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Transit's Role in Advancing Mobility for All

August 26, 2014
National Rural ITS Conference

U.S. Department of Transportation

Federal Transit Administration

Agenda

- **Mobility on Demand** – Matt Lesh, FTA
- **Mobility Services for All Americans** – Matt Lesh, FTA
- **Rural and Targeted Programs** – Mary Leary, FTA
- **Accessible Transportation Technologies Research Initiative** – Mohammed Yousuf, FHWA

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Mobility on Demand (MOD)

Multimodal, Integrated & Connected Transportation System
Research & Development Concept

August 26, 2014
National Rural ITS Conference

U.S. Department of Transportation

Federal Transit Administration

What is Mobility on Demand (MOD)?

- Long term strategic vision for a multimodal, integrated and connected transportation system.

- A concept which imagines mobility as a commodity and a service.

- Conceptual Notions of MOD:
  - Promotes choice in personal mobility
  - Promotes Intelligent Transportation Systems
  - Advances connected vehicles
  - Advances vehicle automation
  - Leverages emerging technologies
  - Leverages data exchange
  - Encourages multimodal connectivity
  - Encourages system interoperability

A New ~~Transit~~ Multimodal Mobility Concept

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What's Driving MOD?

- **Aging Americans <u>Require</u> Mobility Choice**
  - ➢ Aging Americans on the rise
  - ➢ From 2005 to 2020 there will be 30 million additional people age 60 or older
  - ➢ "Aging in place" requires unique mobility options
- **Millennial Americans <u>Want</u> Mobility Choice**
  - ➢ Public transportation utilization is on the rise
  - ➢ Younger generations want both convenience and cost savings
  - ➢ 66% of Millennials consider transportation alongside housing decisions
- **All Travelers <u>Need</u> Mobility Choice**
  - ➢ Wounded Warriors
  - ➢ Travelers with disabilities
  - ➢ Low income individuals & Minors

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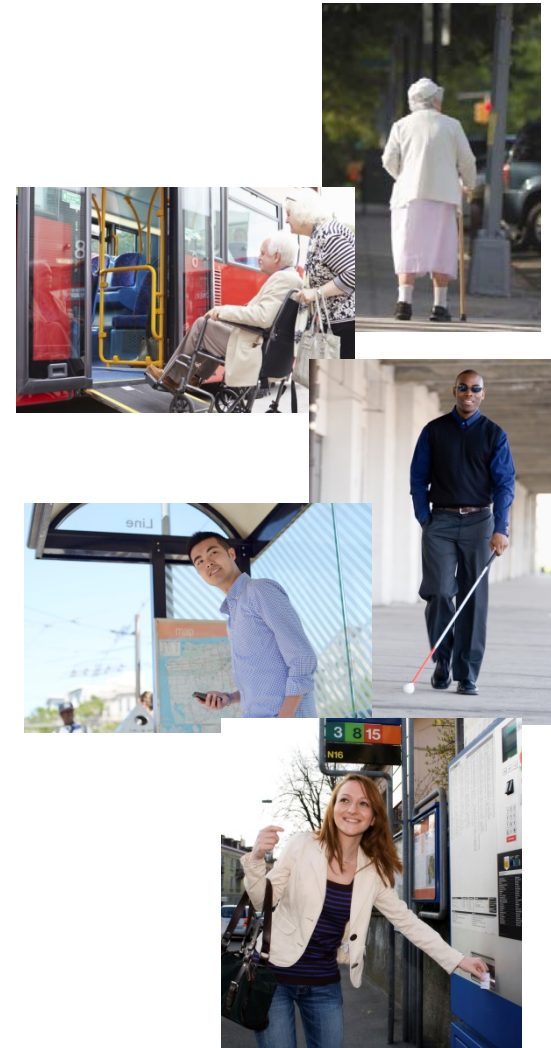
Technologies Enabling MOD

- <u>Technology serves and enables mobility</u>
  - ➤ "Big Data" and New Analytics
  - ➤ Smart Cities and the "Internet of Things"
  - ➤ Connected Vehicles
  - ➤ Automation and Automated Vehicles
  - ➤ Social media
  - ➤ Smartphone technology and new payment apps

July 2014 Cover

Conditions Encouraging MOD

- <u>Conditions setting stage for transformative change</u>
  - ➤ Renewed concepts in car ownership (RelayRides, Car2Go)
  - ➤ Shared economy model is growing (Lyft, RideScout)
  - ➤ Peer to peer transactions (airbnb, Peerby)
  - ➤ Increased urbanization and changing demographics
  - ➤ Pre___tion

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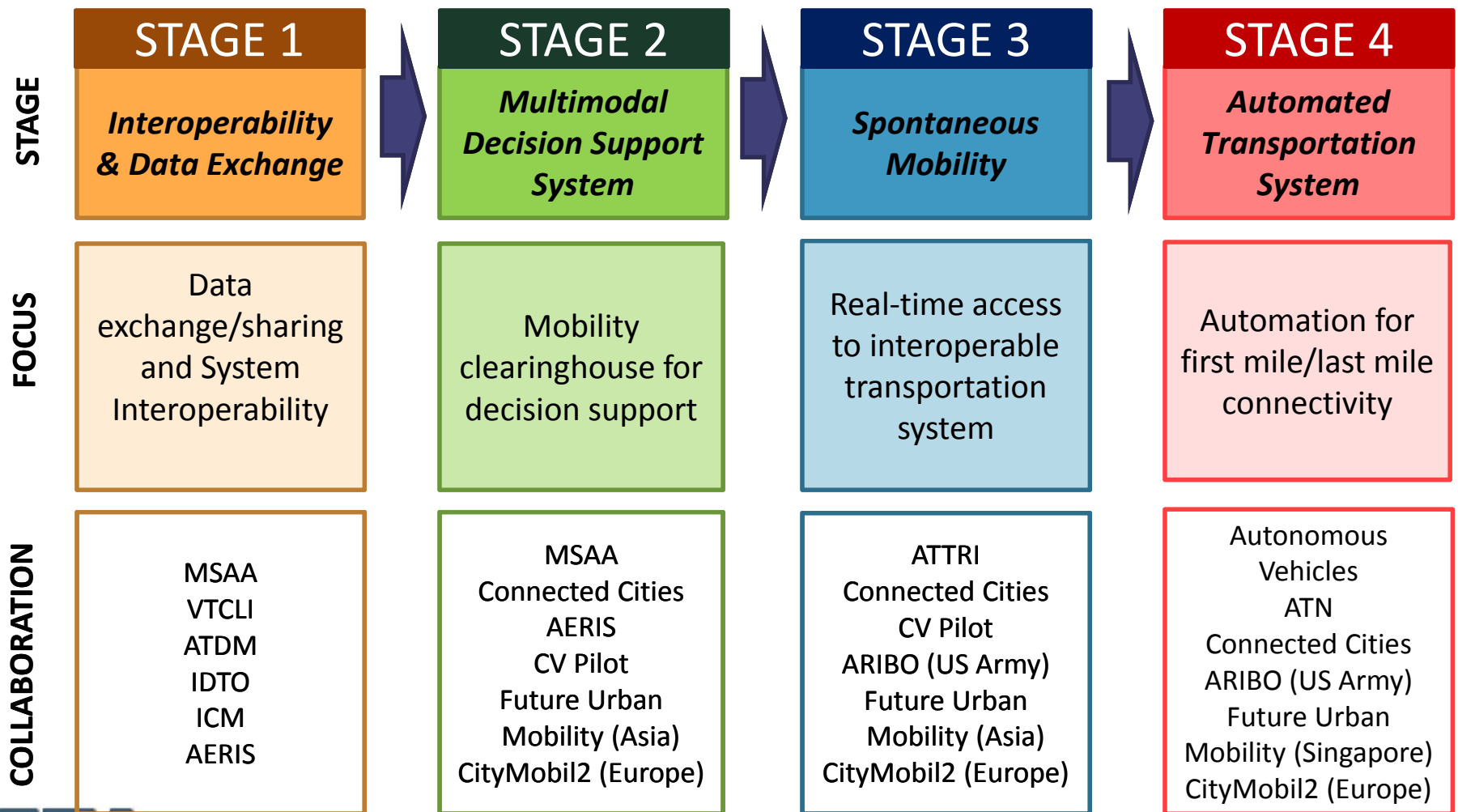
Guiding Principles of MOD Vision

- **Traveler Centric/Consumer Driven**
  - ➢ MOD is defined by performance
  - ➢ <u>Quality</u> and <u>Carefree</u> 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.

