Insight from New Mexico's Intelligent Transportation Systems Projects

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Wisconsin ITE Traffic Engineering Workshop &
Transportation Planning Forum

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Presentation Outline

- Program Background & Scope
- TSMO
- Rural ITS Plan & Toolbox
- Similar UDOT Project

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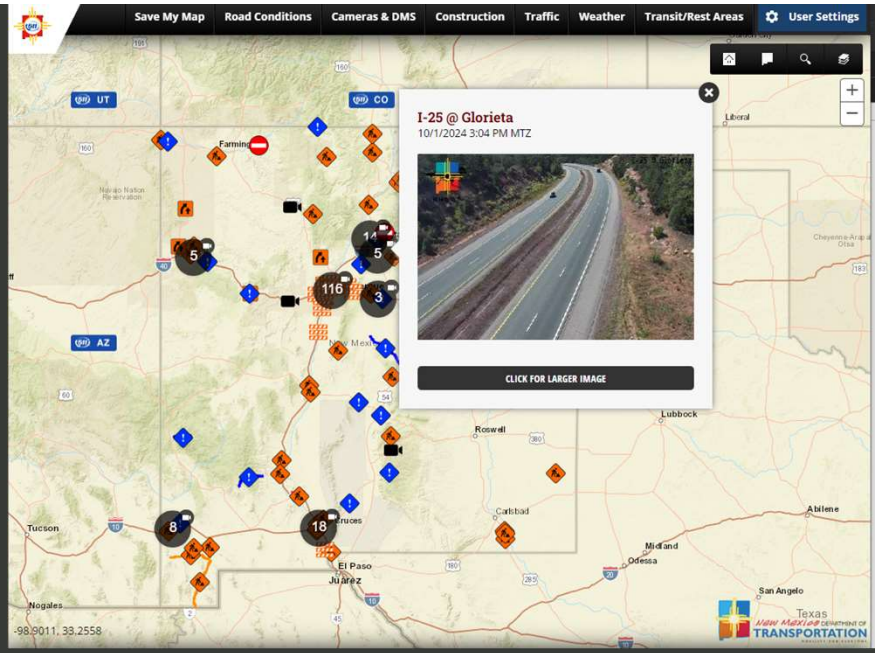
Where Are We Now?

PROGRAMS AND FACILITIES

- Dedicated ITS staff
- Traveler Information program
- Traffic Operations center
- Incident Management Program
- ITS Plans and Polices
- ITS Special Provisions & Standard Drawings
- Dynamic Message Signs
- Cameras
- Road Weather Information Systems
- Vehicle Detection Systems
- Fiber Optic Communications



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The Vision for Operations And Technology

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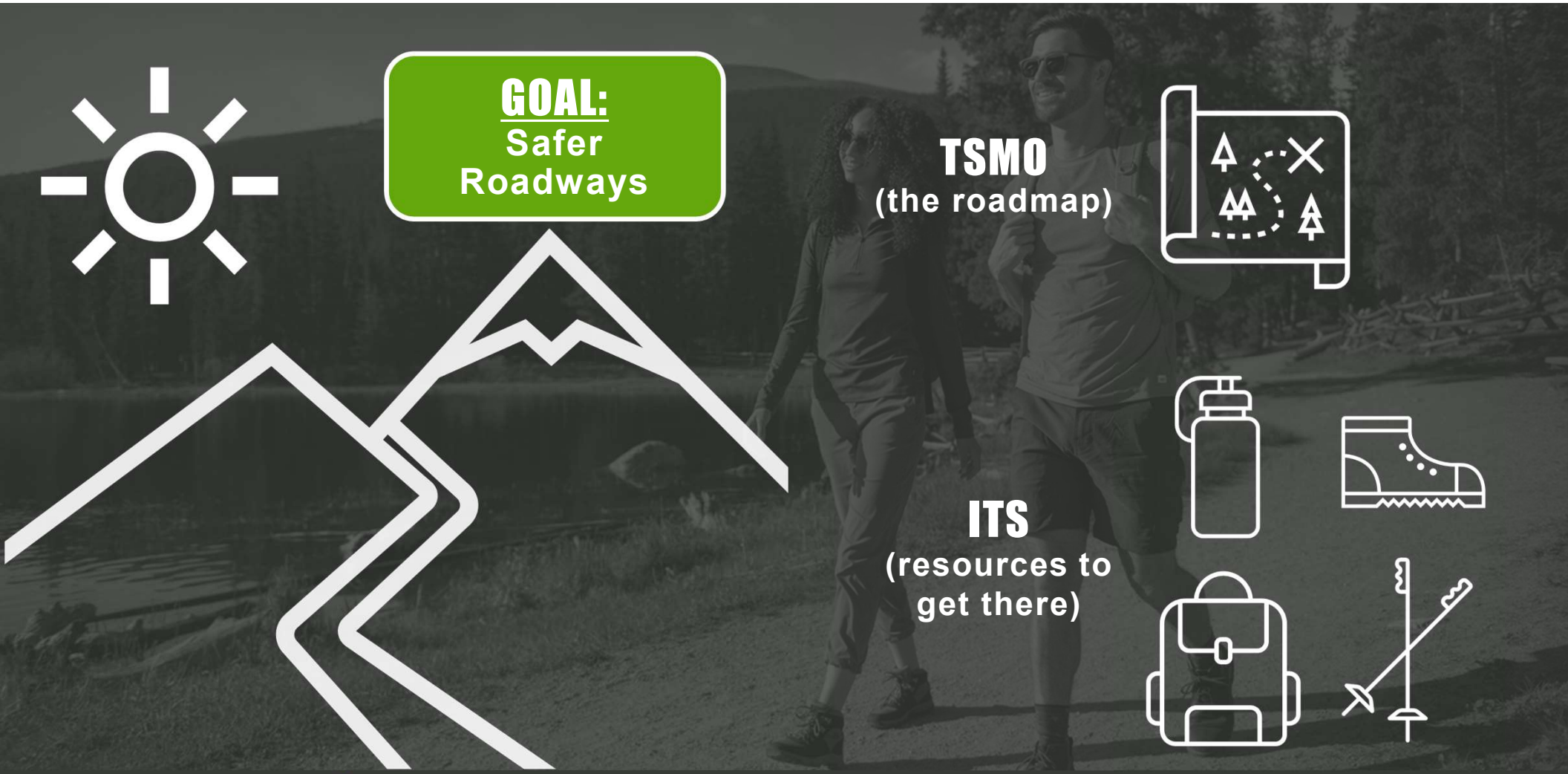

