

Photo Source: USDOT

INTELLIGENT TRANSPORTATION SYSTEMS (ITS) BENEFITS FOR RURAL COMMUNITIES



Each year, rural roadways experience a greater number of fatal crashes than urban roadways. In 2015, there were more than 6.2 million traffic crashes in the United States, in which 35,092 people were killed. Of this staggering number, rural fatalities accounted for 49 percent—despite estimates that only 19 percent of the U.S. population live in rural areas, according to the 2015 American Community Survey from the U.S. Census Bureau.

The safety of our roads is the top priority of the U.S. Department of Transportation (USDOT). The Department is committed to reducing the number of traffic crashes across the country by investing in innovative technologies that benefit the American people. Intelligent transportation systems (ITS) promise to do just that, as well as reduce congestion and improve mobility. ITS technologies advance transportation safety and mobility and enhance American productivity by integrating advanced communications technologies into transportation infrastructure and vehicles. The benefits of ITS extend across modes and across regions—lending themselves to both rural and urban environments.

What Are the Benefits of ITS Technologies?

ITS encompasses a broad range of wireless and traditional communications-based information and electronic technologies. The USDOT is pursuing the deployment of transformative ITS technologies, such as connected vehicles, automated vehicles, dynamic message signs, road sensors, and more, because of their tremendous potential to improve the safety and efficiency of our roads, communities, and lives.

In particular, connected vehicles exchange critical safety and mobility information with each other, advanced roadside equipment, and smartphones to provide warnings to drivers about imminent crash situations, as well as speed and route recommendations. The Department's research studies and tests show that connected vehicle technology could reduce unimpaired vehicle crashes by 80 percent. Moreover, our studies have shown that 94 percent of serious crashes are due to human error. Automated vehicles have the potential to remove human error from the crash equation, which will help protect drivers and passengers, as well as bicyclists and pedestrians. Integrating these technologies into our transportation systems and communities will drastically improve mobility and accessibility for us all.

The ultimate benefits of a transformed transportation system—one that is fully connected; information-rich; and able to address safety, mobility, and accessibility—are wide-ranging and powerful. They will be felt by every one of us, delivering greater livability to our communities and to our daily lives.

The ITS Professional Capacity Building (PCB) Program Is a Resource for Rural Communities

The application of ITS in different geographic, jurisdictional, and land use contexts creates unique challenges and opportunities for ITS professionals. The USDOT ITS PCB Program offers the *ITS ePrimer Module 10: Rural and Regional ITS Applications*, which considers varying contexts, from rural applications to large, multi-state, multimodal programs.

The module is available at: <https://www.pcb.its.dot.gov/eprimer/module10.aspx>



Photo Source: USDOT



U.S. Department of Transportation

How Can ITS Technologies Help Rural Communities?

The Department is funding regional pilots and demonstrations of innovative and life-saving applications to accelerate their advancement and widespread deployment. Many of these connected vehicle applications, such as those described below, provide safety benefits for rural communities:

- **Curve Speed Warning:** Alerts drivers approaching a curve to slow down if their vehicle speed is too high to travel safely through the curve
- **Work Zone Warnings:** Provides approaching vehicles with information about work zone activities, such as travel lane obstructions, lane closures, lane shifts, speed reductions, or vehicles entering/exiting the work zone
- **Stop Sign Gap Assistance:** Warns drivers on secondary minor roads when it is unsafe to proceed through a stop-sign controlled intersection
- **Do Not Pass Warning:** Warns drivers if the passing lane is occupied, making it unsafe to pass a slower-moving vehicle
- **Response, Emergency Staging and Communications, Uniform Management, and Evacuation (R.E.S.C.U.M.E.):** Warns drivers of lane closings and reduced speeds when approaching incident zones; also warns on-scene responders of vehicles approaching the incident zone at speeds or in lanes that pose a high risk to their safety.

