FTA RESEARCH

FEDERAL TRANSIT ADMINISTRATION

FTA Research – Defining the Path Forward through Data Driven Decisions and Evaluation Excellence

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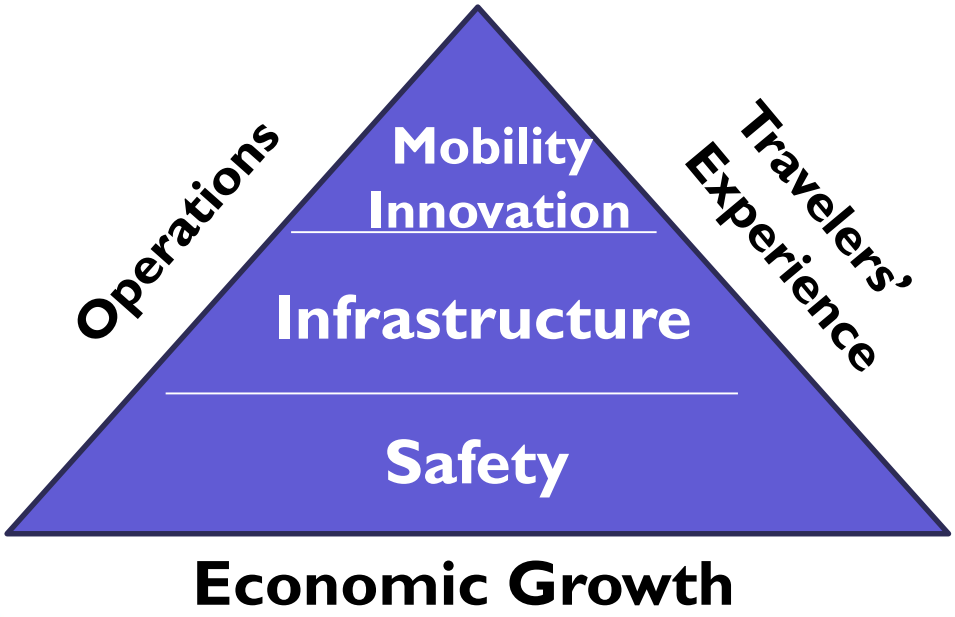
Deputy Associate Administrator
FTA Office of Research, Demonstration and Innovation

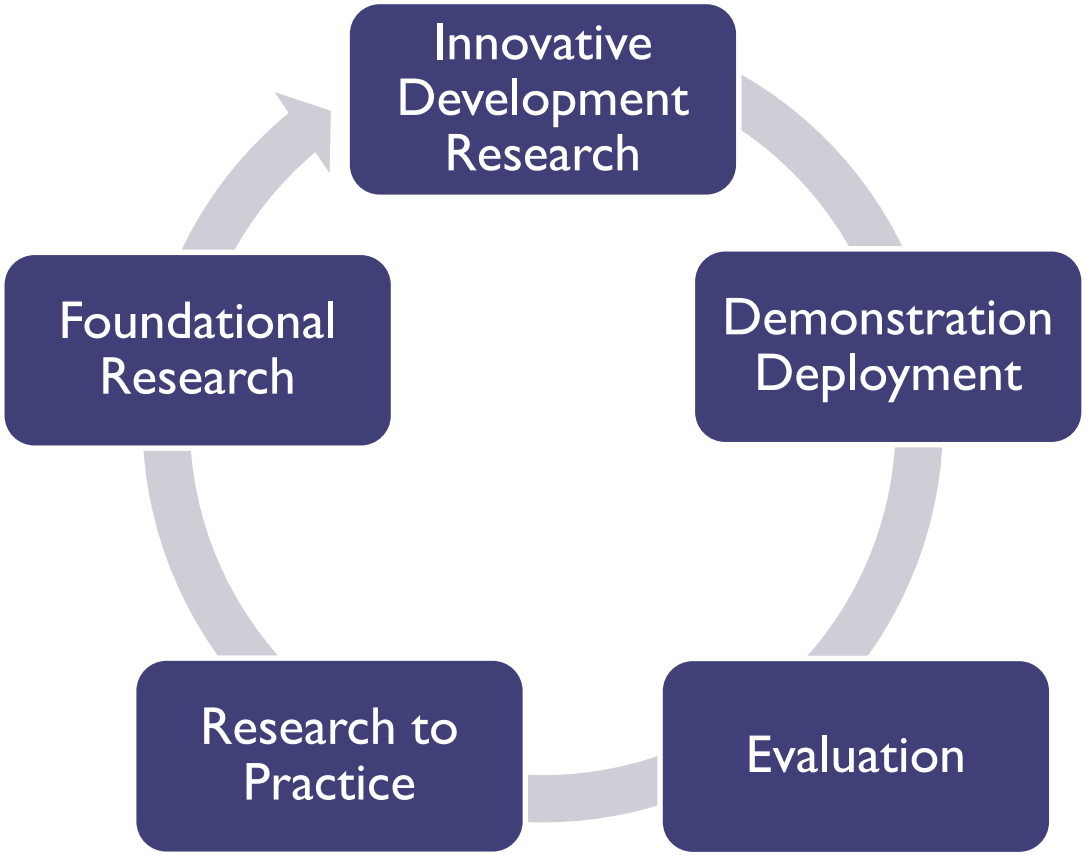
U.S. Department of Transportation
Federal Transit Administration

FTA Research Mission

To advance public transportation innovation by leading research, development, demonstration, deployment, evaluation, and implementation practices and technologies that enhance effectiveness, increase efficiency, expand quality, promote safety, and ultimately improve the transit rider's experience



