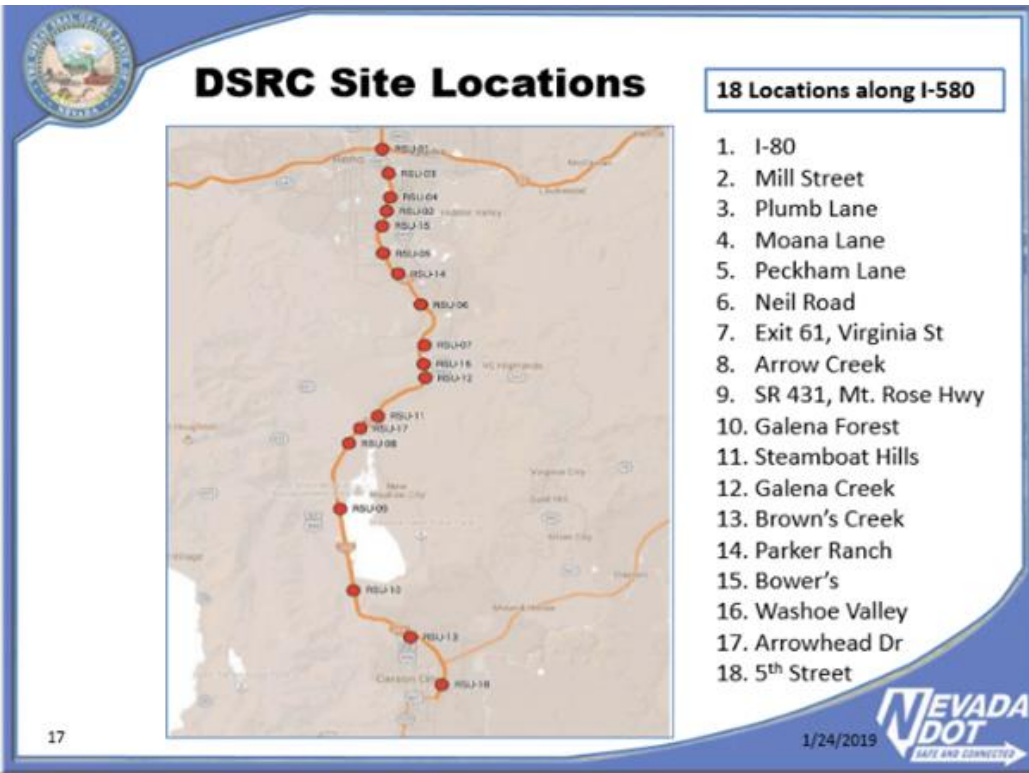
South East Area Transit and Transit Tech Ohio: Participant in statewide broadband and software standard program leading to new operations decisions, improved scheduling and dispatching, and increased rides.

Volunteer Transportation Center of New Hampshire and New York: 350-member volunteer team uses specialized software to track trips, funding, volunteer availability and credentials, and send passenger alerts.

A map of the I-580 corridor indicates the locations of Nevada DOT's Dedicated Short-Range Communications Systems roadside units.
Image courtesy NDOT

Vehicle Connectivity and Automated Vehicles

Nevada DOT Integrated Mobile Operations: Testing dedicated short-range communications (DSRC) on snowplows for weather condition data. Involves roadside units on I-580, cellular signals and onboard instruments

Wyoming I-80 Connected Vehicle Pilot: DSRC between roadside units and on-board truck cab units for real-time driver alerts, closures, wind warnings, and truck parking.

Vehicle Connectivity and Automated Vehicles

City of Marysville Director of Public Service shows visitors the connected signal cabinet interior. Image courtesy NADO Research Foundation

Connected Marysville, Ohio: 27 signals equipped with DSRC to interact with test connected vehicles. Part of Ohio's U.S. 33 Smart Mobility Corridor.

Minnesota's Connected Vehicles Plans: Connected and Automated Vehicles CAV-X Strategic Plan included survey and working groups of RDOs, cities, counties, and other localities to identify needs and determine statewide communications framework.

The Road Ahead:
Lessons Learned and Opportunities

- Many technologies are applicable in rural and small urban areas.

- Effective ITS projects can be low cost.

- State DOT partnership is important for ITS discussion, broadband expansion, and statewide technology standards.

- ITS outcomes include improved environment, saved resources, saved time, and saved lives.

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Visit www.nado.org and
www.ruraltransportation.org

Follow @NADOWeb and @RPOAmerica

Thank you!

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