

National STIC Network Showcase 2023



Category:

Planning & Environment



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.

Contents:

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

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

CA: DISTRICT 11 Wrong Way Driver Offramp Enhancement Package

DE: Parklet Pilot Program

FL: Intersection Lighting Retrofits: Improving Existing Street Lighting for Crosswalk Safety

FL: LED Luminary Glare Shield Improves Visibility for Motorists

FL: eSTORM—an Innovative Emergency Management Device Operational Status Platform

FL: Internally Cured Concrete in Florida's Concrete Bridge Decks and Rigid Pavements

FL: ZICLA Zipper System on Oakridge Boulevard (SR 430)

IA: Flood Resiliency Analysis Tool

IA: Public Involvement Management Application

ID: Federal Grant Notification Newsletter

ID: Temporary Traffic Signal with Bicyclist Button

IL: Solar Sites

KS: Development of a Rural Primary Road System (RPRS)

MI: Slope Restoration on Urban Freeways

MO: Additional 5% Increased Federal Share

MS: Virtual Public Involvement (VPI)

NC: T-SURGE

NC: Right-Of-Way and Utility Dashboard

NH: An engineered log jam provides erosion defense along the Magalloway River in Errol, New Hampshire

NH: Improving a road-stream crossing in northern New Hampshire benefits Eastern brook trout and mammals

NJ: Bicycle-Friendly Resurfacing in Mercer County

NJ: Virtual Public Involvement

OH: Bridge Upcycling

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

PR: PMIS and its benefits for e-construction

PR: Puerto Rico Road Safety Observatory

SC: Develop a DOT Specific UAS Simulator and Flight Proficiency Exam

SC: Strategic Deployment of Drone Technology and Software to Support SCDOT Operations

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

TX: Assessing Efficacy of Amphibian and Reptile Exclusion Fence (AREF) to Prevent Herpetofauna, with Emphasis on Houston Toad, from Entering Construction Zones

UT: Dash Cam Imaging Improves Outdoor Advertising Enforcement

VA: Wildlife Carcass Removal App

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

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

WA: WSDOT Diversity, Equity, & Inclusion (DEI) Plan

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

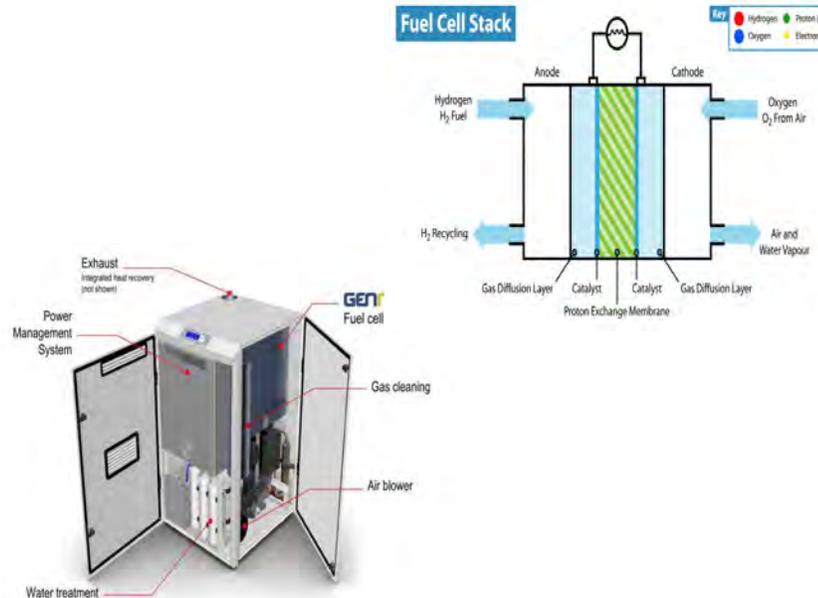
In response to severe weather, a Public Safety Power Shutoff (PSPS) are a preventative measure where regional power utilities may temporarily turn off power to specific areas to reduce the risk of fires caused by electric infrastructure. PSPS events could last from a few hours to several days.

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

Louie La Compte
Electrical Systems Support
Phone: (858) 467-3219
Email: louie.lacompte@dot.ca.gov

Mona Attallah, Supervisor Electrical Systems
Phone: (858) 467-3060
Email: mona.attallah@dot.ca.gov

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

Nikki Tiongco
SCTC, Corridor Project Director

Phone: (619) 909-6308
Email: nikki.tiongco@dot.ca.gov

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

May Alsheikh
Chief (Acting), Safety Program

Phone: (619) 688-6640
Email: may.z.alsheikh@dot.ca.gov

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

Parklet Pilot Program



OVERVIEW OF INNOVATION

Parklets are public seating platforms that convert curbside parking spaces into vibrant community spaces.

Most parklets have a distinctive design that incorporates seating, greenery, and/or bike racks and accommodate unmet demand for public space on thriving neighborhood retail streets or commercial areas. Parklets are typically applied where narrow or congested sidewalks prevent the installation of traditional sidewalk cafes, or where local property owners or residents see a need to expand the seating capacity and public space on a given street.

Dover Kent MPO has made available a “mobile parklet” that can be loaned to Kent County municipalities and other partners for use as a pilot, for special events, etc. The MPO developed a Parklet How-to Guide specific to Kent County. Particular attention was paid to sample local ordinances, liability issues, equipment options and specifications, accessibility, etc. The MPO utilized STIC funds to create and administer a Parklet Mini Grant program for Kent County municipalities to apply for and receive partial reimbursement for parklet implementation (purchase of equipment, site preparation, signage, etc.) MPO staff provides technical assistance to municipalities seeking to adopt a parklet program.

Since parklets occupy space in the public roadway, suitable locations are those where traffic flow is relatively calm and sidewalk conditions are adequate for pedestrians. Not only do parklets offer a relatively easy urban solution to open space, they also have enormous potential to improve the safety and experience of pedestrians and bicyclists.

Parklets repurpose two to three parking stalls along a block as a space for people to relax, drink a cup of coffee, and enjoy the city around them. Parklets do this by building out a platform into the parking lane so that the grade of the sidewalk gets carried out into the parking lane.



Source:
Dover Kent MPO



BENEFITS

Parklets symbolize the desire to create a more communal, enjoyable, healthy, and vibrant public realm. Transforming excess street space into a cost-effective, small park can have a big impact.

Overall, these installations are re-imagining small portions of the urban landscape from ordinary car-storage spaces into beautiful public space assets for all to enjoy.

FIND OUT MORE . . .