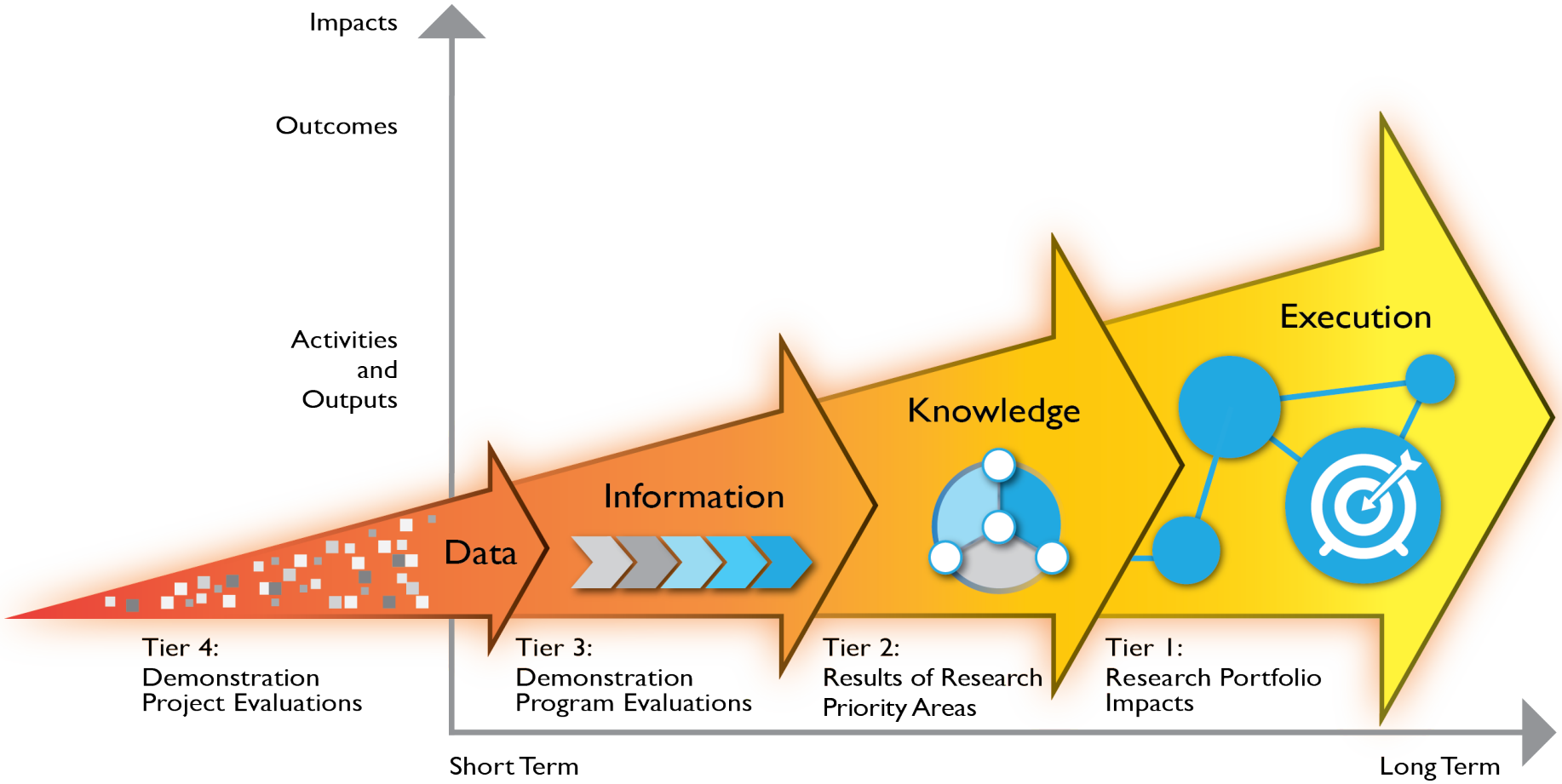
FTA Research Lifecycle
Public Transportation Innovation



Performance-Based Research

- **Train staff** – taught staff performance measurement using logic models
- **Develop Tiered (Nested) Evaluation Framework** – Center for Urban Transportation Research (CUTR) now implementing FTA's vision
- **Create new Data Scientist Position** – just hired data scientist
- **Leverage DOT Data Investments** – Secure Data Commons, National Transportation Library, Bureau of Transportation Statistics, National Transit Database
- **Research to Practice Technical Assistance Center**

FTA Nested Research Evaluation Framework



Solution – 'Nested' Evaluations

Level of Evaluation	*Description*
T1 **FTA Research Portfolio Results**	• Assesses FTA Research plan against our strategic plan • Ties to FTA Agency plan • Integrates with OST-R and other mode plans
T2 **FTA Research Priorities Results**	• Time-series– compares year over year results (impacts) • Based upon Strategic plan goals • Builds upon T2 outcomes • Assesses how well priorities were met and how they further innovation in public transportation
T3 **FTA Demonstration & Deployment Program Results**	• Evaluates results (outputs and outcomes) of the demonstration grant in accordance with goals and pre-determined measures • Harvests success stories for 5312 annual report to Congress • Notes further research needed or questions generated by the discovery process
T4 **Evaluation grantee activities within demonstration grant projects**	• Requires technical expertise in the project • Led by project manager • Establishes clear roles and accountability and process for sharing outputs and results for T1 through T3 evaluations • Strong technical assistance component for pilot grantees

Developmental Concepts for Framework Design

- FTA's research innovation statutory lifecycle
- Nested tiers of research activity
- Layering of data
- Need to set a long-term method of demonstrating the value of FTA's research
- Focus on well-understood measures: efficiency, effectiveness, quality

FTA Research Data Strategy

Goal: Create data analytic and business intelligence capacity

Objectives:

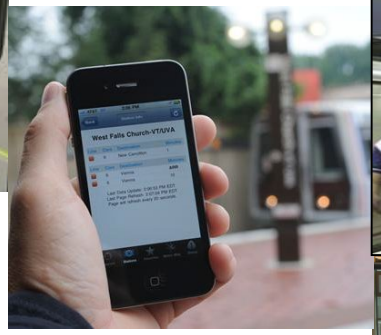
- Dev. Quarterly research information dashboard
- Analyze data and connect in with other Federal Data Initiative through new FTA Research Data Scientist – David Schneider
- Re-use and mine both grantee data (Public Data Access Plan management plan Fed. Requirement) and other datasets
- Utilize visualization tools to tell our success stories

Solution – Research to Practice Strategies

- Knowledge transfer through training
- Industry Diffusion
- Operation testing/demonstration
- Partnerships
- Standards Development
- Formal dissemination – webinars, training, website
- Communities of Practice
- Social network marketing

FTA Research Vision – The Path to the Future

Innovative technologies, projects, partnerships, and world-class infrastructure promote economic growth, productivity, safety, and improve quality of life in communities.



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FEDERAL TRANSIT ADMINISTRATION

The Way Forward to Complete Trips for All

Rik Opstelten, FTA Office of Mobility Innovation

April 16, 2019

U.S. Department of Transportation
Federal Transit Administration

Agenda

- The MOD Vision and Mission
- 2016 MOD Sandbox- Review and Initial Findings
- Previewing the IMI NOFO

Mobility on Demand (MOD)

MOD is a ***vision*** for an integrated network of **safe**, **carefree**, and **reliable** transportation options that are **available to ALL**

The Complete Trip

1. Plan and Book a Trip

Andy uses a **pre-trip concierge application**.

2. Travel to Transit Station

An **automated shuttle** (rideshare service) is dispatched.

3. Ride the Bus

While on the bus, Andy receives direction on when to pull the Stop Request cord from his **wayfinding and navigation application**.

4. Cross the Street

As Andy approaches an intersection, his **safe intersection crossing application** communicates with the traffic signal.

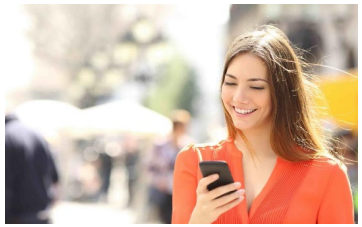
5. Arrival at Destination

Andy safely arrives at his destination, while the **pre-trip concierge application** plans his return trip home.