MOD Leverages Existing Programs & Initiatives

- Data Capture, Interoperability & Exchange are focus of stage 1 (*MSAA, ICM, AERIS*).

- Multimodal Decision Support System driven by real-time data transfer and customer demand developed in stage 2 (*Connected Cities, ICM*).

- Spontaneous mobility applications deployed through connected, interoperable systems in stage 3 (*Connected Vehicle, ATDM, ATTRI*).

- MOD realized with automation and an integrated multimodal transportation system in stage 4.

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Developmental Stages of MOD

	STAGE 1	STAGE 2	STAGE 3	STAGE 4
STAGE	*Interoperability & Data Exchange*	*Multimodal Decision Support System*	*Spontaneous Mobility*	*Automated Transportation System*
FOCUS	Data exchange/sharing and System Interoperability	Mobility clearinghouse for decision support	Real-time access to interoperable transportation system	Automation for first mile/last mile connectivity
COLLABORATION	MSAA VTCLI ATDM IDTO ICM AERIS	MSAA Connected Cities AERIS CV Pilot Future Urban Mobility (Asia) CityMobil2 (Europe)	ATTRI Connected Cities CV Pilot ARIBO (US Army) Future Urban Mobility (Asia) CityMobil2 (Europe)	Autonomous Vehicles ATN Connected Cities ARIBO (US Army) Future Urban Mobility (Singapore) CityMobil2 (Europe)

MOD Field Impacts & Milestones 2015 - 2019

- ## Field Impacts through Deployment

  - ➤ Technology assessment and knowledge dissemination
  - ➤ Technology transfer and workforce readiness
  - ➤ Deployment support for decision-making, funding, policy and regulatory issues

Mobility on Demand (MOD) Key Milestones	Time Frame
Stakeholder engagement workshops on MOD needs and opportunities	2015
MOD joint research collaboration and strategic partners identified	2015
State of the art/science assessment	2015 - 2016
MOD policy and institutional assessment	2015 - 2016
MOD Concept of Operations and phased demonstration plan	2016 - 2017
MOD joint demonstrations and evaluations	2017 - 2019
Knowledge and technology transfer + deployment support	2019

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Mobility on Demand (MOD)

Redefines the Transportation Landscape with _Quality_ and _Carefree_ _Personal Mobility_ Choices.

Quality is affordable, convenient, comfortable, reliable, accessible (space/all abilities), sustainable, safe, and secure based on competition-based choices.

Carefree is spontaneous, easy to use, and always available with minimal requirements on advanced planning (e.g. reservation) and commitment (e.g., private ownership and associated costs).

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Mobility Services for All Americans
(MSAA)

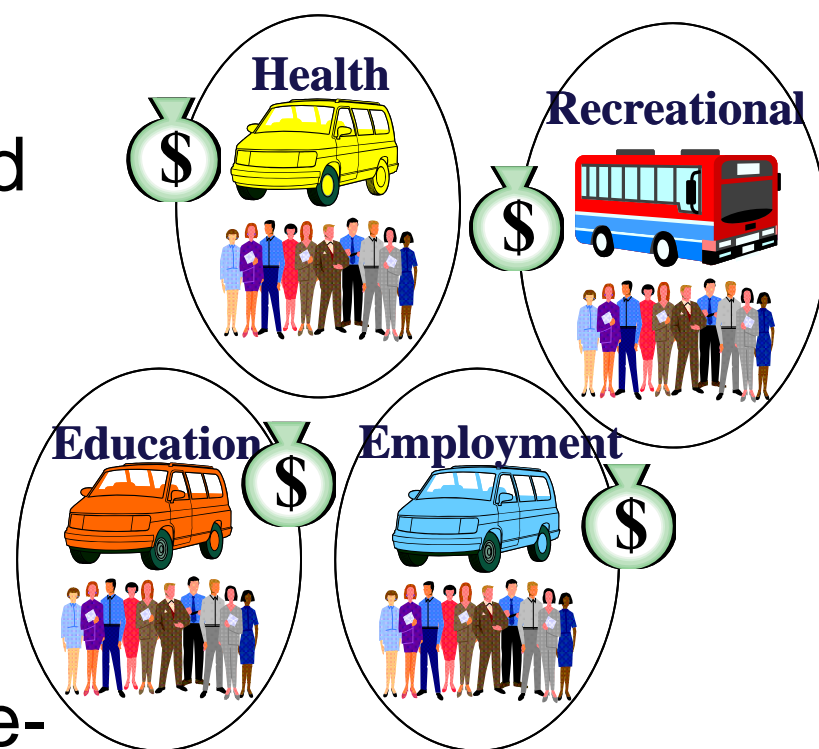## National Rural ITS Conference
August 26, 2014

Matthew Lesh
Transportation Program Specialist
Office of Research, Demonstration and Innovation