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Meet the Team

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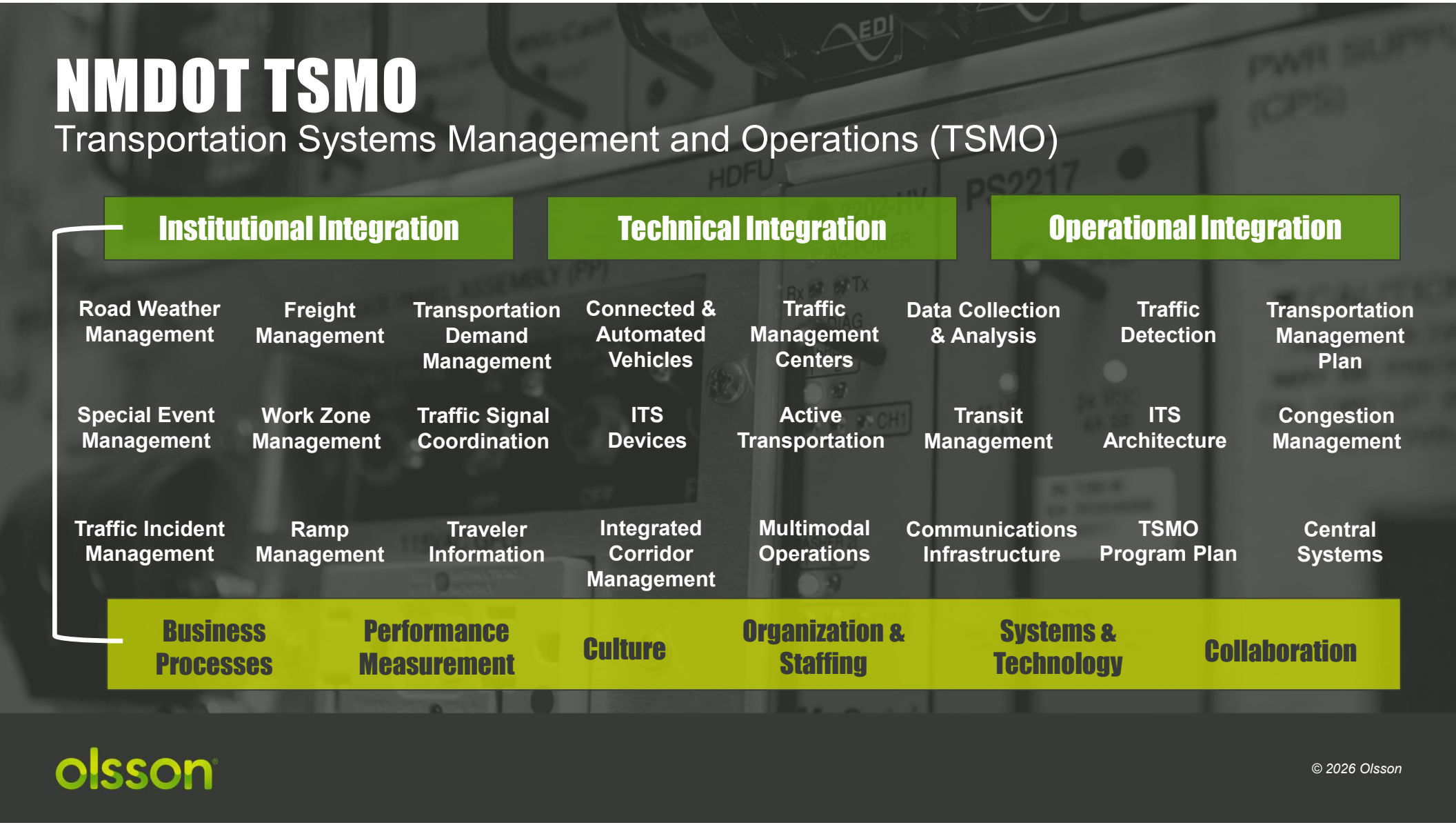
NMDOT TSMO

