

National STIC Network Showcase 2023



Category:

Operations



U.S. Department of Transportation
Federal Highway Administration



National STIC Network Showcase

The EDC-7 virtual summit, held in February 2023, included a platform for the State Transportation Innovation Councils (STICs) to showcase homegrown innovations that their members developed and implemented in their state. The purpose of this National STIC Network Showcase was to celebrate and share innovations with a wider audience to expand their potential use and impact. These innovations are saving lives, building sustainable infrastructure, growing an inclusive workforce, saving time, and making our transportation system more efficient. Over 100 innovations were shared by STIC members and are grouped into the following categories.

- Asset Management & Finance
- Maintenance & Emergency Response
- Operations
- Design & Construction
- Technology & Materials
- Planning & Environment
- Safety
- Pavement & Structures
- Civil Rights, Workforce, and Equity

This event also featured short presentations from State and local agencies on some of these homegrown innovations, which are also [available on-demand](#).

Disclaimer

These presentations were created by non-FHWA organizations. The views expressed do not necessarily reflect the official policy of FHWA or the U.S. Department of Transportation (USDOT). The U.S. Government does not endorse products or manufacturers. Trademarks or manufacturers' names appear in this National STIC Network Showcase only because they are considered essential to the objective of the National STIC Network Showcase. They are included for informational purposes only and are not intended to reflect a preference, approval, or endorsement of any one product or entity.

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NC: T-SURGE

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OH: Drone Bridge Inspection

OH: Electric/Gas Utility Account Aggregation

OH: LED Highway Lighting Conversion

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PA: Spreader Chute for Winter Operations

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VA: Informative Monitoring Platform: Reporting the Occupancy of Vehicles (IMPROVE)

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WA: Movable Sign Fabrication Table

WA: Spokane County Design and Fabrication of Grader Boots (Snow and Gravel)

District 11 Transportation Management Center: Hydrogen Fuel Cell Alternative Emergency Power Pilot for Traffic Signals during PSPS events



OVERVIEW OF INNOVATION

LEAD CLIMATE ACTION WHILE PROVIDING A RELIABLE TRANSPORTATION NETWORK

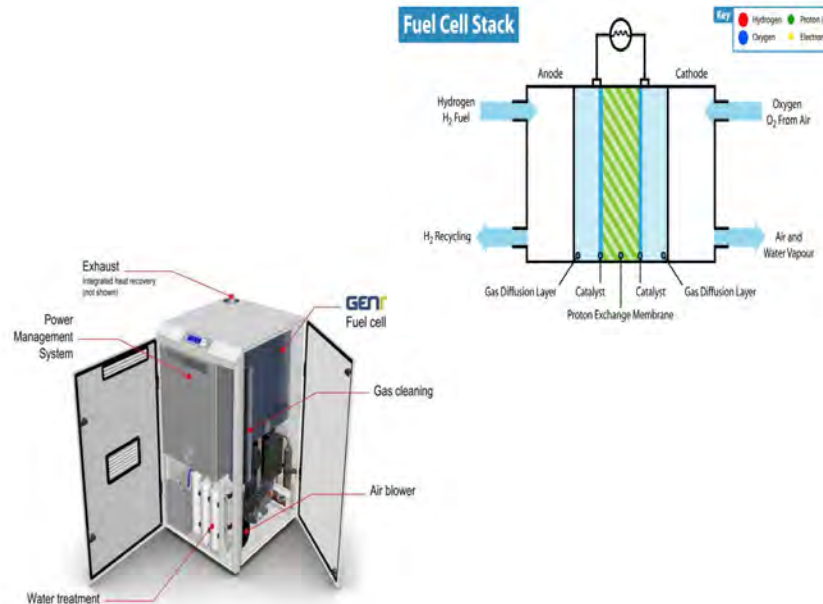
In response to severe weather, a Public Safety Power Shutoff (PSPS) are a preventative measure where regional power utilities may temporarily turn off power to specific areas to reduce the risk of fires caused by electric infrastructure. PSPS events could last from a few hours to several days.

Traditionally, Batteries and generators have been the popular choices for backup power for public services infrastructure such as traffic signals. However, batteries typically cannot provide long performance and require frequent replacement, while generators are noisy, bulky, maintenance intensive, and a product of dirty energy.

Hydrogen fuel cell technology requires less field maintenance than batteries and generators, lessening Caltrans personnel's field maintenance burdens during planned/ unplanned PSPS events.

Hydrogen fuel cell technology works like a battery, the major difference being the chemical material and electrolytic medium. The runtime of hydrogen fuel cell technology is dependent on the amount of hydrogen bottles stored at the field site, which will typically run up to 90 hours. It can have unlimited runtime with hydrogen refueling, provided that the inlet air filter is cleaned or replaced once a year or every 500 hours of operation.

Hydrogen fuel cell technology is the cleanest option compared to its counterparts: batteries and generators. It burns cleanly because it produces water vapor as its emission. It does not produce any carbon-based fuels or contributes to greenhouse gas emissions. It is a clean alternative that is also efficient.



<https://www.altery.com/>

BENEFITS

- A major advantage of the hydrogen fuel cell is the zero-carbon emission.
- Hydrogen is 125 times more energy-dense compared to Lithium and there are no heavy metal hazardous waste to dispose at the end of life.

FIND OUT MORE . . .

2021 District 11 Innovation Fair

<https://www.youtube.com/watch?v=OigDMS6pKqo>

Altery.com

https://www.altery.com/wp-content/uploads/2020/08/2020_Altery_Reformer_Data_sheet_2.pdf

DRISI- Public Safety Power Shutdown

[Public Safety Power Shutdown – Hydrogen Fuel Cell Mitigation Pilot \(ca.gov\)](#)

District 11 Transportation Management Center

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Sustainability, Operations, Environment,
Technology, Emergency Response / Relief

District 11 San Diego: South County Trade Corridors State Route 11 Enrico Fermi Diverging Diamond Interchange



OVERVIEW OF INNOVATION

Starting with policy and planning, multimodal considerations, safety, operational characteristics, geometric design, and completed construction and maintenance, The State Route 11 Enrico Fermi Diverging Diamond Interchange features an unconventional and innovative Diverging Diamond Interchange design.

As part of a larger purpose and transportation system in this corridor, this Enrico Fermi Diverging Diamond Interchange (DDI) will satisfy the increasing demand for California-Mexico trade at existing border crossings.

The efficient delivery of goods and services is critical to the customer's satisfaction – the success of individual businesses and the urban and global economies. Yet to reach the destination, goods distributors face significant challenges across urban and metropolitan environments, regional highway networks, and bottlenecked ports.

This Diverging Diamond Interchange design facilitates the most efficient traffic patterns from Mexico into the United States. Access to border wait times at the different Ports of Entry will reduce congestion and positively impacts the air quality of moving travelers and goods throughout the country.



Caltrans D11

BENEFITS

- Traffic patterns promoted by the DDI will facilitate continuous movement from Mexico into the California State Transportation System, helping to reduce the air quality impact created by the movement of goods and the traveling public.
- The novel DDI design also promotes intersection safety for pedestrians and bikers while meeting the conflicting demands for increasing capacity, decreasing congestion, and minimizing the cost of multiple infrastructures.

FIND OUT MORE . . .

2021 District 11 Innovation Fair

<https://youtu.be/OigDMS6pKqo>

Keep San Diego Moving
– State Route 11 Corridor

<https://www.keepsandiegomoving.com/SR-11-Corridor/SR11-intro.aspx>

Caltrans Innovation EXPO 2022

<https://caltrans-innovation-expo.constantcontactsites.com/enrico-fermi-diverging-diamond-interchange-with-border-wait-time-technologies>

South County Trade Corridors (SCTC) Contact Information

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Equity, Operations, Planning, Environment,
Structures, Design, Freight/Goods Movement

DISTRICT 11

Wrong Way Driver Offramp Enhancement Package



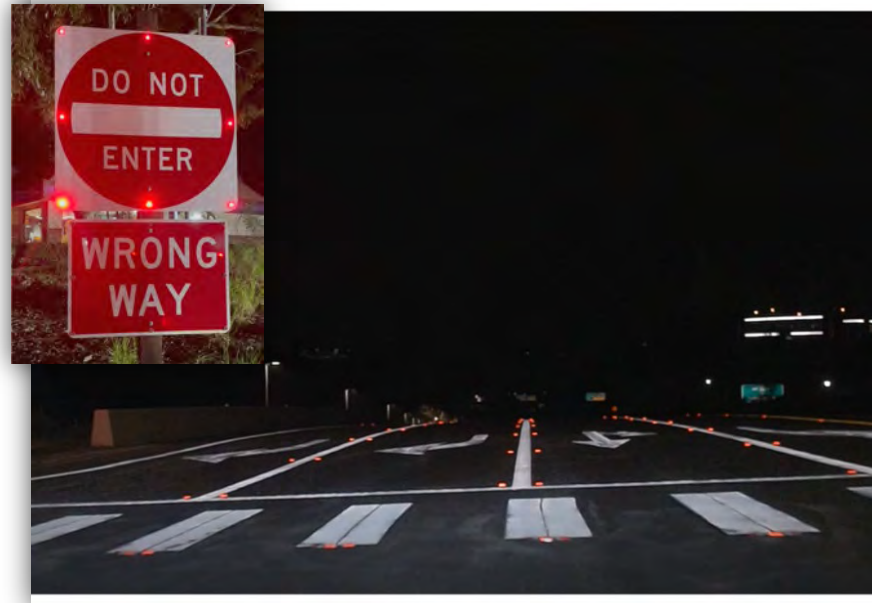
OVERVIEW OF INNOVATION

District 11 took the lead for the wrong-way prevention pilot project initiated after a series of Wrong Way (WW) collisions in 2015 in the San Diego and Sacramento regions that had resulted in several fatalities.

