



U.S. Department of Transportation

Planning for Mobility & Accessibility: An Overview of Key USDOT Resources and Activities

Danielle Blackshear
Federal Highway Administration

Rik Opstelten
Federal Transit Administration



USDOT Research Topics

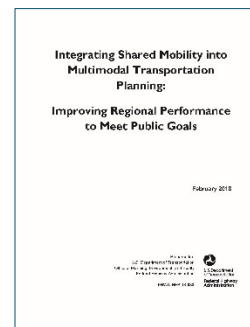
- Shared Mobility (Mobility on Demand)
- Micromobility
- Complete Trip – Accessibility for All Users
- Connected & Automated Vehicles
- Transportation Equity
- Multimodal Network Connectivity
- Bicycle & Pedestrian
- Curbside Management
- Safety

Integrating Shared Mobility into Multimodal Transportation Planning

Improving Regional Performance to Meet Public Goals

- Scan of practices in 13 Metropolitan areas
- Shared Mobility Conceptual Framework
 - Multimodal Planning
 - Planning Interventions
 - Evaluation and Learning
 - Project Implementation
- Key Takeaway: A Cooperative Approach is Needed
- Emerging Practices and Strategies
 - Data Access and Sharing
 - Regulating Use of Public Infrastructure
 - Strategic Planning
 - Operational Partnerships
 - Publicly Operated Shared Mobility Services
 - Shared Mobility in Modeling and Forecasting
 - Technical Assistance to Member Communities

	MPO	Local Government	Transit Agency	State DOT
g shared mobility operations		✓		✓
g the use of public right-of-way space		✓	✓	✓
action, analysis and tion	✓	✓	✓	✓
ips with shared mobility to complement transit or	✓		✓	
and technical assistance for partners	✓			
eadership and research	✓			✓
coordination and consensus	✓			
on into transportation plans ams of projects	✓	✓	✓	✓



Find the document online:
https://www.planning.dot.gov/documents/SharedMobility_Whitepaper_02-2018.pdf

Integrating Shared Mobility into Multimodal Transportation Planning

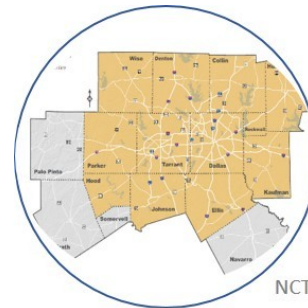
Metropolitan Area Case Studies

- More in-depth look at three metropolitan areas:

- Dallas/Ft. Worth, Texas
- San Francisco Bay Area, California
- Boston, Massachusetts

- Key Takeaways:

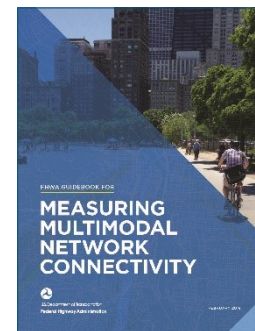
- MPOs Creating Forums for Working Together
- MPOs are Well-Positioned to Support Pilots and Regional Studies
- Pilot Projects provide Opportunities for Experimentation and Learning
- Integrating Shared Mobility into Models and Planning Frameworks is a Priority



Find the document online:
https://www.planning.dot.gov/documents/regional_shared_mobility_planning_caseStudies.pdf

Guidebook for Measuring Multimodal Network Connectivity

- Focus on Bicycles and Pedestrian Network Connectivity
- Analysis methods and supporting measures for 5 Core Components
 - Network Completeness
 - Network Density
 - Route Directness
 - Access to destinations
 - Network Quality
- 5 Case Study Assessments
- Key Takeaways:
 - Identify the Planning Context
 - Define the Analysis Method
 - Assemble Data
 - Compute Metrics
 - Package Results

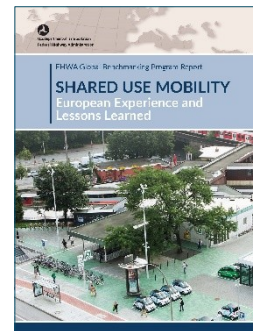


Find the document online:
https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/multimodal_connectivity/fhwahep18032.pdf