What Is A Parklet?

https://www.youtube.com/watch?v=TW5txUKjKRI&ab_channel=Dover%2FKentCountyMPO

Parklet Pilot Program Presentation Slides

<https://doverkentmpo.delaware.gov/files/2021/10/Parklet-pilot-program-1.pdf>

Parklet How-to Guide

<https://doverkentmpo.delaware.gov/files/2022/03/how-to-guide-final-1.pdf>

Parklet Mini Grant Application

<https://doverkentmpo.delaware.gov/files/2022/04/mini-grant-guidance-application-v2.pdf>

Marilyn J. Smith

302.387.6030

marilyn.smith@doverkentmpo.org

Helen Wiles

302.387.6026

helen.wiles@doverkentmpo.org

Keywords:

parklet, urban street design, traffic calming

Intersection Lighting Retrofits: Improving Existing Street Lighting for Crosswalk Safety



OVERVIEW OF INNOVATION

Florida DOT has a unique, systemic program to upgrade existing intersection lighting to increase safety at crosswalks, known as “Intersection Lighting Retrofits.” Sufficient intersection lighting is proven to reduce nighttime pedestrian crashes by over 40%.¹

After a multi-year program, FDOT has now installed “Intersection Lighting Retrofits” at over 1,800 intersections. This is the result of a strategic initiative to improve the lighting of pedestrian crosswalks at over 2,500 signalized intersections by 2024.

In general, these retrofit operations include switching old lamps to new LED technology in order to meet the FDOT’s own vertical illumination criteria. Additionally, new light poles or fixture mounting arms may be added among existing structures to improve the directionality of light projected on pedestrians.

Prior to launching this retrofit program, FDOT developed the policy and lighting criteria to define an “Intersection Lighting Retrofit” operation and achieve positive contrast of pedestrians in crosswalks as recommended by AASHTO and the Illuminating Engineering Society (IES). Positive contrast is generally found by placing streetlights between crosswalks and approaching vehicles, thereby illuminating the front of pedestrians from the driver’s perspective. This helps approaching drivers to better see pedestrians and avoid crosswalk collisions.

1. “Handbook of Road Safety Measures.” Elvik & Vaa, Oxford, United Kingdom, Elsevier



Source: FDOT Research BDV25-977-60

BENEFITS

Intersection Lighting Retrofits allow for:

- Lower cost lighting improvements at signalized intersections as existing structures do not require removal or rebuilding
- Greater numbers of signalized intersections with vertical illumination design and positive contrast for pedestrian lighting
- Improved nighttime driver visibility and pedestrian safety at signalized intersection crosswalks

FIND OUT MORE . . .

FHWA Video:

<https://www.youtube.com/watch?v=E0A6Ha5eQmo>

FDOT Roadway Design Office

Richard Stepp, P.E.

(850) 414-4313,

richard.stepp@dot.state.fl.us

Keywords: Light, Streetlight, Intersection, Crosswalk, Safety, Environment, Design

LED Luminary Glare Shield Improves Visibility for Motorists



OVERVIEW OF INNOVATION

William “Bill” McGhee, the FDOT District 5 Field Maintenance Manager, was presented with the Secretary’s Innovation & Efficiency Award for his display of innovation and commitment to safety. When a concern was identified regarding 149 LED luminaries creating glares for motorists on the U.S. 17-92 bridge over the St. John’s River in Debarry, Florida, McGhee went to work and developed a solution. He designed 12 light shields out of sheet metal for the luminaries that light up the multi-use path along the bridge, improving visibility for motorists without sacrificing visibility for pedestrians or bicyclists. McGhee even dipped the shields in liquid rubber to remove any sharp edges to prevent possible injury.

Creating and installing these shields in-house are also a cost savings for FDOT. If the remaining 137 luminaries were contracted, the cost to the agency would be near \$50,000.

BENEFITS

Safely light the multi-use path along the bridge, removing glare for motorists.

Near \$50,000 savings to the Department by performing in-house.

FIND OUT MORE . . .

FDOT DeLand Operations

Christine Barone
(386) 740-3401,
Christine.barone@dot.state.fl.us

Rick Snow
(386) 740-3414,
Rick.snow@dot.state.fl.us

Luminaries, lighting, maintenance,
environment, design, safety

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

Contact Info:

Mariano Amicarelli, FDOT Central Office

Mariano.Amicarelli@dot.state.fl.us ; 850-510-5100

Amy DiRusso, FDOT District 3

Amy.dirusso@dot.state.fl.us; 850-330-1241

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

Internally Cured Concrete in Florida's Concrete Bridge Decks and Rigid Pavements

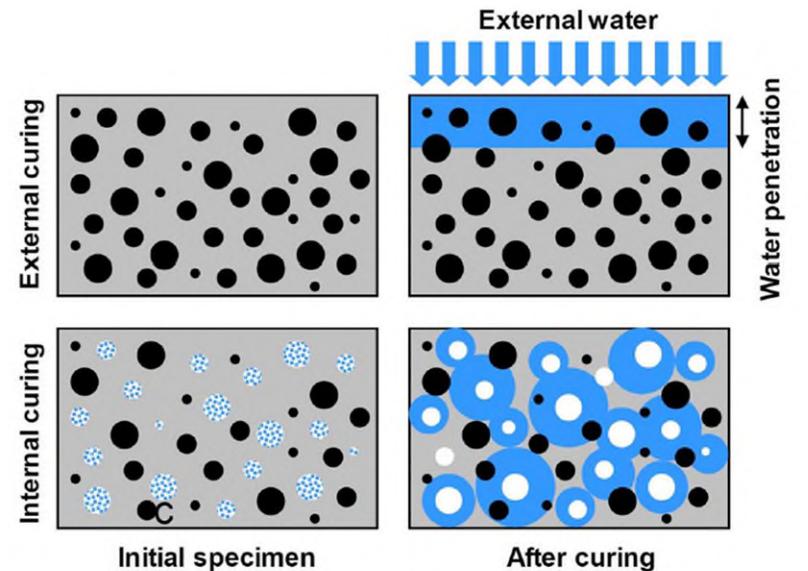


OVERVIEW OF INNOVATION

Typically, high-strength concrete used in bridge decks and rigid pavements has very high early-age shrinkage, which often leads to cracking. Cracks can greatly decrease the structural service life, causing decks or pavements to prematurely fail.

The innovative approach of internal curing concrete was investigated by the Florida Department of Transportation (FDOT) in partnership with the University of Florida. The resulting research concluded that resistance to shrinkage cracking was substantially higher for Internally Cured Concrete (ICC) than for standard high-strength concrete. Additionally, permeability of the ICC was reduced/improved compared to standard high-strength concrete.

As a result of its research, FDOT developed and implemented standard specifications for ICC and currently allows its use in bridge decks and rigid pavements.



● Normal aggregate ● Water-filled intrusion ● Cured zone

National Institute of Standards and Technology, U.S. Department of Commerce

BENEFITS

Durability (Reduced Cracking and Permeability), Reduced cracking due to reduced early-age shrinkage, Improved hydration – no self-desiccation, denser interfacial transition zone, Reduced permeability – less ingress of chlorides, etc., Reduced slab curling and warping

Structural Endurance (Reduced Cracking & Fatigue), Small reduction in weight, Lower elastic modulus, Lower coefficient of thermal expansion, Small increase in strength

FIND OUT MORE . . .