Trends: What's Driving MOD?

Societal Trends

- Over the next 30 years, the U.S. population is expected to grow by 70 million
- By 2045 the number of Americans over the age of 65 will increase by 77%



Technological Trends

- The transportation sector is increasingly relying on data to drive decisions and to enable innovative travel options
- 72% of Americans own a smartphone, allowing them to access to traffic and transit information to information travel choices
- Automated transportation offers transformation possibilities for safety, mobility, and accessibility

Mobility and Environmental Trends

- On average, Americans spend over 40 hours stuck in traffic each year, costing $121 billion
- There is growing popularity of shared mobility and shared modes, such as bikesharing, carsharing, and ridesourcing

Trends: What's Driving Accessibilty?

Persons with Disabilities

- 12.8% US population (2016)
- Unemployment Rate – 10.5%; Income: $22,047 (2016)
- Poverty: 24.7% (9.0%)
- Rise in Autism: 1 in 150 (2000) to 1 in 68 (2010)
- Fed expenditures: $226 billion (2002); $357 billion (2008)

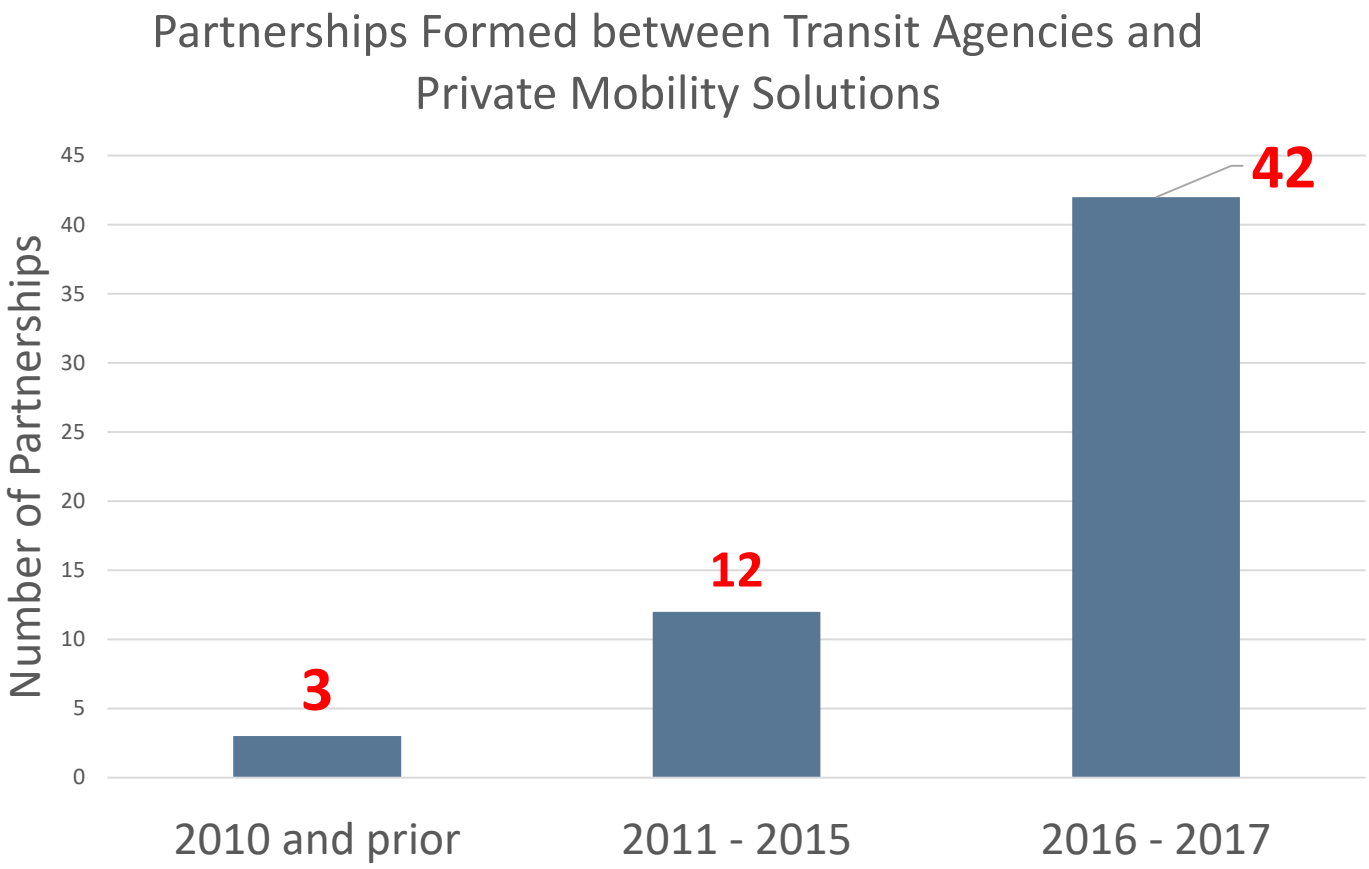
Veterans with Disabilities

- 21.4 million Americas are Veterans
- Disability claims: 104,819 (2006) vs. 634,743 (2012); 45% of eligible Veterans file claims for disability
- 2.6 million deployed in 2012
- Spending: $0.93 billion (2006) vs. $5.95 billion (2012)

Older Adults

- 43.1 million age 65+ in 2012 or 1 in 7 people, Expected to reach 72.1 million by 2030
- Disability rates rise as people get older
- 28% live alone