Shared Use Mobility - European Experience and Lessons Learned

FHWA Global Benchmarking Program Report

- 3 European Site Visits – Munich, Germany; Paris, France; and Brussels, Belgium
- Effective Practices:
 - Boundary-defying public-private organizations and contracting methods
 - Proactive planning and design for shared infrastructure and electrification
 - Forward thinking transit agency leadership with a vision for shared mobility connectivity
 - Development of “whole community” approaches to reducing personal vehicle travel and to creating and supporting shared mobility innovations
- Key Takeaway: Cities and transit agencies can use policies related to marketing and outreach, parking regulations, and shared infrastructure.



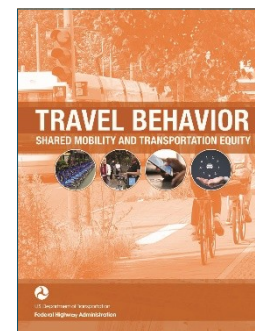
Find the document online:
[https://international.fhwa
.dot.gov/sum/fhwapl18026.p
df](https://international.fhwa.dot.gov/sum/fhwapl18026.pdf)

Travel Behavior: Shared Mobility and Transportation Equity

- *STEPS to Transportation Equity* framework barrier categories
 - Spatial
 - Temporal
 - Economic
 - Physiological
 - Social
- Shared Mobility Opportunities & Challenges and Policy Recommendations
- **Key Takeaway:** MPOs have many potential roles within shared mobility equity
 - Knowledge Transfer and Partnership Facilitation
 - Funding
 - Regulation/Legislation
 - Data and Metrics

Table 1: STEPS to Transportation Equity

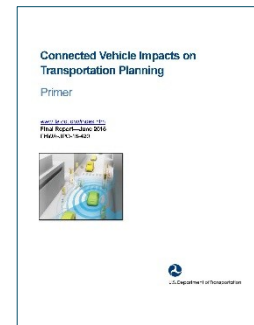
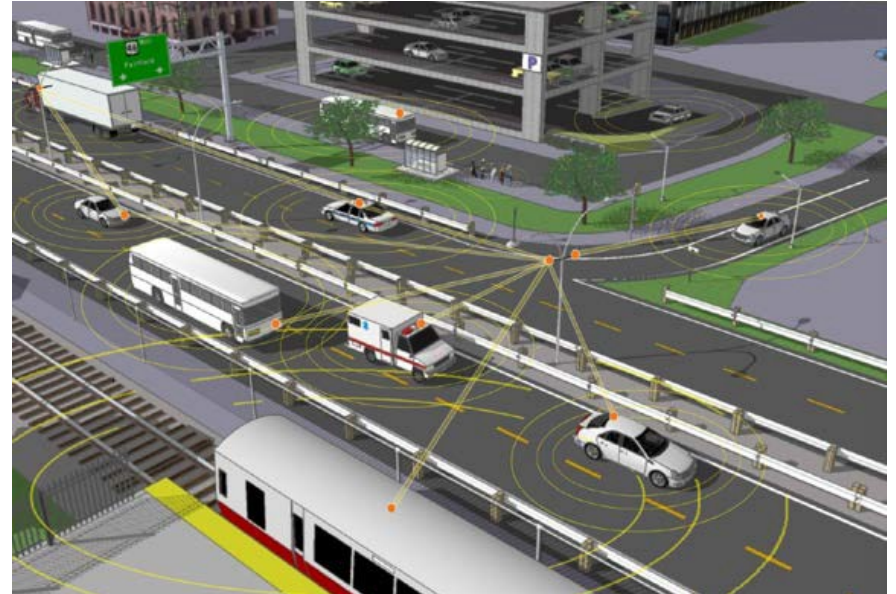
Transportation Barriers	Definition	Shared Mobility Opportunities	Shared Mobility Challenges
Spatial	Spatial factors that compromise daily travel needs (e.g., excessively long distances between destinations, lack of public transit within walking distance)	<ul style="list-style-type: none"> Public transit operators and ridesourcing first- and last-mile partnerships Microtransit for lower-density areas 	<ul style="list-style-type: none"> Higher operating costs in lower-density exurban and rural settings Limited curb space for increasing variety of mobility services
Temporal	Travel time barriers that inhibit a user from completing time-sensitive trips, such as arriving to work (e.g. public transit reliability issues, limited operating hours, traffic congestion)	<ul style="list-style-type: none"> Dynamic microtransit Late-night ridesourcing and shuttle services Commuter carpooling services 	<ul style="list-style-type: none"> Wait-time and travel-time volatility on congested roadways Unpredictable wait times due to supply fluctuations
Economic	Direct costs (e.g., fares, tolls, vehicle ownership costs) and indirect costs (e.g., smartphone, Internet, credit card access) that create economic hardship or preclude users from completing basic travel	<ul style="list-style-type: none"> Shared mobility subsidies for low-income users Multiple payment options for shared mobility services Multi-modal hubs with Wi-Fi access 	<ul style="list-style-type: none"> Credit/Debit Card payment High cost for longer distance and peak-demand trips Maintaining affordability, while providing livable wages