U.S. Department of Transportation

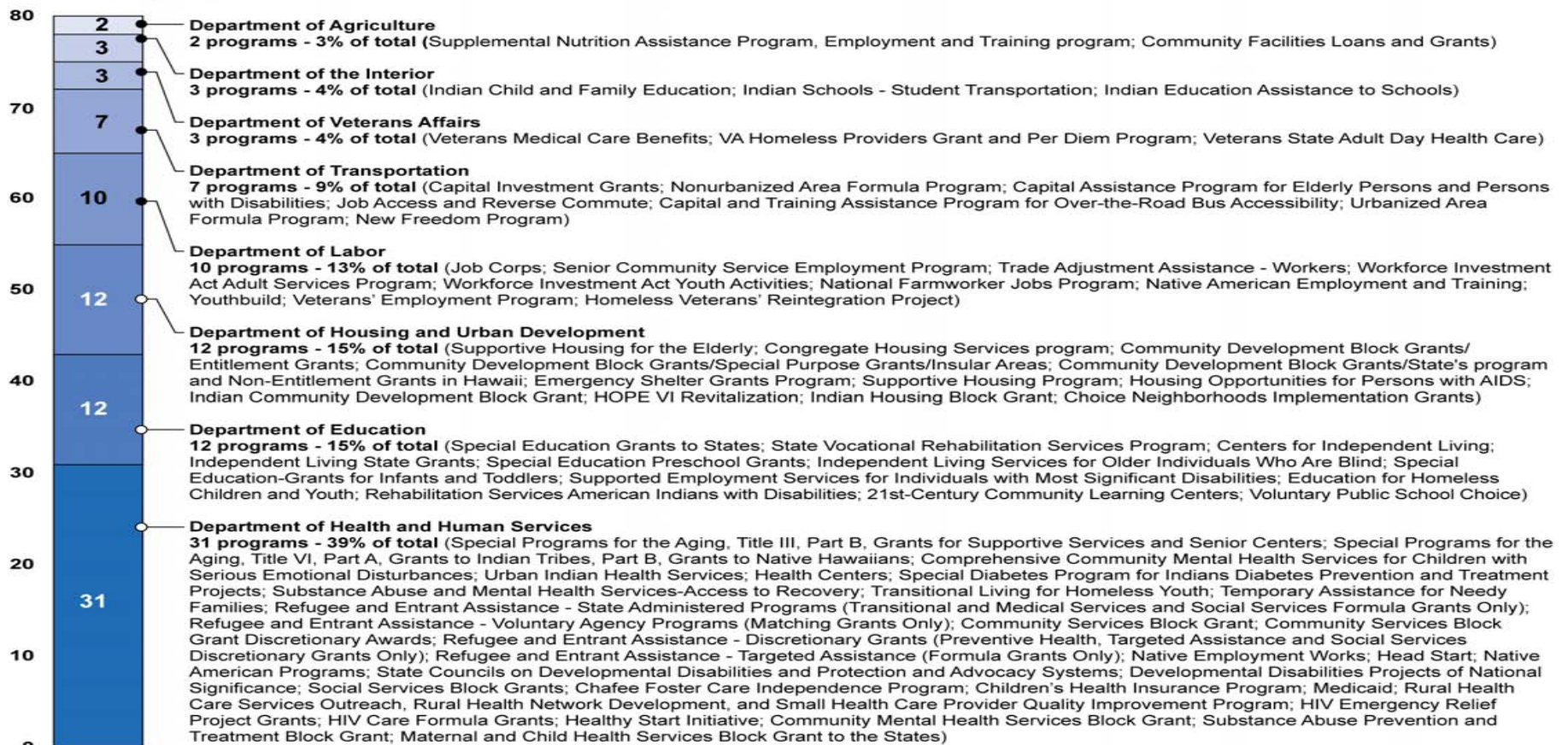**Federal Transit Administration**

Human Service Transportation (HST)

- 80 Federal programs fund transportation services for transportation disadvantaged

- "Silo" service delivery approach

- $ billions spent each year

- Government agencies continue to fund custom, one-off solutions…

Health

Recreational

Education

Employment

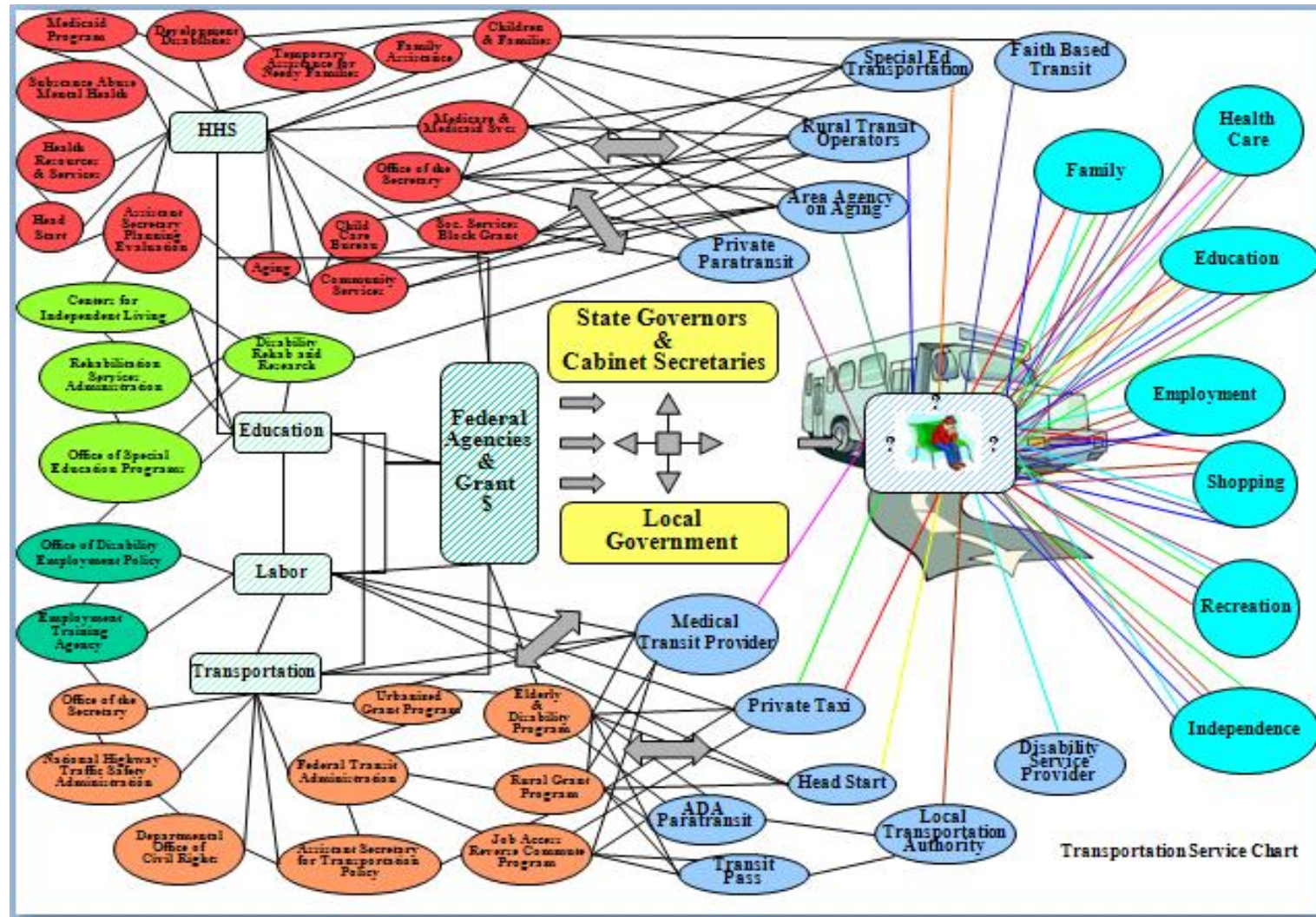# 80 Federal Programs Fund Transportation Services

