Objective-Driven Data Sharing for Transit Agencies in Mobility Partnerships

- Executive Summary -

Objective-Driven Data Sharing for Transit Agencies in Mobility Partnerships

Shared-Use Mobility Center
Federal Transit Administration

Webinar & White Paper
July 10, 2019
Webinar will be approximately 45 minutes, with the last 10 minutes for Q&A.

Enter questions through the chat box.

Webinar will be recorded, and slides will be posted onto SUMC’s website.

For real-time captions, go to: tinyurl.com/p3-data

Webinar & White Paper
July 10, 2019
Speakers

Sharon Feigon, Shared-Use Mobility Center (SUMC)

Murat Omay, Federal Transit Administration

Prashanth Gururaja, SUMC

Rudy Faust, SUMC
SUMC is a public-interest non-profit organization that aims to make it possible for people to live well without owning a car through a multimodal transportation system that works for all.

**SUMC-FTA Mobility On Demand (MOD) Sandbox Innovation & Knowledge Accelerator**

**Goals**
- Identify Sandbox project-specific challenges
- Provide technical assistance
- Accelerate learning on MOD
- Develop resources for the MOD community

**Methods**
- Workshops
- Webinars
- MOD Learning Center
- White Papers
Mobility Performance Metrics (MPM) as a Perspective on Objective-Driven Data Sharing for Transit Agencies in Mobility Partnerships

July, 10 2019

Murat Omay
FTA Office of Research, Demonstration, and Innovation (TRI-10)
Key Challenges in Mobility Management

• Data-driven challenges:
  – Data availability (lack of data and abundance of data)
  – Data sharing and integration
  – Data security

• Organizational challenges:
  – Integration and coordination of multiple systems
  – Harmony between multiple agencies/providers
  – Mismatch of objectives of providers in the regional mobility system
  – Capability maturity of agencies/providers (e.g., technical, resource, culture)

• Objective-driven challenges:
  – Clear objectives for performance measurement (agencies)
  – Clear objectives for regional mobility performance measurement
Current State of Mobility Performance Measurement

• Current performance indicators tend to focus on:
  – measuring operational adequacy of travel modes in isolation
  – measuring system efficiency from operator perspective
  – evaluating system performance based on unlinked trip data

• Limited feedback from travelers (experience, expectancy, alignment with travelers’ objectives)

• Indicators to measure the performance of the integrativeness do not exist

• Indicators to measure the value of options within a mobility system do not exist

• Systemwide performance is not captured, thus supplemental performance indicators to complement existing ones are needed
Objectives of Mobility Performance Metrics

- **Traveler**
  - Measure how well the integrated mobility system meets the needs of its individual travelers (closeness of qualitative and quantitative supply/demand)

- **System**
  - Measure how effectively and efficiently the system performs while meeting its travelers’ demands

- **Regional**
  - Impact of the mobility system regionally from multiple perspectives (e.g., regional mobility, sustainability, reliability, accessibility, social, programmatic, environmental, employment/healthcare/educational opportunities, economic development)

- **National**
  - Impact of the mobility system nationally from multiple perspectives (e.g., meeting USDOT/National goals, sustainability, economic benefits, financial benefits, accessibility, effectiveness of social programs, efficiency of USDOT investments, environmental and workforce impacts)
## What are we trying to measure?