This pilot focused on three areas of enhancement measures:

- Replace traditional one-way markers on exit ramps with red-clear retroreflective markers on lane & channelizing lines. Install red-yellow retroreflective markers along the left edge line and one-way red retroreflective markers along the sides of Type V (through) arrows. In addition, add dashed yellow extension lines to guide motorists to the entrance ramp when it is adjacent to an exit ramp.
- Place additional retroreflective markers on edge lines. With the left edge line, we decreased the spacing of the red-yellow retroreflective markers in the first 480' from the exit terminus. With the right edge line, we reduced the spacing of the one-way red retroreflective markers for 360' starting 120' from the exit terminus.
- Install Blinking LED bordered Wrong Way signs with a wrong way detection system or 24/7 operation.

The pilot project was successful and is currently part of the Caltrans standard wrong-way package at freeway exit ramps.



District 11

BENEFITS

- Red retroreflective pavement markers (backside) resulted in a 44% to 64% reduction in reported wrong way events.
- Blinking LED wrong way signs resulted in a 60% reduction in reported wrong way events

FIND OUT MORE . . .

Wrong Way Pilot Projects

[Wrong Way Pilot Projects | Caltrans](#)

District 11
Traffic Safety and Operations Division

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Safety, Operations, Design,
Construction, Maintenance,
Planning, Equity

eSTORM – an Innovative Emergency Management Device Operational Status Platform



OVERVIEW OF INNOVATION

The eSTORM web- and phone-based application collects, in one place, the necessary field data, device operational status, generator deployment, cabinet flooding, and downed structures events for ITS and traffic signals devices following a hurricane or thunderstorm. The application works offline, collecting information and pictures even if there is no cellular coverage. This data is uploaded automatically once internet service is available. Collected information is displayed in a dashboard for a quick real-time snapshot of the work that is done by the field staff. This allows for resource planning and allocation to expedite the recovery efforts.

The application, built on ArcGIS, was conceptualized in FDOT District 3 during Hurricane Sally in 2020 and converted into a statewide application in the 2021. Recently, the application was used during Hurricane Ian in September 2022.

The application has been pioneered in the State of Florida and has usability across the nation for any emergency management scenarios when the knowledge of device operational status is critical to safe and efficient traffic movement. The application is portable and scalable and can connect with arterial and freeway management software for a direct connection to extract operational status remotely.

BENEFITS

eSTORM allows FDOT to allocate its resources efficiently and expedite recovery efforts to make Florida roadways safe and traversable again.

FIND OUT MORE . . .

Website link:

eSTORM Article:

<https://bit.ly/56934FL578>

TIM Website:

www.fdot.gov/emergencymanagement

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Hurricane, estorm, situational awareness, emergency management, GIS, planning, freight/goods movement, technology, asset management, emergency response/relief, operations

FDOT's eTRAC – an Innovative Technology Solution for Traffic Incident Management and Stakeholder Coordination



OVERVIEW OF INNOVATION

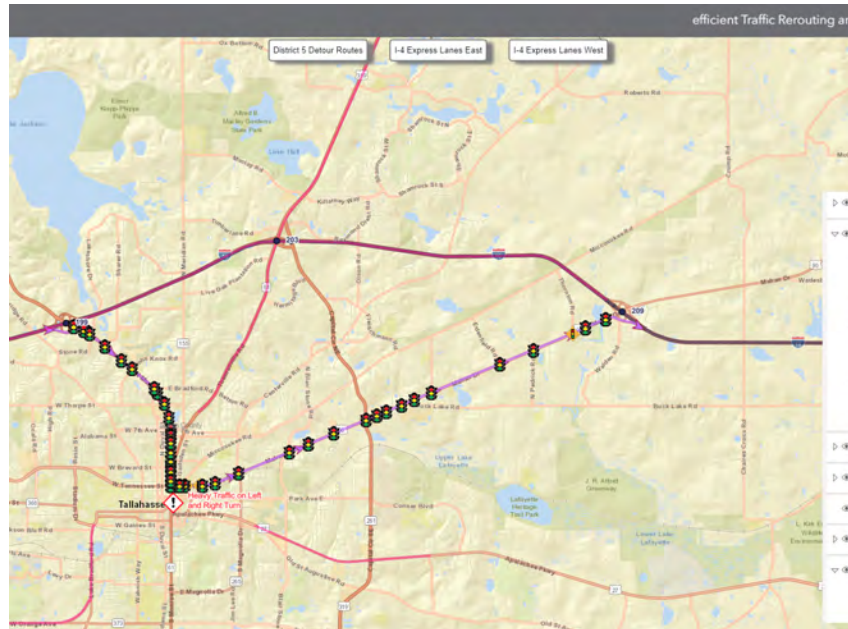
The eTRAC (efficient Traffic Rerouting and Agency Coordination) is a web-based application that allows Law Enforcement Agencies to auto-identify detour/diversion routes with all necessary information on their phones/laptops including – active construction, traffic signals with agency contact information, turn lane restrictions, railroad crossings, bridges, crossovers, rest areas, and live traffic data. This helps the agency save time and make an informed decision efficiently. For long-term detours, the solution also provides PDFs of temporary traffic control plans and resources needed.

Traffic incidents are a major cause of traffic congestion on the freeway system and every second counts to prevent secondary crashes and conform to the FDOT's Open Roads Policy. The policy requires the incident to clear within 90 minutes.

This solution was started by FDOT District 3 and is now being adopted statewide to carry out integrated corridor management services and post information on FL511 and third-party applications such as Google and Waze.

The picture of the web-based application shows a selected detour route between two sets of exits. If there is more than one route available, longer detour routes can be selected. Therefore, depending on the congestion, traffic could be diverted to the alternate route. The application has several different layers and points of interest along the detour routes to aid in decision-making.

The application is easily portable and scalable for any state in the country.



Source: FDOT eTRAC

BENEFITS

The benefits of using eTRAC includes congestion reduction, incident clearance, time savings in opening the detour route(s), efficient agency coordination, and informed decision-making. The application provides a platform for integrated corridor management and improved agency coordination.

FIND OUT MORE . . .

Website link:

eTRAC website:

<https://etrac.fdot.gov/>

Florida TIM Website:

www.FloridaTIM.com

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Traffic incident management, TIM, etrac, integrated corridor management, ICM, technology, operations, freight/goods movement, emergency response/relief

Federal Grant Notification Newsletter



OVERVIEW OF INNOVATION

Every day, there are hundreds of federal grant opportunities that become available through grants.gov and other websites. It can be difficult and time-consuming for ITD employees to keep track of all the available grant opportunities.

To address this issue, ITD employees created a weekly newsletter that outlines information on currently available federal grant opportunities. For each available grant, the newsletter outlines who is eligible for the grant, the grant's deadline, the grant's amount, and where to find additional information on the grant.

The Federal Grant Notification Newsletter is sent to over 150 employees across ITD on a weekly basis and has helped increase awareness and access to potential funding opportunities from federal grants.



Source: The Idaho Transportation Department

BENEFITS

By compiling all information on Federal Grants into one newsletter, ITD is able to increase awareness and access to potential funding opportunities from federal grants.

FIND OUT MORE . . .

[Grant Newsletter 9.14.22](#)

[Grant Newsletter 9.21.22](#)

[Grant Newsletter 9.27.22](#)

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Grants, Notification, Newsletter, Funding,
Information



Mobile Eyewash Station Attachable to Striping Trucks

OVERVIEW OF INNOVATION

After witnessing a pavement-marking contractor get splashed in the face with striping paint, three ITD employees decided to take it upon themselves to engineer a mobile eye washing station that is mountable to existing striping trucks.

Prior to this innovation, contractors would splash water in their face to wash off paint. Aside from sanitation concerns, water was not always available to contractors to use.

This innovation addressed both of those issues by being mountable to existing striping trucks. Furthermore, to reduce the eye washing station's install time, the station utilizes the water supply and pump already onboard the striping trucks.



Source: The Idaho Transportation Department

BENEFITS

The primary benefit of this innovation is increased access to critical safety equipment used to wash potentially harmful substances out of worker's eyes.

FIND OUT MORE . . .

N/A

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Safety, Eyewash, Striping, Trucks



Temporary Traffic Signal with Bicyclist Button

OVERVIEW OF INNOVATION

Temporary traffic signals are often used in work zones where only direction of traffic can move at a time. However, though these signals work well for vehicles, they often neglect other road users such as bicyclists and pedestrians.

To address this issue in a work zone along a popular biking route, ITD employees decided to use a temporary traffic signal with a button that allows bicyclists and pedestrians to safely move through the work zone.

This innovation not only increased safety for all road users, but it addressed equity issues by allowing those not in vehicles to navigate through the work zone.



Source: The Idaho Transportation Department

BENEFITS

By employing a temporary traffic signal with a bicyclist button, ITD was able to increase safety for all road users and address equity issues by allowing those not in vehicles to navigate through the work zone.

FIND OUT MORE . . .