Number of Federal Programs GAO Identified Authorized to Provide Transportation Services to the Transportation Disadvantaged in Fiscal Year 2010, by Agency
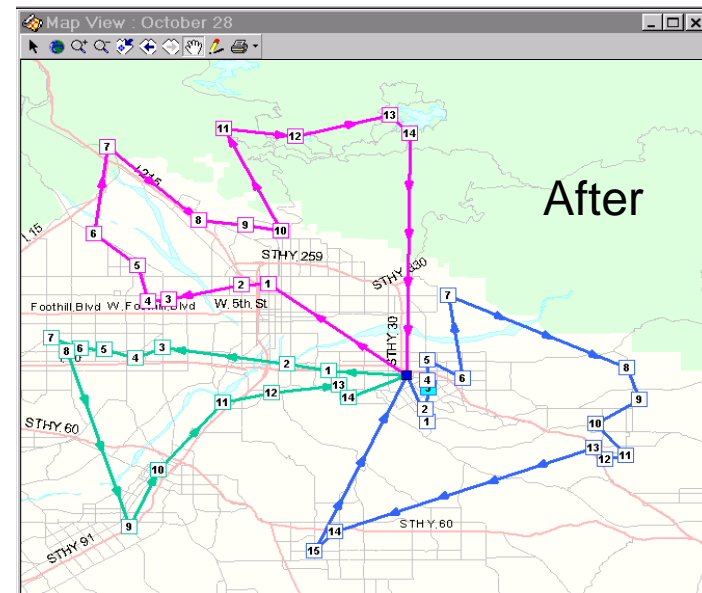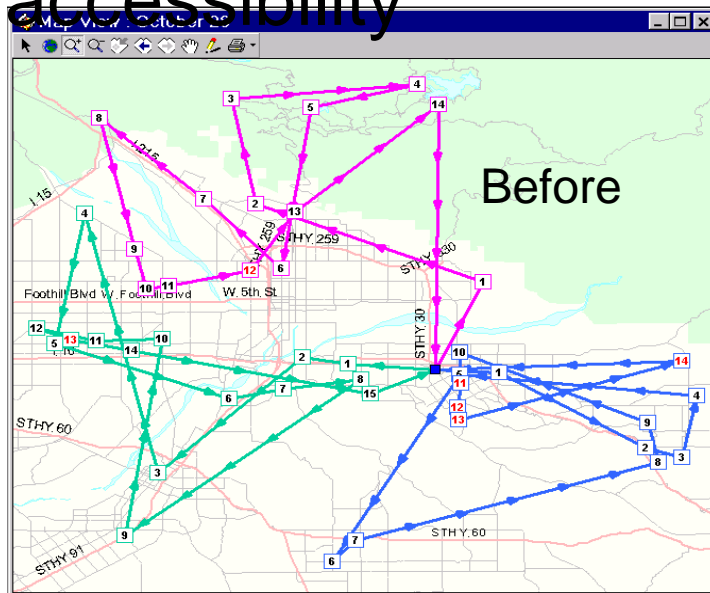
Number of programs (80 total)

Department of Agriculture
2 programs - 3% of total (Supplemental Nutrition Assistance Program, Employment and Training program; Community Facilities Loans and Grants)

Department of the Interior
3 programs - 4% of total (Indian Child and Family Education; Indian Schools - Student Transportation; Indian Education Assistance to Schools)

Department of Veterans Affairs
3 programs - 4% of total (Veterans Medical Care Benefits; VA Homeless Providers Grant and Per Diem Program; Veterans State Adult Day Health Care)

Department of Transportation
7 programs - 9% of total (Capital Investment Grants; Nonurbanized Area Formula Program; Capital Assistance Program for Elderly Persons and Persons with Disabilities; Job Access and Reverse Commute; Capital and Training Assistance Program for Over-the-Road Bus Accessibility; Urbanized Area Formula Program; New Freedom Program)

Department of Labor
10 programs - 13% of total (Job Corps; Senior Community Service Employment Program; Trade Adjustment Assistance - Workers; Workforce Investment Act Adult Services Program; Workforce Investment Act Youth Activities; National Farmworker Jobs Program; Native American Employment and Training; Youthbuild; Veterans' Employment Program; Homeless Veterans' Reintegration Project)

Department of Housing and Urban Development
12 programs - 15% of total (Supportive Housing for the Elderly; Congregate Housing Services program; Community Development Block Grants/ Entitlement Grants; Community Development Block Grants/Special Purpose Grants/Insular Areas; Community Development Block Grants/State's program and Non-Entitlement Grants in Hawaii; Emergency Shelter Grants Program; Supportive Housing Program; Housing Opportunities for Persons with AIDS; Indian Community Development Block Grant; HOPE VI Revitalization; Indian Housing Block Grant; Choice Neighborhoods Implementation Grants)

Department of Education
12 programs - 15% of total (Special Education Grants to States; State Vocational Rehabilitation Services Program; Centers for Independent Living; Independent Living State Grants; Special Education Preschool Grants; Independent Living Services for Older Individuals Who Are Blind; Special Education-Grants for Infants and Toddlers; Supported Employment Services for Individuals with Most Significant Disabilities; Education for Homeless Children and Youth; Rehabilitation Services American Indians with Disabilities; 21st-Century Community Learning Centers; Voluntary Public School Choice)

Department of Health and Human Services
31 programs - 39% of total (Special Programs for the Aging, Title III, Part B, Grants for Supportive Services and Senior Centers; Special Programs for the Aging, Title VI, Part A, Grants to Indian Tribes, Part B, Grants to Native Hawaiians; Comprehensive Community Mental Health Services for Children with Serious Emotional Disturbances; Urban Indian Health Services; Health Centers; Special Diabetes Program for Indians Diabetes Prevention and Treatment Projects; Substance Abuse and Mental Health Services-Access to Recovery; Transitional Living for Homeless Youth; Temporary Assistance for Needy Families; Refugee and Entrant Assistance - State Administered Programs (Transitional and Medical Services and Social Services Formula Grants Only); Refugee and Entrant Assistance - Voluntary Agency Programs (Matching Grants Only); Community Services Block Grant; Community Services Block Grant Discretionary Awards; Refugee and Entrant Assistance - Discretionary Grants (Preventive Health, Targeted Assistance and Social Services Discretionary Grants Only); Refugee and Entrant Assistance - Targeted Assistance (Formula Grants Only); Native Employment Works; Head Start; Native American Programs; State Councils on Developmental Disabilities and Protection and Advocacy Systems; Developmental Disabilities Projects of National Significance; Social Services Block Grants; Chafee Foster Care Independence Program; Children's Health Insurance Program; Medicaid; Rural Health Care Services Outreach, Rural Health Network Development, and Small Health Care Provider Quality Improvement Program; HIV Emergency Relief Project Grants; HIV Care Formula Grants; Healthy Start Initiative; Community Mental Health Services Block Grant; Substance Abuse Prevention and Treatment Block Grant; Maternal and Child Health Services Block Grant to the States)

Source: GAO analysis.

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The Challenge

Transportation Service Chart

Intelligent Transportation System (ITS)

- Clear role for ITS in HST
- Contributes to greater efficiency
- Facilitates coordination and enhance accessibility

Before

After

MSAA Initiative

- R&D initiative launched in 2006

- Funded through the US DOT ITS Joint Program Office (OST-R)

- Goal: Utilize service coordination and technology integration to:

  – Increase mobility and transportation accessibility for transportation disadvantaged and general public

  – Achieve more efficient use of federal transportation funding resources

TMCC Concepts/Design

- Core concepts – Interoperability, service coordination, enhanced customer experience
- No "one-size-fits-all" or preferred model
  - Centralized
  - Decentralized
  - Hybrid
- Driven by user and community needs
- Includes both institutional and technology framework