What Is the USDOT Doing to Support ITS Deployment in Rural Areas?

The USDOT provides several initiatives and resources to assist in deployment of ITS technologies.

Connected Vehicle Pilot Deployment Program

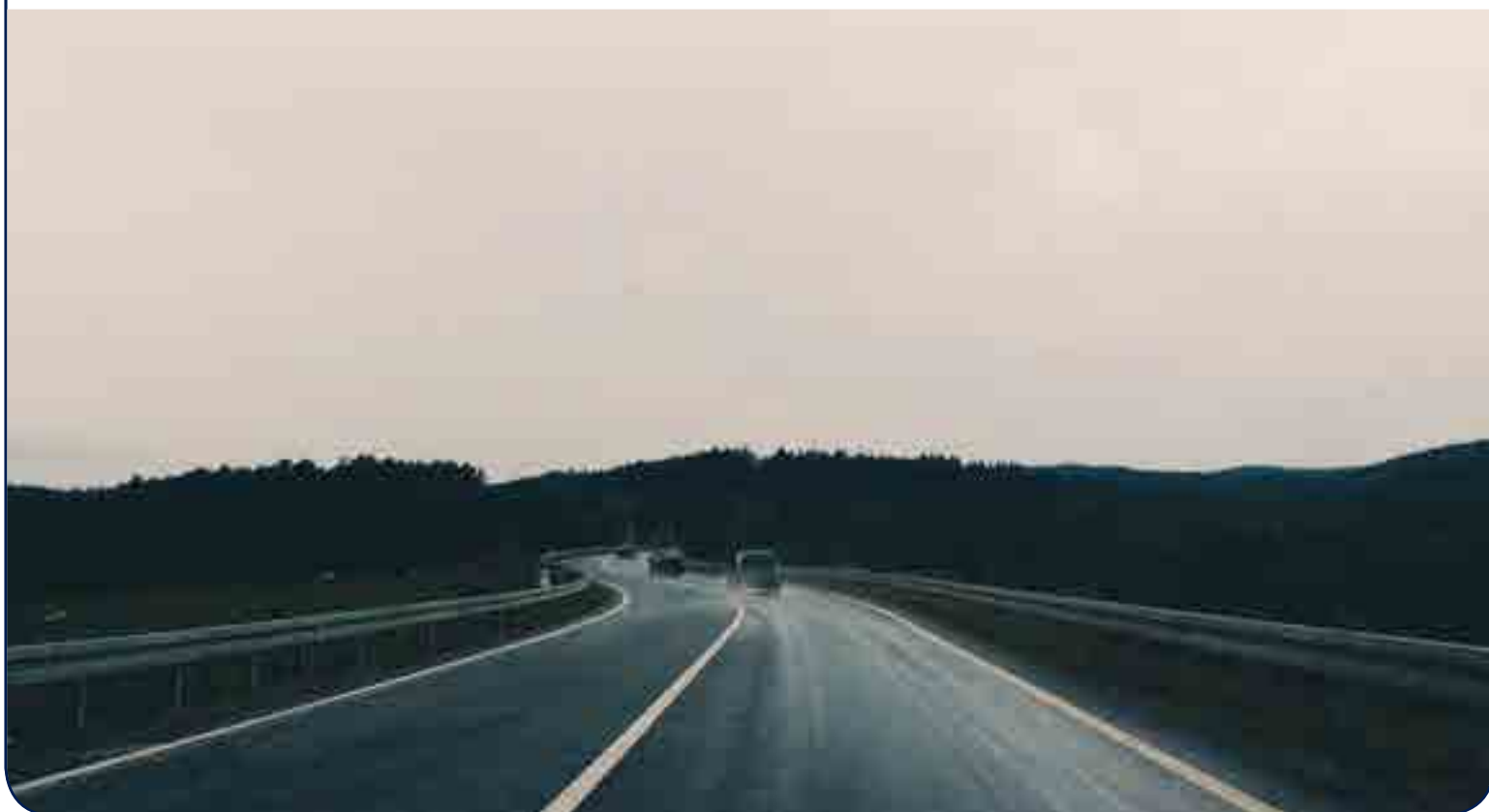
<https://www.its.dot.gov/pilots/index.htm>

