July 9, 2020

Mobility as a Service

- National Technical Assistance Center
- Launched in late 2019
- Operated by Community Transportation Association of America
- Through a cooperative agreement with the Federal Transit Administration (FTA)

N-CATT's mission is to provide small-urban, rural, and tribal transit agencies with practical, replicable resources that help them apply technological solutions and innovations.

N-CATT is carrying out this mission by analyzing information, communicating it, helping transit systems plan, and encouraging implementation of cost-effective, value-adding technology.

n-catt

National Center for Applied Transit Technology

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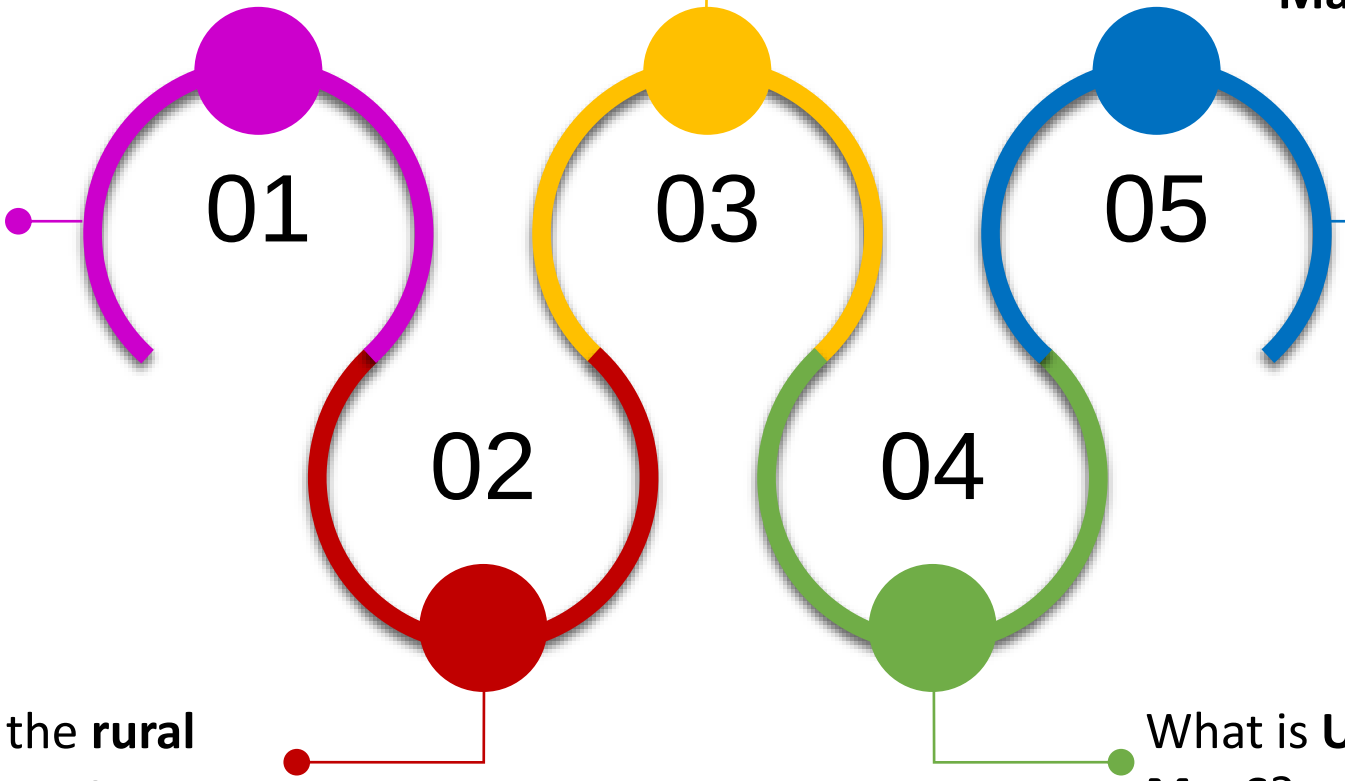
https://n-catt.org/

Mobility as a Service (MaaS)

Carol Schweiger
President, Schweiger Consulting
N-CATT Webinar
Thursday, July 9, 2020

PRESENTATION OUTLINE

What is **Mobility as a Service (MaaS)** and is it related to **Mobility Management**?