<table>
<thead>
<tr>
<th>Traveler-centric</th>
<th>System-centric: Impact to the multimodal transportation or mobility system (not transit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact to individual traveler</td>
<td>Measure a system’s ability to meet travelers’ needs and preferences</td>
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<tr>
<td>Complement existing metrics such as ridership by introducing additional data/granularity such as linked trip data</td>
<td>Measure performance from user experience perspective</td>
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<tr>
<td>Explore new measures such as spontaneity, availability, value-based affordability, mobility and transfer options, impact of reliability, etc.</td>
<td>Measure the system performance from multiple perspectives:</td>
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<tr>
<td>Futureproof through dynamic target-setting strategies and monitoring the dynamicity of supply/demand equilibrium</td>
<td>- Effectiveness of the system: to implement demand-specific indicators based on traveler and user expectancies</td>
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<td></td>
<td>- Efficiency of the system: to create opportunities for right-sizing of fleet and operations/capture/service, effective service planning and delivery, targeted service, converging of services such as specialized transportation/paratransit</td>
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<td>- Safety of the system: to engage strategic planning activities to reduce exposure to unsafe conditions</td>
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<td>- Effectiveness (e.g., price points, incentive strategies, fare policies, value-based affordability, behavioral changes)</td>
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<tr>
<td></td>
<td>- Sustainability of operations and collaborations/partnerships</td>
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<th>Region-centric</th>
<th>National: Impact (or contribution) to the Nation’s indicators and resources</th>
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<tr>
<td>Impact to cities and regions</td>
<td>Long-term impacts of collaboration and integration to the overall economy</td>
</tr>
<tr>
<td>Multi-perspective impact:</td>
<td>Multi-perspective impact: Economy, Workforce, Financial, Environmental, Social Equity, Safety, Security</td>
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<td>- Regional mobility, safety, and congestion</td>
<td>- Economic and economic development opportunities</td>
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**Region**
- Regional mobility, safety, and congestion
- Economy and economic development opportunities
- Workforce, employment, education, and healthcare opportunities
- Financial impacts and benefits/disbenefits
- Environmental impacts and air quality implications
- Social equity and effectiveness of social programs

**Nation**
- National: Impact (or contribution) to the Nation’s indicators and resources
- Long-term impacts of collaboration and integration to the overall economy
- Multi-perspective impact: Economy, Workforce, Financial, Environmental, Social Equity, Safety, Security
Purpose
Issue:

Transit agencies are looking to partner with new mobility companies.

Reaching data agreements has been a persistent challenge.

Our paper:

...provides a strategic approach to help agencies form a data-sharing agreement with their project partner

...is NOT a strategy for regulating or requiring data about the general direct-to-consumer operations of private mobility service providers
Objective-Driven Data Sharing
Common MOD Service Data Needs

**Planning** – Where should service be provided?
- Historical/Aggregated:
  - Travel Patterns
  - Pickup/Drop-offs

**Auditing** – Is the partner providing what was agreed to?
- Trip-level/Aggregated:
  - Origins/Destinations
  - Pickup/Dropoff times
  - Wheelchair requests/rides

**Operations** – How is the service being used?
- Trip-level/Aggregated:
  - Origins/Destinations
  - Pickup/Dropoff times
  - Wait times
  - Travel times
  - Vehicle occupancy

**Accounting** – What does the service cost the traveler and the agency?
- Trip-level:
  - Pricing
  - Fares
  - Total Cost

- Aggregated:
  - Surge Pricing Trends
  - Average Fares
  - Pooled vs. non-pooled rides
Common Multimodal Trip-Planning Data Needs

Trip Discovery
Where and how can I get a ride?
- Vehicle availability
- Wait time (est.)
- Travel time (est.)

Booking
How do I reserve my multimodal trip?
- Account information
- Provider API

Payment
How do I pay for my trip?
- Fare structures
- Discount eligibility
- Payment API

Real-time information, APIs
Challenges
Challenges Areas

• Privacy
• Competitiveness
• Public Records Laws
• Data Security
• Aggregation
• National Transit Database and Performance-Based Funding
• Capability Constraints
Challenges