Find the document online:
https://www.fhwa.dot.gov/policy/otps/shared_use_mobility_equity_final.pdf

Connected Vehicle Impacts on Transportation Planning

- 4 types of analysis to assess the impact of Connected and Automated Vehicles (C/AV) on transportation planning processes & products
 - Impact Typology
 - 11 Case Studies
 - Analytical Tools and Techniques
 - Workforce Skills and Training
- **Key Takeaway:** During the evolution of C/AV, planners should keep in mind
 - Timeframes for implementing C/AV-supporting infrastructure and programs.
 - Funding sources for C/AV-supporting infrastructure and programs.
 - Societal and organizational impacts, as well as ways to adapt to disruption in the private and public sectors.
 - C/AV data outputs to support planning needs.



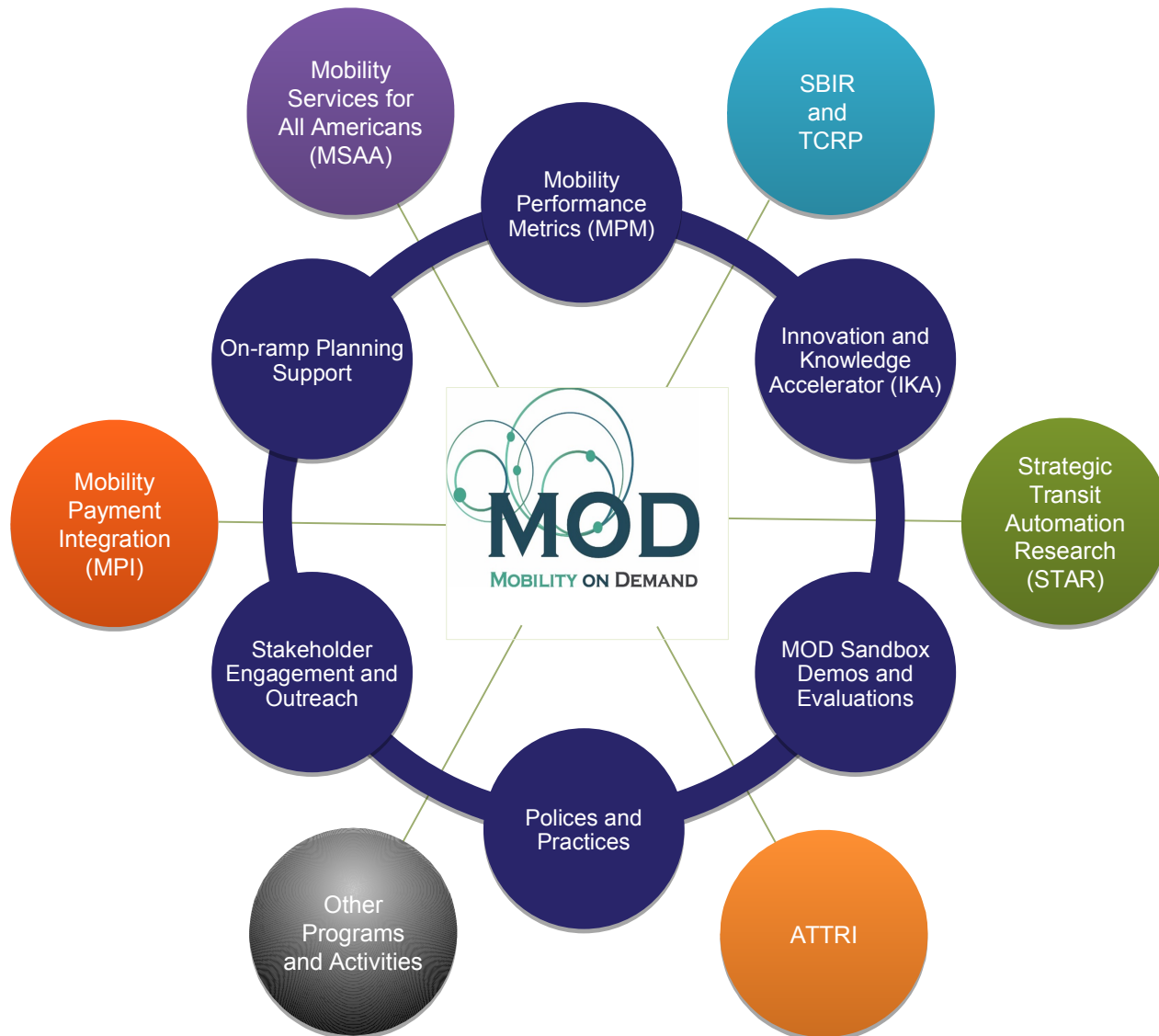
Find the document online:
<https://rosap.ntl.bts.gov/view/dot/31397>

FHWA Program Links and Resources

- **Environmental Justice, Title VI, Non-Discrimination, and Equity**
 - https://www.fhwa.dot.gov/environment/environmental_justice/equity/
- **Bicycle & Pedestrian Program**
 - https://www.fhwa.dot.gov/environment/bicycle_pedestrian/
- **Pedestrian and Bicycle Information Center (PBIC)**
 - <http://www.pedbikeinfo.org/>
- **Transportation Planning Capacity Building (TPCB) Connected and Automated Vehicles (Updated!)**
 - https://www.planning.dot.gov/planning/topic_CVAV.aspx
- **Office of Transportation Policy Studies**
 - <https://www.fhwa.dot.gov/policy/otps/>