Mobility management = MaaS?

Roadmap, Readiness and Evaluation

MaaS in the **rural environment**

What is **Universal MaaS**?

DEFINITIONS

Mobility as a Service (MaaS)	An integrated mobility concept in which travelers can access their transportation modes over a **single digital interface**. MaaS primarily focuses on passenger mobility allowing travelers to **seamlessly plan, book, and pay** for travel on a pay-as-you-go and/or subscription basis.
Mobility on Demand	A concept based on the principle that transportation is a **commodity where modes have distinguishable economic values**. MOD enables customers to access mobility, goods, and services on demand. – **Not MaaS**
Shared Mobility	The shared use of a travel mode that provides travelers with **access to a transportation mode on an as-needed basis**. – **Not MaaS**
Mobility Management	An innovative approach for **managing and delivering coordinated transportation services to customers**, including older adults, people with disabilities, and individuals with lower incomes. – **Not MaaS**

Mobility Innovation Principles

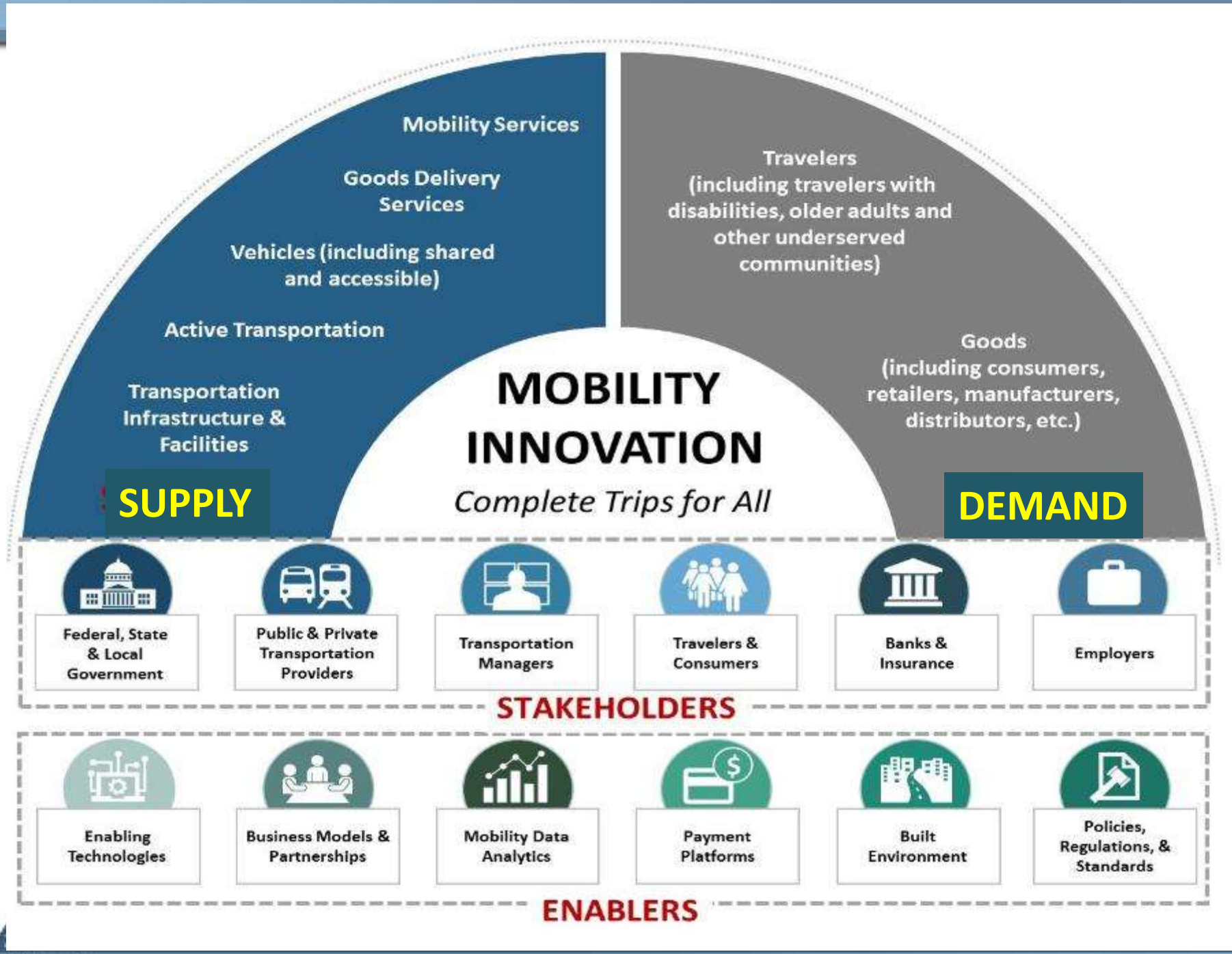
Traveler-centric – promotes choice in personal mobility driven by the specific needs of the traveler and utilizes universal design principles to capture the needs of all travelers.