Transportation Systems Management and Operations (TSMO)



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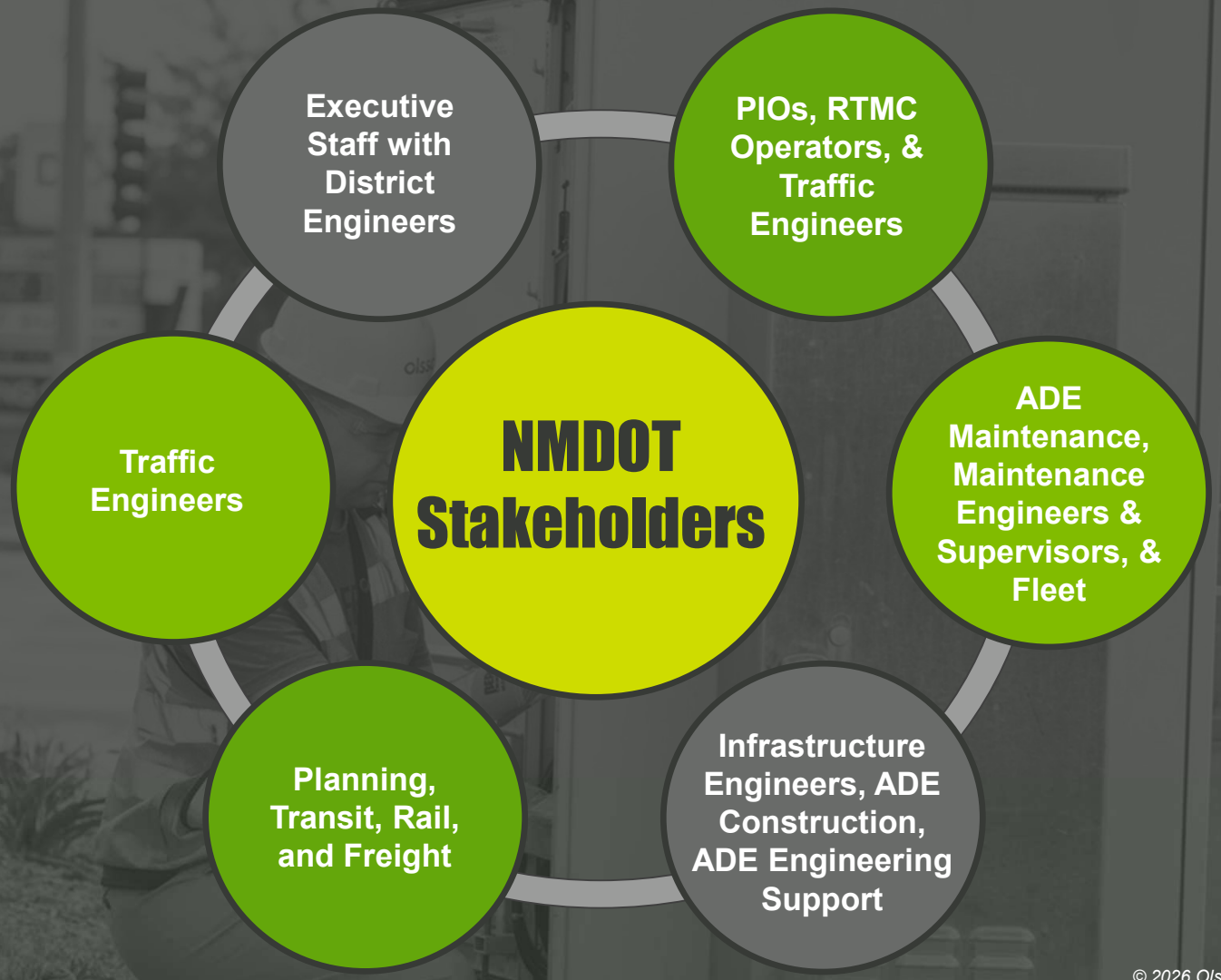
Stakeholders