[Justification for the Innovation](#)

[Render of the Signal in Use](#)

[Diagram of the Signal](#)

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Safety, Equity, Mobility, Bicyclist, Signal

Oversize/Overweight Audible Route Guidance



OVERVIEW OF INNOVATION

Permitted turn-by-turn route details for oversize/overweight loads traveling on Illinois roads and structures were only available to drivers in printed form, requiring them to look at a set of paper directions to navigate their route. This routinely resulted in distracted driving, bridge strikes and other damage to infrastructure, causing undue public safety risks and costly damages across the state.

To improve safety, reduce distracted driving, enhance driver experience and protect Illinois assets from damage, a groundbreaking mobile app was developed in partnership with ProMiles to provide audible turn-by-turn route guidance for oversize/overweight loads. Drivers may now scan a code on their permit to launch the app for route-specific audible turn-by-turn driving instructions, safety announcements, restriction warnings and off-route alerts. This solution enables safe routing for all Illinois drivers of oversize/overweight loads, facilitating the movement of goods critical to our economy and the nation's supply chain.



Illinois Department of Transportation

BENEFITS

The new app provides distraction-free directions to keep motorists on the correct path. Drivers can easily launch the app, available in iOS and Android app stores, by scanning the QR code on their permit.

FIND OUT MORE . . .

Illinois Department of Transportation

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Keywords – oversize load, overweight load, navigation, route guidance

Snowplow Latch Extension

OVERVIEW OF INNOVATION

When a salt load freezes, it can be difficult to open tailgates secured by chains to remove the salt. This is a dangerous inconvenience that causes unwanted downtime and potential injury to staff. A frozen salt load puts tremendous pressure on the tailgate, and getting it open often requires more than one maintainer using hammers and prybars to release the chains. What's more, this happens most when the weather is at its worst and trucks should be out on the road clearing snow.

New tailgate latch extensions alleviate the potential downtime and injury risk posed by frozen salt loads. The extensions allow the tailgate to be locked in the partially open position using the truck's normal tailgate latches with chains set loosely as backup only. The extensions make it much easier to unload frozen salt, because there is no longer pressure on the tailgate chains. Now, instead of having to beat chains loose because they are under immense pressure from the frozen salt load, the operator can simply trip the tailgate latch and release the frozen load from the bed of the truck.



Illinois Department of Transportation

BENEFITS

Tailgate latch extensions enable a single person to release frozen loads safely, quickly and easily. Carthage Team Section created plans to enable others to replicate the latch extensions for use throughout the state. The extensions can be made easily and at minimal cost.

FIND OUT MORE . . .

Illinois Department of Transportation

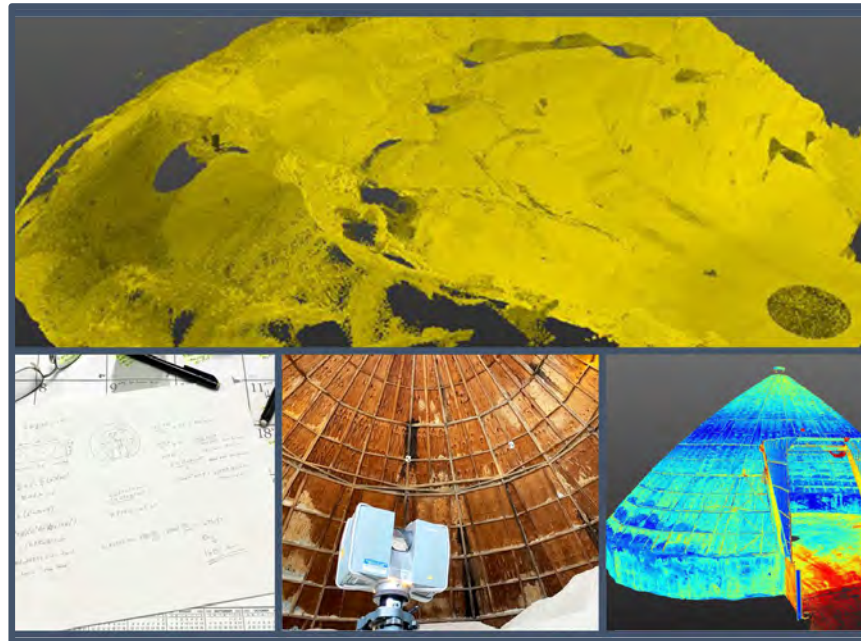
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Keywords – snowplow, tailgate release, salt spreading

OVERVIEW OF INNOVATION

Accurately measuring salt in a salt dome has traditionally involved climbing the salt pile to measure dimensions. This process typically involves a lot of estimation, which prevents accurate measuring. Volume is then figured by hand with the help of a calculator.

A new process was developed using 3-D scanning technology to more accurately measure the volume of salt using the district survey crew's existing software and equipment. First, the empty dome is outfitted with survey "targets" and scanned to provide baseline measurements. Next, salt piles are scanned. The data collected via scanning is then downloaded to Trimble Realworks software to determine salt pile volume. This method has been used successfully for salt domes in LaSalle, Princeton, Langley and Ottawa.



Illinois Department of Transportation

BENEFITS

Previous methods involved estimation and extensive calculations. The new scanning process provides accurate volumes and reduces the potential of injury by eliminating the need to climb on piles to retrieve measurements.

FIND OUT MORE . . .

Illinois Department of Transportation

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Keywords – 3-D scan, salt measurement

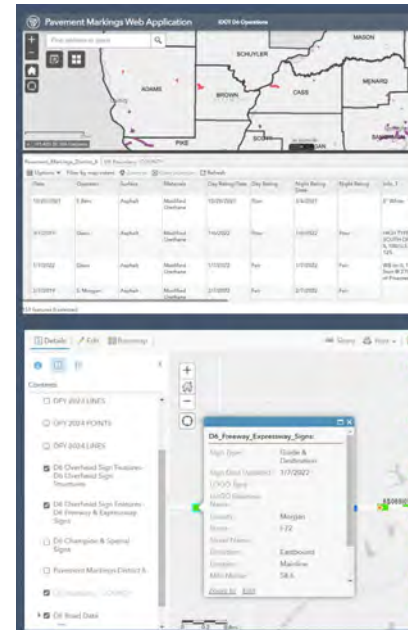
Tracking and Programming Maps



OVERVIEW OF INNOVATION

Decisions regarding when or where high-type pavement marking required restriping relied on past plan sets and technician memory, while hard-copy binders were used to track interstate, overhead, championship and special town name signs. Neither of these systems was reliable or efficient, and pavement markings became unnecessarily deficient throughout the district as a result.

A new system was developed using GIS technology to create a complete inventory of all high-type pavement markings maintained throughout the district, along with an up-to-date evaluation of each. The inventory can be easily filtered to provide a list of all road sections in need of restriping throughout the district. The system also provides a mapped inventory of all interstate and specialty signs, allowing for mobile access while decreasing time and manpower used to approve installation and repairs.



Illinois Department of Transportation

BENEFITS

The new system uses GIS to show striping sections throughout the district. Colors are used to indicate striping conditions. Sign information is filterable by type of sign, and colors and shapes indicate specifics of sign build and purpose. System information is clear, concise and readily accessible.

FIND OUT MORE . . .

Illinois Department of Transportation

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Keywords – pavement marking, asset inventory, asset mapping

Push Arm Stand



OVERVIEW OF INNOVATION

This stand made of used plow blades holds push arms off the floor when detached from trucks, both during the winter and for summer storage. The crew in Eddington made these years ago.

They have recently been discovered by MaineDOT Innovates and a new design with wheels to make them easier to move is under development at the MaineDOT Fab Shop.

Engineered plans for either design are available for replication.



Photo by MaineDOT

BENEFITS

The stand reduces the repeated lifting of arms when mounting and dismounting, keeps the arms off the floor to reduce tripping hazard, and protects the connecting pins.

FIND OUT MORE . . .

Engineered plans to replicate available. Contact MaineDOTInnovates@maine.gov to have file e-mailed.

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Maintenance, Safety

Slope Restoration on Urban Freeways



OVERVIEW OF INNOVATION

Grassy slopes along Michigan’s urban freeways once posed safety hazards and logistical challenges for roadside maintenance crews. But new research shows just what to plant and how to achieve great results, making these areas useful green spaces that reduce erosion and keep pollutants out of Michigan’s waterways.

Highway roadsides are difficult sites on which to establish plants, particularly on sloped roadsides in urban areas. Plants on these sites are often subjected to poor soil conditions and face aboveground stresses, including elevated temperatures associated with urban heat island effects and increased wind exposure due to nearby traffic and wind tunnelling effects of sloped freeways.

By testing and tracking different soil improvement strategies and dozens of plant types over several years, the Michigan Department of Transportation (MDOT) developed a process for planting on slopes and a list of plant species suitable for Michigan roadsides that are environmentally advantageous, cost-effective and lower-maintenance. Useful guidance includes the *MDOT Plant Selection Manual* and an associated plant list.

Landscape plantings along sloped roadsides provide a range of benefits, including slope stabilization, improved aesthetics, increased biodiversity and pollinator habitat, reduced need for mowing, and improved driver awareness and safety.



Source: Michigan DOT

BENEFITS

Effective plant selection and site preparation of sloped green spaces on urban roadways decreases maintenance costs and increases sustainability, offers more environmental benefits, and increases safety for maintenance crews and motorists alike.

FIND OUT MORE . . .