Mitigation of Cracking in Florida Structural Concrete
[Summary](#) | [Final Report](#)

Internally Cured Concrete for Pavement and Bridge Deck Applications
[Summary](#) | [Final Report](#)

FDOT State Materials Office

Harvey (Dale) DeFord, PhD
(352) 955-6671, harvey.deford@dot.state.fl.us

Jose Armenteros, PE
(352) 955-6666, jose.Armenteros@dot.state.fl.us

Keywords:

internally cured concrete, lightweight aggregate, bridge deck, pavement slab, coefficient of thermal expansion, modulus of elasticity, shrinkage cracking, restrained shrinkage, sustainability, pavement, structures, materials

ZICLA Zipper System on Oakridge Boulevard (SR 430)



OVERVIEW OF INNOVATION

This project implemented safety improvements on Oakridge Boulevard (State Road (S.R.) 430) from the east side of the Halifax River to S.R. A1A. The roadway was repurposed by reducing the number of travel lanes from three to two and creating a 7-foot-wide, green, buffered bicycle lane.

As part of this project, the Department introduced the innovative ZICLA Zipper bicycle buffering system, which is the first of its kind to be used in an FDOT construction project. The ZICLA Zipper system is a series of reflective, raised separators designed to protect cyclists and prevent motorists from entering the bike lane. The ZICLA Zipper is widely used in Spain and provides real and perceived safety benefits to cyclists. They are highly visible because 50% of the surface is retroreflective.

Other improvements include a dedicated left-turn lane from Oakridge Boulevard onto Halifax Avenue, repaving Oakridge Boulevard to extend the life of the existing roadway, and landscaping enhancements. Additional pedestrian and bicycle improvements are also included in the project such as upgrading existing sidewalks and adding a bicycle lane transition at Grandview Avenue. A bicycle lane transition provides a place where bicyclists can safely and easily access the sidewalk from the bicycle lane.



Source: FDOT

BENEFITS

- Improved safety for bicyclists
- Improved non-motorized travel options
- Enhanced corridor aesthetics

FIND OUT MORE . . .

Project website -

<https://www.cflroads.com/project/441139-1>

ZICLA website -

<https://www.zicla.com/en/zipper/>

FDOT Project Manager:

Steven Buck, P.E.
Project Development Administrator
386-943-5171
Steven.Buck@dot.state.fl.us

Keywords

ZICLA Zipper bicycle buffering system, lane repurposing , safety, environment, design

Flood Resiliency Analysis Tool



OVERVIEW OF INNOVATION

A methodological framework helps Iowa DOT identify the roads most vulnerable to extreme flood events and prioritize the state's investments.

As severe floods in Iowa become more frequent, catastrophic, and costly, understanding the risks to the state's infrastructure and preparing for changing conditions can make a big difference in how quickly the state recovers from potential disruptions.

In 2021, the Iowa DOT asked its Resiliency Working Group to develop a flood resiliency methodology that could be integrated into the agency's decision-making process and long-range planning activities. The group conducted a review of the state's primary highway system, identifying the corridors at greatest risk of extreme flooding and developing a methodology to objectively determine where mitigation efforts and investments would be most beneficial.

By considering seven weighted factors, Iowa DOT engineers can give each of the state's key highway segments a composite score up to 100. The higher the score, the greater the corridor's resiliency in the event of a 100-year flood.



Source: Iowa DOT

BENEFITS

Understanding the risks to the state's highways can help Iowa DOT plan for and invest in appropriate mitigation measures that minimize transportation-related disruptions in the event of a severe flood.

The metrics and framework used in Iowa's resiliency analysis tool can be easily replicated or adapted by other transportation agencies.

FIND OUT MORE . . .

Iowa DOT Resiliency Working Group
<https://iowadot.gov/sustainabilityandresiliency/Up-Close-Resiliency-Working-Group#53947672-i-classfa-fa-map-aria-hiddentruei-our-strategies>

Iowa DOT Resiliency Working Group

Craig Markley
515-239-1027, Craig.Markley@iowadot.us

Samuel Sturtz
515-239-1788, Samuel.Sturtz@iowadot.us

Planning, Structures, Asset Management,
Emergency Response, Emergency Relief,
Stormwater Management

Public Involvement Management Application



OVERVIEW OF INNOVATION

A powerful virtual tool facilitates management and coordination of public engagement and agency communications for thousands of active and completed transportation projects.

Across the state, Iowa DOT manages approximately 4,000 active transportation projects at any given time. However, the agency only has two staff members devoted to coordinating public and stakeholder involvement throughout the development and construction process.

To provide its Public Involvement staff with the right tools for this important work, Iowa DOT developed the Public Involvement Management Application, or PIMA, in 2015 to manage registrations for public meetings. Since that time the app has expanded to also manage stakeholder contact information, track project feedback and agency responses, collect and report project-specific data and analytics, and more.

Iowa DOT is part of multi-state PIMA consortium that also includes Maine, Wisconsin, Massachusetts, and Texas. Representatives from these states meet monthly to discuss the app's usage and potential improvements. The consortium's no-cost sharing agreement gives member states full access to all updates and improvements while allowing each state to implement the features that support their particular needs and stakeholders.

SHARE YOUR FEEDBACK ON PROJECTS & STUDIES

We are committed to improving our transportation system through your participation and feedback. Public hearings, meetings, and notices allow you to take part in the planning process and help you better understand the highway projects and studies that affect your community. We provide auto-translation tools on this website if you have limited English skills. Iowa DOT does not guarantee the accuracy of auto-translation tools. For more information, see the disclaimer below. If you need more help, please email the project contact listed on each project web page.

SEARCH PROJECTS & STUDIES

Search the site for project information, handouts and materials. Includes both current and historical project info.

MAP SEARCH

Find any active project or study on our interactive map. Share your thoughts and view feedback.



Source: Iowa DOT

BENEFITS

PIMA gives a two-person staff the power to successfully manage details and communications regarding thousands of transportation projects across Iowa. By sharing the costs and benefits of developing and maintaining the application, the multi-state PIMA consortium maximizes the app's potential. Recent and in-progress improvements include a dashboard that shows the equity of transportation projects as well as an extension that allows access via cell phone.

FIND OUT MORE . . .