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TMCC Concept
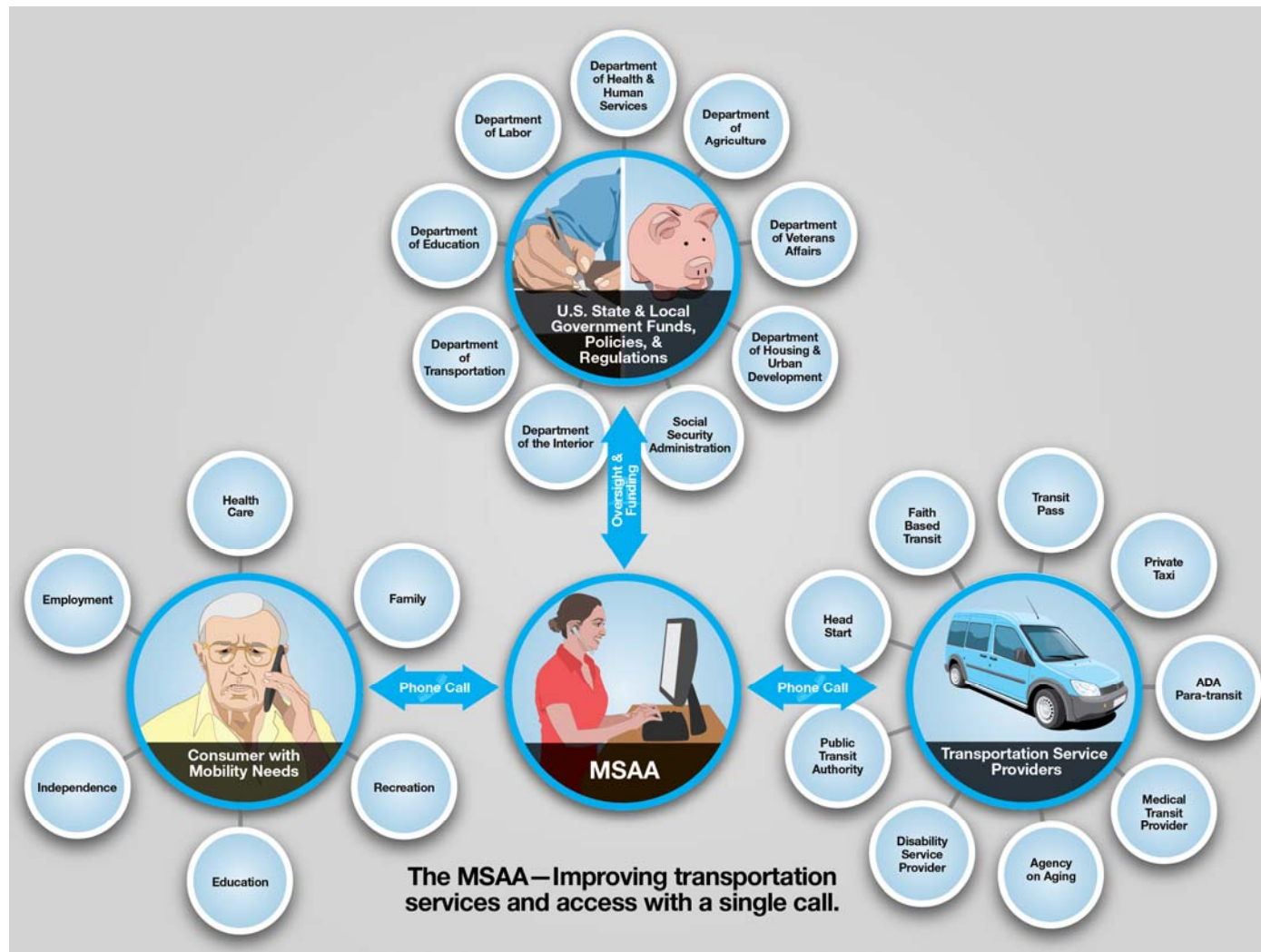
Travel Management Coordination Centers (TMCC)

Service Coordination

Technology Integration
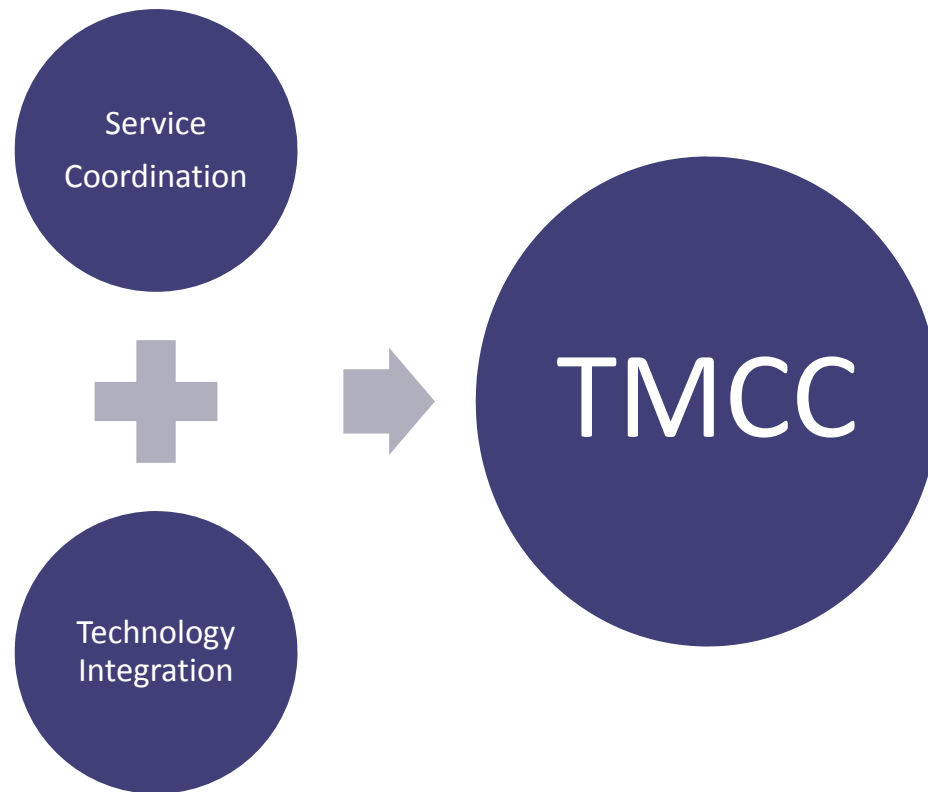
TMCC

Replicable/Scalable TMCC:

- Provides one-stop, unified, customer-based travel information and trip planning services

- Supports coordinated human service transportation

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TMCC Vision

An interoperable system that adds value to the customer, service provider and human service program:

Customer	Provider	Human Service Program
• Simplified Access • Trip Planning • Information	• Operational Efficiency • More Service (rides) with Same costs & Resources	• Streamlined program management, billing, and accounting

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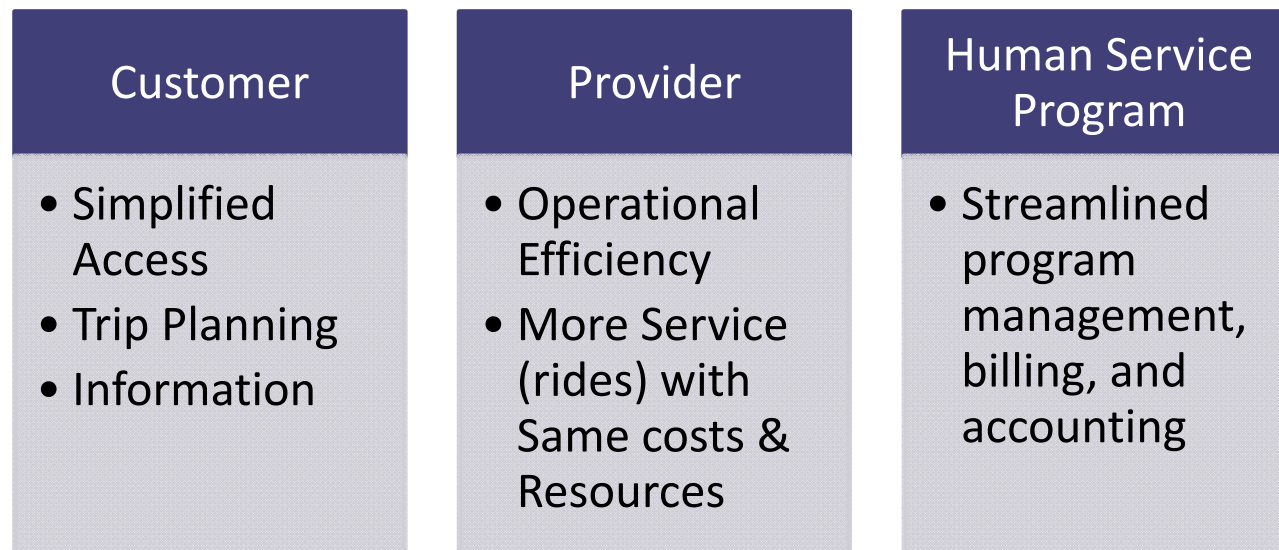
Request for Proposals

- Posted to FTA website and **grants.gov** May 1, 2014

- Promote TMCC phased-implementation demonstration by providing "seed" funding

- Use ITS technologies to enable data sharing and system and data interoperability

- $795,545 in available funds, possibly more

- Seeking multiple awards

- Cost-sharing of at least 20% of project cost required

- **RFP closed July 1, 2014**.