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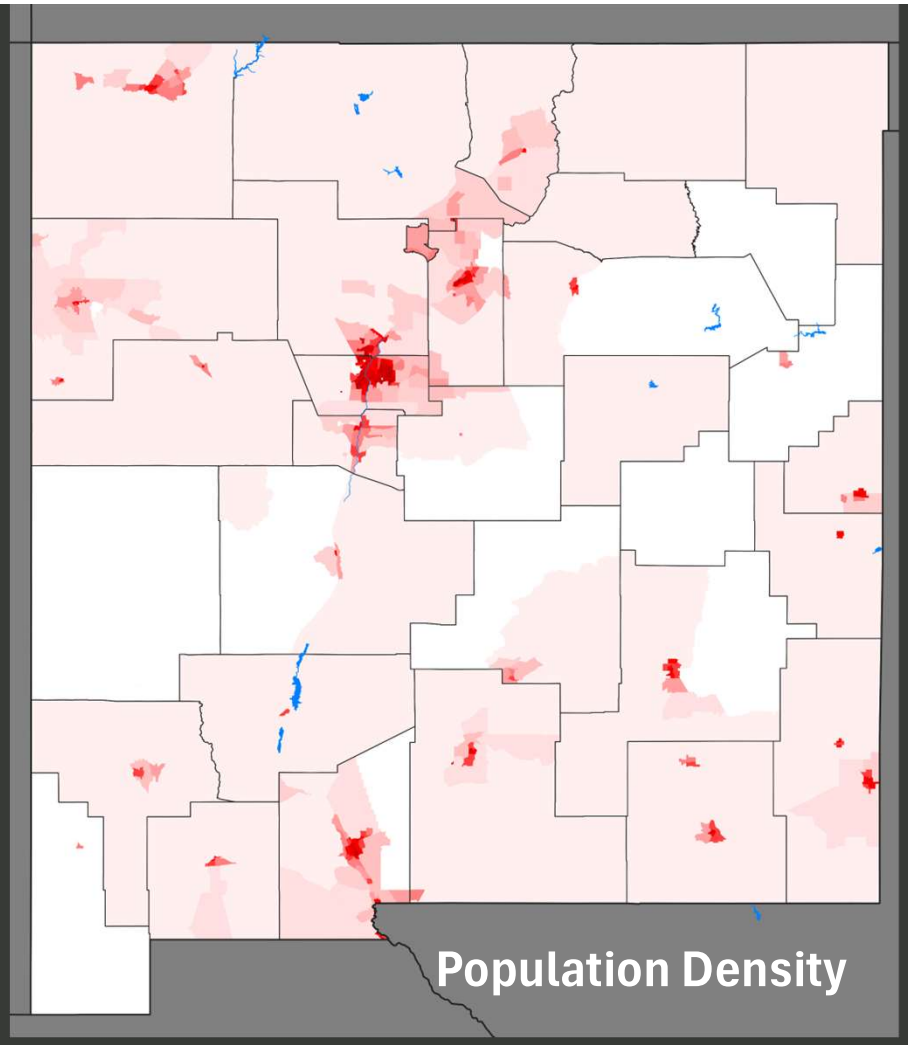
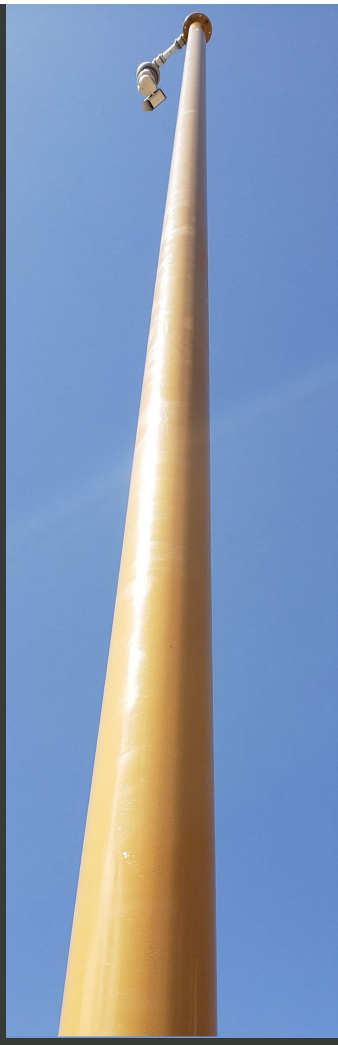
Rural ITS Plan





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Goal for Traveler Safety

Fatality Rate Per 100 Million Vehicle-Miles Traveled is 1.4 times greater in rural areas