Iowa DOT's Public Involvement Website
<https://www.news.iowadot.gov/pim/>

YouTube Video
<https://www.youtube.com/watch?v=9oeQ1td5ORs>

FHWA's *Innovator* Newsletter Article
https://www.fhwa.dot.gov/innovation/innovator/issue80/page_05.html

Iowa DOT Office of Public Involvement

Valerie Brewer
515-239-1626, Valerie.Brewer@iowadot.us

Trisha Miller
515-233-7821, Trisha.Miller@iowadot.us

Planning, Technology, Equity, Design,
Construction

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](#)

Sonna Lynn Fernandez
(208) 334-8209,
sonnalynn.fernandez@itd.idaho.gov

Scott Luekenga
(208) 334-8057,
scott.luekenga@itd.idaho.gov

Grants, Notification, Newsletter, Funding,
Information



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](#)

Shayna Sutton

(208) 459-7420,

shayna.sutton@itd.idaho.gov

Styles Salek

(208) 459-7429,

styles.salek@itd.idaho.gov

Safety, Equity, Mobility, Bicyclist, Signal

OVERVIEW OF INNOVATION

With the newly passed Climate and Equitable Jobs Act, Illinois will need to be reliant on 100% renewable energy by 2050. The fifth-largest energy-consuming state, Illinois currently gets just 10% of its electricity from renewable sources.

Through the Technical and Financial Feasibility Study for Installation of Solar Panels at IDOT-owned Facilities, potential locations for solar array installation were evaluated for various factors, including solar radiation, slope percentages, distance from transmission line, elevation, accessibility to road networks, and population center density to create a list of sites ripe for solar production. As one of the largest landowners in Illinois, IDOT has the potential to lead the state in its transition to a renewable energy future by leveraging these sites for placement of solar arrays.



Illinois Department of Transportation

BENEFITS

Identified sites have the potential to create more energy than IDOT consumes. Using these sites for solar power could make Illinois one of the largest renewable energy producers in the state.

FIND OUT MORE . . .

Illinois Department of Transportation

Christopher D. Schmidt
(217) 782-4134,
Christopher.Schmidt@illinois.gov

Keywords – solar panels, renewable energy, climate, environment

Development of a Rural Primary Road System (RPRS)

OVERVIEW OF INNOVATION

THE PROBLEM:

The disparity between identified capital improvement needs and available financial resources was and is a significant issue. Transportation infrastructure was stretching a limited budget beyond its capacity to do most things well. Due to changes in the agriculture industry, many of our structures had become obsolete. We needed to document a method to prioritize expenditures.

THE SOLUTION:

"We developed a road system inside the current system called the Rural Primary Road System that identified areas of high traffic and agricultural use to focus available funding. Road upgrades are based primarily on traffic volumes and correlations between maintainability and soil conditions. "



BENEFITS

The identified Rural Primary Roads will receive higher priority when it comes to investing the County's limited available funds to upgrade road surfaces and drainage structures and repair/rehabilitate/replace facilities and still allow adequate access to property.

FIND OUT MORE . . .

KUTC BABM Winner, YouTube
<https://www.youtube.com/watch?v=Ob1h8zV9tHk>

KUTC 2022 Autumn LTAP Newsletter
<https://kutc.ku.edu/sites/kutc/files/documents/2022%20Autumn%20LTAP%20Newsletter.pdf>

Saline County Road & Bridge

Darren Fishel
(785) 826-6327, Darren.fishel@saline.org

Planning, Maintenance, Asset Management,
Finance/Funding

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

Nanette Alton

517-285-1924, AltonN@Michigan.gov

Michigan State University

Bert Cregg, Ph.D.

517-353-0335, cregg@msu.edu

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 \(modot.org\)](#)

Glenn Konersmann, MoDOT Senior
Highway Designer

Glenn.Konersmann@modot.mo.gov

(314) 453-5088

Sustainability, Operations, Planning,
Funding/Finance

Virtual Public Involvement (VPI)



OVERVIEW OF INNOVATION

Virtual Public Involvement (VPI)

VPI has become a useful tool to supplement traditional in-person meetings.

VPI has been utilized by the Mississippi Department of Transportation (MDOT) and various Metropolitan Planning Organizations (MPO) for some time now and really took off due to the COVID-19 pandemic. As a result, we updated our Public Participation Plan to include language around VPI.

Virtual Public Meetings were held for our Long-Range Transportation Plan (LRTP) update. Additionally, virtual meetings were utilized by our Freight Advisory Committee (FAC) as MDOT was updating our Freight Plan. MDOT Planning Division also utilized VPI during the National Electric Vehicle Infrastructure (NEVI) plan creation process to gain insight on a new to the DOT topic. The information we received was utilized in the plan development and final plan.

Not only has VPI become an integral part of our Planning Process, it has also been utilized by our Environmental Division for various public meetings as well.

Mississippi Electric Vehicle Infrastructure Deployment Plan

We want to hear from you!

Take our online EV survey to share your input.

Source: MDOT Planning Division

BENEFITS

VPI allows for more opportunities for the public to be involved. Many people cannot make an in-person meeting for various reasons and the virtual option allows for an additional opportunity for their voices or comments to be heard.

FIND OUT MORE . . .

MDOT Public Participation Process and Plan:
<https://mdot.ms.gov/documents/Planning/Public%20Participation%20Process%20and%20Plan%202021.pdf>

Jessica Dilley, P.E.
Assistant State Planning Engineer
601-359-7685
jdilley@mdot.ms.gov

Sammy Holcomb
Statewide Planning Manager
601-359-7685
sholcomb@mdot.ms.gov

Planning, Environment

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

Kurt Golembesky, PE, CFM

Highway Floodplain Program – Engineer III
(919) 707-6733, kpgolembesky@ncdot.gov

Matthew Lauffer, PE, CPM

Assistant State Hydraulics Engineer
919-707-6700, mslauffer@ncdot.gov

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

Right-Of-Way and Utility Dashboard

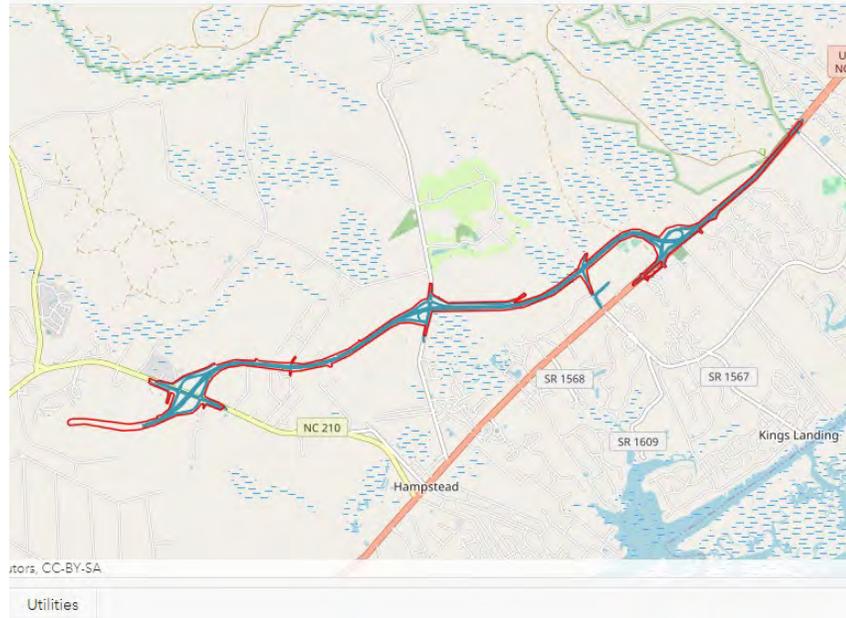


OVERVIEW OF INNOVATION

Priority parcels are determined based on construction phasing needs and are typically related to utility relocation durations. The tool combines the following into one GIS Map to prioritize parcels:

1. ROW Report B – submitted by ROW agents, tracks ROW acquisition progress and updates remaining ROW costs.
2. Utilities – added to the GIS map as a layer for easy cross reference.
3. Areas of Concern – Archeological sites, septic fields, wetlands, species habitat, etc. Each of these can be added as a layer.