Research Spotlight Brief:

<https://www.Michigan.gov/MDOT/-/Media/Project/Websites/MDOT/Programs/Research-Administration/Research-Spotlights/SPR-1701-Spotlight.pdf>

Michigan Department of Transportation Plant Selection Manual:

<https://www.Michigan.gov/MDOT/-/Media/Project/Websites/MDOT/Programs/Research-Administration/Documents/SPR-1701-Plant-Selection-Manual.pdf>

Plant List:

<https://www.Michigan.gov/MDOT/-/Media/Project/Websites/MDOT/Programs/Research-Administration/Documents/SPR-1701-Plant-Selection-Database.pdf>

Spotlight Video:

<https://www.youtube.com/watch?v=F6ZL1sBT1H4>

Michigan Department of Transportation

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Green space, Environmental, Roadside, Safety, Maintenance

Additional 5% Increased Federal Share



OVERVIEW OF INNOVATION

An increase in Federal Reimbursement of National Highway Performance Program, Surface Transportation Block Grant Program and Unified Planning Work Program PL funded projects from 80% to 85% is an exciting opportunity for MoDOT. This opportunity also allows for MoDOT to incorporate innovative delivery methods, construction materials, and techniques that will not only reduce future maintenance costs, but also delay future replacement frequencies. This innovation utilizes all innovative methods, materials and techniques in order to capture significant financial savings.



Source: Missouri Department of Transportation

BENEFITS

This innovative program directly saved the State of Missouri \$16.8M in fiscal year 2021 through the Increased Federal Share on \$340M worth of work. Of the \$340M worth of projects, this program drove innovative methods that otherwise may not have happened. While this program has directly saved \$16.8 million, the amount saved indirectly is immeasurable.

FIND OUT MORE . . .

Missouri Department of Transportation
Innovations Showcase

[5% Increased Federal Share | Missouri Department of Transportation \(modot.org\)](#)

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Sustainability, Operations, Planning,
Funding/Finance

Signals and Lighting Training Facilities



OVERVIEW OF INNOVATION

MoDOT Signals and Lighting Training Facility is a safety improvement innovation to train lighting and signal workers in a safe environment. A complete sign and lighting intersection was created on a MoDOT parking lot. The training facility is beneficial to help build confidence in workers when placed in actual conditions by training them to complete tasks in a calm, quick and efficient manner.



Source: Missouri Department of Transportation

BENEFITS

This innovation saves time and increases safety by creating the ability to train staff in safe conditions before working in live intersections. Money is saved using MoDOT's own products during training that have been recycled.

FIND OUT MORE . . .

Missouri Department of Transportation
Innovations Showcase

[SigningSignalsTrainingLotProductivityHandout_KC.pdf \(modot.org\)](#)

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Workforce Development, Traffic, Lighting,
Safety training

Tractor Halo



OVERVIEW OF INNOVATION

The halo for a cab tractor is a barrier that surrounds the top of the cab and was built to protect the glass, fiberglass body and lines of the tractor from being damaged by overhanging limbs. The halo also protects the operator from flying debris caused by branches breaking through the cab glass. The halo sweeps low lying limbs up and over the cab protecting the lights and glass. The halo can be custom sized depending on the tractor model and implemented on any tractor that has a secure attachment point to the existing rollover protection system.

Existing metal at the district maintenance shed was used to fabricate the halo so the cost was minimal.



Source: Missouri Department of Transportation

BENEFITS

The Tractor Halo has saved MoDOT money due to fewer costs related to replacement of expensive glass, lights and cab parts. The halo provides safety to the operator during mowing operations, which reduces injuries and related costs.

FIND OUT MORE . . .

Missouri Department of Transportation
Innovations Showcase

[50: Tractor Halo | Missouri Department of Transportation \(modot.org\)](#)

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Safety, Savings, Maintenance, Operations,
Mowing

Wing Camera



OVERVIEW OF INNOVATION

When a wing plow is attached to a snowplow in the up position, it is impossible to see out the passenger window while plowing or when pulling out of an intersection. This requires lowering and raising the wing every time or continuously driving with it down. Both of which could inadvertently damage a car, sign, mailbox, or anything along the roadway. With a backup camera mounted to the top of the passenger side mirror, you can see over the front mounted wing plow, making it easier to see cars or other obstructions while plowing.



Source: Missouri Department of Transportation

BENEFITS

Drivers can now use the camera to see over the wing in places they could not see before. This keeps the public and MoDOT drivers safer and reduces claims for damages.

FIND OUT MORE . . .

Missouri Department of Transportation
Innovations Showcase

[WingCamera_NW.pdf \(modot.org\)](#)

[Wing Camera NW Hamilton MT - YouTube](#)

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Operations, Maintenance

LIVE 511 CALL CENTER CREATED BETWEEN NORTH CAROLINA DOT AND CORRECTIONAL INSTITUTE FOR WOMEN



OVERVIEW OF INNOVATION

NCDOT has provided traveler information via a 511 phone system since 2004. The initial 511 implementation included an interactive voice recognition (IVR) menu-driven solution allowing users to use prompts to access road conditions in a specific region. The 511 system supported significant peak call volumes during major events, such as hurricanes and snow. But as smartphones gained popularity and websites and applications were introduced to more efficiently deliver traveler information, NCDOT evaluated the IVR solution based on cost-benefit analysis and user navigation and modified their approach to providing the service.

Since the late 1990s, NCDOT has worked with the Department of Commerce Travel and Tourism Division and the Department of Public Safety Corrections Division to occasionally have inmates answer DOT related phone calls. Originally created to answer travel and tourism related phone calls, the call center is located at the North Carolina Correctional Institute for Women (NCCIW). The call center has evolved to take NCDOT customer service calls on weekends during emergencies, as well as routine calls for the NCDOT Rail Division.

In 2016, NCDOT tested having the NCCIW call center answer 511 calls. The operators used the NCDOT DriveNC.gov website to answer traveler info questions. NCDOT surveyed 511 callers who repeatedly expressed how happy they were to speak with a live person rather than an IVR. NCDOT and NCCIW saw the benefit of converting the 511 system permanently to the NCCIW call center and turned off the IVR at the end of 2017, allowing the NCCIW operators to handle all 511 calls. The center handles about 35,000 511 calls each year.

In 2019, due to budget cuts at NCDOT, NCDOT Customer Service was also moved to the NCCIW Call Center and handles about 80 NCDOT Customer Service calls per day.



Source: NCDOT

BENEFITS

The benefits of using a Live 511 Call Center include cost savings, improved customer service, and providing skills to inmates who will reenter the workforce.

FIND OUT MORE . . .

NOCoE Case Study:

<https://itsheartland.org/wp-content/uploads/2019/08/NCDOT-Case-Study-511-Call-Center.pdf>

511 Information Line Website:

<https://drivenc.gov/>

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511 Call Center, Correctional Institute for Women

Commercial Trucking Alert System



OVERVIEW OF INNOVATION

NCDOT is partnering with Drivewyze, a company that provides innovative connected-truck technology, including in-cab communications, and INRIX, a probe speed data provider, to provide real-time in-truck messaging of urgent road conditions. The alerts help commercial drivers react more quickly before encountering stopped traffic or major slowdowns.

NCDOT identified certain major rural interstate routes, where Dynamic Message Signs (DMS) may be lacking. NCDOT maintains more than 300 DMS that provide important traffic updates across 2,500 miles of controlled access freeways. The safety alerts under the pilot, however, can reach commercial drivers even where there is not a digital sign.

Drivewyze monitors INRIX for sudden slowdown and congestion events and distributes the alerts to subscribed drivers for free. The alerts will have messages such as "Sudden Slowdown Ahead" and "Congestion Ahead" about 2 or 3 miles before commercial truck drivers encounter the slowed traffic or incident. These alerts will complement other safety notifications such as low-clearance bridges, rollover risk, steep grades, restricted roads, and approaching work zones.



Source: Drivewyze

BENEFITS

Providing Commercial Vehicles with advanced notification of slowdowns and congestion allows them more time to slow down and potentially reduce secondary crashes.

FIND OUT MORE . . .

Drivewyze Website:

<https://drivewyze.com/drivewyze-infrastructure-services/smart-roadways/>

INRIX Website:

<https://inrix.com/press-releases/ncdot-drivewyze/>

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Commercial Trucking, Drivewyze

NCDOT Traffic Incident Management (TIM) Training Track



OVERVIEW OF INNOVATION

NCDOT has envisioned a lifelike classroom where IMAP responders can train and refine their skills in a more realistic environment without being exposed to the hazards of live traffic. The initiation of the track design focused on the intended purpose of training IMAP responders to safely and efficiently manage and clear incidents.

The NCDOT partnered with the North Carolina State Highway Patrol (NCSHP) to construct a training track on land located within the larger loop of the NCSHP's high-speed training track. The new TIM Training Track includes a half-mile of TIM-focused training facilities and ties into the existing two miles of track. The TIM Training Track was designed to incorporate a broad range of physical characteristics that allow agencies to practice various incident work zone applications and vehicle maneuvers.

The track allows IMAP responders and other agencies to train on newer technologies, such as drones for crash investigations and on new technologies for IMAP vehicles.

With the construction of the TIM Training Track, IMAP training is evolving from individualized, agency-led training to an all-responder training environment, focused on fostering consistent TIM culture across multiple agencies.



Source: NCSHP, Apex PD, and IMAP Multi Vehicle Crash Simulation

BENEFITS

The typical classroom-style learning paired with hands-on practical training on the TIM Training Track will prove helpful in efficient on-scene management, quicker incident clearance, and injury reductions to first responders while on the scene of an incident.