FTA Research

Supporting Mobility Innovation



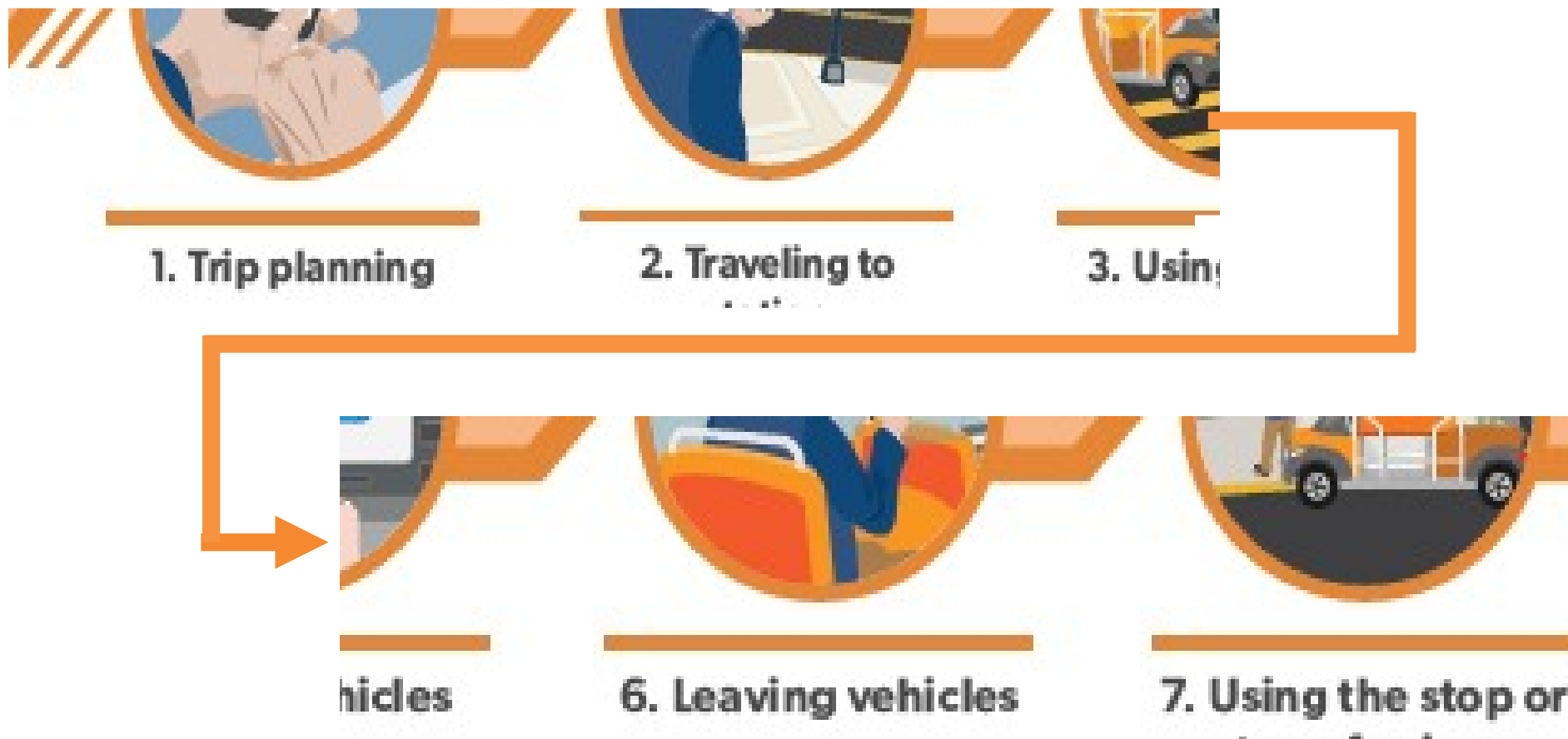
Integrated Mobility Innovation (IMI)

FTA's Integrated Mobility Innovation (IMI)

Program funds projects that :

- Demonstrate innovative and effective practices
- Demonstrate partnerships and technologies to enhance public transportation effectiveness
- Increase efficiency
- Expand quality
- Promote safety
- Improve the traveler experience

Complete Trip Concept



FTA's Mobility Innovation Program Portfolio

- Mobility on Demand (MOD)
- Mobility Payment Integration (MPI)
- Strategic Transit Automation Research (STAR)
- Accessible Transportation Technologies Research Initiative (ATTRI) – *originally with FHWA and ITS JPO*
- Mobility Performance Metrics (MPM)
- Mobility Services for All Americans (MSAA)
- Small Business Innovative Research (SBIR)
- Transit Cooperative Research Program (TCRP)
- <https://www.transit.dot.gov/about/research-innovation>

Mobility on Demand (MOD)

- A vision for an **integrated** and connected multimodal network of **safe, affordable, equitable, and reliable** options for personal mobility and goods delivery that are available and accessible to all.
- Leverages innovative technologies and facilitates public private partnerships to allow for a **user-centric approach** that improves personal mobility options and delivery of goods and services.