To keep the tool up to date and accurate, a Microsoft Teams site was created. The shared excel file stay up to date and before each bi-weekly ROW meeting, the excel is converted to a CSV file and used to update the dataset of ArcGIS.



Website

BENEFITS

The purpose of the Dashboard is to quickly and clearly identify/track priority parcels and display the associated ROW costs.

FIND OUT MORE . . .

<https://ncdot.maps.arcgis.com/apps/dashboards/16a211fcc933453aa113ceb749086a4b>

Contact Info:
Michael Madsen - Division 3 GIS
Manager/Analyst

mjmadsen@ncdot.gov

Utility Dashboard, Priority Parcels, ROW

An engineered log jam provides erosion defense along the Magalloway River in Errol, New Hampshire.



OVERVIEW OF INNOVATION

A first for New Hampshire, the innovative engineered log jam solution was selected as the streambank stabilization method.

A section of NH 16 in Errol, NH, experienced extreme bank erosion that resulted in failure of the road structure. The installation of engineered log jams (ELJs) is a river restoration practice, implemented to modify flow structure and increase hydraulic complexity for the benefit of streambank protection and fish habitat (*L'Hommedieu, 2014*). Streambank protection options were evaluated and, because the roadway was realigned about 90 feet from the river, an ELJ could be considered and was ultimately selected. Construction was performed in winter 2020/2021 with topsoil and plantings completed in spring 2021.

The layered installation incorporated log members, with and without root balls, stone ballast, and a surface landscaping, restoring the streambank with natural materials. As part of the permitting process, NHDOT Research engaged the University of New Hampshire to perform the required pre- and post-construction monitoring and documentation.



Source: NHDOT



Source: SLR

BENEFITS

The ELJ provided the benefit of a natural instream structure and resulted in cost savings over a conventional bank stabilization system. Some trees harvested from the site during roadway realignment were incorporated into the ELJ. The results of the monitoring performed by UNH will document information on the hydrologic and environmental aspects of the ELJ.

FIND OUT MORE . . .

NHDOT Research Link:

<https://www.nh.gov/dot/org/projectdevelopment/materials/research/projects/26962w.htm>

Contract Administrator:

Dan Caouette, NHDOT

Daniel.N.Caouette@dot.nh.gov

Project Champion:

Tobey Reynolds, NHDOT

Principle Investigator:

Tom Ballestero, UNH

Designer:

SLR International Corp.

Contractor: *J.P. Sicard, Inc.*

engineered log jam,
streambank protection,
erosion, stormwater
management, environment,
construction, materials

Improving a road-stream crossing in northern New Hampshire benefits Eastern brook trout and mammals



OVERVIEW OF INNOVATION

New Hampshire DOT partners with The Nature Conservancy to improve wildlife connectivity across US 3 in Stratford, NH

Habitat fragmentation threatens the long-term sustainability of healthy wildlife populations. In 2009, New Hampshire Department of Transportation (NHDOT) and The Nature Conservancy (TNC) began addressing landscape connectivity across northern Vermont and New Hampshire. This project helped restore aquatic connectivity in the Connecticut River Valley by replacing a deteriorated culvert in a high priority site for Eastern brook trout and multiple mammal species that reside in the area.

The bottom of the culvert was specifically designed to provide for aquatic passage through a low flow channel and for mammal passage via a wildlife shelf. The project is part of the Staying Connected Initiative (SCI) that spans from the Tug Hill Plateau west of the Adirondacks, across Vermont, northern New Hampshire and Maine, and into the Canadian Maritimes.



Source: NHDOT



Source: NHDOT



Source: TNC



Source: TNC

BENEFITS

Six months of wildlife camera trap monitoring at the crossing indicated that the culvert is regularly used by small mammals to cross under US 3. It is anticipated that more wildlife will use the improved culvert rather than crossing at the roadway surface, enhancing safe passage for aquatic and terrestrial species and safety for drivers.

FIND OUT MORE . . .

NHDOT Contact:

Jim McMahon

Asst. District Engineer

NHDOT Maintenance District 1

James.F.McMahon@dot.nh.gov

Project Partners:

- *New Hampshire DOT*
- *The Nature Conservancy (TNC)*
- *New Hampshire Fish & Game*
- *National Fish & Wildlife Foundation*

wildlife crossing, culverts, landscape, aquatic, terrestrial, connectivity, sustainability, environment, structures, stormwater management

Bicycle-Friendly Resurfacing in Mercer County



OVERVIEW OF INNOVATION

Mercer County's Bicycle Friendly Resurfacing Program integrates bicycle facilities into resurfacing projects and ensures that bicycle facilities are considered during routine road maintenance, reconstruction, construction, and land development reviews to create a network in alignment with the County's Complete Streets Policy.

The Mercer County Bicycle Master Plan describes factors for analysis of County Roads such as cartway width, environmental constraints, crashes records involving bicycles, network connectivity, Level of Traffic Stress (LTS), Annual Average Daily Traffic, truck volumes, existing bus routes, existing and proposed speed limits, bicycle travel demand modeling and 8-80 Design.

Some routes require simple striping and others will require more intensive work such as road widening or intersection redesign that may involve drainage or right-of-way issues for example. The County prioritizes roadways that are in need of repaving, and only need additions of epoxy paint or thermoplastic and signage to define the bicycle facility, and continues to plan for more complicated segments.

BENEFITS

Bicycle infrastructure is integrated into the repaving program to conduct all work at one time which increases efficiency and cost savings.

The addition of bicycle infrastructure increases safety for all road users.

The integration of bicycle facilities into resurfacing projects advances a multimodal network in alignment with the County's Complete Streets Policy.

FIND OUT MORE . . .

