Rural Intelligent Transportation Systems (ITS) Toolkit

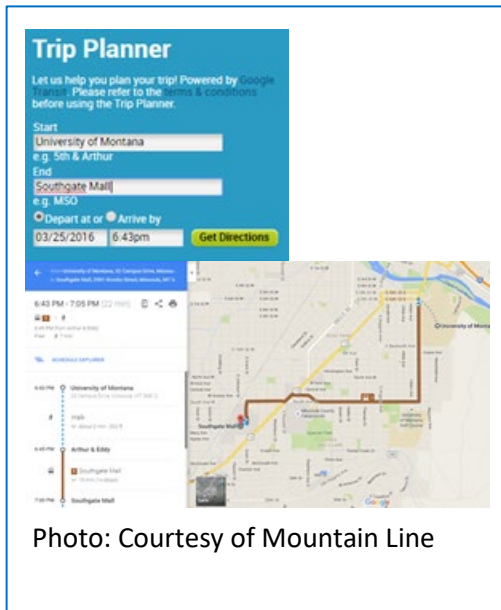## Public Transportation Trip Planner

TTI 6

Photo: Courtesy of Mountain Line

Description: A public transportation trip planner is a website or mobile app that provides a user with pre-trip or en-route information on routes, transit options, and travel times. It allows a user to enter various parameters such as origin, destination, mode of travel, or travel time, and the planner will provide a detailed travel itinerary or turn-by-turn navigation based on these inputs. A trip planner can be customized to varying forms of transportation including driving, public transit, or walking/biking. Also, these tools can include information on real-time traffic, parking, construction zones, gas prices or nearby points of interest.

Rural Transportation Critical Needs	Issues Addressed	Strategies Achieved
☐ Crash Countermeasures	☑ Pre-trip Information	☑ Road User
☐ Emergency Services	☑ En-route Information	☐ Road
☐ Operations & Maintenance	☐ Public Data Collection	☐ Vehicle
☑ Rural Transit & Mobility	☐ Public's Ability to Communicate to Transportation Agency or Emergency Services	☐ Safety Culture
☐ Surface Transportation & Weather		☐ Engineering
☑ Tourism & Travel Information		☐ Emergency Response
☐ Traffic Management		☐ Enforcement
		☑ Education

Rural Intelligent Transportation Systems (ITS) Toolkit

Applicability

- While not low cost, the benefit of deploying a public transportation trip planner is providing users with accurate and convenient traveler information for a specific area. This could be most useful for tourists as many areas they will travel to are in rural areas with travel conditions and safety challenges that are very different than what they are used to. More informed users can result in increased use of non-auto modes, better utilization of less congested areas of the road network and reduction in motorist stress. A trip planner is applicable for any location, especially areas with public transit, tourist traffic, or congestion issues.

Partnerships

- Applications benefit from collaboration among numerous agencies, which may include:
  - Departments of Transportation (Federal, State, Local)
  - Transit Agencies
  - Federal Land Management Agencies
  - Local Bicycle Advocacy Groups
  - Google, Waze, and Other App Providers

Key Components

- Smartphone or Computer
- Server
- Road Network Data
- Transit Schedule Data
- Database of Points of Interest Locations

Examples of Implementation

- **Mountain Line Bus – Missoula, Montana**

The Mountain Line Bus in Missoula, Montana provides a trip planner on its webpage that allows a user to enter an origin and destination, date, and time of travel. This trip planner was created using Google Transit and provides the user with a Google Map that shows the travel route, bus information, cost, and a contact phone number if the user has any questions.

- **Transit and Trails**

Transit and Trails provides a website and mobile app that allow users to search for nearby trails and campgrounds and plan how to get there, including mode of travel (transit, bike, walk, or drive) and departure time. The trip planner provides the users with directions and a Google Map of their itinerary.

Implementation Considerations (Pro)	Implementation Considerations (Con)
• Trip planner usage can reduce the call center burden for transit agencies. • Tools provide better traveler information to users. • Access to alternative transportation information can encourage the use of non-auto modes of transportation. • Tools can combine data from multiple transit networks in order to provide regional travel information. • Open source options are available and widely used, such as General Transit Feed Specification (GTFS).	• Input data (transit routes, road networks, sidewalk data, etc.) tends to be in silos. • Agency may need to hire specific staff for start-up programming needs.

Opportunities for Future Expansion

- GTFS data can be used to combine multiple public transportation trip planners. Historic travel time data can be integrated into a trip planner to provide realistic travel times depending on when a person will be traveling. A public transportation trip planner can also be combined with automatic vehicle location (AVL) on transit vehicles, which informs users of transit delays and reduces time waiting at transit stops. In the future, connected vehicles may be able to provide drivers with trip planning information as they drive by locations (e.g., hotels with vacancies, restaurants in the area, etc.)

Additional Resources

- *Google Developers: Information and Reference Guides on General Transit Feed Specification (GTFS)*, found here: https://developers.google.com/transit/
- Federal Transit Administration (FTA) *Multimodal Trip Planner System Final Evaluation Report*, found here: https://rosap.ntl.bts.gov/view/dot/34582

Rural Intelligent Transportation Systems (ITS) Toolkit

Useful Tip

Can't afford to create a public transportation trip planner? A low-cost tip is to consider partnering with your local tourist destinations (e.g., National Parks, public lands, ski areas, etc.) that may already have a trip planner, or you can develop something less formal such as sharing information on your websites. This will benefit both the transportation agency and the tourist destination and increase the number of people receiving your traveler information to increase safety.

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: Total capital costs range from high ($100,000 to $250,000) to higher (above $250,000). Cost can vary greatly depending on whether open source software is used. The estimated costs to develop custom software and data feeds that are owned and maintained by the local jurisdiction (e.g., transit authority) can total more than $4.3 million[1]. To use open source software and pre-existing data feeds such as formatting bus schedules for use in Google transit and hosting on an agency website costs around $148,000[2].

Operations Costs: Operations costs will range from low to higher, depending on who and to what extent a trip planner is maintained. For example, if there is staff in house that has capabilities to update as necessary, operations costs could be low. Agencies need to consider ongoing operations and maintenance costs, such as data maintenance, adding new data as it becomes available, system upgrades, troubleshooting, and debugging.