Mobility Payment Integration (MPI)

- Recognizes the emergence and rapid evolution of the mobility payment marketplace, **its importance in managing and integrating mobility**, and its overall influence on mobility outcomes.
- MPI will explore emerging solutions and operational approaches for **integrated payment solutions**, and demonstrating and evaluate integrated payment solutions via investment and **strategic partnerships**
- MPI will prepare transportation industry to use multimodal integrated payment services to **enhance efficiency, improve customer convenience, and increase access** to evolving personal mobility services
- MPI will also support U.S. Mobility Innovation goals for multimodal integrated solutions



Strategic Transit Automation Research Program

(STAR)

- Automation capabilities have grown rapidly in recent years
- The domestic transit bus industry lags behind both light-duty vehicles and heavy-duty trucking, as well as international transit manufacturers and providers
- Transit bus automation could deliver many potential benefits, but transit agencies need additional research and policy to make informed deployment decisions
- The FTA will demonstrate many automation technologies in real-world settings



Accessible Transportation Technologies Research Initiative (ATTRI)

ATTRI aims to remove barriers to transportation by leveraging advanced technology to enable people to travel independently, anytime of the day to any destination, regardless of their individual abilities



Wayfinding and Navigation:



CITY COLLEGE OF NEW YORK

Smart Cane for Assistive Navigation (SCAN), a wayfinding solution for those with low vision integrated with a smart phone application



ABLELINK

An open wayfinding media standard and related infrastructure to create geographically-specific, cloud-based libraries of routes in metropolitan or rural areas



PATHWAYS SOLUTIONS

A wayfinding tool for wheelchair users and people with visual impairment that guides users along routes tailored to their preferences



TRX SYSTEMS

A smart wayfinding and navigation system to obtain real-time location, en-route assistance, and situational awareness.



Pre-Trip Concierge and Virtualization:



ABLELINK

A suite of assessment, self-directed learning, and trip execution technologies to support pre-trip planning for individuals with cognitive disabilities.



Safe Intersection Crossing:



CARNEGIE MELLON UNIVERSITY

A tool to connect pedestrians with disabilities to the traffic signal systems infrastructure (and nearby connected vehicles and infrastructure) and create situational awareness to improve the safety of intersection crossing and increase independent mobility.



Robotics and Automation:



The National Institute on Disability, Independent Living, and Rehabilitation Research, a key ATTRI partner, will make a separate award announcement for applications in the robotics and automation technology area.



Mobility Performance Metrics (MPM)