An additional benefit of training on a closed course is having the ability to record activities and review the response. These recordings are used to play back and highlight specific actions that were conducted properly as well as identify activities that require further training or the development of additional training modules.

FIND OUT MORE . . .

NCDOT TIM Training Track Website:
<https://www.ncdot.gov/news/press-releases/Pages/2022/2022-06-23-incident-management-track-ncdot.aspx>

NCDOT Transportation Mobility and Safety Division

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Incident management, First responder, Roadside safety

BridgeWatch: Public Safety Through Real-time Structure Monitoring



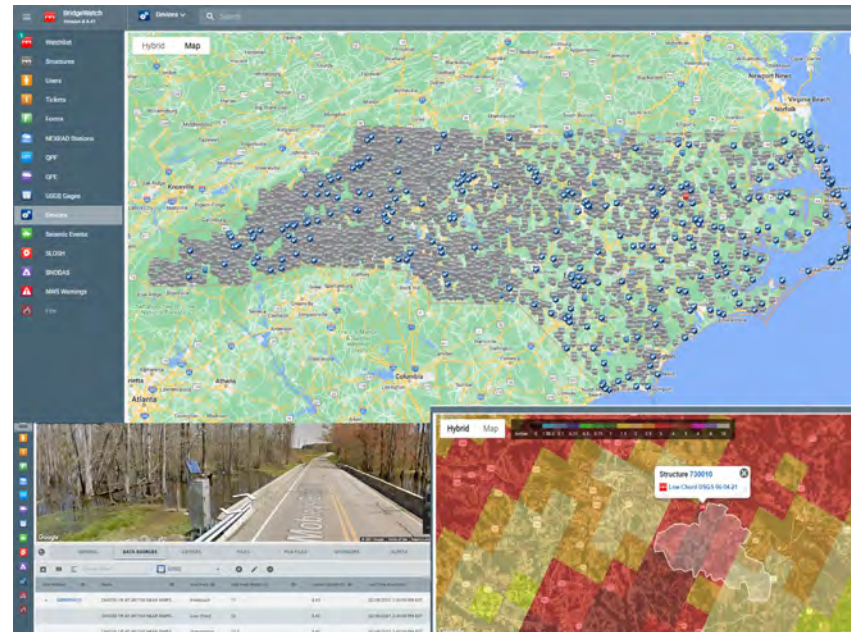
OVERVIEW OF INNOVATION

BridgeWatch empowers bridge management to predict, identify, prepare for, and record potentially destructive environmental events by proactively monitoring, in real-time, bridge infrastructure.

BridgeWatch collects and processes real-time data at regular intervals from meteorologic, hydrologic, and oceanographic sources, gauges, and other sensing devices. Data comparisons are then performed with internal NCDOT bridge parameters such as flood impact (floodwaters reaching structure levels) or roadway overtopping. NCDOT officials and Emergency managers can customize alerts, when appropriate, via any electronic medium (cell phones, email, application dashboard, etc.) when bridges are experiencing a dangerous or critical condition.

Officials are notified as sensors in the field detect water levels or high rainfall intensity levels that could indicate that the roadway is overtopped either at the bridge or bridge approaches based on elevation or design data. This valuable information can be used for road closure, emergency response, and post-event inspection prioritization.

In addition, BridgeWatch can also be utilized as a hands-on training and scenario tool for emergency evacuation or security drills with event simulation capabilities.



Source: BridgeWatch

BENEFITS

The benefits of using BridgeWatch include improved monitoring and awareness of structures impacted during major storm events.

In the past 3 years, the North Carolina DOT has piloted BridgeWatch and integrated it into its storm response. Structures management uses BridgeWatch alerted structures to aid in identification of critical structures to inspect post-storm.

FIND OUT MORE . . .

NCDOT BridgeWatch Website (Login Required) [BridgeWatch v8.4.41 from USEngineeringSolutions](#)

Hydraulics Storm Tools Website [NCDOT - Hydraulics & EM Flood Warning Tools - Home \(sharepoint.com\)](#)

US Engineering Solutions Website (BridgeWatch) <https://usengineeringsolutions.com/bridge-watch/>

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Structure Management, Flood Warning, Emergency Response, Situational Awareness, Roadway Flooding, Hydraulics, Operations,

T-SURGE



OVERVIEW OF INNOVATION

Expanding on the FIMAN-T (Flood Inundation Mapping and Alert Network for Transportation) system, T-Surge helps NCDOT identify potentially-impacted roadways and assets during a storm surge event.

Rather than relying on gauge-based data like the rest of the FIMAN-T network, this dashboard uses data from RENCI (Renaissance Computing Institute at The University of North Carolina), which models storm surge for the entire North Carolina coastline based on National Hurricane Center official advisories.

T-Surge automatically downloads maximum water elevation and wave height rasters as soon as they are available. This data runs through a model that maps predicted flood inundation extents and depths, and uses lidar-derived roadway elevations to estimate flooding along roadways. The roadway inundation is then viewable on the interactive dashboard application that allows users to view mapping, filter roads by type and depth of flooding, and view summaries of predicted impacts.

T-Surge provides visualization and metrics for roadway inundation from forecasted hurricane and tropical storm surges. The dashboard application maps predicted flood and roadway impacts for the entire North Carolina coastline. This information allows emergency managers and first responders to reach critical destinations, like hospitals, while avoiding potential roadway flooding.

BENEFITS

- Easily identify areas and roadways forecasted to be impacted by flooding during a storm event
- Provides summary reports and navigable tables for predicted roadway inundation to aid in quick decision-making
- Expands coverage to include all coastal areas

FIND OUT MORE . . .

[T-Surge Dashboard](#) (beta version – open to NCDOT staff)

NCDOT Hydraulics Unit

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Emergency Response/ Relief, Technology,
Roadway Flooding, Inundation Mapping,
Hurricane Preparedness

Commercial Service Vehicle Alerts



OVERVIEW OF INNOVATION

NJDOT wants to get more information into the hands of drivers about changing roadway conditions – the earlier the better – to inform their decision making in an effort to reduce crashes. Commercial vehicle alerts inform truck drivers of hazards on the road, such as sudden slowdowns, disabled vehicles, debris, and adverse weather conditions, before the truck is affected by the incident. The driver can seek an alternate route or pull over until the slowdown is cleared.

NJDOT partnered with INRIX which collects and delivers real-time data that detects and describes sudden slowdowns, closures, and queues by location for specific events, and Drivewyze which provides communication with some 2.8 million trucks via its Drivewyze application which is embedded in the electronic logging device (ELD) of the truck. Drivewyze takes data from INRIX and communicates it to commercial truck drivers.

With this system, NJDOT can identify hazards and prevent crashes by issuing alerts of adverse road conditions before problems arise.



Source: Sblover99, Wikimedia

BENEFITS

Commercial vehicle drivers can avoid slowdowns, choose alternate routes, or pull over which can increase efficiency.

Awareness of adverse road conditions can help prevent crashes to improve overall safety for roadway users. In one example, a "major winter storm alert" was distributed to several states in the Northeast and reached some 4,811 trucks at a critical time over a 30-hour period.

FIND OUT MORE . . .

National Operations for Excellence Webinar
<https://www.njdottechtransfer.net/NOE-CVA-webinar>

NJ STIC Crowdsourcing for Advancing Operations
<https://www.njdottechtransfer.net/NJSTIC-COA>

New Jersey Department of Transportation

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Safety, Technology, Freight/Goods Movement

Weather Savvy Roads Pilot Program

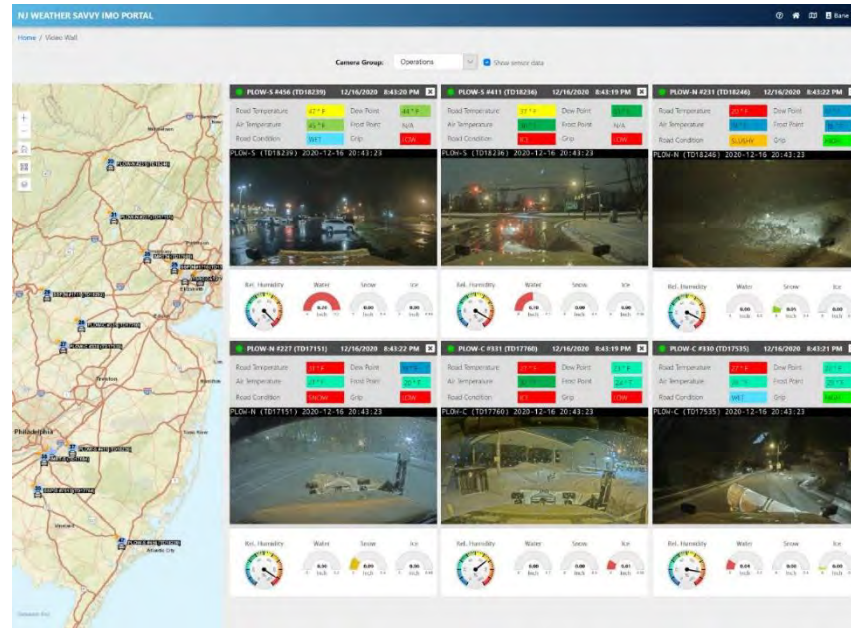


OVERVIEW OF INNOVATION

The deployment of real-time vehicle-based Intelligent Transportation System (ITS) road weather sensors and video cameras, improves NJDOT's ability to detect and forecast adverse road weather and pavement conditions, and determine the most effective roadway and traffic management response. These technologies have enabled the communication of critical road-weather data between vehicles, infrastructure, and Department personnel across the State to assess the impacts of weather on roads, vehicles, and travelers, and has also been used to inform the decision making process by the Department leadership.