2020 Mercer County Bicycle Plan Element
<http://www.mercercounty.org/departments/planning/2019-bicycle-master-plan>

NJ STIC Innovation Spotlight: Bicycle-Friendly Resurfacing Program
<https://www.njdottechtransfer.net/bike-friendly-resurfacing>

FHWA's Incorporating On-Road Bicycle Networks into Resurfacing Projects
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/resurfacing/

Mercer County Planning Department

Matthew Zochowski, Senior Planner
609-989-6985,
mzochowski@mercercounty.org

Safety, Planning, Pavement, Maintenance

Virtual Public Involvement



OVERVIEW OF INNOVATION

North Jersey Transportation Planning Authority (NJTPA), one of New Jersey's three MPOs, has used several innovative forms of virtual public involvement (VPI) to increase public participation in the long-range planning process. These strategies include approaches to promote engagement with populations that are difficult to reach and that historically have been less likely to be involved in the transportation planning process. New Jersey MPOs are also engaging members of the transportation community in conversation on emerging topics through virtual meetings.

To gather public input for its long-range transportation plans, online ads geo-targeted to the region invited people to participate in an online survey covering the Plan's seven focus areas. The campaign reached 1.6 million people over six weeks and received a robust response. NJTPA has used a broad range of engagement tools. The agency held focus groups with traditionally underserved demographic groups, created a young adult advisory group, held online meetings to engage broad audiences, and held an innovative online contest for children ages 5-15 to engage this hard-to-reach segment.

NJTPA also created its Tuesday Symposium series to engage planning and transportation professionals, advocates, and other interested parties. The series focused on various emerging issues and equity themes in transportation.

The Delaware Valley Regional Planning Commission (DVRPC), another New Jersey MPO, convenes its Futures Group, a collaborative, transdisciplinary group of subject matter experts and interested stakeholders to discuss emerging trends and forces affecting the region. A subset of the larger Futures Group conducts an exploratory scenario planning exercise as part of the Long-Range Planning process.



Source: NJTPA, Public Engagement

BENEFITS

VPI has proven effective in saving time and reducing costs through engagement with affected populations early and on a continuing basis in the planning process.

NJTPA has devised VPI strategies to explore inclusion, opportunity and equity issues in transportation planning processes.

Dialogue within the Futures Group benefits both DVRPC and the group's participants who are able to take what they learn back to their organizations.

FIND OUT MORE . . .

NJ STIC Virtual Public Involvement in NJ
<https://www.njdottechtransfer.net/VPI>

NJTPA Plan 2050: Transportation. People. Opportunity, Public Engagement
<https://www.njdottechtransfer.net/NJTPA-Plan-2050>

DVRPC's Futures Group
<https://www.dvrpc.org/plan/futuresgroup>

Ted Ritter, North Jersey Transportation Planning Authority
(973) 639-8447, tritter@njtpa.org

Brett Fusco, Delaware Valley Regional Planning Commission
(215) 238-2937, bfusco@dvrpc.org

Equity, Planning

Bridge Upcycling



OVERVIEW OF INNOVATION

“Upcycling is the act of taking something no longer in use and giving it a second life and new function.” - Habitat for Humanity.

The innovative Ohio County Engineer’s Bridge Upcycling program is the state LTAP Center’s top Local Public Agency success story.

The Ohio Department of Transportation partnered with the County Engineers Association of Ohio to upcycle steel beams leftover from bridge projects that were demolished or rehabilitated.

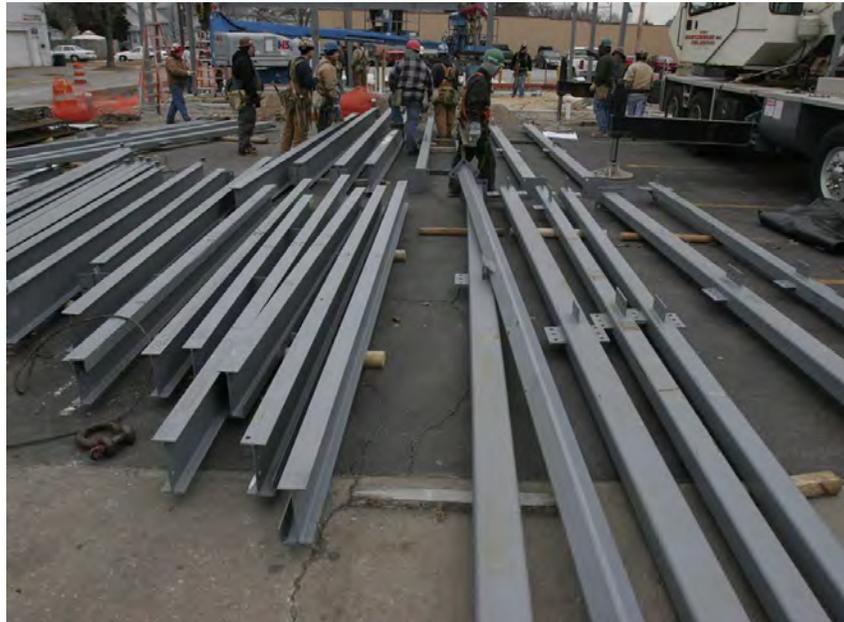
Reusing this existing product helps stretch financial resources and reduces potentially unsafe bridge rating conditions.

Two Ohio counties, Defiance and Muskingum, have successfully used upcycled steel beams on several projects.

"It's a benefit to our county, a benefit to our community, and we're not scrapping valuable products," said Muskingum County Engineer Mark Eicher.

Defiance County Engineer Warren Schlatter praised the program's cost savings benefits and is confident that the bridge is just as safe and just as strong as if they had used new steel.

"So, in the end the capacity of the bridge is not of concern. These are rock solid bridges," he said.



Upcycled bridge beams ready for a local construction project. - The Toledo Blade newspaper

BENEFITS

Upcycling reuses steel bridge beams that previously had been discarded.

Saves costs by reducing the need to fabricate new material.

Enables additional bridge reconstruction and enhances motorist safety.

FIND OUT MORE . . .

<https://youtu.be/r5AyX5uDH8U>

Muskingum County Engineer

Mark Eicher
(740) 454-0155, meicher@mceo.org

Sustainability, Planning, Structures,
Construction, Materials, Asset
Management

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/idlest 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

PMIS and its benefits for e-construction



OVERVIEW OF INNOVATION

The Project Management Information System (PMIS) is a comprehensive solution to streamline the full project life cycle management including Planning, Design, Environmental, Land Acquisition, Bids, Construction and Closing with the objective to expedite the project delivery, improve accountability, security and audit capability and being the single source of truth for all projects.

PMIS is a cloud web-based solution and includes a mobile app for allowing the access to the system from anywhere including field activities. This PMIS has been designed with more than 100 business processes that allow compliance with the procedures and requirements of Puerto Rico Highways and Transportation Authority (PRHTA) and FHWA for the management of construction projects and professional services associated with the different phases of the project.

All business processes defined in PMIS are supported by the centralized document repository that facilitates agency-level collaboration, thus keeping all project information in one place. PMIS workflows allows the user to approve and electronically sign off.