NEW!

Objectives of MSAA Deployment Planning Initiative

Overcome **technical and institutional barriers** to promote **system interoperability**

- Involve at least two human service transportation programs and providers

- Establish operational **data sharing and coordination** between **multiple technology platforms**

- Demonstrate functional common fleet information platform to, at a minimum, view each other's trip scheduling and vehicle location information in real time

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Intended Outcomes

- Enhance customer experience
- Improve effectiveness and efficiency of services being provided by different transportation providers
- Produce **sustainable institutional model(s)** enhanced by information technology
- Data sharing by addressing institutional barriers
- Utilization of Intelligent Transportation Systems

Intended Outcomes (*continued*)

- Advance the state-of-the-art in:
  - Comprehensive traveler support
  - Interoperable and coordinated transportation service operations and management
  - Streamlined program management requirements
- **Data sharing and exchange** within HST
- **System interoperability** by leveraging existing proprietary solutions

Business Case

- **Why Coordinate?** There is a lack of quantitative and tangible empirical evidence on potential coordination impacts at the local level.

Simulating Coordination Impacts

- Define reasonable estimation of cost savings to support state and local stakeholders to make informed decisions.

- Results presented and published at 2014 TRB Annual Meeting.

Literature Review	Site and Simulation Tool Selection	Data Collection and Analysis	Coordination Scenario Modeling

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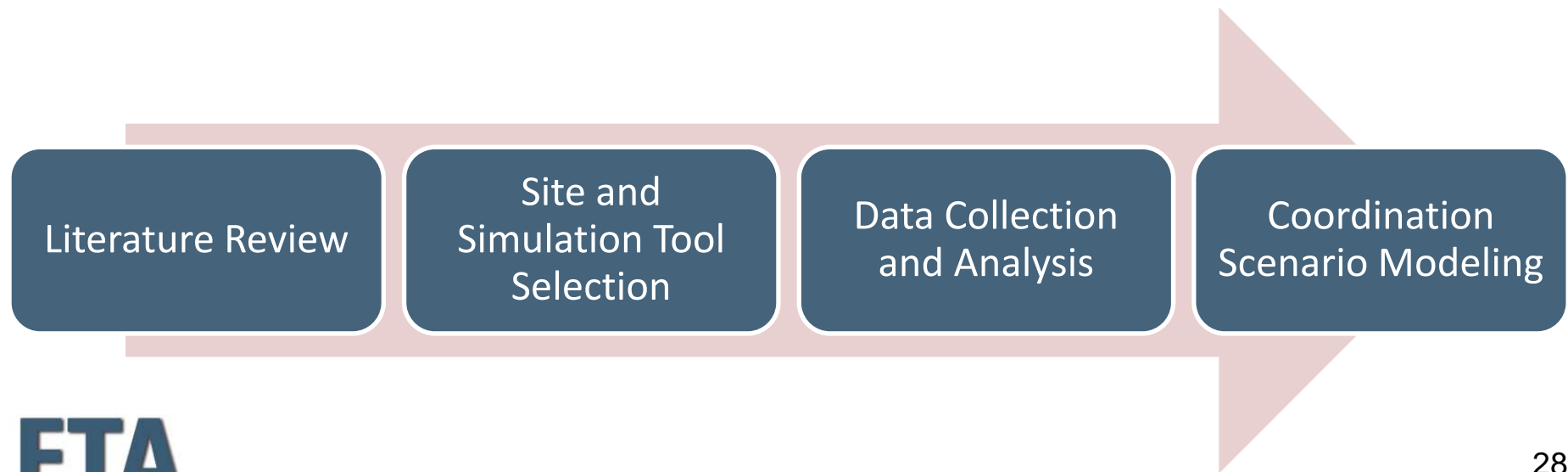
Sample Simulation Scenarios

- Agency: Santee Wateree Regional Transit Authority in SC
- Sample data: two normal service days in 2012
- Three simulated coordination scenarios: Some | More | Full

Some
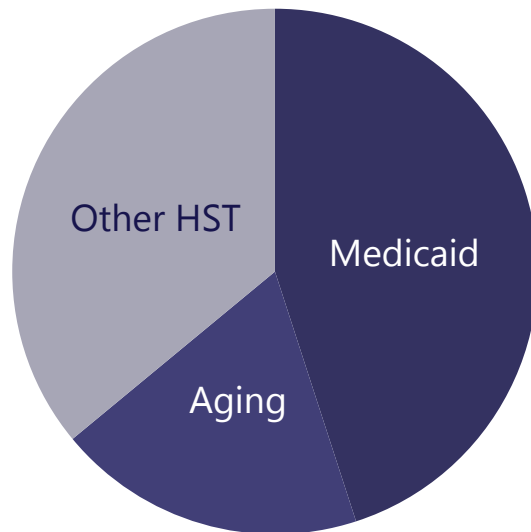
More
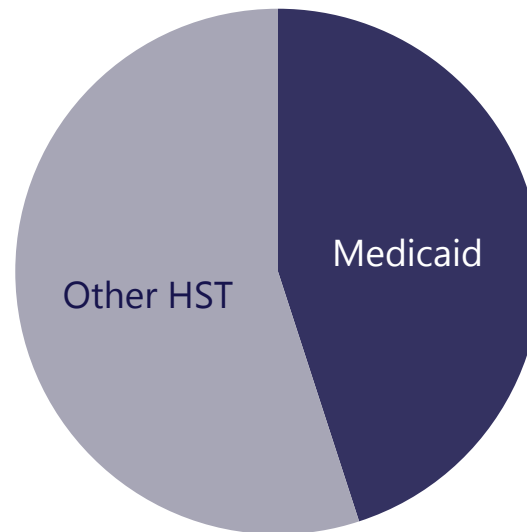
Full
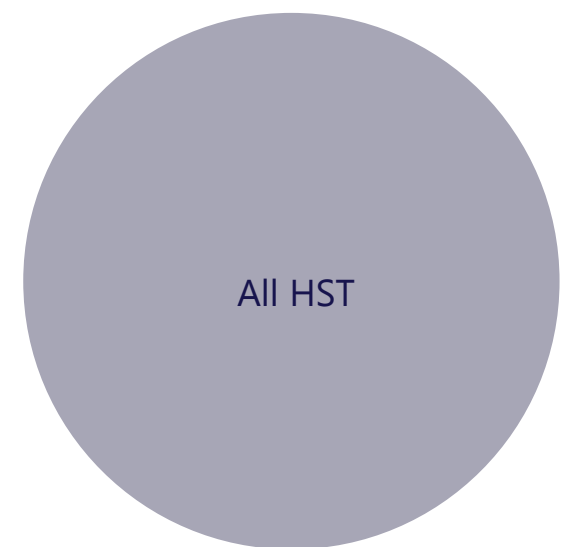
Sample Simulation Results

- Agency: Santee Wateree Regional Transit Authority in SC
- Sample data: two normal service days in 2012
- Three simulated scenarios: **Some | More | Full**

Performance Measures	Scenario #1 **Some** Coordination	Scenario #2 **More** Coordination	Scenario #3 **Full** Coordination	% Difference (from **Some** to **Full**)	% Difference (from **More** to **Full**)
Total Vehicle Hours (hrs.)	1,141	1,105	1,024	-10%	-7%
Total Vehicle Distance (mi.)	21,634	20,525	18,826	-13%	-8%
Passengers per Revenue Hour	1.53	1.57	1.69	11%	8%

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Impacts on Individual Trip Times

- The impacts of coordination on individual travelers' trip time are inconclusive.