NJDOT equipped 24 fleet vehicles with windshield cameras, mobile Road Weather Information Systems (RWIS) sensors, portable PC computers, and cellular routers. The equipment in each vehicle was integrated to provide a continuous feed of road weather data and video of the roadway conditions to the remote data center using cellular communications. The data feed from all vehicles was integrated in a unified data management platform, which also provided a web-based graphical user interface for data and video feed visualization, among other features.

The mobile RWIS provides information on ambient temperature, road temperature, road condition and grip, as well as a windshield view of road conditions. Management can see what the drivers are seeing. The information helps to assess a storm's duration and intensity while it is ongoing and helps management determine appropriate responses.



Source: New Jersey Department of Transportation

BENEFITS

Safety is improved through provision of a continuous feed of road weather data and video of roadway condition which can inform real-time management decisions, post-event analysis, and pavement treatment strategies.

Improves information sharing and communications among agencies including emergency services.

Real-time data is harnessed to inform weather responsive deployment of personnel and vehicle fleet which offers efficiencies for weather responsive management and operations.

FIND OUT MORE . . .

NJDOT Weather Savvy Roads Pilot: Update and Lessons Learned Summary
<https://www.njdottechtransfer.net/weather-savvy-update>

NJDOT Weather Savvy Roads Pilot Program: Final Report
<https://www.njdottechtransfer.net/weather-savvy-final-report>

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Safety, Operations, Technology

Catch Basin Trailer



OVERVIEW OF INNOVATION

Outfitting an available trailer with equipment and materials needed to replace or repair catch basins has improved service, increased efficiency, and reduced costs associated with this ongoing Violet Township, Ohio work.

Before implementing the trailer's use each catch basin took hours to repair. Preparing the materials and equipment would take at least an hour alone.

Its use also reduced the number of people and equipment that were needed for the work.

Using the trailer freed two employees that could be deployed for other work.

An additional benefit includes if a basin is observed in the field and needs repaired the only requirement now is hitching the trailer and returning to complete the needed work eliminating time consuming prep.



Outfitted trailer ready for catch basin repair project - Violet Township, Pickerington, Ohio

BENEFITS

Reduces set up and break down time.

Saves taxpayer funding.

FIND OUT MORE . . .

[Welcome to Violet Township, OH](#)

Violet Township

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Operations, structures, maintenance

Drone Bridge Inspection



OVERVIEW OF INNOVATION

The Ohio Department of Transportation's (ODOT) expansion of Unmanned Aircraft System (UAS) bridge inspections allowed the department to reduce costs and time associated with essential structure examinations.

ODOT used State Transportation Innovative Council (STIC) funding to purchase equipment and software for new and existing pilots.

A total of eight Skydio 2 UAS and one Skydio X2E were purchased using STIC and ODOT funding. Initially UAS's were mainly used as a supplement for snoopers truck inspections. However, the department is moving toward drone use for other services as well.

This migration to using UAS for bridge inspection has significant cost savings. A UAS inspection can be carried out by one or two bridge specialists, without any need for traffic management personnel or equipment. The use of drones for bridge inspections has saved the department over \$1.6 million.

The use of a drone to conduct bridge inspections eliminates the need for lane closures that can cause traffic delays and safety hazards that existed previously with snooper or bucket truck use.

Expanded drone bridge inspections were particularly beneficial during the height of COVID-19 because a minimal number of inspectors could complete this important task while social distancing.



Drone Bridge Inspection of the Jeremiah Morrow Bridge, Warren County, Ohio - Ohio Department of Transportation

BENEFITS

UAS inspection requires fewer people, less time, and reduces costs as compared to using a snooper truck.

Less travel disruption to motorists.

Improved safety conditions.

FIND OUT MORE . . .

[DriveOhio | Ohio.gov](https://www.driveohio.com)

[About UAS | Ohio Unmanned Aircraft Systems Center](#)

ODOT Office of Unmanned Aircraft Systems

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Safety, Operations, Structures, Technology,
Asset Management

Electric/Gas Utility Account Aggregation



OVERVIEW OF INNOVATION

Consolidating the Ohio Department of Transportation's (ODOT) electric and gas utility accounts saved state taxpayer's \$3 million over a four-year period.

ODOT consolidated over 3,000 various electric and gas utility accounts and bid on the open market.

This account combination took a great deal of coordination with ODOT 12 districts offices that were previously responsible for bidding their own accounts.

It was identified that ODOT could get better bids by aggregating all of the accounts. This effort took several years to synch the expiration date of all accounts so they could be bid together.

The savings from this activity is reinvested into the maintenance, preservation, and strategic expansion of Ohio's state transportation system.



ODOT consolidated over 3,000 various electric and gas utility accounts. - Ohio Department of Transportation

BENEFITS

Greater buying power and access.

Reduced energy pricing.

Lowered transaction costs.

FIND OUT MORE . . .

[Ohio Department of Transportation | Ohio.gov](https://www.ohio.gov)

ODOT Office of Facilities Management

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Operations, Maintenance

LED Highway Lighting Conversion



OVERVIEW OF INNOVATION

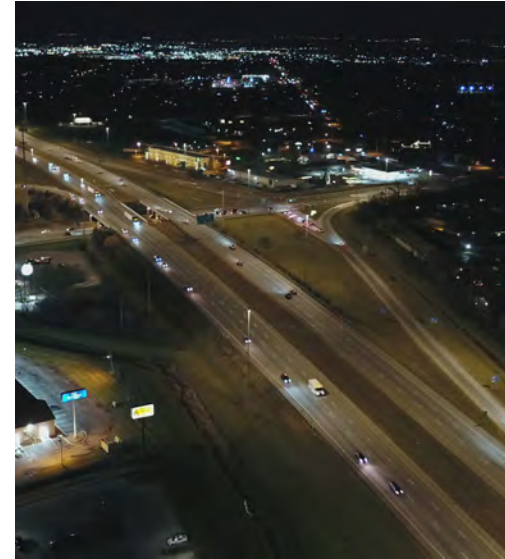
Replacing all high-pressure sodium lightbulbs with brighter, more efficient LED lights improves highway visibility and safety while reducing long-term maintenance costs.

The implementation of an Ohio Department of Transportation (ODOT) employee LED highway lighting conversion recommendation to the department's \$100 million cost savings initiative will result in a long-term savings of nearly \$27 million.

The project replaces all ODOT's existing high-pressure sodium luminaires on high and low mast light supports with more efficient LED luminaires that provide superior roadway illumination.

There are over 45,000 total luminaires lighting ODOT's system with more than 24,000 (over 53%) of being high-mast luminaires. The 19,000 high-pressure sodium lights will be replaced by 11,000 LED lights.

The conversion will save money, improve safety, and lower environmental impacts. This project is well underway and is expected to be completed by the summer of 2023.



Lucas County, Ohio I-75 and U.S. 20 interchange before (left) and after (right) LED highway lighting conversion. - Ohio Department of Transportation

BENEFITS

LED highway lighting improves nighttime visibility, increases safety, and reduces long-term maintenance costs.

Ohio's overall savings is projected to be nearly \$27 million.

FIND OUT MORE . . .

The following videos do not represent ODOT projects, rather they present the benefits of switching to LED lights from the HPS lamps:

[Wellesley Municipal Light Plant Switches to LED Street Lights – YouTube](#)

[Urban Green - Streetlight Replacement Project - December, 2018 - YouTube](#)

ODOT Office of Roadway Engineering

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Safety, Operations, Maintenance, Materials

Traffic Signal Test Cabinet



OVERVIEW OF INNOVATION

The fabrication of a test traffic signal by the Lucas County Engineers Office (LCEO) has allowed for troubleshooting in a controlled environment while eliminating the risks of working among live traffic.

Employees brainstormed various ideas including a “Virtual Cabinet” that eventually was ruled out because that approach wouldn’t allow physical elements of a traffic signal to be analyzed.

The LCEO repurposed an existing traffic signal cabinet and mocked it up as an actual physical signal in the traffic operations shop.

The LCEO currently uses a full NEMA TS1 signal cabinet located at its facility. This allows staff to troubleshoot, diagnosis, and test questionable equipment that has been removed from the field.

There are plans to build a second test signal NEMA TS2 in the future.

Staff knowledge and expertise will increase by having both types of signals that are in use in the field.

Traffic signal complaints or failures are addressed in a timely manner, due to accurate troubleshooting the test cabinet allows staff to perform.

Minimal costs because labor was performed in house using an existing traffic signal cabinet and components.



Equipped traffic signal ready to analyze defective equipment - Lucas County Engineer's Office

BENEFITS

Eliminates risk of working among live traffic.

Increases knowledge and troubleshooting capabilities.

Timely response to problems and outages.

Minimal costs.

FIND OUT MORE . . .