Rural
1.51

Urban
1.08

40%
of highway fatalities occur on rural roads

Rural
15,541

Urban
23,482

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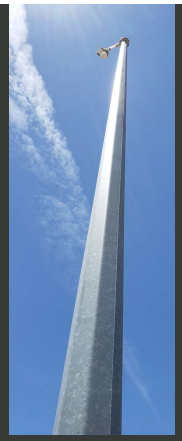
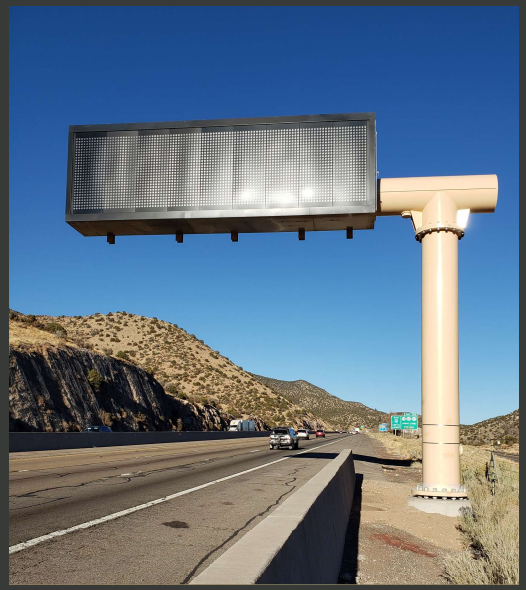
NMDOT's ITS Services





1. CCTV Camera
2. Commercial Vehicle Operations (CVO)
3. Driver alert roadway signage
4. Dust storm system
5. Dynamic message sign (DMS)
6. Mobile & environmental sensors on DOT fleet

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NMDOT's ITS Services *(cont.)*

7. Smart work zones
8. Vehicle detection system (VDS)
9. Variable speed limit system (VSL)
10. Wrong way detection (WWD)

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Functionality of Rural ITS Toolbox

HOW TO KNOW WHAT ITS SYSTEMS TO USE?

1. Identify transportation challenge
2. Use toolbox to determine applicable ITS systems
3. Educate on existing ITS systems via tech sheets
4. Submit info on site location and potential ITS system(s) that would help to NMDOT ITS staff

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NM Example Tactical Sheets

Road Weather Information System (RWIS) Tech Sheet

Description

RWIS provides real-time roadway surface and atmospheric weather information that include the following:

- Precipitation intensity and accumulation (rain, snow, sleet)
- Temperature (atmospheric and road surface)
- Roadway Surface conditions (e.g., ice, snow, precipitation, traction)
- Barometric Pressure
- Relative Humidity
- Wind speed and direction
- Visibility

In addition to providing roadway surface and atmospheric weather information, RWIS can be used in conjunction with other ITS systems such as closed-circuit television cameras (CCTV) that provide imagery of roadway and driving conditions.

Benefits

- Identification of potentially hazardous weather and roadway conditions
- Improvement of NMDOT maintenance operations
- Improvement of traveler decision making
- Optimization of roadway safety during weather events
- User access to online dashboard

Maintenance & Operations

Device Maintenance Responsibility:

- District:
  - NM811 utility locating support
  - Assist ITS Bureau in first line of diagnostics for troubleshooting by designated staff, such as patrol, AMS, or traffic section personnel
  - Provide traffic control when the work is being performed by NMDOT staff
- ITS Bureau:
  - Regular inspection, cleaning, and/or repair on an as-needed basis

Costs & Budgeting per Site

- District Costs:
  - Equipment and construction: $135,000 (+/- 15%)
  - Power and communication costs (i.e. DSL): up to $200 per month
- ITS Bureau:
  - Annual maintenance and calibration: $3,000
  - Annual application hosting fees: $2,500
- Other Factors:
  - Costs could include potential prime contractor markup if installed on a construction project
  - Average life cycle of electronic equipment: ~10 years
  - Does the location require guardrail or site maintenance accessibility?
- Funding Opportunities:
  - Inclusion into larger roadway improvement projects
  - Highway Operations Maintenance funds using ITS Price Agreement
  - Highway Safety Improvement Program funds (HSIP)

Other Considerations

- Is this RWIS and proposed location in the NMDOT's Map of ITS Needs?
- Special Provisions on RWIS design requirements can be found on the NMDOT's ITS website
- To determine if an RWIS is right for your needs, access the ITS Needs Toolbox

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SEVERE DRIVING CONDITIONS

DIFFICULT DRIVING CONDITIONS

See examples at NMRoads

Dynamic Message Sign (DMS) Tech Sheet

Description

A DMS is an electronic sign that uses light-emitting diodes capable of displaying customizable messages using any combination of characters, numeric values, and in some instances, symbols, and graphics.