Transit Agency and Private Mobility Partnerships



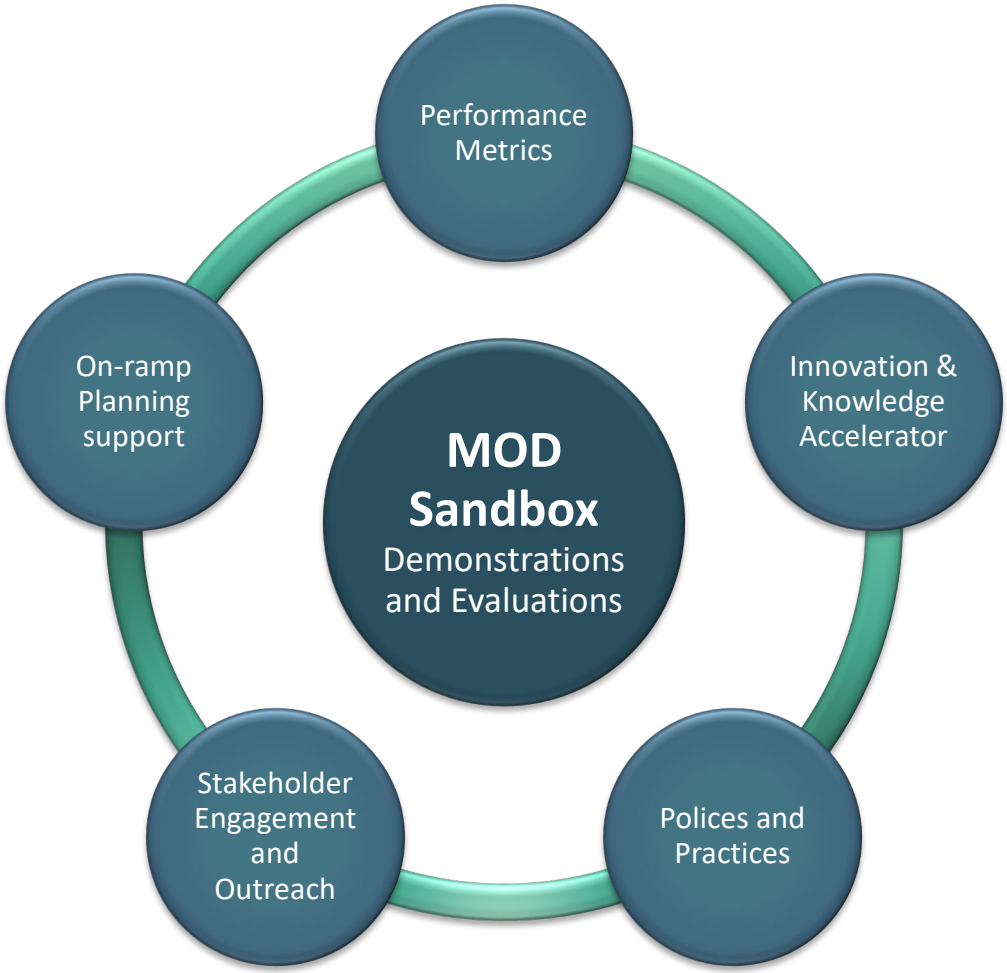
FTA Approach to Mobility Innovation

Explore emerging technology solutions and new business approaches

Enable public transportation industry to adopt innovative mobility partnerships and solutions

Facilitate widespread deployment of proven mobility solutions and partnerships

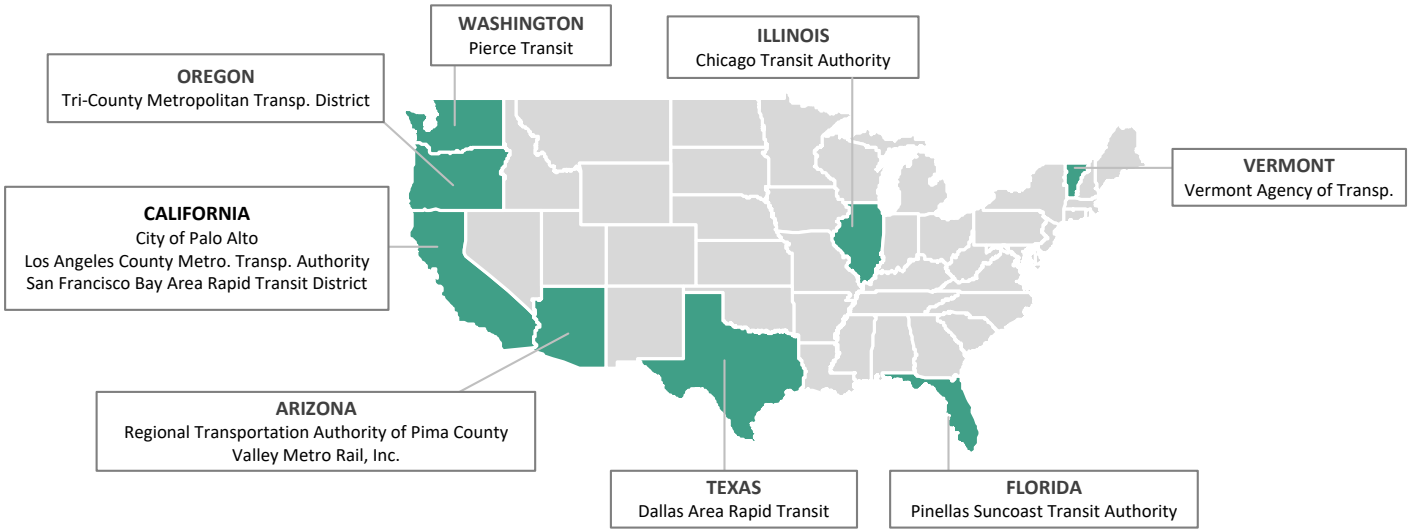
FTA MOD Program Activities



Review and Initial Findings

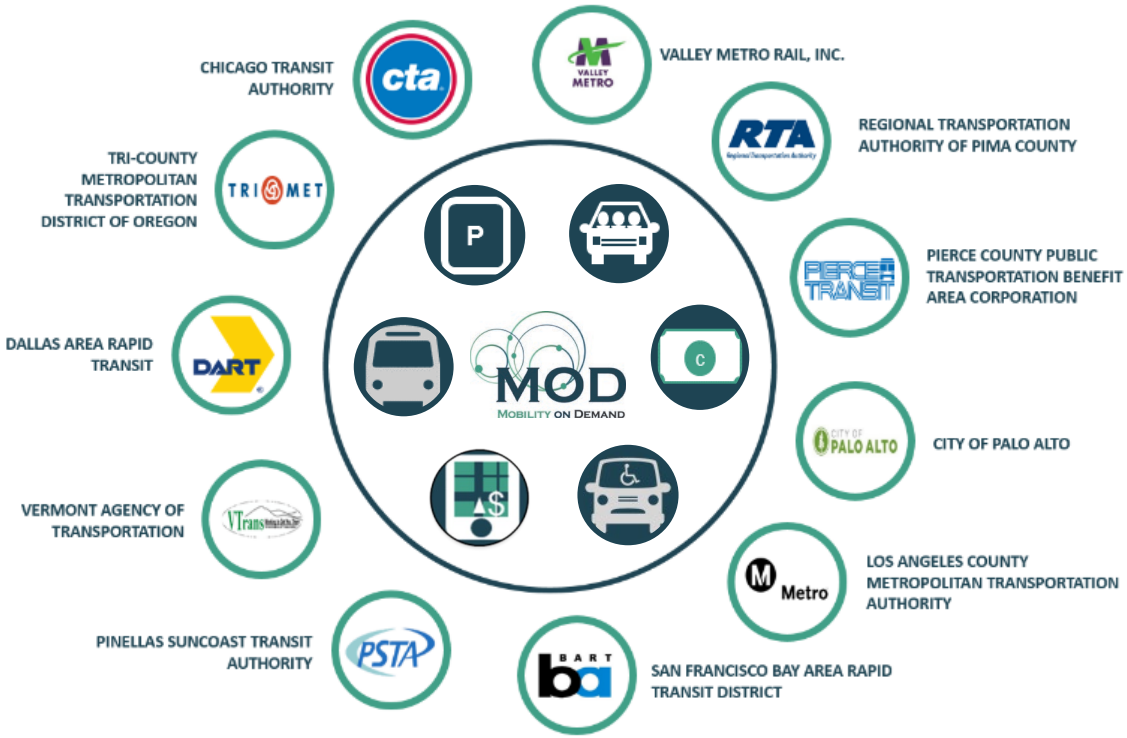
2016 MOD SANDBOX

2016 MOD Sandbox Projects
Results coming soon – "out of the box"



11 Projects: $7,931,080

2016 Sandbox Projects At a Glance



Use Cases from the MOD Sandbox

Trip Planning/Payment Integration

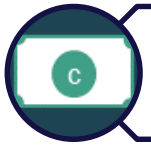
- Consolidates options for travelers to plan, book and pay for trips, often through mobile app