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.

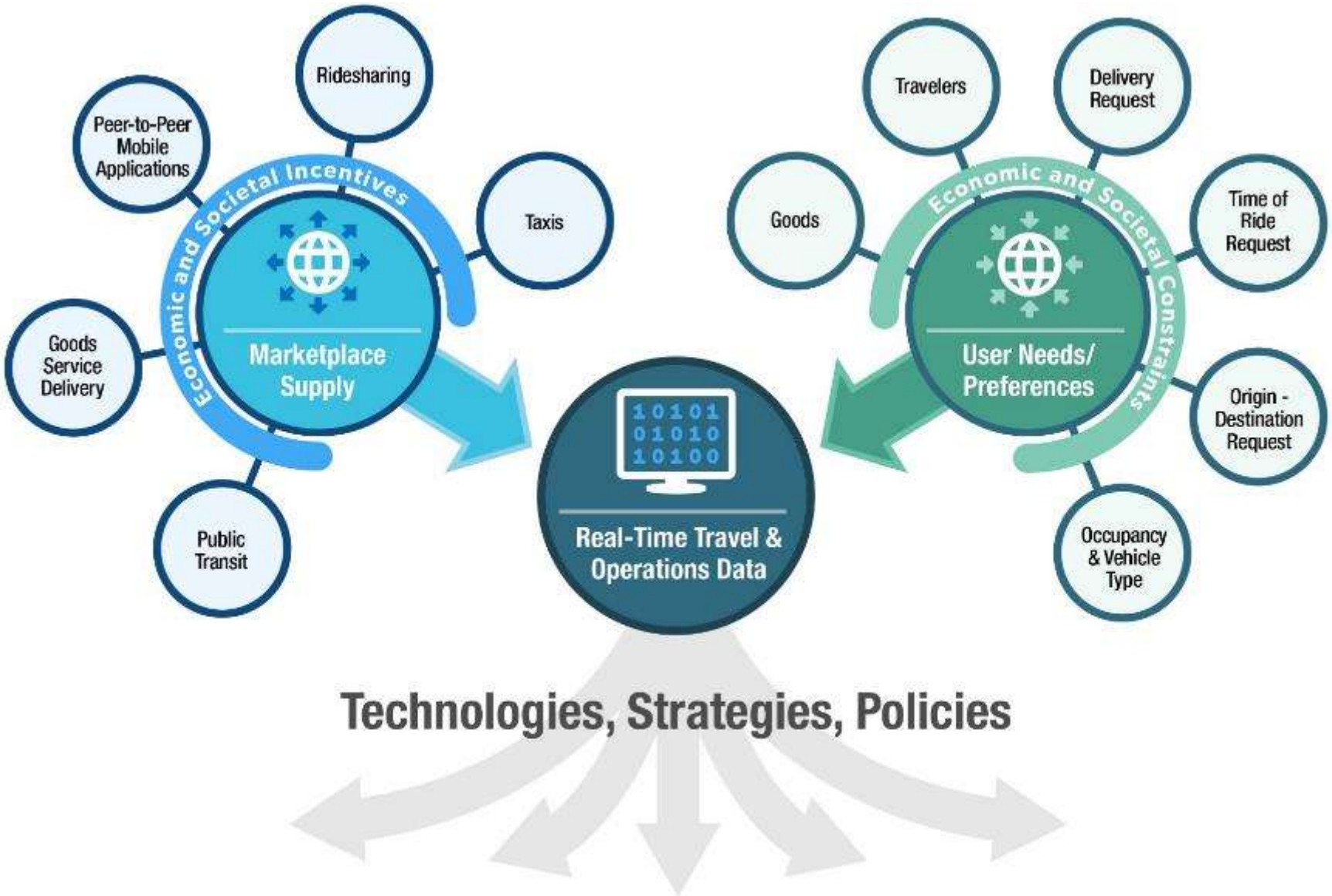
Partnership driven – develop and leverage unique partnerships, both public and private, to accelerate deployment of emerging mobility options.