[Lucas County Engineer's Office | Lucas County, OH - Official Website](#)

Lucas County Engineers Office

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Safety, Operations, Technology

GTFS-ride: Easing the use of transit ridership data with a common data standard



OVERVIEW OF INNOVATION

- Transit ridership data is needed to set policy, develop plans, and prioritize investments but is not easily available and/or not in a useful standard format. Transit agencies vary widely in their ability to provide sufficient quantities of high-quality ridership data, and the data that does exist is often of little use due to a high level of aggregation, broad scope, sparsity, errors, and lack of standardization.
- These inconsistencies in the availability, format, and quality of ridership data make it very difficult (if not impossible) for entities with an interest in multi-agency transit networks to make effective and informed decisions. Regional governments, researchers, policymakers and transit agencies themselves don't have an easy way to collect, store, share, report, and analyze their ridership data.
- GTFS-ride provides a comprehensive (yet flexible) public transit ridership data standard. It was designed to improve the processes of ridership data collection, management, reporting, and analysis. Web-based software tools have been developed to support the core functionality of GTFS-ride.

BENEFITS

- Link ridership data to GTFS data accurately
- Identify the most productive route(s)
- Find the busiest/idle stops in the system
- Integrate with common transit analysis software
- Simplify reporting to the National Transit Database

FIND OUT MORE . . .

GTFS-ride: <http://gtfsride.org/>

GTFS-ride Github:
<https://github.com/ODOT-PTS/GTFS-ride>

Zephyr Foundation
<https://zephyrtransport.org/projects/5-transit-ridership-standard/>

Contact:

Name: Professor Dr. David Porter

Email: David.Porter@oregonstate.edu

Keywords: transit, bus, data, ridership, GTFS, GTFS-ride, analysis, data standard, route, stop, integration

Live Accident Notification Form



OVERVIEW OF INNOVATION

The live Accident Notification Form uses Microsoft Forms with an email notification to improve the line of communication.

When the unfortunate event occurs of an employee being injured on the job or being involved in an accident, a line of communication is needed to notify the appropriate staff. In the past, per PennDOT policy, a hard copy Accident Notification Form (ANF) would need to be completed and sent to key personnel, which could take up to two to three days for notifications to be completed. That's where the use of Microsoft Forms with an email notification came in to improve the line of communication of the ANF.

The ANF Microsoft Form was created for time-sensitive information to be emailed to the appropriate people regarding any accident and/or injury within the district. It was created with the goal of having the foreman, supervisor, or manager complete the form once they arrive on the site of an accident. The reporting tool gives a snapshot of the severity of the accident and provides time-sensitive information. Once submitted, a high priority email is sent to key personnel within the district and PennDOT's Safety Division.

The "live" link to the form was placed on all iOS user devices within the district and displays on the home screen in the same way as an app. A user accesses the form by tapping on the icon, which then accesses Microsoft Forms through the user's web browser.

The screenshot shows a mobile form interface with the following sections:

- 10. Type of Accident:** Radio buttons for "Work Related Injury" (selected), "Fleet/Equipment Accident", and "Med Express".
- 11. Nature of Injury:** A text input field with the placeholder "Enter your answer".
- 12. Body Part Affected:** A text input field with the placeholder "Enter your answer".
- 13. Medical Treatment Received:** Radio buttons for "None", "First Aid", and "Med Express".
- 14. Method of Transportation:** Radio buttons for "Hospital/ER" (selected), "Foreman/Co-Worker Driven", "Ambulance", and "Medical Helicopter".
- A green "Submit" button.
- Footer text: "Never give out your password. Report abuse", "Powered by Microsoft Forms | The owner of this form has not provided a privacy statement as to how they will use your response data. Do not provide personal or sensitive information. | Terms of Use".

Live link to form was placed on all iOS devices. Source: PennDOT

BENEFITS

The benefits of using the live Accident Notification Form include expediting the notifications to key personnel in two to three minutes compared to two to three days and eliminating the use of hard copies.

FIND OUT MORE . . .

Pennsylvania DOT

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Safety, Operations

Spreader Chute for Winter Operations

OVERVIEW OF INNOVATION

The spreader chute directly deposits materials to the shoulders making repairs more efficient, easier, and safer.

In the past, when placing materials to repair roadway shoulders during the winter months, an additional piece of equipment or effort was needed due to the truck's salt spreader being in the way. If this work was being done during mild winter days, it meant removing the winter material spreaders from the dump truck and then reattaching it in preparation for winter weather.

To eliminate or decrease some of that work, Warren County in PennDOT's Engineering District 1 fashioned a prototype chute from a PVC pipe. The goal was to find a way to cover and bypass the spreader while also efficiently place the material along the shoulder. Once the prototype was approved, the county upgraded to a metal chute. The total material costs were approximately \$300 compared to purchasing one for approximately \$750.

The aluminum device attaches to the spreader and can be used to fill low shoulders along the roadway without having to remove the spreader. The chute directs material to the shoulders to fill low spots while keeping the equipment and truck on the main road. Along with making shoulder repairs easier and more efficient, using the chute also created safer work conditions for the operators and laborers.



Aluminum device attaches to the spreader. Source: PennDOT

BENEFITS

The benefits of using the spreader chute include directly depositing materials to the shoulders while keeping the truck and equipment on the roadway. Not only is this more efficient, but it is safer for the crew.

FIND OUT MORE . . .

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Maintenance, Construction

Hybrid EDC Training: Success Stories of Next Generation TIM & Microsurfacing Using Drones in Puerto Rico



OVERVIEW OF INNOVATION

The Puerto Rico LTAP has adapted its training program to address a combination of strategic virtual webinars, field demonstration of EDC proven initiatives combined with UAS (unmanned aerial systems), and in-person seminars to be able to open the educational spread to all of our stakeholders. Vital elements for the success of the hybrid EDC trainings in Puerto Rico includes:

- Webinar to present the practical uses of UAS in the transportation area.
- Field Demonstration with different types of drones used for Traffic Incident Management.
- Hands-on practice on flying a UAS.
- Assistance in taking *The Recreational UAS Safety Test* (TRUST) Certificate.
- Includes a bilingual translation of pertinent technical information when a SME (subject matter expert) from State and Federal agencies from Puerto Rico and the US are in the same technical session.
- Use of mentimeter with strategic poll questions to know the diversity of our participants and promote active participation in the hybrid training.



Sources/Credits: Puerto Rico LTAP-T², FHWA, PRHTA & NICR

BENEFITS

A 100% increase in participation in virtual events.

Improve adult learning with one-to-one technical assistance in using apps; train-the-trainer with field demos and technical assistance in the process for UAS recreational license exam.

Raise safety awareness in work zones for all users.

The learning process of EDC initiatives and emerging technologies is fun and exciting for participants of all ages, and is cost effective.

FIND OUT MORE . . .

PRLTAP Website

<https://www.prltap.org>

PRLTAP Webinars Recordings

<https://www.gotostage.com/channel/prltap>

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Technology Transfer, Continuing Education, TIM, EDC, Traffic Incident Management

Creating a Resilient Port System in Texas: Assessing and Mitigating Extreme Weather Events



OVERVIEW OF INNOVATION

Extreme weather events, such as hurricanes and tropical storms, pose considerable challenges to the Texas port system. Given the economic and strategic significance of the Texas port system, ensuring its resilience against such hazards is essential.

The port resilience assessment considered not only the ability of the port system to endure the extreme weather events, but also the other aspects of port operations that augment rapid restoration and recovery of constituent infrastructure components if impacted by large-scale extreme weather events.

The project employed techniques capable for assessing both quantitative and qualitative aspects of risk and resilience so that the findings from the research could be immediately implemented to improve real-world practices.

BENEFITS

The project team provided port resilience improvement recommendations to TxDOT, the Texas legislature, port authorities, port tenants, and other stakeholders to act on, respectively.

FIND OUT MORE . . .

Project Web Link: [TxDOT Research Library: Project No. 0-7055](#) – Creating a Resilient Port System in Texas: Assessing and Mitigating Extreme Weather Events

Video: <https://youtu.be/5wB1ZMr9Pp4>

Texas STIC Website: <http://txstic.org/>

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Keywords: Planning, Emergency Response/Relief, Freight/Goods Movement

Freight Optimization in Dallas-Fort Worth (DFW)



North Central Texas
Council of Governments

OVERVIEW OF INNOVATION

At the intersection of multiple interstate highways and Class 1 railroads, plus DFW Airport, DFW is a key part of the nation's freight system. This North Central Texas Council of Governments (NCTCOG) project is intended to **optimize the flow of freight vehicles through up to 500 signalized intersections in the region** to improve traffic flow between regional freight hubs and expressways.

The project is the first to combine Green Light Optimized Signal Advisory (GLOSA) and signal priority solutions. The project will use existing in-vehicle technology and established NTCIP protocols. No new roadside or onboard vehicle equipment will be required. When fully built out, the system will operate in up to ten jurisdictions and serve up to 5,000 vehicles simultaneously.

Through use of smartphone apps, the system is accessible even by truckers that lack AVL equipment in their cabs. NCTCOG's contract with the integrator includes a performance incentive payable when the system delivers travel times savings for freight vehicles at least equal to the amount of NCTCOG's investment, aligning public and private sector incentives. Local authorities can retain full control over their traffic signals; the project is a collaborative effort informed by a detailed performance dashboard that will guide system optimization adjustments over the course of the project.

BENEFITS

Lessening the number of freight vehicle stops and starts at signalized intersections will improve traffic flow for all vehicles and deliver safety benefits such as reduced rear end collisions. Based on past research, emissions reductions in the range of 5%-10% are anticipated from less truck idling and fewer deceleration/acceleration cycles. Travel time savings for freight vehicles will help lower the cost of the freight being delivered, a tangible economic benefit. There may be travel time savings for non-freight vehicles as well.

FIND OUT MORE . . .