Sponsored by the USDOT ITS Joint Program Office (JPO), the Connected Vehicle Pilot Deployment Program is a national effort to deploy, test, and operationalize cutting-edge mobile and roadside technologies and enable multiple connected vehicle applications. The USDOT awarded three cooperative agreements, collectively worth more than \$45 million, to three sites for the regional pilots—New York City, New York; Wyoming; and Tampa, Florida.

The deployment most relevant to rural communities is the Wyoming Connected Vehicle Pilot, which is being implemented along 402 miles of I-80 in Wyoming. This pilot focuses on the needs of the commercial vehicle operator in the state and will develop applications that use vehicle-to-vehicle and vehicle-to-infrastructure connectivity to support a range of services such as advisories on weather and road conditions, roadside alerts, and dynamic travel guidance for freight and passenger travel.

The Wyoming pilot is expected to reduce the number of blow-over incidents and adverse weather-related incidents (including secondary incidents) in the corridor.

The implications of this pilot will serve as a valuable resource to ensure rural-specific deployment success.





Mobility Services for All Americans (MSAA)

https://www.its.dot.gov/research_archives/msaa/index.htm

Improving paratransit and other human service transportation (HST) operations using ITS technologies can improve service and expand travel opportunities for Americans with mobility challenges. Through the MSAA initiative, the USDOT fosters partnerships among paratransit service providers; local governments; and other public, private, and non-profit organizations to share data and better manage resources to improve mobility options for all.

In 2015, the MSAA initiative funded additional deployment planning projects to further improve HST coordination and delivery. The deployment planning projects chosen included VIA Mobility Services in Denver, CO; the United Cerebral Palsy San Luis Obispo/Ride-on Transportation in San Luis Obispo, CA; the Atlanta Regional Commission in Atlanta, GA; and the Greater Wisconsin Agency on Aging Resources in Madison, WI.

Mobility on Demand (MOD)

<https://www.transit.dot.gov/research-innovation/mobility-demand-mod-sandbox-program.html>

MOD is a vision for an integrated and connected multimodal network of safe, affordable, and reliable transportation options that are available to all. MOD enables the use of on-demand information, real-time data, and predictive analysis to provide individual travelers with transportation choices that best serve their specific needs and circumstances.

In 2016, the Federal Transit Administration awarded \$8 million in funding for MOD public transportation projects that integrate new mobility tools like smartphone apps, ride-sharing, paratransit, and demand-responsive bus and van services (<https://www.transit.dot.gov/research-innovation/mobility-demand-mod-sandbox-program.html>). MOD projects help make transportation systems more efficient and accessible, particularly for people who lack access to a car.

Several rural communities received grants including the Regional Transportation Authority of Pima County (Arizona), Pinellas Suncoast (Florida) Transit Authority, Tri-County (Oregon) Metropolitan Transportation District, Vermont Agency of Transportation, and Pierce County Public Transportation Benefit Area Corporation (Washington). The ITS JPO is managing the evaluation of this program.

Accessible Transportation Technologies Research Initiative (ATTRI)

https://www.its.dot.gov/research_areas/attri/index.htm

ATTRI leads efforts to develop and implement transformative applications to improve mobility options for all travelers, particularly those with disabilities including older adults and veterans with disabilities. With nearly 20 percent of the U.S. population comprising individuals with disabilities, and other demographic trends such as the increasing number of older Americans, the USDOT aims to expand innovative travel options.

ATTRI research focuses on removing barriers to transportation for people with visual, hearing, cognitive, and mobility disabilities in both urban and rural environments. Emerging technologies and creative service models funded by ATTRI will offer all Americans enhanced travel choices and accessibility at levels once only imagined.