Bob Sheehan, "Mobility Marketplace Connecting Trips for All," International Conference on Demand Responsive and Innovative Transportation Services, Tuesday, April 16, 2019, Baltimore, MD



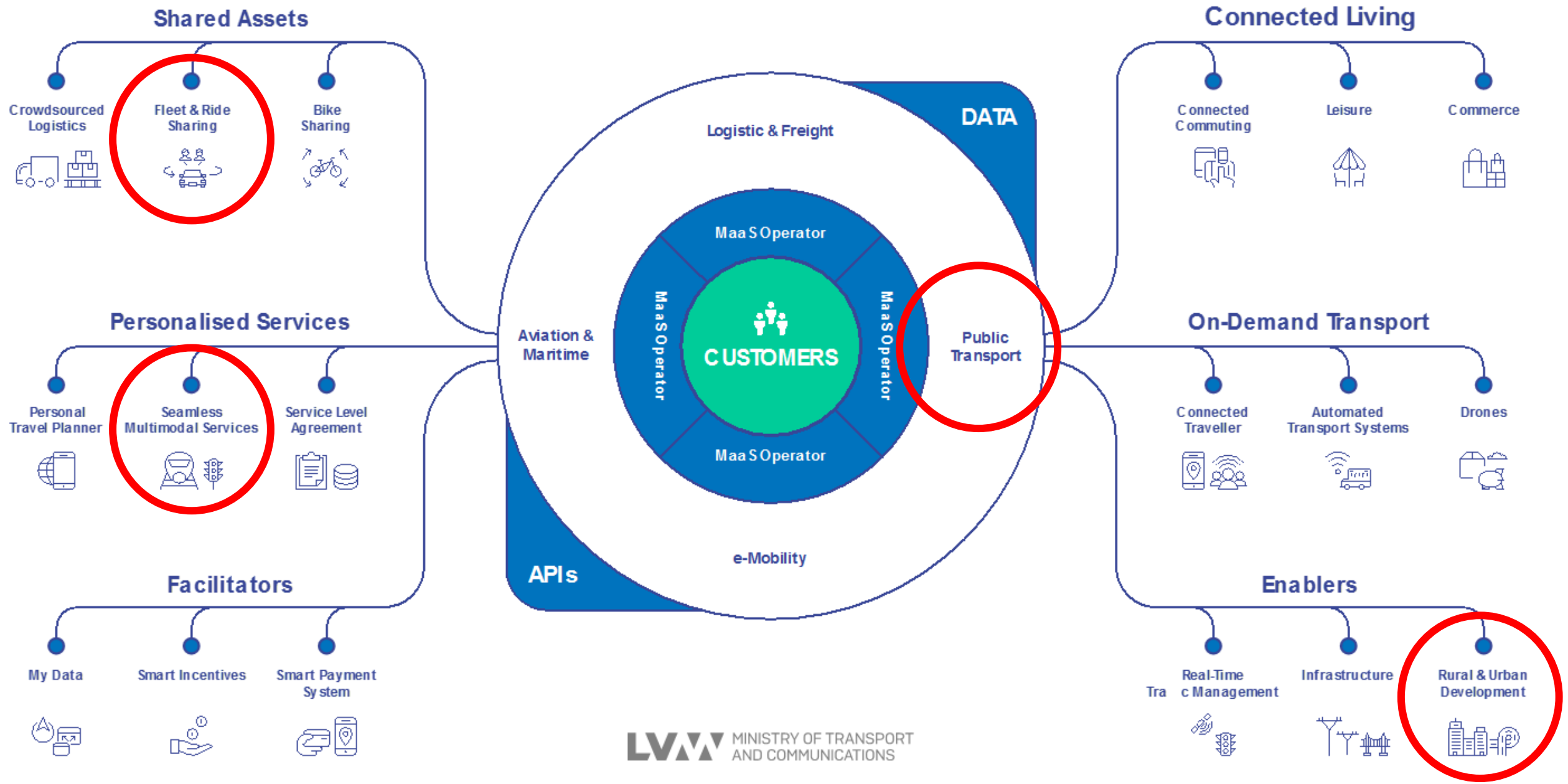
Bob Sheehan, "Mobility Marketplace Connecting Trips for All," International Conference on Demand Responsive and Innovative Transportation Services, Tuesday, April 16, 2019, Baltimore, MD