Competing interests can lead to divergent data-sharing preferences

**Agency Needs**
- Planning
- Operations
- Accounting
- Auditing
- Trip-Planning

**Provider Concerns**
- Trade Secrets
- Competitiveness
- Privacy
- Public Records Disclosures

More / Finer Data Sharing

Less / Coarser Data Sharing
Solutions
Mutually Agreeable Data Aggregation

Select examples from transit-ride hailing service partnerships

<table>
<thead>
<tr>
<th>Agency / Project</th>
<th>On-Demand Project Type</th>
<th>Reporting Frequency</th>
<th>O/D Spatial Resolution</th>
<th>O/D Temporal Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBTA – The RIDE On-Demand (Boston area)</td>
<td>Service for ADA paratransit users</td>
<td>Monthly</td>
<td>Individual trip – ZIP Code</td>
<td>Aggregated begin and end times for trips</td>
</tr>
<tr>
<td>Arlington, Texas – Rideshare</td>
<td>Microtransit</td>
<td>Periodic</td>
<td>Individual trip – requested locations</td>
<td>Individual trip times</td>
</tr>
<tr>
<td>Pierce Transit – Limited Access Connections (Pierce County, WA)</td>
<td>First/last-mile (free fare)</td>
<td>Monthly</td>
<td>Individual trip – census tract</td>
<td>Individual trip – time of day (AM peak, midday, PM peak)</td>
</tr>
<tr>
<td>PSTA – Direct Connect (Pinellas County, FL)</td>
<td>First/last-mile (subsidized fare)</td>
<td>Monthly</td>
<td>Total trips – No spatial information</td>
<td>Total trips - No temporal information</td>
</tr>
</tbody>
</table>
Public Records Laws

• Created to increase transparency in government
• Usually predate large-scale data collection
• Government records presumed public unless exempted
• Exemptions often include personally identifiable information (PII) and business secrets, but provisions vary in language and interpretation by jurisdiction
Public Records Laws

• Public Records Exemptions
  • Sound Transit, King County Metro (“Via to Transit”):
    *Use information pertaining to Fare Payment Media (PII)*
  • LA Metro MOD agreement with Via:
    *Travel Pattern Data from Electronic Transit Fare Collection (PII), Trade Secrets*

• Modernization with help from agencies
  • TriMet → Oregon Revised Statutes 192.345
  • DART → Texas Transportation Code Section 451.061
  • Should be politically uncontroversial
  • Need considerations for protecting origin-destination data
Third Party Repositories

- Disaggregated data resides with third-party
- Academic, government, non-profit, or private-sector entities
- Warehousing, management, and/or analysis
- BUT, not a preferred solution for most MOD partnerships
- Instead, a growing solution for understanding general travel patterns
- Planning phase for MOD projects?
API Requirements for Trip-Planning Apps

• Data about vehicle availability, booking, etc; NOT trip data
• Arlington, VA
  • Open API requirements for all micromobility operators
• Finland Transport Codes
  • Open data requirements for all transport operators (public and private)
• Without requirements, need one-off agreements with every provider
Decision Tree
Decision Tree

A thought process for forming data agreements for your MOD projects

Considers **project-level** decisions and **policy-level** decisions

Tradeoffs for each decision
Decision Tree

Example:

MOD Service Project

→ Trouble with agreeing on data aggregation due to public records laws
→ If laws can’t be changed, consider repository
→ If repository feasible, then form your agreement
→ If not, then reconsider aggregation levels with partner
Decision Tree

Example:

**Multimodal Trip-Planning App**

- Try establishing API requirements
- If this is not feasible, develop API agreements with individual providers
- Develop metrics and data needs that serve objectives
- Reach mutually agreeable aggregation and manage data in-house
- Form your data agreement
Key Questions to Ask Yourself

**Project-level decisions**
- What data resolution is sufficient to understand if my project is achieving the intended outcomes?
- Do I have the capability and infrastructure to manage and analyze data?

**Policy-level decisions**
- Will the time frame for policy change align with my project schedule?
- Do relationships need to be built with other agencies or legislators?
Conclusions

• Agencies should select a partner with whom they can find a mutually agreeable data parameter set and aggregation.

• If constraints related to public records disclosures or agency capability are impediments, agencies should explore using a third-party repository.

• Transit agencies and supporting organizations can proactively influence the modernization of public records laws.
Conclusions

• Transit agencies, together with states or cities, can establish API requirements to open up basic data parameters needed for trip-planning apps.

• Federal involvement can encourage data management strategies

• Follow a structured approach → Decision Tree
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Check Out the Paper!

Executive Summary available.
Full Paper to be released shortly!

www.sharedusemobilitycenter.org/publications
MOD Learning Center
learn.sharedusemobilitycenter.org

- Online Repository of all things MOD
- Graduated Educational Experience
- Supported by FTA
Acknowledgments

Federal Transit Administration
LA Metro
King County Metro
Sound Transit
Pierce Transit
Dallas Area Rapid Transit

TriMet
University of Washington
City of Arlington, TX
Massachusetts Bay Transportation Authority
Pinellas Suncoast Transit Authority
Vermont Agency of Transportation

Additional references in full white paper.
Thank you!

Questions?

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For questions about the FTA Integrated Mobility Innovation funding opportunity, see www.transit.dot.gov/imi