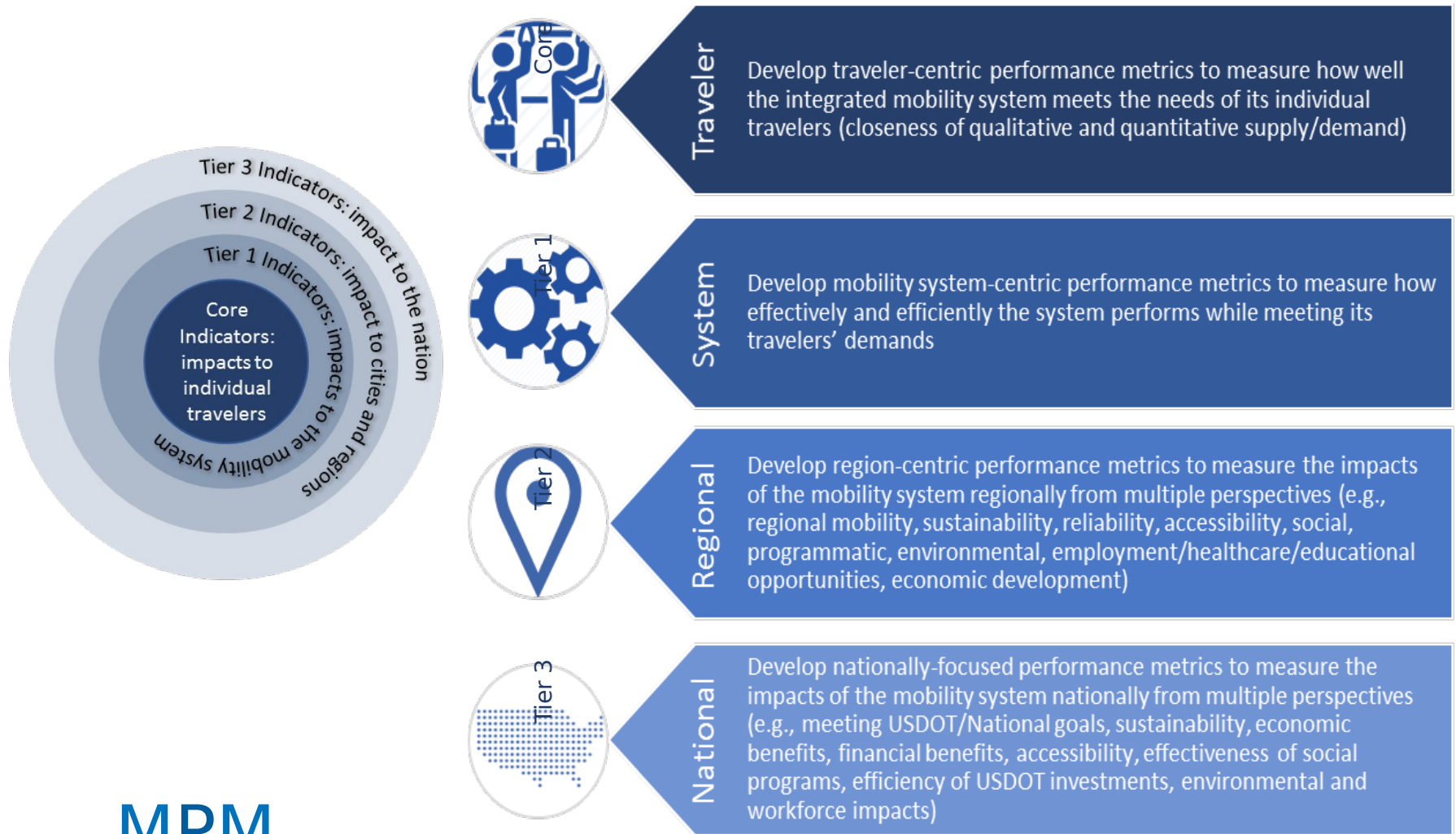
- Current performance indicators focus on:
 - measuring operational adequacy of travel modes in isolation
 - measuring system efficiency from operator perspective
 - evaluating system performance based on unlinked trip data
- Limited feedback from travelers (experience, expectancy, alignment with travelers' 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

MPM

Mobility Performance Metrics



Mobility Performance Metrics (MPM) - Goals



MPM

Mobility Performance Metrics

FTA Program Links and Resources

- **Integrated Mobility Innovation (IMI):**
 - <https://www.transit.dot.gov/IMI>
- **MOD Program and Sandbox Projects:**
 - <https://www.transit.dot.gov/research-innovation/mobility-demand-mod-sandbox-program.html>
 - <https://www.transit.dot.gov/research-innovation/fiscal-year-2016-mobility-demand-mod-sandbox-program-projects>
- **Mobility Payment Integration (MPI):**
 - <https://www.transit.dot.gov/IMI> (dedicated website under development)
- **Strategic Transit Automation Research (STAR):**
 - <https://www.transit.dot.gov/automation-research>
- **Accessible Transportation Technologies Research Initiative (ATTRI):**
 - https://www.its.dot.gov/research_areas/attri/index.htm
- **Mobility Services for All Americans (MSAA):**
 - https://www.its.dot.gov/research_archives/msaa/index.htm
- **TRI Website:**
 - <https://www.transit.dot.gov/about/research-innovation>