Holistic View and Enablers



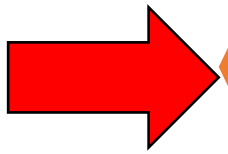
Bob Sheehan, "Mobility Marketplace Connecting Trips for All," International Conference on Demand Responsive and Innovative Transportation Services, Tuesday, April 16, 2019, Baltimore, MD

MOBILITY AS A SERVICE



MINISTRY OF TRANSPORT AND COMMUNICATIONS

MAAS SERVICE COMBINATIONS FOR DIFFERENT GEOGRAPHICAL AREAS



Rural MaaS Objectives

- Increase efficiency and utilization rate
- Maintain sufficient service level
- Improve accessibility

Based on:

- Demand-responsive transport, taxis, buses and connections to long-haul transport, and car pooling
- Additional services: parcel deliveries, library services, and food and medicine distribution…

Suburban MaaS Objectives

- No need for a 2nd car
- First-/last-mile accessibility

Based on: Park & ride -services, on-demand transport and other services connecting suburban to city transport services

MaaS in Different Geographic Areas

Urban MaaS Objectives

- Reduce the use private of cars (congestion, parking)
- Reduce emissions

Based on: (1) Existing public transport; and (2) Extended with rental and shared cars and bikes…

National and International MaaS Objective

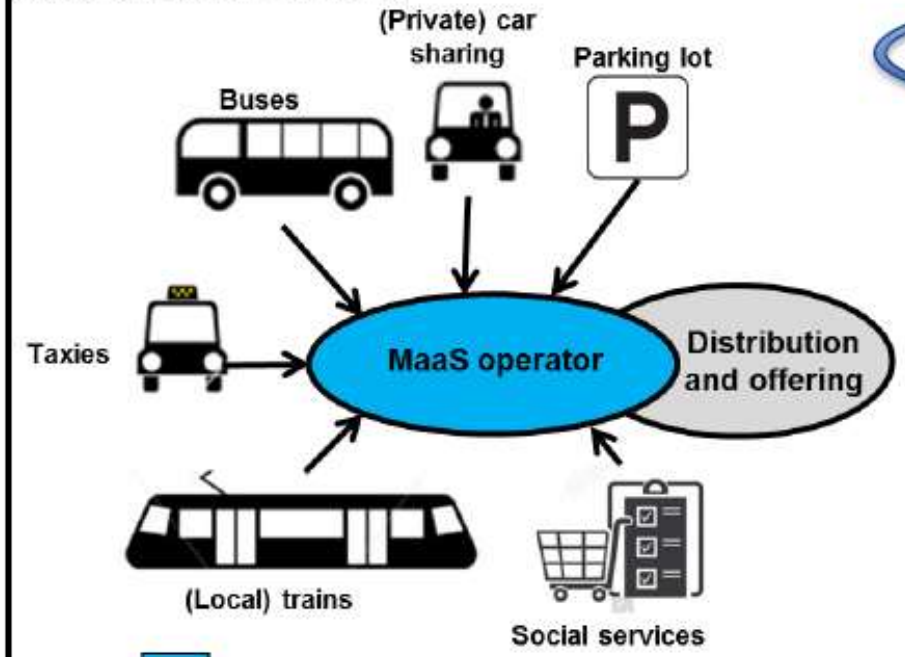
- Offer easy all-in-one packages

Based on: (1) Long-haul transport including air traffic; and (2) Additional services: accommodation, event tickets, activities…

Aki Aapaoja, "MaaS service combinations for different geographical areas," 24th World Congress on Intelligent Transportation Systems, 29 October - 2 November 2017, Montreal, Canada