Scenario		Average Trip Time (minutes)		
		Some Coordination	**More** Coordination	**Full** Coordination
SWRTA	Medicaid Only (45%)	57.8	57.8	54.8
	Aging (19%)	48.6	50.6	53.2*
	Others (36%)	53.9	51.8	52.9
	Total	*54.3*	*53.8*	*53.6*

* Difference between Some and Full coordination is statistically significant at 95% level of confidence

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Simulation on Urban Systems

- Can similar benefits from coordination be expected in urban settings where ridership is much higher, combined with larger fleet size and more complex road network and traffic patterns?

- Currently collecting data from 2 urban locations

- Preliminary results expected Fall 2014

FTA/Bridgewater State University Cooperative Agreement
Support Data Interoperability in MSAA

- Approach to problem
  - Historical Analysis of public initiatives
  - Review current projects supporting MSAA goals
  - Outreach to emerging public and private partnerships
  - Consensus building for data interoperability

MSAA Core Team

- Bob Sheehan – USDOT, JPO
- Jeff Spencer – USDOT, FTA
- Matthew Lesh – USDOT, FTA
- Gwo-Wei Torng – Noblis
- Carolina Burnier – Noblis
- Amy Jacobi – Noblis
- Technical Assistance – Battelle
- Carol Schweiger – TranSystems
- Larry Harman – Bridgewater State University
- Uma Shama – Bridgewater State University

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ITS Team Leader
Federal Transit Administration
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Rural and Targeted Programs

Connecting People and Communities to Opportunity

Mary Leary, Ph.D.
Division Chief, Rural and Targeted Programs

U.S. Department of Transportation
Federal Transit Administration

Topics for Presentation

- What is the Rural and Targeted Programs Division?

- Our Programs

- Targeted Technical Assistance Centers

- Mobility Management and intelligent transportation systems

- Veterans Transportation Community Living Initiative

Rural and Targeted Programs Division

New Division in FTA's Office of Program Management

Integrates rural and targeted populations' programs with commensurate technical assistance projects

Team: Rik Opstelten, Elan Flippin, Cathy Caldwell, Gil Williams, upcoming open position for 5311 program manager

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Enhanced Mobility of Seniors and Individuals with Disabilities (Sec. 5310)

Funds services that go beyond traditional public transportation services and Americans with Disabilities Act-mandated paratransit service

Locally developed, coordinated public transit-human service transportation plan critical element to project selection and requires key stakeholder input

5310 Projects Could Include

Mobility Management: *linking transportation options to each other and people to better serve communities*

ITS and other technology solutions to make public transportation services more usable by people with disabilities and others

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Technical Assistance

National Center for Mobility Management

- Work with communities to leverage innovation approaches to drive transportation strategies that increase mobility
- Catalog best practices in mobility management
- Regional Communications Liaisons, local technical assistance, training programs and peer networks
- http://nationalcenterformobilitymanagement.org

Population-Specific Technical Assistance Centers

Easter Seals Project ACTION

- Expanding accessible transportation services for people with disabilities
  - ProjectAction.org

National Center for Senior Transportation

- Increasing transportation options for seniors
- SeniorTransportation.net

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Formula Grants Program for Rural Areas (Sec. 5311)

Provides capital, planning, and operating assistance to states to support public transportation in rural areas with populations less than 50,000

Eligible activities: Planning, capital, operating, job access and reverse commute projects, and the acquisition of public transportation services

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National Rural Technical Assistance Project

Creating rural transit solutions through technical assistance, partner collaboration and FREE training and other transit industry products examples:

- Website Builder
- Useful materials such as State RTAP Manager's Toolkit

NationalRTAP.org
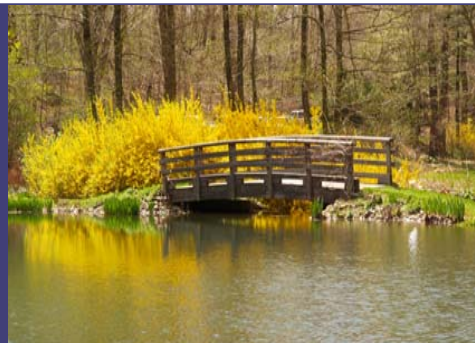
Veterans Transportation Community Living Initiative VTCLI

Connecting Veterans to Transportation and their Communities through Technology and Partnerships

What is VTCLI?

$63 million invested to help communities:

- Identify transportation and mobility needs of their veterans and military community
- Create/expand one-call/one-click resource centers to better meet those needs
- Foster mobility management within the VA network

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Where are VTCLI grantees?

Who are key VTCLI stakeholders?

One call one click no wrong door

- Urban Transit Agencies (36)
- COGs, Planning Agencies, etc. (10)
- Local Human Services Transportation Providers (10)
- Rural Transit Agencies (9)
- "Non-traditional" Partners (8)
- State DOTs (7)
- Local Government (6)

Using Technology to Build Connections

Innovative Project solutions

- Multi-agency trip planning
- On-line trip scheduling
- Real-time traveler information
- Integration with 211/511
- On-vehicle technology
- Smartphone apps
- State-wide no wrong door multi-modal ride information

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PROJECT HIGHLIGHTS

Featuring VTCLI Solutions in
Idaho and San Diego

Customer-focused

Searchable accommodations include:
- Curb to curb
- Door to door
- Hand to hand
- Several types of mobility devices
- Child seats and strollers
- Help with stairs, packages
- Bike racks

Full Access & Coordinated Transportation (FACT)