PMIS is integrated with the PRHTA's financial systems (Oracle EBS) to streamline the finance process. PMIS will carry out the allocation of funds and budget for a project, and the creation and approval of contracts, change orders and payment certifications for each project. PMIS is a Web Based solution and includes a mobile app for allowing the access to the system from anywhere including field activities.

PMIS has an electronic bidding module that includes a Web Portal for bids activities, from publication to award, which is supported by business processes designed for the creation of estimates and specifications packages, approvals, questions and answers and for the automatic generation of the resulting contracts.

PMIS is a solution built on the Oracle Primavera Unifier solution, which has extensive integration capabilities with other systems like Laboratory Material Testing System, FMIS, e-ticketing, among others. In addition, it has the ability to generate reports, supported by Oracle BI Publisher.

BENEFITS

- Standardize processes through all organization and eliminate silos
- Streamline the project delivery processes by electronics signoff and approvals; and provides the contract documents in a paperless environment.
- Single source of truth for all projects
- Better projects funds visibility and tracking
- Integration between accounting, project controls and more
- Better security, audit, and backup

FIND OUT MORE . . .

End-user e-Learning site:

<https://pmis-elearning.info/>

Oracle Unifier, PMIS platform:

<https://www.oracle.com/industries/construction-engineering/primavera-unifier-project-controls-facilities-asset-management/project-controls-datasheet/>

PRHTA

Eng. Ana L. Torres

787-721-8787 x51008, antorres@act.pr.gov

FHWA

Eng. Juan C. Rivera

787-771-2517, juan.riveraortiz@dot.gov

PMIS, Single Source, Project Development, Business Processes, Technology

Puerto Rico Road Safety Observatory



OVERVIEW OF INNOVATION

Puerto Rico Road Safety Observatory Overview:

The Puerto Rico's Road Safety Observatory (Observatory) is a set of tools for easy access, visualization, and analysis of crash and traffic records data which has been developed by a team of data scientists house under the Puerto Rico Traffic Safety Commission with funding and support from the National Highway Traffic Safety Administration (NHTSA) and the Puerto Rico Traffic Safety Commission (PRTSC).

The Observatory database is made up primarily of the universe of crash reports generated by the Puerto Rico Police Bureau on a daily basis. Other traffic records databases linked to the Observatory include a state and local highway base map and roadways, milepost data, highway performance monitoring system data, and toxicology report data.

The Observatory tools include: (1) an interactive dashboard for viewing crash statistics, (2) a crash geolocation tool, (3) an individual complaint search tool, (4) a data entry tool for reports submitted on paper by those Municipal Police that do not have the software to run the digital crash report, and (5) a newly developed high-crash location analysis tool that uses an average crash weighting methodology to identify hot-spots.

The Observatory is currently used by various government agencies, consultants to the Puerto Rico Highway & Transportation Authority, contractors, and proponents of the Puerto Rico Traffic Safety Commission (PRTSC), the Strategic Highway Safety Plan of Puerto Rico (SHSP), the Bureau of Transportation and Other Public Services (NTSP) for the crash analysis of areas with high crash locations and identification of areas of emphasis. Annually, the data from the Observatory is also used to create and support project proposals with federal and state funds, develop crash prevention campaigns, analyze areas of high concentration of crashes, and scientific research for the development of cutting-edge technology, among others.

To provide the full cycle of road safety analyses, the Observatory will be the repository for all the databases related to road safety. Providing a place where every road safety stakeholder can access and perform the Safety Management Process from network screening to prioritize projects and the safety effectiveness evaluation.

BENEFITS

The Puerto Rico Department of Transportation and road safety related agencies will be able to employ interactive tools developed by the Puerto Rico Road Safety Observatory to strategically prioritize planning efforts, enforcement resources and budget allocation based on data.

With the implementation of the Puerto Rico Road Safety Observatory tools, the road safety stakeholders will benefit from the development of strategies that will impact the fatality rate and the frequency of crashes.

FIND OUT MORE . . .

Puerto Rico Road Safety Observatory
for registered users:

<https://beta.observatoriovial.net/>

For new access contact:

Damaris Rivera

Damaris.silva@cst.pr.gov

Puerto Rico Road Safety Observatory
Contact Information

Kenneth Vélez, PhD

Kenneth.velez@upr.edu, 787-644-1697

Josie Bianchi, PhD

Josie.Bianchi@upr.edu, 787-673-2260

Safety, Technology, Planning

Develop a DOT Specific UAS Simulator and Flight Proficiency Exam



OVERVIEW OF INNOVATION

Most state DOT Unmanned Aircraft Systems (UAS) commercial operations are governed by CFR 14 Part 107. This regulation requires pilots pass a knowledge test but does not require a demonstration of minimum flight proficiency to operate in the national airspace. This project addresses this limitation by developing a computer-based flight proficiency simulator based on the National Institute of Standards and Technology (NIST) Basic Maneuvering Test (BMT). The simulator realistically recreates environmental conditions, UAS physics, stick control and field conditions of the BMT. A “drone rodeo” was hosted to evaluate if the simulator BMT performance data is simulator to traditional in-person methods. Twenty-four Part 107 pilots completed the BMT in-person and with the simulator. At 95% confidences, the pilots scores at times were statistically the same. The significant percentage of the SCDOT pilots completed the BMT under proctored conditions. Based on their performance and similar nationally recognized organization’s certifications, the research team recommends that the SCDOT require a minimum score of 80% on the BMT with a maximum duration of 5 minutes per maneuver before flight privileges are granted. In addition to the NIST scenarios develop, a bridge inspection scenario was developed to support this common use for UAS.



Source: Clemson University

BENEFITS

Drone flight proficiency is a skill that requires continual practice. The simulator developed in this project provides a convenient way to practice, teach and assess UAS flight skills. This software is available at no cost to all state DOTs.

To date, 24 state DOTs have requested licenses and made this simulator an important part of their drone program.

FIND OUT MORE . . .

Little Arm Studio:

<https://www.zephyr-sim.com/>

Clemson University – Department of Construction, Development, and Planning:

<http://www.clemson.edu/degrees/construction-science-and-management>

Eric Stuckey (SCDOT)

803-737-1003 StuckeyEC@scdot.org

Joe Burgett (Clemson University)

864-722-2026 jmburg@clemson.edu

UAS, UAV, Drone, Simulator

Strategic Deployment of Drone Technology and Software to Support SCDOT Operations



OVERVIEW OF INNOVATION

A recent FHWA publication found that all 50 state DOT's are using Unmanned Aircraft Systems (UAS), commonly referred to as "drones," in some capacity. As the cost of UAS equipment can be relatively low, the greatest challenge limiting the benefit that this technology can provide is the lack of education and training. By partnering with Clemson University, this project aggressively addressed this challenge and made meaningful drone deployment a viable option for employees across the SCDOT. The project leveraged Clemson University's nationally recognized School of Construction Management to develop a drone training program tailored to the SCDOT's needs. The course was structured so Clemson students and SCDOT employees could work shoulder-to-shoulder as they learned leading edge drone workflows. The program participants came from a wide range of SCDOT offices including (among others) Construction, Communications, IT Services, Preconstruction Engineering, Planning, Traffic Engineering, Survey and Maintenance. Through its professional studies program, Clemson University has made this course available fully online to any state DOT.