The USDOT's ATTRI team and partners are developing applications in four technology areas: Wayfinding and Navigation, Pre-trip Concierge and Virtualization, Safe Intersection Crossing, and Robotics and Automation. Working together, the four technology areas will provide the basis for an accessible transportation network that is far more economical, expansive, and welcoming to all travelers in the United States in rural and urban communities.

Road Weather Research

https://www.its.dot.gov/factsheets/roadweather_management.htm

Rural transportation agencies have adopted road weather information systems (RWIS) to provide travelers with better information about the impact of current weather conditions on the roadway. However, RWIS can only provide data for a specific location, and localized weather conditions require continuous high-resolution road weather condition reporting. ITS technologies, such as connected vehicles, will provide new sources of road weather information that can dramatically enhance our existing systems and create transformative applications.

The USDOT's Road Weather Management Program is exploring ways to collect and assess this data and provide it to drivers and transportation managers to improve the safety and mobility of our roads. For example, connected vehicles could deliver information to travelers in real-time about icy bridges, water on the road, rain or fog ahead, and other potentially hazardous conditions through dynamic message signs, highway advisory radio, and in-vehicle navigation systems.

Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) Grants

<https://www.fhwa.dot.gov/fastact/factsheets/advtranscongmtfs.cfm>

The ATCMTD program funds cutting-edge technologies that are ready to be deployed to enhance existing traffic capacity for commuters and businesses. The grants will enable cities and rural communities to harness new technologies to tackle hard problems like reducing congestion, connecting people to mass transit, and enhancing safety.

The Department recently awarded ATCMTD grants valued at \$53.6 million to 10 states to fund advanced technologies that include advanced real-time traveler information for drivers, public transit riders and freight shippers, vehicle-to-infrastructure communications that will enhance safety and pave the way for autonomous vehicles, and congestion-relieving traffic management systems.

ITS Professional Capacity Building (PCB)

<https://www.pcb.its.dot.gov/>

The ITS PCB Program is the USDOT's primary mechanism for educating the public sector transportation workforce about ITS. The program supports activities that deliver multimodal ITS learning opportunities to the current and future workforce and:

- Coordinates outreach related to the USDOT's ITS research initiatives
- Provides technical assistance to public-sector ITS deployers through ITS Peer-to-Peer and Talking Technology Transportation webinar programs
- Delivers ITS training through partners.

The program offers several archived courses on rural ITS, including a 2016 webinar on connected vehicles and rural road weather management and an online module on the unique needs and challenges of deploying ITS in rural and regional settings.

National Rural ITS (NRITS) Conference

The annual NRITS Conference provides participants with an opportunity to network and share experiences within and across a wide variety of ITS disciplines. The event brings together both traditional and non-traditional ITS users to address such issues as rural mobility, safety, multi-agency coordination, and workforce development, as well as emergency medical services, commercial vehicles, and transit issues. The ITS JPO has supported the NRITS Conference for the past 25 years to promote the use of ITS to address the challenges rural communities face.

ITS JPO Resources

The ITS JPO is responsible for conducting research on behalf of the Department and all major modes to advance transportation safety, mobility, and environmental sustainability through ITS.

The ITS JPO web site (<https://www.its.dot.gov/>) provides access to many planning tools, fact sheets, and other resources to help your transportation organization and community benefit from ITS:

- ITS research fact sheets (https://www.its.dot.gov/communications/its_factsheets.htm)
- ITS and connected vehicle research data (<https://www.its.dot.gov/data/>)
- Connected vehicle news and events (<https://www.its.dot.gov/pilots/index.htm#news>)
- Technical publications (https://www.its.dot.gov/pilots/cv_pubs.htm)
- Economic data and evaluation results (<http://www.itsknowledgeresources.its.dot.gov/>)



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