MaaS in rural areas

Value creation system



Value proposition

- Increased efficiency and utilization rate of publicly subsidized transport
- Sustaining current services and levels
- Accessibility for different user groups (inhabitants, tourists etc.)
- Integrating private transport with public and social services
  - Combined passenger transport and logistics
- Individual preferences, priorities, constraints and needs

ACCESSIBILITY

Revenue model

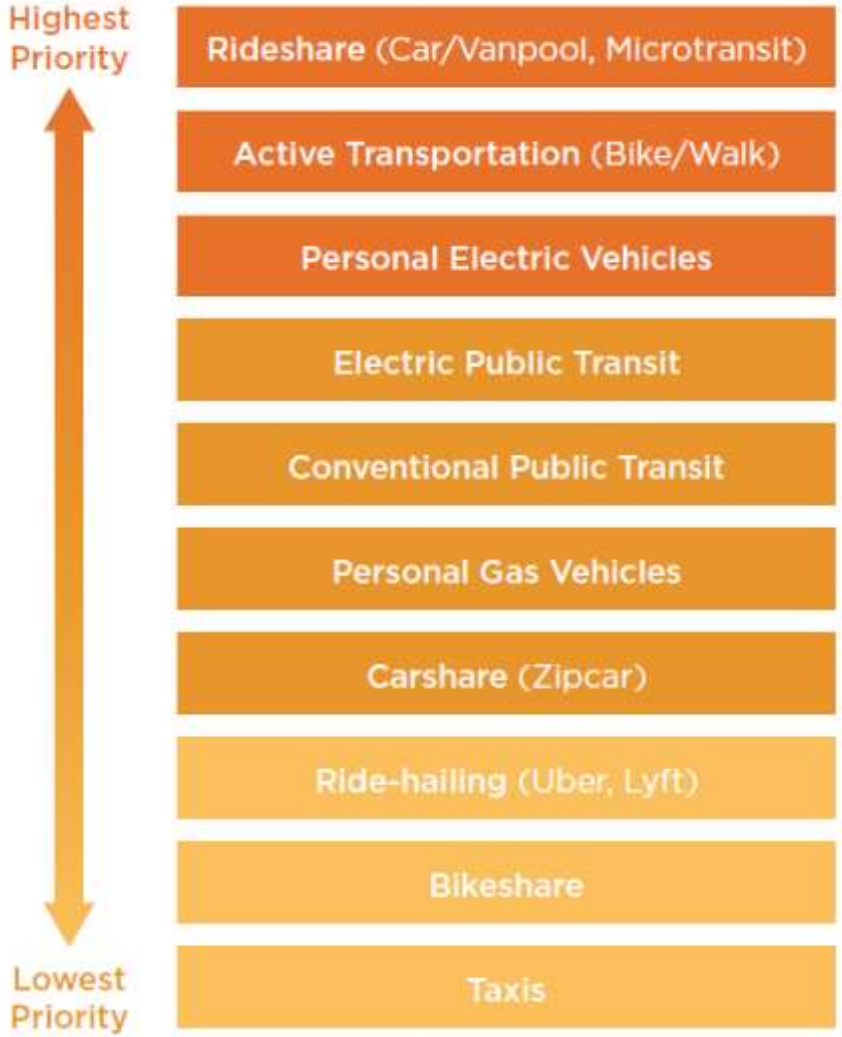
- Pay per usage: A service directory helps in finding the smartest option that may contain journey or related services
- Monthly package: Single access point to multimodal service base (short + long-haul trains and buses, and sufficient amount of taxi)
- Tailored all-in-one package: Highly customized travel solutions for users with varying travel needs. May also include socially supported services (*Monthly fee + pay per usage)*

ITS WORLD CONGRESS 2017
Montréal, OCTOBER 29 - NOVEMBER 2

Aki Aapaoja, "MaaS service combinations for different geographical areas," 24th World Congress on Intelligent Transportation Systems, 29 October - 2 November 2017, Montreal, Canada