First/Last Mile

- Bridges gaps in the traditional transportation network by providing trips to and from transit connections

Supplemental/Extended Service

- Augments the traditional transportation network when transit service is insufficient or not available



Flexible Pricing /Incentives

- Strategies to influence traveler choice on when or how to travel using incentives or games

Innovative Paratransit Services

- Technologies and tools to enable more flexibility to plan, request, and pay for paratransit trips, greatly reducing booking and response times, and costs

Parking Utilization

- Strategies to help manage parking supply to optimize utilization and access to transit for more individuals

Out of the Box

INITIAL SANDBOX FINDINGS

Overview Findings

- **Public-Private Partnerships** can yield success
- **Inclusive planning** is key to success
- MOD has potential to **Complete Trips in all communities.** Approaches vary based on context.
- **Data and Information** are needed to understand MOD impacts, make operational changes. Challenges exist around privacy, proprietary protections, and accuracy.
- Business models must be **sustainable** for all project partners, throughout the pilot, and beyond.
- **Flexibility** is key to success, risk management

MOD SANDBOX EVALUATION PUBLICATIONS

MOD Sandbox Demonstration Evaluation Plans:

- BART: https://rosap.ntl.bts.gov/view/dot/36425
- VTrans: https://rosap.ntl.bts.gov/view/dot/36390
- Pierce Transit: https://rosap.ntl.bts.gov/view/dot/36386
- DART: https://rosap.ntl.bts.gov/view/dot/36657
- TriMet: https://rosap.ntl.bts.gov/view/dot/37168
- RTA/Pima County: https://rosap.ntl.bts.gov/view/dot/37169

…More to come soon!

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Advancing Complete Trips for All

PREVIEWING OF INTEGRATED MOBILITY INNOVATION

Integrated Mobility Innovation

IMI Notice of Funding Opportunity (NOFO) Goals

- ***Explore*** new business approaches and emerging technology solutions that support transformational mobility services
- ***Enable*** communities to adopt innovative mobility solutions that enhance transportation efficiency and effectiveness
- ***Facilitate*** the widespread deployment of proven mobility solutions that foster expanded personal mobility

IMI Demonstration Program NOFO

- ***What it will do***: fund mobility innovations in three areas –
  - (a) mobility on demand;
  - (b) transit automation; and
  - (c) mobility payment integration; all with accessibility in mind

- ***Who can apply***: providers of public transportation, public agencies, state/local government, tribal entities

- ***How do proponents apply***: applicants may apply for any one or combination of the 3 categories shown above and described on the following slide

- ***How much funding is available***: $15M total

Transformative $15M Investment

Mobility on Demand Sandbox ($8M)

- Build on the first round of Mobility on Demand Sandbox projects
- Better connect travelers to overall transportation network
- Explore new MOD accessibility models
- Examine data sharing and data collection methods allowing better understanding of impacts of transportation (economic, societal, personal)

Strategic Transit Automation Research ($5M)

- Automated Shuttles Demonstrations
- Automated Driver Assistance Demonstrations

Mobility Payment Integration ($2M)

- Leverage retail models of payment for public transportation systems
- Integrate regional payment practices (single regional payment platforms)


All progress occurs because
people dare to be different.

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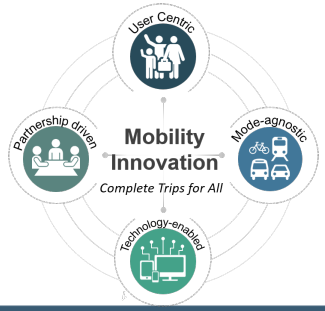
Mobility Innovation
Complete Trips for All

Bob Sheehan
Office of Mobility Innovation
Federal Transit Administration

U.S. Department of Transportation
Federal Transit Administration

Outline

- Applying the complete trip
- Planning and policy implications
- Bringing it all together with the vision for Mobility Innovation



Complete Trip

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Andy uses a **pre-trip concierge application**.

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While on the bus, Andy receives direction on when to pull the Stop Request cord from his **wayfinding and navigation application**.

4. Cross the Street
As Andy approaches an intersection, his **safe intersection crossing application** communicates with the traffic signal.

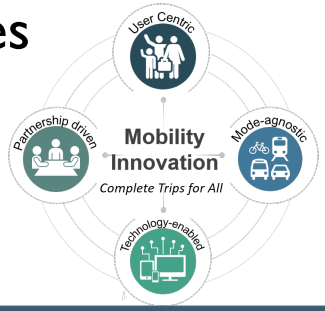
5. Arrival at Destination
Andy safely arrives at his destination, while the **pre-trip concierge application** plans his return trip home.


8. Completing travel to destination
1. Trip planning
2. Traveling to station/ crossing intersections
3. Using station/ stop
4. Boarding/riding vehicles
5. Using vehicles
6. Leaving vehicles
7. Transferring between vehicles
Caregiver, Family, & Safety Alerts.
Connected Citizens. Associated Services


User Centric
Partnership driven
Mobility Innovation
Complete Trips for All
Mode-agnostic
Technology-enabled

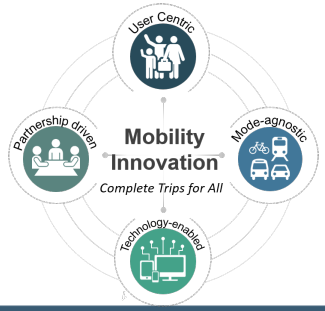
Planning for the Complete Trip

- Scenarios describe actual or hypothetical trips being made by individuals with specific mobility profiles.
- Individuals have characteristics that make some travel activities challenging within current transportation environments.
- The specificity of these scenarios allows for a detailed analysis of the potential challenges of different groups of travelers.
- Every trip (from Origin A to Destination B) requires travelers perform one or more of these trip activity links



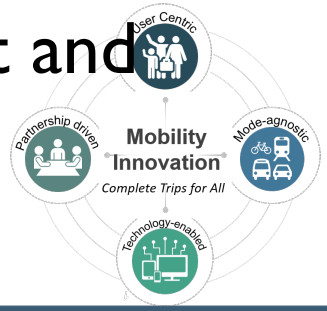
Policies and Practices for Planning

- Strengths, Weaknesses, Opportunities, and Threats
- Organizational Readiness for MOD
- MOD and Equity
- Understanding the Impacts of MOD
- Integration of Mobility on Demand in the Planning Process
- Incorporating MOD into Transportation Modeling