DMS can display real time messages that may pertain to:

- Alerts and advisories
- Roadway closures, incidents, and crashes
- Weather or roadway surface information
- Travel time information
- AMBER alerts and emergency messages
- Special event travel information
- Work zone and alternative route information

DMS is commonly used in conjunction with other ITS devices, such as road weather information system (RWIS) and closed-circuit television camera (CCTV), to share travel information on roadway and driving conditions ahead of the motorist that includes weather related information, crashes, closures, restrictions, and safety.

There are various sizes of DMS installations, selection of which depends on the size and designation of the roadway where they are located. These include mainline walk-in, mainline front access, arterial front access, and trailblazer.

Benefits

- Share real-time travel information to the traveling public
- Report changing driving, weather, and roadway conditions
- Communicate current travel times
- Alert travelers to hazards, special event conditions, or safety alerts

Maintenance & Operations

Device Maintenance Responsibility:

- District:
  - NM811 utility locating support
  - Assist ITS Bureau in first line of diagnostics for troubleshooting by designated staff, such as patrol, AMS, or traffic section personnel
  - Provide traffic control when the work is being performed by NMDOT staff
- ITS Bureau:
  - Regular inspection, cleaning, and/or repair on an as-needed basis

Costs & Budgeting per Site

- District Costs:
  - Equipment and construction: $30,000 - $365,000 (+/- 15%), depending on location, use, and structure (see table below)
  - Power and communication costs (i.e. DSL): up to $200 per month
- Other Factors:
  - Costs could include potential prime contractor markup if installed on a construction project
  - Average life cycle of electronic equipment: ~15 years
  - Does the location require guardrail or site maintenance accessibility?
- Funding Opportunities:
  - Inclusion into larger roadway improvement projects
  - Highway Operations Maintenance funds using ITS Price Agreement
  - Highway Safety Improvement Program funds (HSIP)

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DYNAMIC MESSAGE SIGNS

See real time examples at NMRoads

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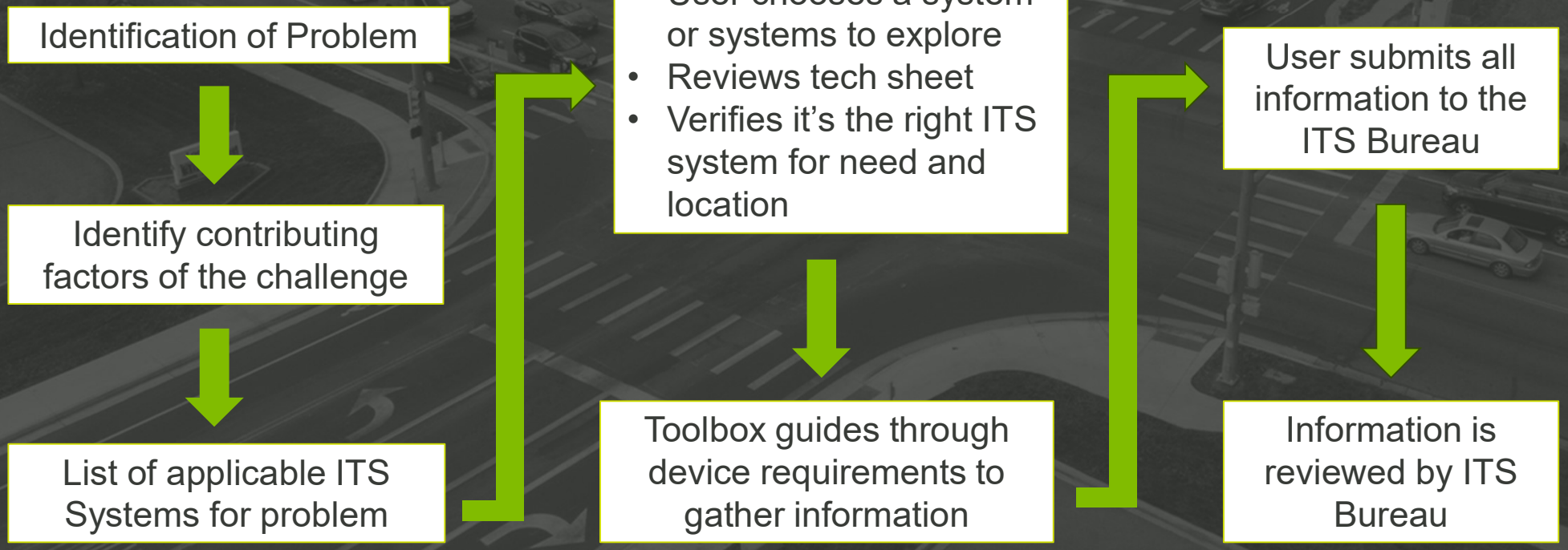
Toolbox Implementation



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UDOT ITS Toolbox

UDOT Employee

Identification of Transportation Challenge

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List of applicable ITS Devices for challenge