Weblink:

NCTCOG - Freight Vehicle
Intersection Optimization Services
<https://freightpriority.com/>

Texas STIC Website: <http://txstic.org/>

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Keywords: Freight/Goods Movement, Safety,
and Operations

Saddle Lift Tool Makes Sign Repairs Safer and Faster



OVERVIEW OF INNOVATION

The saddle lift tool is a low-cost device that allows UDOT crews to quickly and safely repair SN14 signs, without the need for a crane or the closure of a lane of traffic.

Barrier mounted signs (Median Concrete Barrier Pivot Sign Base—SN14) are designed with a safety feature so that, if impacted, the sign post stays attached to the sign base, but swings down into a resting position.

To repair the sign, someone must raise the post to the correct upright position and insert a new pin into the sign base. This means having a couple of workers stand on the concrete barrier to lift the sign themselves. Or, they can close a lane (often the HOV lane) and use a crane to lift the sign. Either way, it is dangerous, resource-intensive, and time-consuming work.

The new tool easily raises the sign post using a truck-mounted winch. First the saddle lift is secured to the sign mount using the sign base bolt. The saddle lift can be mounted to pull the sign in either direction as needed. Once the tool is secured, a cable connects a square bracket to the sign post; the other end of the cable is connected to a vehicle winch cable. The winch provides the mechanical force to lift the sign post while the built-in rollers maintain correct cable alignment, regardless of the position of the winch. The sign is held in the correct position while the replacement pin is inserted in the base and, if needed, the ARGO safety bumper can be installed. Once the sign is repaired, the winch cable is released and the bracket is removed from the post. The saddle lift is disconnected from the base and the base bolt is again secured to the barrier.



Source: UDOT image

BENEFITS

Using this tool reduces the number of workers required to repair a sign, does not require a crane truck or closing a lane of traffic, and workers do not have to lift a sign while standing on the edge of the wall.

FIND OUT MORE . . .

Web link:

[YouTube Innovation Station Video](#)

Information from 2023 Innovation and Efficiency Report

[Saddle Lift Tool](#)

For more information:

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Maintenance, Operations

Wildlife Carcass Removal App



OVERVIEW OF INNOVATION

An app for use by maintenance contractors provides a streamlined and accurate means of tracking wildlife carcass removals and identifying crash hotspots.

Virginia is considered a high-risk state with regard to deer-vehicle collisions, but the magnitude of this problem is not reflected by the police report data used by transportation staff for safety evaluations. This project provides the Virginia DOT (VDOT) with a standardized method of collecting wildlife carcass removal data and tools that allow for simple visualization and identification of wildlife crash problem areas.

Using input gathered from a variety of VDOT staff, researchers developed and tested a web-based app for use by interstate maintenance contractors to record animal carcass removals at their removal site. Data display and evaluation tools were customized to allow maintenance staff to create work tracking reports. The data allows researchers, traffic engineers, and project managers to identify wildlife crash risk areas for the consideration of countermeasures.

BENEFITS

Previous research found that deer carcass removals are up to 9 times higher than the number of deer crashes in police reports. Use of the app not only results in an accurate dataset on wildlife crash locations, but provides transportation staff a more streamlined and efficient contract management process.

FIND OUT MORE . . .

VDOT Wildlife Carcass Tracking Map

<https://arcg.is/1WL00L>

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Web-based app, deer-vehicle collisions, wildlife carcass removal data, wildlife crashes

Informative Monitoring Platform: Reporting the Occupancy of Vehicles (IMPROVE)



OVERVIEW OF INNOVATION

The Informative Monitoring Platform offers an innovative methodology for extracting multi-year vehicle occupancy rates, providing long-term data for improved project management, transportation systems design, and sustainable development.

Publicly available web-based occupancy maps are created for cities, block groups, and roadways based on crash data. This methodology, which integrates a small number of field observations with the large number vehicle crashes, partially controls for crash bias and provides otherwise costly-to-obtain vehicle occupancies. These online maps can be updated annually.

Automated workflow tools have been developed in the form of Python modules and GIS models which helps to efficiently process occupancy data. Considering the high cost of vehicle occupancy field data collection, IMPROVE provides a cost-effective means to estimate occupancies for regions, counties, cities, smaller block groups, and roadways (see figure).

IMPROVE supports decision-making opportunities for planners and engineers in terms of project management and capital outlay. Because higher vehicle occupancies are associated with reduced emissions, IMPROVE strengthens the connection between investment decisions and environmental impacts.

BENEFITS

1. **Project Prioritization:** person throughput—the product of vehicle throughput and vehicle occupancy—account for 45% of a project's evaluation in the urban Virginia project prioritization process. (An occupancy change of 0.10 affects around \$34 million in a case study.)
2. **Planning Tasks:** Long-term occupancy trends support transit design, travel demand models, and alternatives analysis.
3. Occupancy data support **"flexing" federal funds** for goals of single occupant vehicle reduction and improved air quality.

FIND OUT MORE . . .

IMPROVE - Corridor Level Occupancy Map:

<https://arcg.is/159nan>

IMPROVE - Block Group Level Occupancy Map:

<https://arcg.is/1uzqzmz0>

IMPROVE – VDOT District Level Occupancy Map:

<https://arcg.is/0m454u0>

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Keywords:

Vehicle Occupancy, Single Occupant Vehicles, High Occupancy Vehicles, Data Collection

The Low Voltage Auto Start System: We'll leave the light on for you.



OVERVIEW OF INNOVATION

Often, WSDOT vehicles equipped with beacon lights or message signs need to be left in a work zone or near a hazard for prolonged periods of time. This system ensures that when it's time to head for the barn, the vehicle starts right up.

The Low Voltage Auto Start system took the top prize of the WSDOT Innovations Challenge in 2022.

This system integrates into the vehicle using factory electrical connectors and allows the operator to leave a vehicle unattended with warning and information delivering devices communicating to the traveling public.

When activated, the system battery voltage is monitored. When the system voltage drops to 11.5 volts, the vehicle will start up and run for a predetermined time period to properly charge the batteries. When that time period ends, the system shuts the vehicle off. The system will continue to operate in this manner until deactivated and includes safety features for technicians including preventing activation if the hood is open or the doors are unlocked. To prevent theft, when the system is activated and the brake pedal is pressed, the engine shuts off.



Employee Solutions
Making a Difference



Source: WSDOT Fleet Operations

BENEFITS

- A reduction in idle time by 70%.
- Reduced fuel consumption.
- Reduced Carbon Footprint.
- Reduced Maintenance on Heavy Truck Emission Components.

FIND OUT MORE . . .

[Low Voltage Auto Start video](#)

The WSDOT Innovation Challenge is open to all full-time maintenance and operations employees. All Innovations must be in use and showing desired results.

Categories include - Tools & Equipment, Technology Best Practices, and Techniques Best Practices.

<https://www.wsdot.wa.gov/>

WSDOT Innovation Challenge Resources

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Innovations challenge, Auto Start, No Idle, Sustainability, Safety, Operations, Environment, Maintenance.

Movable Sign Fabrication Table

Innovative Design for Easy Adjustment and Efficiency in Building Signs



OVERVIEW OF INNOVATION

The two-person Sign Installation Team at the Washington State Department of Transportation in South Central Region is responsible for building and installing signs along highways in the region. Each sign is delivered in panels to be built before installation. Due to the large size of the signs, the team noticed the stationary table they were using was starting to affect them physically. They needed a table that could adjust to the height of the sign during fabrication. After researching a variety of designs and models, the team designed a hybrid model to fit their needs – a table with easy adjustment to efficiently build signs with less physical demand.



Source: WSDOT



Source: WSDOT

BENEFITS

Benefits of using the movable sign fabrication table are:

- **less physical strain on workers**
- **improved sign fabrication efficiency.**

Using the movable sign fabrication table decreases the likelihood of injury and burn out of the team.

FIND OUT MORE

Sign Shop Website:

<https://wsdot.wa.gov/business-wsdot/highway-signs/sign-shop>

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Sign fabrication table, easy adjustment, efficiency to building signs, design lessens physical demand, operations, safety, design, ergonomic

Spokane County Design and Fabrication of Grader Boots (Snow and Gravel)



OVERVIEW OF INNOVATION

Spokane County ER&R Crew designed and fabricated new boots for County graders to optimize multiple pieces of equipment, while saving overall costs.

Spokane County welders designed a boot that would require no modification to fit on motor graders from different manufacturers (e.g., Caterpillar and John Deere). The mounting plate on the moldboard is the only thing that is different.

The citizens of Spokane County have been requesting that the snow berms in their driveways be manageable to remove. The County's motor graders are used in both rural and urban operations. In the rural area, snow wings are required. In the urban area snow boots are required. The welders designed and fabricated a boot that was the right size and could be quickly fitted to all motor graders, no matter the manufacturer. The quick release attachment means our staff can quickly and easily change out the product on multiple pieces of equipment while not having to remove the existing wing.

In addition to optimizing operational time and getting a great product, approximately \$243,000 in costs were saved in the production of 26 boots versus purchasing a product that would have to be modified to meet all the County's needs.



Source: Spokane County

BENEFITS

By designing and manufacturing snow boots in house, Spokane County can:

- **optimize time,**
- **save on costs, and**
- **get the exact product needed in the field.**

FIND OUT MORE . . .

Spokane County

[Spokane County, WA | Official Website](#)

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Snow Boot, Grader, Fabrication, Design, Operations, Maintenance