Policies and Practices for Implementation

- Understanding the Role of the Built Environment
- Shared Mobility Implementation
- Data Management and Interoperability
- Multimodal Integration
- Integrating MOD into Public Rights-of-Way and Curb Space Management
- MOD, Taxes, and Transportation Finance
- MOD for Transportation Systems Management and Operations



Policy Mapping

Policy Issues	Institutional Issues	Legal Issues
Awareness and Product Development	Changing Demographics	Inconsistent Laws
Funding for Development & Deployment	The Future of Public Transportation	Liability and Indemnification
Funding for Pilot Studies	Seamless Digital and Physical Connections	Equivalent Level of Service
Funding for User Subsidies	Mobility on Demand (MOD) with Transit	International
Research and Development Incentives	Mobility on Demand Replacing Transit	Domestic
Enhancing Awareness of Disabilities Needs	Voluntary Standards	Privacy
Eliminating Barriers in Public Right-of-Way	Future of Mobility	
Planning for Accessibility		
Data Sharing and Auditing		
The Built Environment		
Technology/Innovation Transfer		
Retrofitting Older Infrastructure		
Innovation in Technology and Processes		

Evolution of Research

Traveler Centric
Demand-Responsive
Partnership driven
Service focus

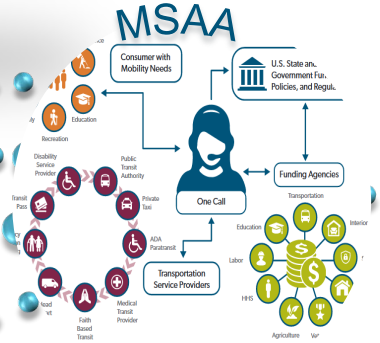
MOD
MOBILITY ON DEMAND

ICM
Integrated
Collaborative
Management
Service focus

Complete Trip
Accessibility
All abilities
Universal Design

allri
ACCESSIBLE TRANSPORTATION TECHNOLOGIES RESEARCH INITIATIVE

MSAA
HST Assets
Coordinated
TMCC
HST users



Payment
Transactions
Security
Business Models

MPI
mobility payment integration

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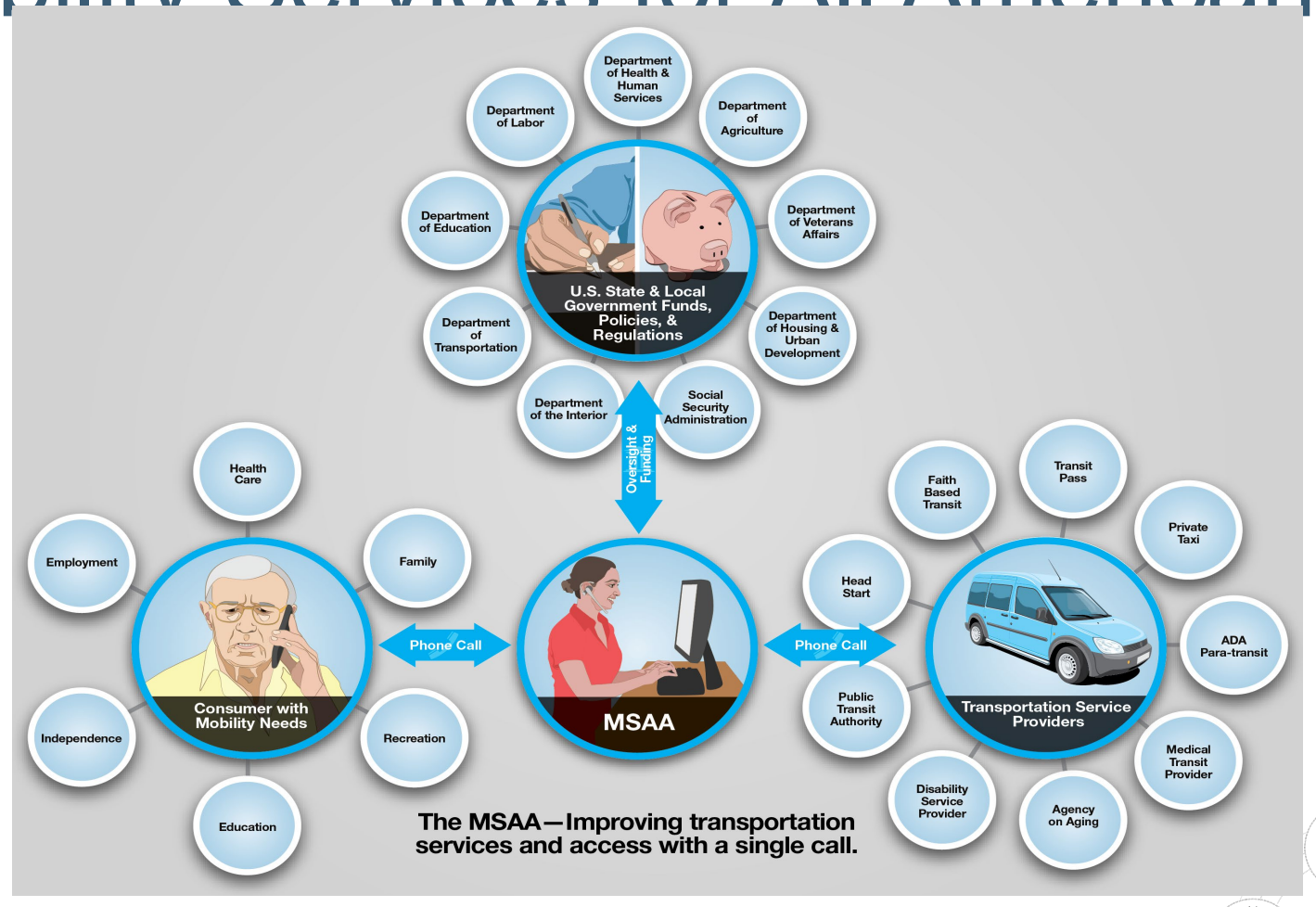
Mobility Services for All Americans



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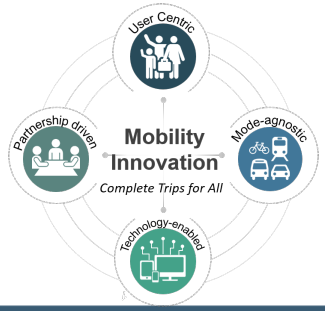
MSAA Supports Mobility Innovation

- Facilitating Inclusion of Human Service Transportation Resources
- Providing Options to Different Market Segments
- Connecting with HST Destinations
- Promoting Equity
- Encouraging Inclusiveness



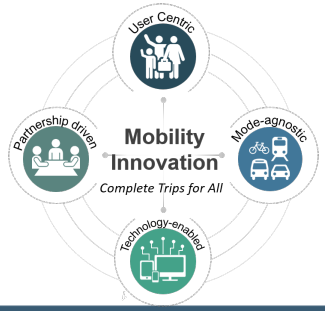
2015 MSAA Deployment Sites

Northwest Metro Denver Coordination System – Via Mobility Services

San Luis Obispo County TMCC - United Cerebral Palsy of San Luis Obispo/Ride-On Transportation

Simply Get There Trip Triage Design – Atlanta Regional Commission

Travel Management Coordination Center of Southern Wisconsin - Greater Wisconsin Agency on Aging Resources, Inc.