Review tech sheets for ITS Device(s)

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ITS Device Tech Sheet covers:

- Description
- Benefits
- Budget Considerations
- Design Considerations
- Maintenance & Operations Considerations

User fills out *UDOT ITS Device Request Form*

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Information is reviewed by ITS Team

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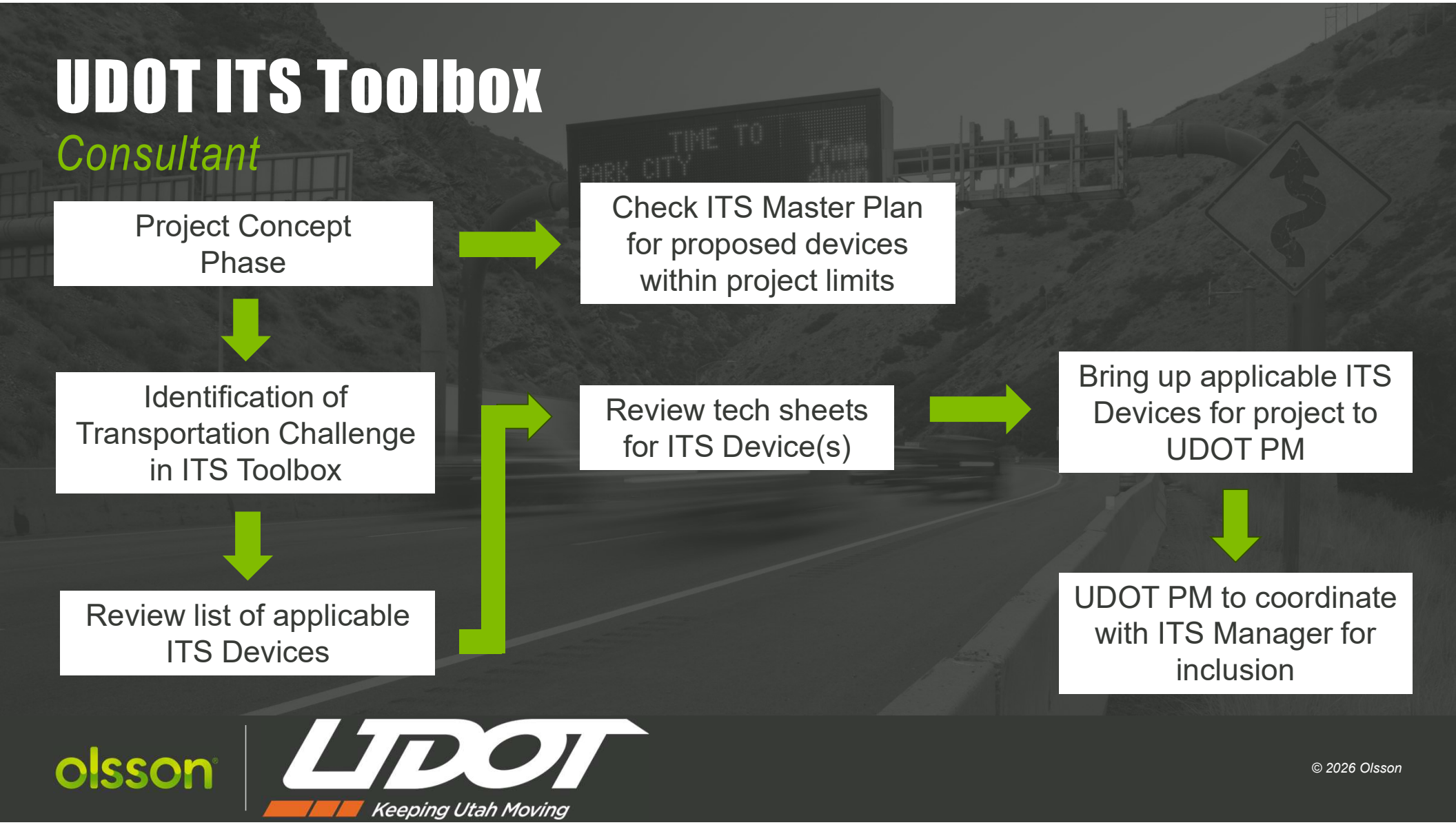
UDOT ITS Toolbox

