Intelligent Transportation Systems
Joint Program Office

Mobility on Demand Sandbox
Webinar 1:
Valley Metro Mobility Program
Pierce Transit Limited Access Connections

October 3, 2017
Today’s Agenda

- Purpose of this Webinar
  - To present two of the MOD Sandbox projects

- Webinar Content
  - Valley Metro
  - Pierce Transit

- Webinar Protocol
  - Please mute your phone during the entire webinar
  - You are welcome to ask questions via chatbox at the Q&A Section
  - Questions will be answered in the order in which they were received
Mobility on Demand Sandbox Overview

Robert Sheehan
USDOT Joint Programs Office
Trends/Setting the Stage
Societal Trends Driving MOD

- **Redefining Longevity**
  - By 2045, the number of Americans over age 65 will increase by 77%

- **Population Growth & Urbanization**
  - In 30 years, our population is expected to grow by about 70 million

Image Source: Thinkstock/USDOT
Technological Trends Driving MOD

• **Big Data & Analytics**
  • Transportation increasingly relying on data to drive decisions and to enable innovative travel options

• **Real-Time Travelers**
  • 72% of Americans own a smartphone, with access to up-to-the-minute traveler information
Mobility & Environmental Trends Driving MOD

• Increasing Congestion
  • On average, Americans spend over 40 hours stuck in traffic each year, costing $121 billion

• Mobility Choices
  • There is growing popularity of shared mobility and shared modes, such as bikesharing, carsharing, and ridesourcing
Public or Private?
Public or Private?
USDOT Mobility on Demand Program
MOD Program Goals

- Explore emerging technology solutions and new business approaches that have the potential to transform mobility services.

- Prepare the transportation industry to deliver innovative mobility solutions that will enhance transportation efficiency and effectiveness, improve customer service, and foster personal mobility and access to goods and services.

- Enable the widespread deployment of integrated mobility solutions that are connected, equitable, and effective to enhance the personal mobility of everyone and provide access to all users.
FTA’s Role in MOD

**Research**
- Promoting transit industry awareness and readiness
- Examining public sector and federal rules, requirements, regulations, and policies

**Innovation**
- Developing MOD “products” within a public transportation framework
- Establishing performance measures
- Creating Sandbox for public/private teams to implement innovative services

**Demonstration**
- Testing new implementation models in a transit environment.
- Deploying promising models in diverse community settings

Image Source: Thinkstock/USDOT
MOD Program Overview

- Multiple MOD Research Efforts are underway:
  - Foundational Research
  - FTA Sandbox Demonstrations
  - Sandbox Evaluations
  - Stakeholder Engagement & Outreach
  - Innovation and Knowledge Accelerator
  - Policies and Practices
What is Mobility on Demand?
What is Mobility on Demand (MOD)?

An integrated and connected multi-modal network of safe, affordable, and reliable transportation options that are available to all

- User-focused options to improve personal mobility and access to more destinations
- Promotes choice in personal mobility & optimizes the transportation system through Intelligent Transportation Systems
- Advances connected vehicles & automation applications
- Utilizes emerging technologies & data exchange to enable personal mobility
- Encourages multimodal connectivity & system interoperability
Guiding Principles of MOD

- **Traveler Centric/Consumer Driven**
  - MOD is defined by quality and carefree personal mobility choice for individuals

- **Data Connected/Platform Independent**
  - MOD (the end state) drives the technology.
  - Technology doesn’t change the MOD vision, it provides the capability to realize in an interoperable fashion

- **Mode Agnostic/Multimodal**
  - MOD embraces all modes and resources to support personal mobility choice in an integrated, connected and multimodal manner
User-centric Travel Options

Carsharing
Provides members with access to a car for short-term use

Bikesharing
Provides members with access to a bike for short-term use

Ridesharing
Carpooling, vanpooling, and real-time ridesharing services

TNCs and Taxis
Transportation Network Companies (TNCs) and Taxi Services

Car Rental
Conventional Rental Car Services

Public Transportation
Public Bus, Light Rail, Heavy Rail and other Public Transport Services

Integrated Payment
Allows users to pay for services using a smartphone app

Incentives
Rewards and incentivizes users for good travel choices

Smart Parking
Allows users to reserve and pay for parking using a mobile app

Trip Planning & Navigation Services

Real-Time Travel & Operations Data
Includes public agency and private sector traffic data