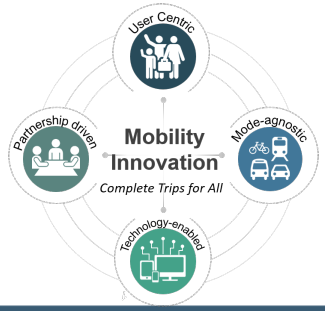


MSAA Program Outputs

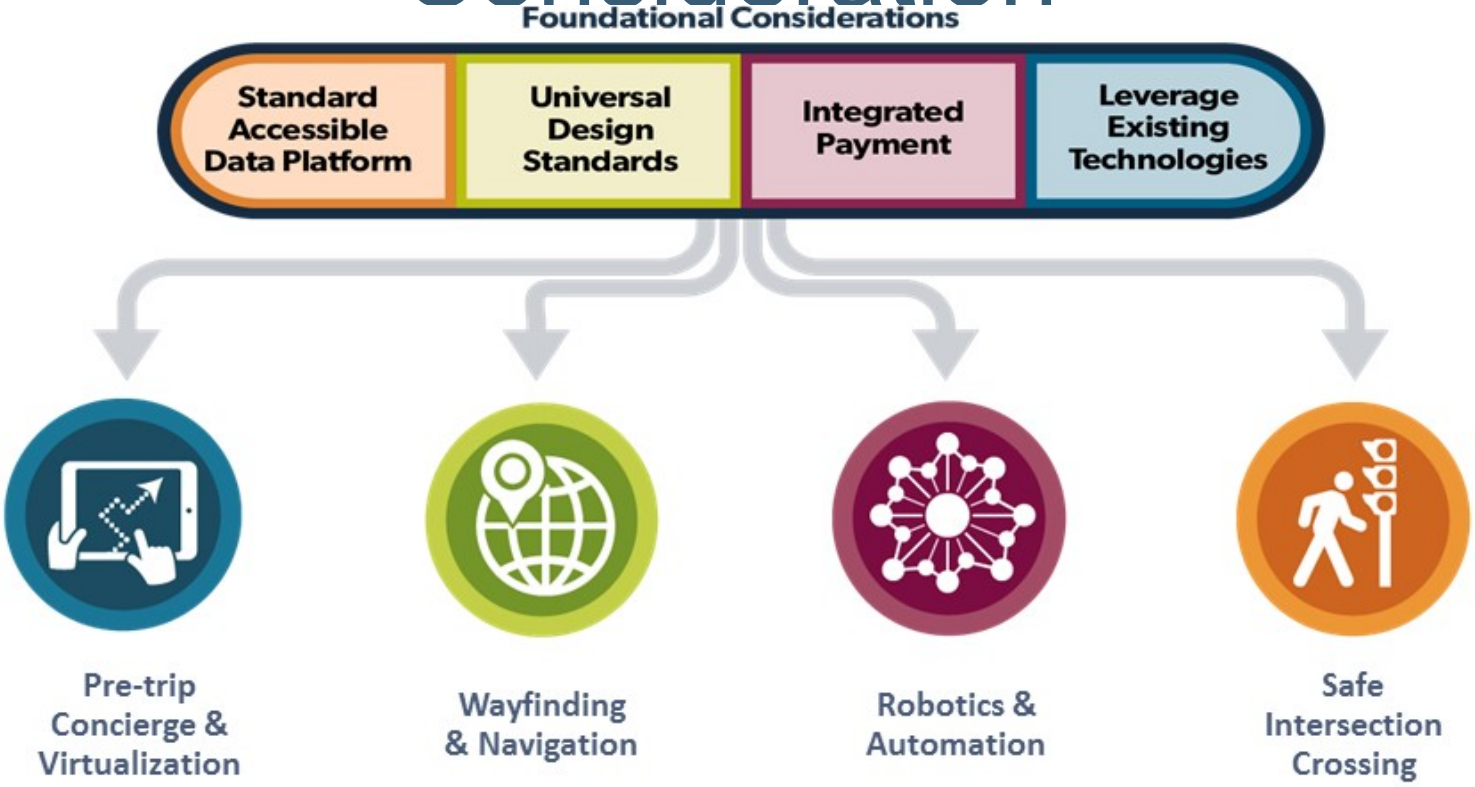
Developer Resources/Digital Toolbox for a TMCC or Mobility Management System

- Resources for Planning and Development
- Resources for Design and Procurement
- Resources for Implementation, Testing, and Full Deployment