Source: Clemson University

BENEFITS

This project created an in-person and online drone course for SCDOT employees. During the class, students earn their FAA Part 107 drone license, flight skills (in-person and with a simulator), and how to create 3D maps/models with drone data. It is an excellent way for employees to gain the skills and knowledge to operate a UAS to benefit their department.

The course is available online for all state DOT employees.

FIND OUT MORE . . .

Overview video of the course:
<https://www.youtube.com/watch?v=YlkoQl64D3w>

Clemson University – Department of Construction, Development, and Planning:
<http://www.clemson.edu/degrees/construction-science-and-management>

Eric Stuckey (SCDOT)

803-737-1003 StuckeyEC@scdot.org

Joe Burgett (Clemson University)

864-722-2026 jmburg@clemson.edu

UAS, UAV, Drone, Class, Course, Professional Development

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/>

Contact Info:

Joanne Steele, Project Manager, TxDOT
joanne.steele@txdot.gov

Shelley Pridgen, TxDOT STIC/EDC
Coordinator Shelley.pridgen@txdot.gov

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

Assessing Efficacy of Amphibian and Reptile Exclusion Fence (AREF) to Prevent Herpetofauna, with Emphasis on Houston Toad, from Entering Construction Zones



OVERVIEW OF INNOVATION

The federally endangered Houston toad (*Anaxyrus houstonensis*) requires effective measures against incidental take within its limited habitat range. This project addresses the need for evaluation of Texas Department of Transportation (TxDOT) amphibian and reptile exclusion fencing (AREF) for its efficacy in preventing federally endangered Houston toad entry to construction zones and roadways within its designated critical habitat.

Three amphibian and reptile exclusion fences were tested for wildlife exclusion efficacy between 2020 and 2022

After rigorous trials and assessment, the TxDOT designed AREF proved effective and acceptable as an exclusion fence for adult and juvenile toads. The TxDOT AREF is recommended as it is as effective or more effective than other commonly used fencing in excluding toads and in facilitating escape in jump-out configurations and is as durable as the commercially available fencing.



Source: TxDOT Project 0-7078

BENEFITS

TxDOT AREF is the most cost effective and easy to install.

Due to factors of high toad exclusion efficacy, low cost, and high durability, TxDOT Geotextile fencing is suggested for installation with jump-outs for prevention of Houston toad mortality in construction areas.

FIND OUT MORE . . .

Project Web Link: [TxDOT Research Library: Project No. 0-7078 – Amphibian and Reptile Exclusion Fence \(AREF\)](#)

Video: <https://youtu.be/Ug3nzomelBA>

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

Contact Info:

Shelley Pridgen, Project Manager, TxDOT, shelley.pridgen@txdot.gov

Mark Fisher, Project Lead, TxDOT

Robert Coulson, Principal Investigator, Texas A&M University

Keywords: Environment, Stormwater Management, Construction

Dash Cam Imaging Improves Outdoor Advertising Enforcement



OVERVIEW OF INNOVATION

Outdoor Advertising Enforcement uses GPS-equipped dash cams to improve safety and efficiency of inspections.

UDOT enforces state and federal standards for the sizing, lighting, spacing, and zoning of advertising signs along state roads. The Outdoor Advertising Control (OAC) team gathers photographic evidence of potential advertising violations. They previously did this by pulling to the side of the road, sometimes in heavy traffic with a narrow shoulder, to take photos.

In order to better communicate violations to sign and property owners, the OAC team purchased a GPS-equipped dash cam to record video as they drive through enforcement areas. Still images are later extracted from the video and oriented on Google Maps. The camera captures an image with location data simultaneously without additional work by the agent.



Source: UDOT Right of Way, Outdoor Advertising

BENEFITS

The use of dash cameras is resulting in a more efficient enforcement process and it is safer for the inspection agents.

FIND OUT MORE . . .

Information from 2023 Innovation and Efficiency Report

[Dash Cam Imaging Improves Outdoor Advertising Enforcement](#)

For more information:

Utah Department of Transportation

Right of Way Division, Outdoor Advertising Control Team

OutdoorAdvertisingControl@utah.gov

Safety, Maintenance, Right of Way

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>

Bridget Donaldson

(434) 203-1922

Bridget.Donaldson@vdot.Virginia.gov

Michelle Fults

(804) 512-7513

Michelle.Fults@vdot.Virginia.gov

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>

VTRC Staff Contact

Yiqing Xu

(434) 293-1997, Yiqing.Xu@VDOT.Virginia.gov

Lance E. Dougald

(434) 293-1974, Lance.Dougald@VDOT.Virginia.gov

John S. Miller

(434) 293-1999, John.Miller@VDOT.Virginia.gov

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 manor 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

Daryl Blumberg
(360) 705-7838,
blumbed@wsdot.wa.gov
challenge@wsdot.wa.gov

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

WSDOT Diversity, Equity, & Inclusion (DEI) Plan



OVERVIEW OF INNOVATION

The Washington State Department of Transportation is deeply committed to actively combatting racism and strengthening our anti-racist, diversity, equity, and inclusion efforts to guarantee that our transportation system serves all Washingtonians, and we have a plan.

Our mission is to provide safe, reliable, and cost-effective transportation options to improve communities and economic vitality. To achieve this, diversity, equity, and inclusion must be at the center of all aspects of our work.

To create the DEI Plan, we formed an agency-wide workgroup made up of employee volunteers from all disciplines. Through their efforts, as well as extensive collaboration with both internal and external key partners, we have focused our diversity, equity and inclusion planning efforts on the following areas:

- Internal Workforce
- Learn and Grow
- Diversity Advisory Groups
- Data Informed Decisions
- Community Engagement
- Healthy Environment for All Act
- External Workforce and Contracting

BENEFITS

The DEI plan is improving our decision-making practices, enhancing access and creating a culture of belonging for the community we serve and our employees.

We have made great strides and will continue working to create a more inclusive work culture, diversify our spending, create business and career opportunities for under-represented individuals and business owners, and enhance community engagement. The plan is a blueprint for the work we still have ahead of us.

FIND OUT MORE . . .

[WSDOT Office of Equity & Civil Rights](#)

- Formerly the Office of Equal Opportunity

[WSDOT DEI Plan](#)

[Equity Readiness Assessment](#)

[Secretary's Executive Order](#)

[Equity Study](#)

Earl Key

Senior Director of Transportation Equity
Office of Equity & Civil Rights

KEYE@wsdot.wa.gov

360-705-7095

Diversity, Equity, Inclusion, Civil Rights,
Planning