



U.S. Department of Transportation
Federal Transit Administration



Mobility on Demand (MOD) Sandbox: Vermont Agency of Transportation (VTrans) Flexible Trip Planner

Final Report

Background

VTrans (Vermont Agency of Transportation) was awarded a \$480,000 FTA Mobility on Demand (MOD) Sandbox grant to develop foundational data and software tools that would enable rural and demand-responsive transportation to be discovered in trip planners, similar to how fixed-route transit providers could already be discovered.

Objectives

Objectives of the project were to 1) specify and develop “GTFS-flex” data for all public transit providers in Vermont, 2) adapt OpenTripPlanner to search and visualize flexible trip plans based on GTFS-flex data, 3) work with the community of open source and open data transit developers to refine the above work, and 4) deploy a statewide trip planner demonstrating accomplishment of the above and provide a new tool for Vermont public transit riders, showing them all available services in the state.

Findings and Conclusions

The combined effect of the results of this project is a demonstration that flexible transit trip planning is possible and practical in production trip planners.

The project team augmented two existing technologies—GTFS-flex, an open data extension of the widely-used General Transit Feed Specification that describes demand-responsive transit services, and OpenTripPlanner (OTP), an open source software application used by more than 30 transit agencies around the world to provide automated itineraries for transit trips.

The project succeeded through three innovations:

- **Specified and developed “GTFS-flex” data for all public transit providers in Vermont** – The data stored at vermont-gtfs.org contains descriptions of all possible trips that could be served by Vermont public transit, including flexible services. Small adaptations were made to the GTFS-flex data specification during the scope of the project to address needed use cases discovered during research.

- **Adapted OpenTripPlanner (OTP) to search and visualize flexible trip plans based on GTFS-flex data** – This includes the discovery of any possible future demand-responsive trip. “Discovery” means the indication that a trip is possible, with the expectation that the end-user books the desired trip in coordination with the agency.
- **Worked with the community of open source and open data transit developers to refine the above work** – The project team presented the GTFS change proposals incorporating GTFS-flex data concepts in partnership with MobilityData IO, constituting the GTFS-flex v2 specification now under consideration for adoption by various parties. The project team also successfully merged OTP code enhancements into OTP 1.4 in partnership with the OTP Project Leadership Committee and reviews by developers at Entur in Oslo and Conveyal in Washington, DC.

Benefits

VTrans created a system wholly owned by the State of Vermont without ongoing license fees. The outcomes of this project—GTFS-flex data sets, lessons for flex data contributed to a revised GTFS-flex v2, and the OTP adaptations—were contributed back to the community and are available for use by any party.

Project Information

FTA Report No. 0150

This research project was conducted by Vermont Agency of Transportation. For more information, contact FTA Project Manager Edwin Rodriguez at (202) 366-0671 or edwin.rodriguez@dot.gov. All research reports can be found at <https://www.transit.dot.gov/about/research-innovation>.