Image Source: Thinkstock/USDOT
<table>
<thead>
<tr>
<th>Who Benefits from MOD?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Travelers</strong></td>
</tr>
<tr>
<td>• Access to more transportation options</td>
</tr>
<tr>
<td>• Builds a more efficient, effective, and customer-centered transportation network</td>
</tr>
<tr>
<td><strong>Public Transit Providers</strong></td>
</tr>
<tr>
<td>• Connects ALL regional transportation services and assets into a seamless public transit network</td>
</tr>
<tr>
<td>• Extends service quality and coverage</td>
</tr>
<tr>
<td><strong>Shared-Use Transportation Providers</strong></td>
</tr>
<tr>
<td>• Connects travelers to provider services</td>
</tr>
<tr>
<td>• Provides an easy to use, common technology platform for mobility options</td>
</tr>
<tr>
<td><strong>Mobility Managers</strong></td>
</tr>
<tr>
<td>• Streamlines information for transportation options</td>
</tr>
<tr>
<td>• Growing employment and transportation partnerships</td>
</tr>
</tbody>
</table>
FTA MOD Sandbox
FTA Mobility on Demand Sandbox
Why a Sandbox?

- Many players can come together to innovate, experiment and learn
- Apart from conventional practices and constraints
- No one way to play
- All can bring different tools and play together as they choose
MOD Sandbox Program Overview

Funding and Eligible Applicants

- **$8 Million** in FTA FY14 and FY16 research funds

- **Local Share Minimum of 20%** of the net project cost in cash, or in-kind

- **Providers of public transportation** (public transit agencies, state/local government DOTs, and federally recognized Indian tribes) with one or more strategic partners

- Projects solicited through Notice of Funding Opportunity (NOFO) published May 3, 2016, with proposals due July 5. The 11 awardees were announced on October 13, 2016
MOD Sandbox: More than One Way to Play
MOD Sandbox: Projects

- Address how public transportation providers can collaborate and establish productive relationships with MOD providers and services to benefit travelers
- Demonstrates innovative traveler-centric transportation models that can provide better service for everyone, everywhere, all the time
- Considers equity and accessibility for all travelers, including payment options that can accommodate all users
Mobility on Demand (MOD) Sandbox

- 78 eligible applications to FTA for the MOD Sandbox
- 33 states, including DC, submitted applications
- $57 million in FTA funding requested with a minimum of $112,000 and a maximum of $3.5M requested
- $8 million in federal funding available from the MOD Sandbox
MOD Sandbox At a Glance
# Overall Evaluation Framework

## Guiding Principles
- System Integration
- Partnership Driven
- Innovative Business Model
- Equity of Service Delivery

## Hypothesis Development
- User Impact Hypotheses
- System Operations Hypotheses
- Institutional Impact Hypotheses

## Performance Metric Establishment
|-----------|------------------|-------------------|-------------------|------------------|----------------------|------------------------|------------------------|----------------------|

## Data Design and Collection
- User Surveys
- Ridership Data
- Financial Data
- Energy Data
- Expert Interviews
- Operational Statistics

## Methodological Approach
- Attributional & Causal Response Questions
- Control & Treatment Survey Samples
- Discrete Choice Models
- Before, Interim & After Measurements
- Difference-in-Difference Analysis
- Statistical T-tests on Mean Measurements
- Poisson and Negative Binomial Models
- Qualitative Expert Interview Summaries

Image Source: Thinkstock/USDOT
Analysis planning: Methodological approach

- A number of Different Methodologies to Conduct the Analysis will be applied to conduct the Evaluation.
  - The method applied to assess an individual Hypothesis will be in part dependent on the data design that is obtained or Supplied to the IE Team.

- Whenever possible, methods will seek to test changes using a parametric or non-parametric test, to assess whether there has been a substantive change in activity, behavior, or other system attribute.

- Survey Responses will provide ordinal scale responses that may address the hypothesis directly, without the need for a statistical test.

- Statistical Models of different kinds will be developed to Explore hypotheses in More Depth.
MOD Sandbox: Today’s spotlight

Webinar 1:
Highlight two of the eleven FTA MOD Sandbox sites
Focusing on integrated platforms and services.

PIERCE TRANSIT (PIERCE COUNTY, WA)
• Limited Access Connections project connects service across two transit systems –
local and regional – and ride-share companies to increase transit use across the
Seattle region.