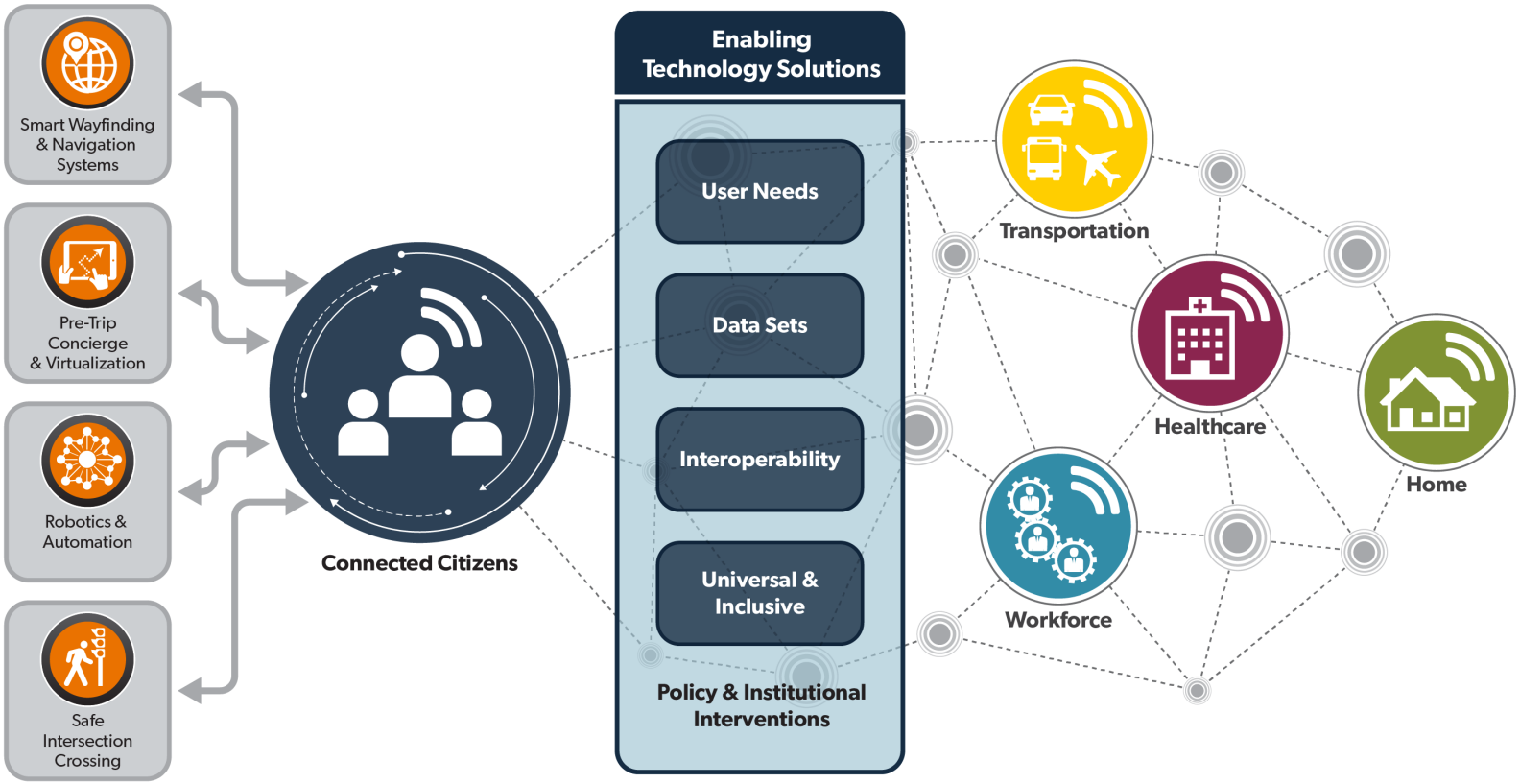
https://www.its.dot.gov/research_archives/msaa/developers_resources.htm

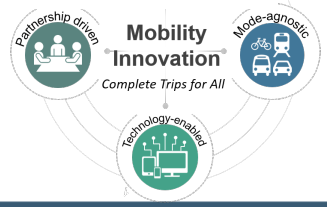


Application Priorities and Consideration



ATTRI and Other Possibilities





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Mobility Innovation Principles

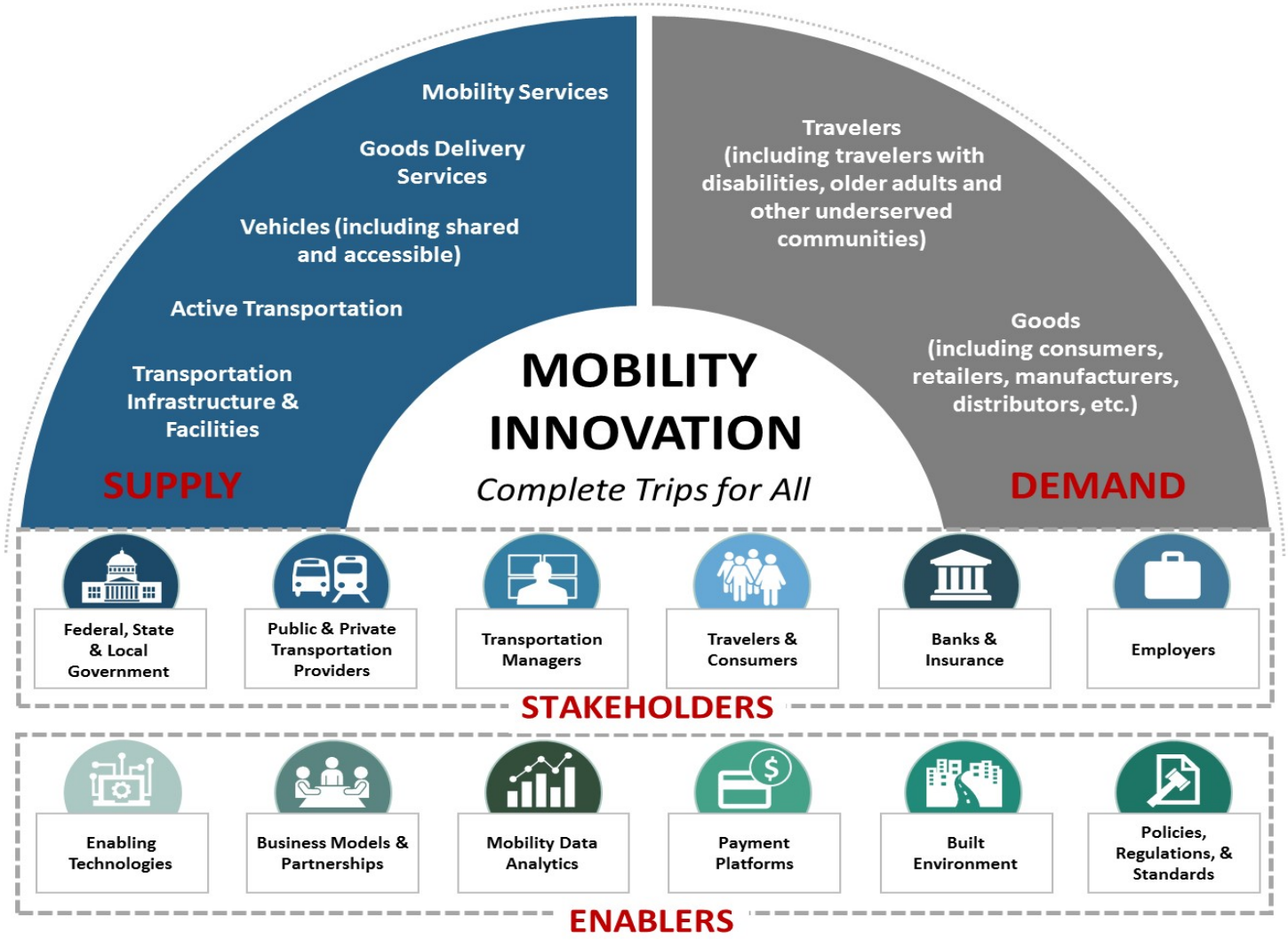
Traveler-centric – promotes choice in personal mobility driven by the specific needs of the traveler and utilizes universal design principles to capture the needs of all travelers.

Mode-agnostic – encourages multimodal connectivity and system interoperability where all modes of travel are considered and integrated seamlessly to achieve the complete trip vision.

Technology-enabled – leverages emerging and existing technologies, data connectivity, and standardization to support personal mobility choices.

Partnership driven – develop and leverage unique partnerships, both public and private, to accelerate deployment of emerging mobility options.

Bringing it All Together




Don't let what you can't do
interfere with what you can do.