

# TECHBRIEF



The national Intelligent Transportation Systems (ITS) program includes the development and application of advanced systems upon all parts of the transportation network, including rural areas. The U.S. DOT has developed the Advanced Rural Transportation Systems (ARTS) program to meet the needs of travelers in and through rural areas, as well as the agencies responsible for the operation and maintenance of the rural transportation system. The ARTS program complements the ITS efforts in metropolitan areas and commercial vehicle operations (CVO) by studying ways to best implement technologies that address transportation problems in rural areas.



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## Rural ITS

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### Rural ITS Needs and Challenges

Rural America accounts for a small and dispersed portion of our Nation's population, yet it encompasses a significant portion of the transportation system. Rural areas account for 80 percent of the total U.S. road mileage and 40 percent of the vehicle-miles traveled. Rural travel reflects the rural environment of long distances, relatively low traffic volumes, relatively rare traffic congestion, travelers unfamiliar with the surroundings, and rugged terrain in remote areas.

Rural ITS refers to that portion of the ITS program that focuses on travelers' and operators' needs in non-urbanized areas of the United States. As such, it involves interurban/interstate travel, small communities, rural counties, two-lane rural roads, and statewide and regional systems. Rural ITS infrastructure aims to improve the quality of life for rural residents and travelers by facilitating safer, more secure, available, and more efficient movement of people and goods in rural America.

The challenges to developing these services include the wide variety of conditions found in rural travel, the many types of travelers in a rural or statewide setting, and the costs of maintaining the rural transportation system. The rural ITS program is focused on developing rural ITS options and managing emerging ITS technology within rural settings from conception to viable options for implementation.

### Solutions Through Identification of Critical Program Areas

Early activities under the Rural ITS program have resulted in a comprehensive definition and identification of rural transportation needs. Given the diversity of these needs, they have been categorized into seven Critical Program Areas:

- (1) Traveler Safety and Security Technologies use in-vehicle sensors and information systems to alert drivers to hazardous conditions and dangers. This also includes wide-area information dissemination of site-specific safety advisories and warnings.
- (2) Emergency Services Technologies use satellites and advanced communications systems to automatically notify the nearest police, rescue squad, or firefighters in case of collision or other emergency.
- (3) Tourism and Traveler Information Services use in-vehicle navigation and roadside communications systems to provide information to

travelers who are unfamiliar with the local area. These services can be provided at specific locations en route or before travelers even begin their trip.

(4) Public Transit and Mobility Services improve the efficiency of transit services and their accessibility to rural residents. Better scheduling, improved dispatching, Smartcard payment transactions, and computerized ride-sharing and ride-matching systems can be achieved through advanced vehicle-locating devices and communications systems.

(5) Infrastructure Operations and Maintenance Technologies improve the ability of highway workers to maintain and operate rural roads. These include severe weather information systems and immediate detection and alerting of dangers to work-zone crews.

(6) Fleet Operations and Maintenance Systems improve the efficiency of rural transit and other fleets, such as snowplows and law enforcement vehicles, through advanced vehicle tracking and on-board equipment monitoring systems.

(7) Commercial Vehicle Operations use satellites, computers, and communications systems to manage the movement and logistics of commercial vehicles and to locate vehicles during emergencies and breakdowns.

### Implementation Strategy

The U.S. Department of Transportation (DOT) is working with a wide

range of stakeholders to define and develop these cost-effective, fully integrated Rural ITS. Cost-effective, systems-based ITS solutions are goals that could be reached through the application of new technology.

Solutions will be realized by the *development* of a Rural ITS infrastructure, *delivery* of training and technical assistance related to Rural ITS, and the *deployment* of systems that meet the needs and requirements of users and stakeholders.

### Development

The focus of the Rural ITS program during the next 5 years will be on developing and defining an integrated infrastructure for Rural ITS. This includes developing a better understanding of Rural ITS infrastructure and refining the National ITS Architecture to include applications that address the unique Rural ITS needs and user services.

DOT will continue to examine and further refine the architecture and standards efforts currently underway, and to learn from rural stakeholders who are developing and deploying systems in the field.

### Delivery

DOT will develop training courses and provide technical assistance to rural stakeholders. Lessons learned from the development projects will form the training and guidance materials, and the materials will be

tailored to meet the various needs of the broad group of rural stakeholders. Information will include benefits; guidance for planning integrated projects; and technical implementation guidance, including project specifications, standards, and design.

In addition to the multiple jurisdictions within the State (county law enforcement, State highway departments, Indian tribal leadership, regional hospitals/trauma centers, etc.), the various Federal departments and agencies will need to work together to combine their expertise to resolve rural issues.

### Deployment

As the results from operational tests and deployments accumulate over the next 5 years, DOT will issue deployment-planning guidance, continually refining it as new deployment projects are completed and evaluated. This guidance will be sent to rural transportation decision-makers, State and local officials, and representatives from other Federal agencies with transportation-related missions in rural areas. Ultimately, these real-world projects will set the stage for successful integrated deployment in the future.

### For more information

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