Connecting San Diego

- 16 military facilities/bases,
- Major Veterans Affairs hospital,
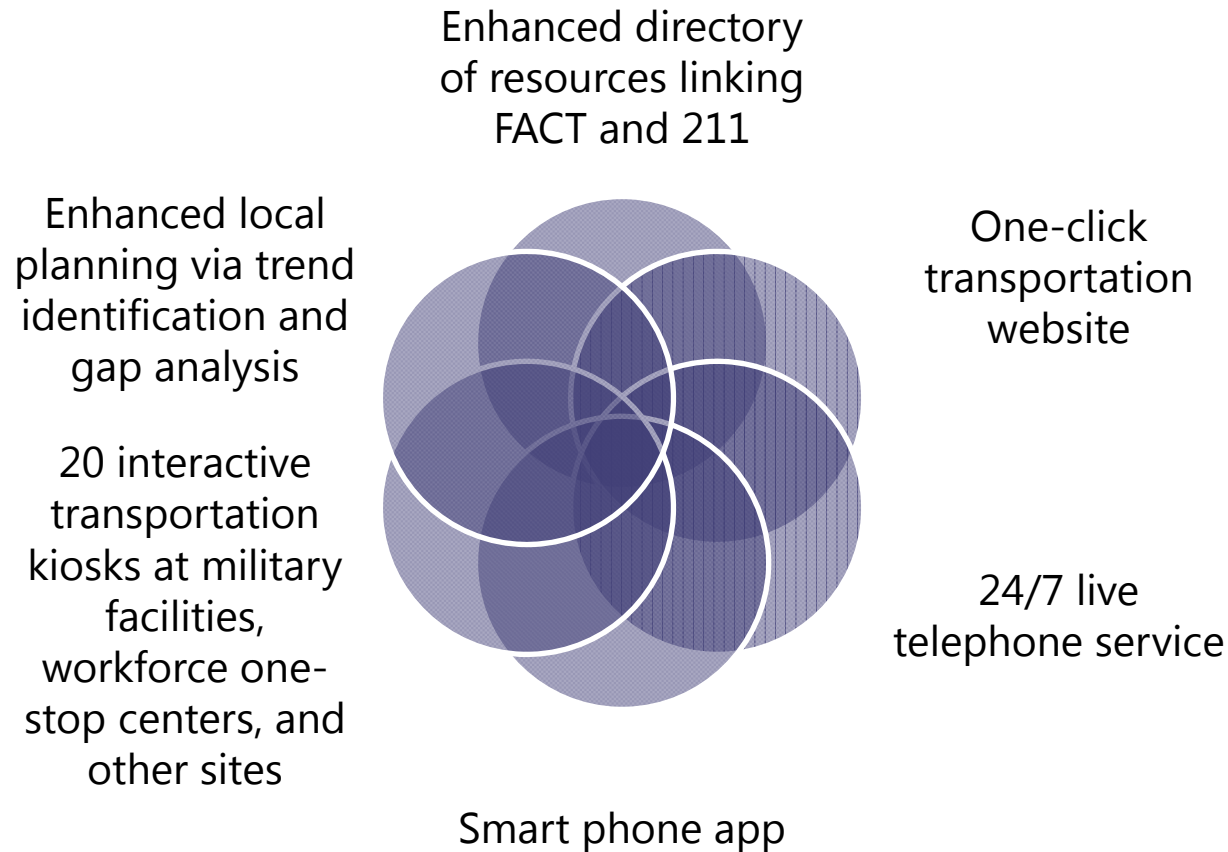- Leveraging existing programs for seniors and people with disabilities

Largest number of active duty military in the nation

- Established a Military and Veterans Partnership administered by 211 San Diego, in partnership with SANDAG, the region's primary public planning and research agency to expand services

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Current website that will be upgraded to include Veteran
And Military Family information

FACT Program Highlights

Enhanced directory
of resources linking
FACT and 211

Enhanced local
planning via trend
identification and
gap analysis

One-click
transportation
website

20 interactive
transportation
kiosks at military
facilities,
workforce one-
stop centers, and
other sites

24/7 live
telephone service

Smart phone app

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**Other Questions? Call or email: Mary
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202-366-2204
Mary.leary@dot.gov**

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Accessible Transportation Technologies Research Initiative (ATTRI)

Mohammed Yousuf, FHWA

National Rural ITS Conference 2014

August 26, 2014

U.S. Department of Transportation
Federal Highway Administration

The Challenge

Persons with Disabilities

- 54.4 million; 20% US population
- Unemployment 63%;Income: $38,400 ($61,000)
- Poverty: 24.7% (9.0%)
- Fed expenditures: $226 B (2002); $357 B (2008)

Veterans with Disabilities

- Disability claims: 104,819 (2006) vs. 634,743 (2012)
- 1.4 million deployed; one third report a disability
- Spending: $0.93 billion (2006) vs. $5.95 billion (2012)

Older Adults

- Disability rates rise as people get older
- 35 million age 65 + in 2004
- Expected to reach 72 million by 2025

U.S. Department of Transportation
Federal Highway Administration

Accessible Transportation Technologies Research Initiative (ATTRI)

- **A U.S. DOT Multimodal Research and Development Effort**

  - Co-led by FHWA and FTA with support from Intelligent Transportation Systems (ITS) Joint Program Office

  - National Institute on Disability and Rehabilitation Research (NIDRR) is a key strategic partner

- **Enhanced Mobility Quality and Choice for Travelers with Disabilities Using ITS and Other Assistive Technologies**

  - Apply research and innovation to accessible transportation

  - Leverage technologies and innovations from Federal research and development activities

- **Accessibility Benefits that Would Extend to All Travelers**

Image Source: Thinkstock/USDOT

Challenges and Opportunities

Technology Focused Solutions

| ITS, Wireless and Sensors | Connected Vehicles | Automated Vehicles/ Personal Mobility | Robotics, Artificial Intelligence | Accessible Data |

Targeted Populations

Persons with Disabilities

Veterans with Disabilities

Older Adults

Types of Disabilities

Visual

Mobility

Hearing

Cognitive

ATTRI Concept

Photos courtesy of: USDOT and Jeffrey Katz

U.S. Department of Transportation
Federal Highway Administration

ATTRI Phases

PHASE 1
Exploratory & User Needs Research
Sept. 2013 – Sept. 2014

- Collaboration Building
- Stakeholder Engagement and User Needs Assessment
- State of the Practice/ Innovation Scan
- Strategic Plan and Roadmap

PHASE 2
Innovation & Prototype
Sept. 2014 – Sept. 2017

- Institutional and Policy Issues Assessment
- International Research Coordination
- Standard Development & Harmonization
- Impacts Assessment
- ATTRI Effects on the Non-User
- Accessible Transportation Applications Selection
- ConOps & SyRS

PHASE 3
Demonstration
Sept. 2017 – Sept. 2019

- ATTRI Joint Demonstrations
- Joint Demonstration Evaluations
- Deployment Guidance

Image Source: Thinkstock/USDOT

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Federal Highway Administration

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We want your input!

Come participate after the break in our interactive session:

Technology Solutions for Accessible Transportation

Join us to...

- Learn about state of the art accessible technology applications from the US and abroad

- Participate in an interactive activity to develop scenarios and technology solutions for accessible transportation

Thank You!

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U.S. Department of Transportation
Federal Highway Administration

Join us after lunch

for a session on

Technology Solutions for Accessible Transportation

ATTRI Vision

To enhance the mobility of travelers with disabilities by providing the capability to reliably, safely and independently plan and execute their travel. ATTRI identifies, coordinates, develops, and implements new integrated solutions in advancing such capabilities.

ATTRI Strategic Planning Activities

- Strategic Research Plan under development
  - Shaping ATTRI strategic goals and activities
  - Version 1.0 expected September 2014
  - Input from:
    - Stakeholders
    - Federal Agencies
    - Technologists

- Key Activities:
  - Collaboration with other federal initiatives:
    - NIDRR
    - TARDEC
  - USDOT internal visioning session, January 2014
  - Listening Sessions, May 2014:
    - NACEM 2014
    - General Motors - People with Disabilities Affinity Group
    - TARDEC
  - Expert Panel, May 2014
  - Online Dialogues, May – June 2014
    - 60 ideas and 122 comments
  - RERC Projector Directors Conference, June 2014
  - NRITS, August 2014
  - ITS World Congress, September 2014

U.S. Department of Transportation
Federal Highway Administration

Potential ATTRI Application Areas

- Real-time multi-modal trip planning and traveler decision support application

- Wayfinding and navigation applications – Crowd-sourced/real-time

- Integration of travelers with disabilities in the Connected Vehicle environment

- Automated vehicles that enhance independent and spontaneous travel

- Travel assistance device (tablet, smartphone, or wristband) for persons with cognitive disabilities

Image Source: Thinkstock/USDOT

Accessible Transportation User Needs

1. One-stop pre-trip information

2. Door to door direct service

3. Accessible physical environment

4. Accessible en-route traveler information

5. First-mile/last-mile links

6. Streamlined eligibility screening

7. Allow for more spontaneous travel

8. Independent navigation

9. Travel training

10. Affordable transportation options and technological devices