VALLEY METRO RAIL (PHOENIX, AZ)
Smart phone mobility platform that integrates mobile ticketing and multimodal trip
planning, including ride-hailing, bike sharing, and car-sharing companies.
Pierce Transit
(serving Pierce County, Washington)

Speaker

Penny Grellier
Business Partnership Administrator
Pierce County Public Transportation Benefit Area Corporation (Pierce Transit)

- 33 local routes serve a population of more than 538,700 in a 292 square-mile area
- Local fixed route: 147 buses
  (plus Sound Transit: 135 buses)
- SHUTTLE: 100 vehicles
- Vanpool: 369 vans
- All services combined, approximately 14.8 million rides regionally in 2016
Pierce Transit Sandbox Project

Three-Pronged Approach

- First Mile / Last Mile Solution
- Guaranteed Ride Home
- Trips Provided to/from Park & Ride Lots
  - Needed in order to reduce overcrowding at lots
## Three-Pronged Approach

<table>
<thead>
<tr>
<th>Categories</th>
<th>Supporting Bullets</th>
</tr>
</thead>
</table>
| **First Mile / Last Mile**          | ▪ Service provided to customers whose start or end point lies more than ½ mile from nearest transit access  
▪ Subsidized rides provided by TNCs to and from transit stations  
▪ Fully subsidized by grant funds |
| **Guaranteed Ride Home**            | ▪ Offered outside of transit service operating hours  
▪ Rides provided to transit customers at no cost  
▪ Fully subsidized by grant funds |
| **Park & Ride Congestion Reduction** | ▪ Offer TNC rides within 5 miles of a P&R  
▪ Only offered during peak commuting hours  
▪ Fully subsidized by grant funds |
Pierce Transit Sandbox Project

Expected Benefits

- Increase throughput at parking-constrained P&R Lots
- Facilitate connections to existing Bus Routes
- Make transit more available, more accessible

- Estimated Average Cost per Trip: $11
  - Cost-Effective vs. Fixed Route Demonstration Projects
Mobility Platform – Goals

- **Expand:**
  - Mobility within Region
  - Transportation Options for Customers
  - Number of Public Transit Users
  - Use of Uber in support of Transit Access and Egress
  - Mobility for Underserved Population in Pierce County

- **Improve:**
  - Mobility for Disabled Populations
  - Cost Efficient of Access and Egress Services
  - Level of Service per User Cost
Mobility Platform - Goals

- Promote Equitable Mobility Benefits Across All Populations
- Increase Access to Transit Stations
- Increase Egress from Transit Stations
- Preserve and Enhance Environment
- Reduce Driving in Personal Vehicles
- Ensure Travelers Feel Safe While Utilizing Public Transit (Buses, Stations, P&Rs, etc)
- Build Institutional Relationships and Systems that can be provided to other Transit Operators
Existing Problems / Shortcomings

- Fluctuating Budgets
  - Service hours have been reduced – now approx. 25% below 2008 levels*

- Land Use
  - Extensive areas have medium- and low-density development
  - Geographic gaps in service
  - Wait times can exceed 1 hour

- Congestion at Park & Ride Lots
  - P&R Lots hit capacity limits early in morning rush hour
    - Customers divert to single-occupancy vehicles
    - P&R Expansion is capital-intensive
      - Right-of-Way Acquisition
      - Paving
    - Vanshare provides some remedy

*note: recent restoration of 45,000 service hours (Mar/Sept), system redesign
Potential Shortcomings

Possible Issues / Shortcomings

- Riders without a smartphone or credit card
  - Alternative app access available
    - Website & PayPal
  - Additional tools developed by rideshare partner
    - UberCentral (concierge-type) service
- WAV response and number of requests
Valley Metro

Rob Antoniak
Chief Operating Officer
Valley Metro

- Valley Metro/Regional Public Transportation Authority
  - Maricopa County/Phoenix Metropolitan Area
  - Fourth most populous county in the U.S. – approximately 4.2 million residents
  - Geographically large area – 9,224 sq. miles
  - Bus service area – 512 sq. miles
- 26 Miles of light rail w/ 35 stations
- 102 Bus Routes
- ~ 70 million rides per year
RideKick®

