MOBILITY ON DEMAND (MOD) SANDBOX

Tri-County Metropolitan Transportation District of Oregon (TriMet)

OTP Integration of Transit with Shared-Use Mobility Real-Time & Data Enhancements

TEAM, BUDGET, AND WAIVERS

Key Partners: Conveyal, IBI Group, Mapzen, Oregon Metro Data Resource Center, Moovel

Other Partners: Alameda-Contra Costa Transit District (AC Transit), Los Angeles County Metropolitan Transportation Authority (Metro), Vermont Agency of Transportation (VTrans), VTA, City of Portland, Oregon Metro, Portland Streetcar, Inc., Lyft, Motivate, and Uber

Budget Summary: The budget from the applicant is summarized below:

MOD Sandbox Demonstration Federal Amount ($)	MOD Sandbox Cost Share ($)	Total Cost
$678,000	$284,000	**$962,000**

INNOVATION: PROJECT APPROACH

The Open Trip Planner (OTP), initially released as an open source project by TriMet in 2009, was the first to introduce multiple modes in one trip with the original focus on incorporating biking and walking networks with transit. Adoption of OTP has been strong, with implementation in dozens of cities and countries worldwide. TriMet now proposes to build upon the core of Open Trip Planner to incorporate shared-use mobility (SUM) options.

TriMet's OTP SUM project will create a complete open platform for the integration of transit and shared-use mobility options. The open data, software and user interfaces, responsive on both web and mobile, will help Portland area customers make informed decisions about their mobility choices, including the critical first and last miles of transit trips where a bus or train alone doesn't provide full access. TriMet's project includes the development and expansion of two core data frameworks that current and future collaborative OTP initiatives can be built upon, producing replicable software and results for communities across the country. These two foundational core project elements are to:

- Extend the Open Trip Planner code base to support the integration of transit trip planning with shared-use mobility modes, such as bike share and transportation network companies (TNCs), as well as updated real-time transit information.
- Implement a fully functional and comprehensive open geocoder built off the existing Mapzen Pelias geocoder. Geocoding, or address locating, is a primary requirement for trip planning. A non-proprietary and non-restrictive option for address locating would substantially lower the barrier to entry for many transit systems to offer trip planning and can achieve significant cost savings for transit agencies, government agencies, and the public.

In addition to core elements on the foundation frameworks, the project will also include the development of a comprehensive new web-based user interface that will allow users to make intermodal trip plans including shared use mobility and demand-responsive service. Improvements to base map data will be made so the trip planner can support enhanced pedestrian/ wheelchair accessibility information for customers; and improvements to regional address data that will make location search and geocoding more effective and user-friendly. The project will also

plan for the design and implementation of compatibility for future booking and payment options in Moovel's RideTap product so customers can plan and pay for their trips in one app.

CHALLENGES PROJECT IS DESIGNED TO ADDRESS

The proposed project seeks to address the following challenges:

- OpenTripPlanner (OTP) does not currently incorporate shared modes.
- The trip planning process involves specifying the origin and destination of the trip, starting with a geocoding process, but the geocoding solutions available are often not adequate, leading to poor results and user frustration.
- Accessible trips are difficult to plan accurately due to the lack of data available on the accessibility of pedestrian infrastructure and the absence of these features in a trip planner.

ANTICIPATED OUTCOMES, BENEFITS, IMPACTS

A key component of enhancements to the core OTP routing engine will allow for more detailed pedestrian and wheelchair access routing and directions text to and from transit stops by incorporating updates to the OpenStreetMap (OSM) pedestrian network. The concentrated effort in improving both the accessibility data in the street network and its use in OTP will be a sharp enhancement to equity for persons with disabilities. TriMet is collaborating with the OSM coding community to establish best practices for representing this accessibility information in the base network to serve as a model for communities nationwide. TriMet will build out this accessibility information in the OSM network and provide a model for replicating this work in other regions.

This model will then provide the basis for infusing this information into the OTP core engine so that it can make optimal use for planning accessible trips for persons with disabilities. Further, with this capability included in the OTP core, derivative products such as Transport Analyst will have enhanced capabilities for equity analysis activities. In addition, through other linked applications to this grant (namely, the VTrans' project), the combined efforts will allow OTP to read the GTFS-flex specification, which will surface itineraries for "flexible" public transit modes like hail-and-ride and deviated-fixed services, further improving trip making capabilities for people with disabilities and an aging population who often depend upon these flexible services.