Consultant



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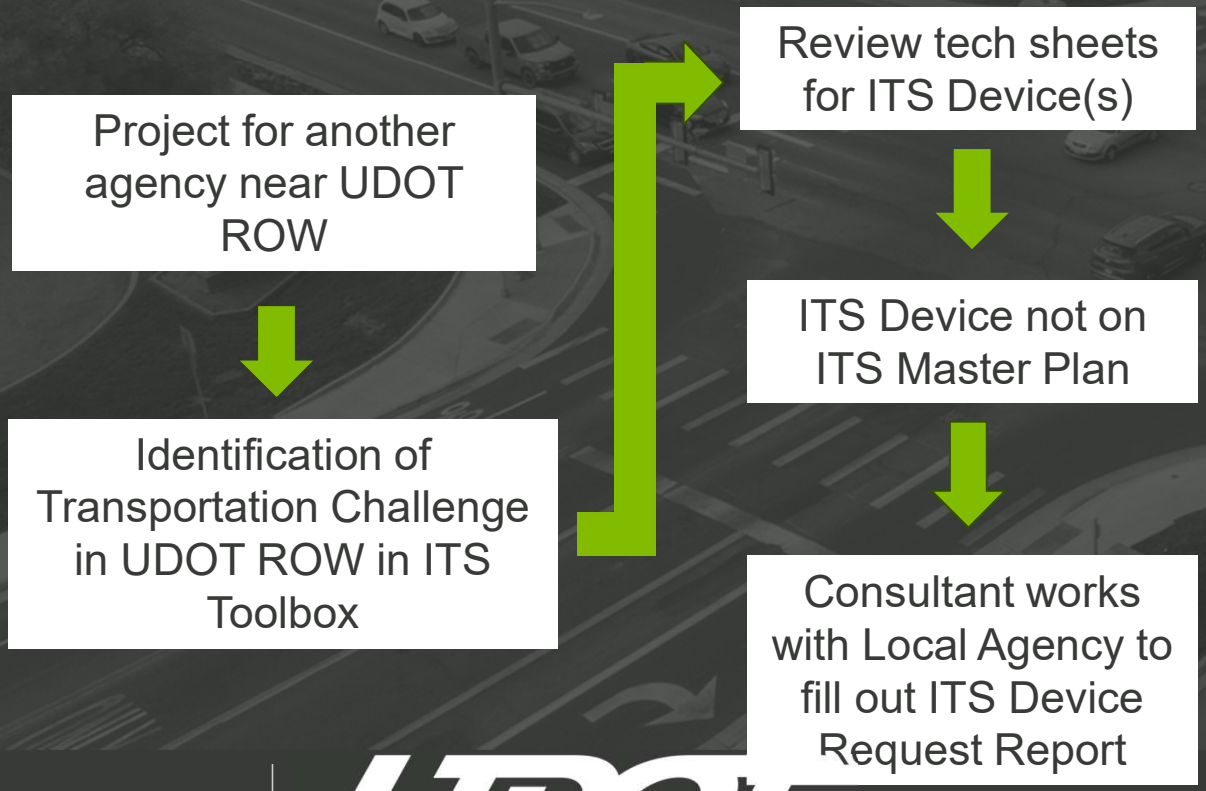
UDOT ITS Toolbox

Non-UDOT Project, Device on UDOT ROW



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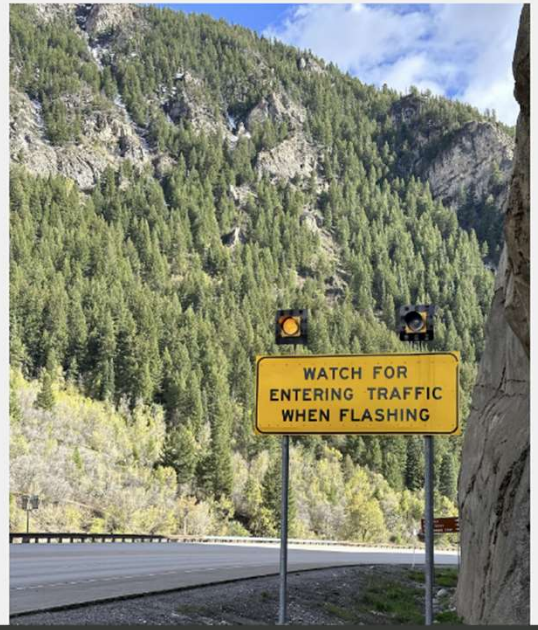
ITS Toolbox

UDOT ITS Toolbox Link



Do you have a traffic or roadway challenge? There may be an Intelligent Transportation System (ITS) device that can help solve it!

The ITS Toolbox will give you a list of possible technology-based solutions for your traffic or roadway challenges.

For each device the ITS Toolbox lists as a possible solution, there is an associated Tactical Sheet that provides information about the device and how it can be used as a solution. You can view and print each tactical sheet.

Several devices can be combined into a larger system to meet the needs of your unique situation.

Top 5 Takeaways for an ITS Toolbox

1. Practical knowledge resource for deployment of ITS devices
2. Applicable to urban or rural areas
3. Can be tailored to various project sizes and budgets
4. Applicable for new or retrofitted ITS devices
5. Cost-effective way to include ITS devices in more transportation projects

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QUESTIONS?

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