- RideKick is Valley Metro’s existing trip planning app

- The existing RideKick app currently offers:
  - Available for iPhone/iPad and Android phones/tablets
  - Limited real-time arrival information
  - Plan a trip using an interactive map
  - Bookmark your favorite routes and destinations
  - View fares and find fare sales locations
  - Locate bus stops and park-and-rides
Sandbox Project: Mobility Platform

- Put the **Rider** in the **Driver’s Seat**
- Expand mobile application:
  - Real-time travel information
  - Optimize trip planning through integration of non-Valley Metro services, such as:
    - TNCs (Uber, Lyft, etc)
    - Bikeshare (GR:D Bike Share)
    - Carshare
- Mobile Ticketing across modes
Mobility Platform - Goals

▪ Reduce:
  □ Travel Time
  □ Wait Time
  □ Paper-Based Tickets
  □ On-Board Cash Pay
  □ Lack of connectivity

▪ Improve:
  □ Personalization
    ▪ User accounts & flexibility
  □ Accessibility of Mobile Application
  □ User-Perceived Connectivity Throughout Transit Network
  □ Perception of safety via incident reporting capability of the application
  □ Connectivity throughout transit network
    ▪ Reduce first mile / last mile challenges common of public transit
Mobility Platform – Goals (Cont’d)

- Increase Mobile-Based Tech Adoption and Multimodal Travel Options
- Provide Single Payment System for Public/Private Transportation Modes
- Enhance the customer experience by providing a traveler-centric service:
  - Real-time travel information
  - Personalized trip routes
  - Rider in the drivers seat
- Enhance trip planning methods for persons with disabilities who need an accessible vehicle to complete travel via a participating ride-share or paratransit provider
- Open Data Platform allowing transit agencies to view and exchange travel information
- Produce Lessons Learned through Stakeholder Interviews
Sandbox Project: Mobility Platform

Image Source: Thinkstock/USDOT
# Sandbox Project: Mobility Platform

<table>
<thead>
<tr>
<th>Riders</th>
<th>Hubs/Trip</th>
<th>Services</th>
<th>Vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Image of students] Transit Center + Satellite Campus</td>
<td>Rail/Bus + Circulator</td>
<td>Rail/Bus + Cutaway Van</td>
<td></td>
</tr>
<tr>
<td>5 miles to Rail + Airport</td>
<td>TNC 1st/last mile + Rail</td>
<td>TNC’s + Rail + PHX Sky Train</td>
<td></td>
</tr>
<tr>
<td>[Image of business people] Rail + Transit Center + Corp. Campus</td>
<td>1st/last mile + Rail + Circulator</td>
<td>TNC’s + Rail + Van On Demand</td>
<td></td>
</tr>
<tr>
<td>[Image of sports icons] System-wide + Sports District</td>
<td>1st/last mile + Rail + Walk</td>
<td>TNC’s + Rail/Bus + Walk</td>
<td></td>
</tr>
<tr>
<td>3/4-mile Rule</td>
<td>Fully Accessible Paratransit w/ Assistant</td>
<td>Accessible Vehicle + Rail</td>
<td></td>
</tr>
</tbody>
</table>
Mobility Platform - Implementation

Phase I
- Enterprise architecture
- Traveler information
- Account profile
- Surveys
- Alerts
- Schedules
- Trip planning
- Mobile purchase pilot

Phase II
- Beacon Technology
- Multi-Modal Ticketing
- Paratransit Integration
- Safety Notification Service
- Bus Arrival times
- Advertising Partnerships
- Additional Security
- TNC Integration
Mobility Platform – Potential Shortcomings

- Riders without a smartphone or credit card
  - Website?
  - Alternative forms of payment
    - EX: Pay Near Me or others?
  - TNC-provided concierge
    - Data requirements
  - Back end reporting
Stay Connected

Contact for USDOT:
- Robert Sheehan
- Program Manager – MOD and ATTRI
  - Robert.Sheehan@dot.gov

Visit the Websites for more Information:
- Pierce Transit: https://www.piercetransit.org/
- Valley Metro: http://www.valleymetro.org
- USDOT MOD Sandbox: https://www.transit.dot.gov/research-innovation/mobility-demand-mod-sandbox-program.html

Contact for Valley Metro:
- Rob Antoniak
- Chief Operating Officer

Contact for Pierce Transit:
- Penny Grellier
- Business Partnership Administrator

Image Source: Thinkstock/USDOT