
# Integrated Traveler Information Systems

**TTI 4**


Photo: Courtesy of Alaska Department of Transportation

**Description:** Traveler information comes in many different forms (pre-trip and en-route) and types (weather conditions, road conditions, real-time transit information, congestion, construction, incident information, tourism information, etc.). The main goal of providing traveler information is to help motorists get from their origin to destination efficiently and safely.

An integrated traveler information system gathers and stores multiple sources of traveler information and then disseminates messages through various means (e.g., website, mobile application, dynamic message sign (DMS) (see #TTI3), commercial radio, etc.). Many of the current systems were created as input and collection systems to feed 511 phone systems and have since been adapted for other dissemination devices such as websites, mobile applications, Highway Advisory Radio (HAR) (see #TTI1), and social media (see #TTI5)).

## Rural Transportation Critical Needs

- ☐ Crash Countermeasures
- ☑ Emergency Services
- ☑ Operations & Maintenance
- ☑ Rural Transit & Mobility
- ☑ Surface Transportation & Weather
- ☑ Tourism & Travel Information
- ☑ Traffic Management

## Issues Addressed

- ☑ Pre-trip Information
- ☑ En-route Information
- ☐ Public Data Collection
- ☐ Public's Ability to Communicate to Transportation Agency

## Strategies Achieved

- ☑ Road User
- ☑ Road
- ☐ Vehicle
- ☐ Safety Culture
- ☑ Engineering
- ☑ Emergency Response
- ☐ Enforcement
- ☑ Education


## Applicability

- An integrated traveler information system is not low cost; however, an organization can start small and once it has been implemented, it is adaptable to adding additional data inputs (e.g., sensors, cameras, etc.) and dissemination systems (e.g., social media, mobile apps, websites, DMS, HAR, etc.) as funding becomes available. Also, because an integrated traveler information system is a data collection and fusion system, it can easily be tailored to collect the safety information that is most useful to a rural area and to disseminate to those devices that are most likely to benefit a rural area.

## Partnerships

- Applications benefit from collaboration among numerous agencies, which may include:
  - Departments of transportation (local, state, federal)
  - Transit agencies
  - Schools
  - Law enforcement agencies (local, state, federal)
  - Toll collection agencies
  - Tourist destinations
  - Media outlets
  - Local community
  - National Weather Service
  - Private Transportation Data Providers

## Key Components

- Traveler information input and storage database
- An intelligent transportation system for data collection (sensors, road weather information system, cameras, etc.)
- Additional Data, such as:
  - National weather service data
  - Snow plow and construction staff input
  - Commercial vehicle regulation
  - AMBER alert information
  - Transit information
  - Travel time data
  - Citizen reporting
  - Company to provide weather forecasts
- Dissemination Interfaces, such as:
  - Website, mobile app, social media
  - Telephone number (e.g., 511)
  - Highway advisory radio (HAR)
  - Dynamic message sign (DMS)
  - Fax to media for use on radio and television
  - In-vehicle devices

## Examples of Implementation

- **One-Stop-Shop (OSS) for Rural Traveler Information**

A web application created by the Western States Rural Transportation Consortium and the Western Transportation Institute that provides traveler information for 11 states including Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. Information provided includes "current weather and traffic information along with traffic cameras, road information, rest stops and points of interest."

- **Regional Integrated Traveler Information System (RITIS)**

"An automated data fusion and dissemination system" created by the University of Maryland's Center for Advanced Transportation Technology Lab.

- **I-95 Corridor Coalition Traveler Information**

Interstate 95 runs from Maine to Florida and the I-95 coalition helps states to share information and research "beyond boundaries." This includes projects such as their 511 traveler information systems.


### Implementation Considerations (General)

- The information collected and provided via an integrated traveler information system must be timely, reliable, and accurate.
- Coordination will be needed with other public agencies for robustness in data collection.
- Coordination is also needed with the public to ensure that they are using the information. Also in some cases the public will be providing crowdsourced data which is then input into the system.
- This information tends to be oriented towards commuters and freight users. Urban systems tend to provide information on congestion, travel times, and transit, whereas, rural systems tend to focus on weather and construction information.
- Consider partnerships with private companies to sell "ads" which will appear on traveler information dissemination systems and the money offsets the cost. Note that some states may have rules that do not allow "ads" on traveler information systems.
- Many states use private companies to operate and maintain the database and dissemination devices.

### Implementation Considerations (Pro)

- Better information leads to more informed decisions about routes to take and alternative modes.

### Implementation Considerations (Con)

- Along with the cost for the database, agencies will also need to plan for the cost of dissemination of the information.
- In rural areas, there tend to be fewer road sensors and less availability of power and communications to add sensors.
- There are ongoing costs for maintenance, database upgrades, and data collection upgrades.

### Opportunities for Future Expansion

- In the future, connected vehicles may lead to improved real-time traveler information. Vehicles that are equipped with sensors will allow for additional, easier, more reliable, anonymous data collection (e.g., travel time, environmental conditions, traffic congestion, etc.). Note that this is beginning to occur already using mobile phones (e.g., Google Traffic, Apple Maps, Waze).
- Connected vehicles will also provide a platform for more vehicles to receive in-vehicle traveler information and may also be able to automatically generate alternative routes based on the provided traveler information.


**Additional Resources**

- FHWA's *Real-time Traveler Information Publication and Studies Page*, found here: http://ops.fhwa.dot.gov/travelinfo/resources/publications.htm
- *Next Generation Traveler Information System Webinar*, found here: https://www.pcb.its.dot.gov/t3/s150923/s150923_nextgen_traveler_info_service_intro.asp

**Useful Tip**

A low-cost tip or trick is to add a feature that would allow the public to provide data as a "citizen reporter" similar to those that have been created in Minnesota and Utah, as well as the one created by the FHWA North/West Passage project for Idaho.

**Cost Range**

*(Cost/financial information, where noted, is based on 2016 dollars (unless otherwise specified). Cost/financial information is estimated, and will vary based on size and scope of project, number of units, etc. In general, capital costs include initial purchase costs of hardware, software, and other required equipment. Maintenance and operations costs include staff time to operate, monitor and maintain systems; data collection; system upgrades; evaluation; etc.)*

**Capital Costs:** The total capital costs for this tool are higher (above $250,000). The costs for developing and implementing an integrated traveler information system vary greatly depending on the type and amount of information to be collected, stored and disseminated. Additional capital costs will be associated with purchasing the dissemination methods. For example, the costs to develop and implement the Alaska 511 traveler information system including Interactive Voice Response (IVR), public website, and reporting tool totaled $487,000; however, an additional $775,000 has been spent on system enhancements (i.e., adding additional functionality and data) to date[1]. Another example from the 511 Deployment Coalition case study: total costs (to design, implement, and operate for one year) averaged $3.6 million per system among six statewide systems and $2.6 million per system among three metropolitan systems[2]."

**Operations Costs:** The total operations and maintenance costs for this tool range from high ($100,000 to $250,000) to higher (above $250,000). For example, annual costs for operations and maintenance of 511 systems ranged from $120,000 to $2.4 million (note that this would include the cost of telephone calls)[3]. It should also be noted that there will be significant staff time costs to collect and input the data for the pieces that are not automated. For example, in Montana, the plow operators provide the road conditions to their maintenance office. This information is then manually input into the database by office staff.

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