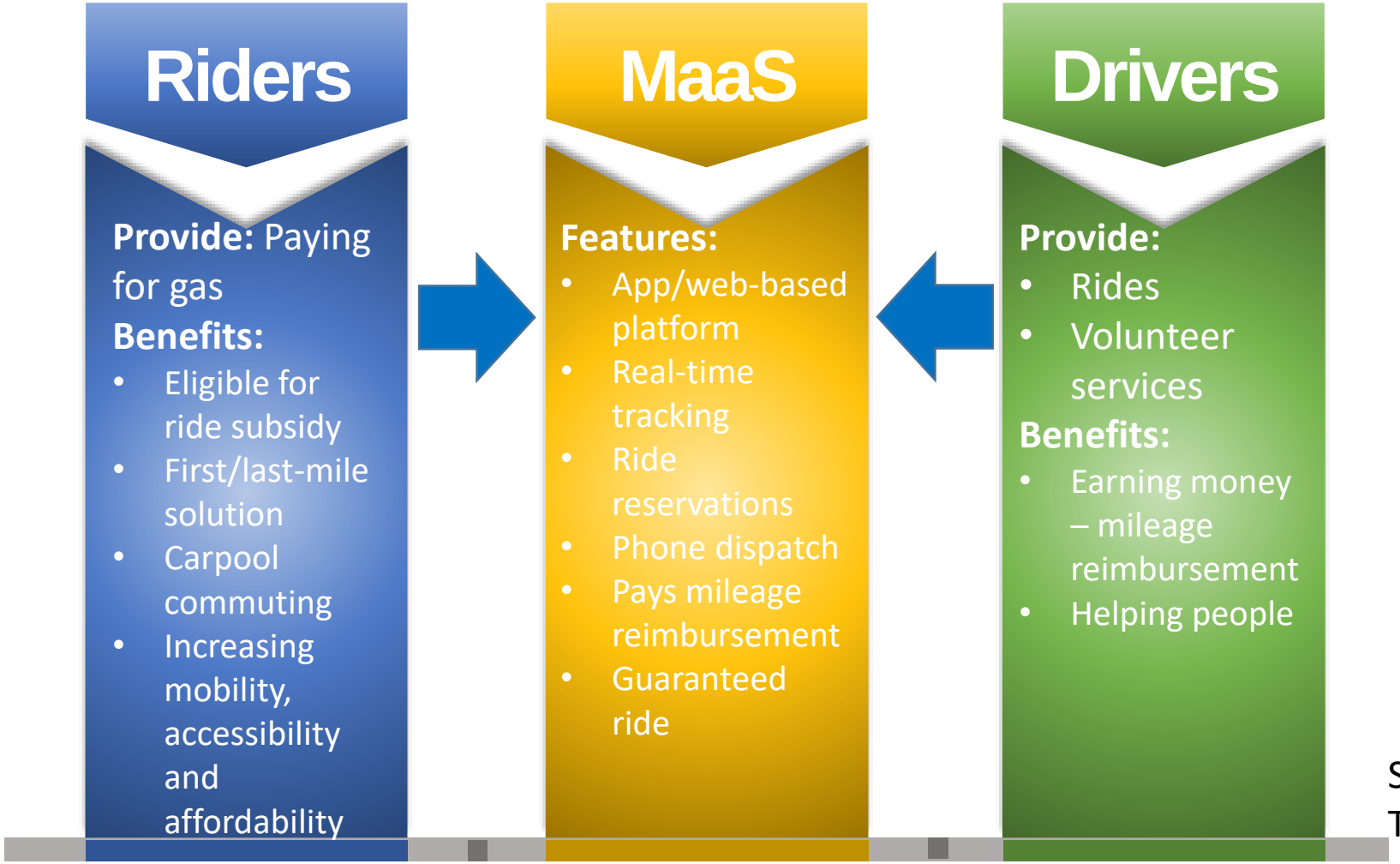
RURAL AREAS MOBILITY CHOICES USING MOBILITY EQUITY INDICATORS

- Because flexible, high-occupancy modes best suit the needs of a rural community, rideshare receives high priority
- Where practical, active transportation ranks as high priority due to need for safe biking and walking infrastructure
- Personal electric vehicles receive high priority, due to dispersed housing and destinations
- Both electric and conventional public transit have medium priority, due to efficiency
- Carshare, ride-sourcing, bikeshare and taxis are ranked low, mostly due to lack of accessibility and feasibility



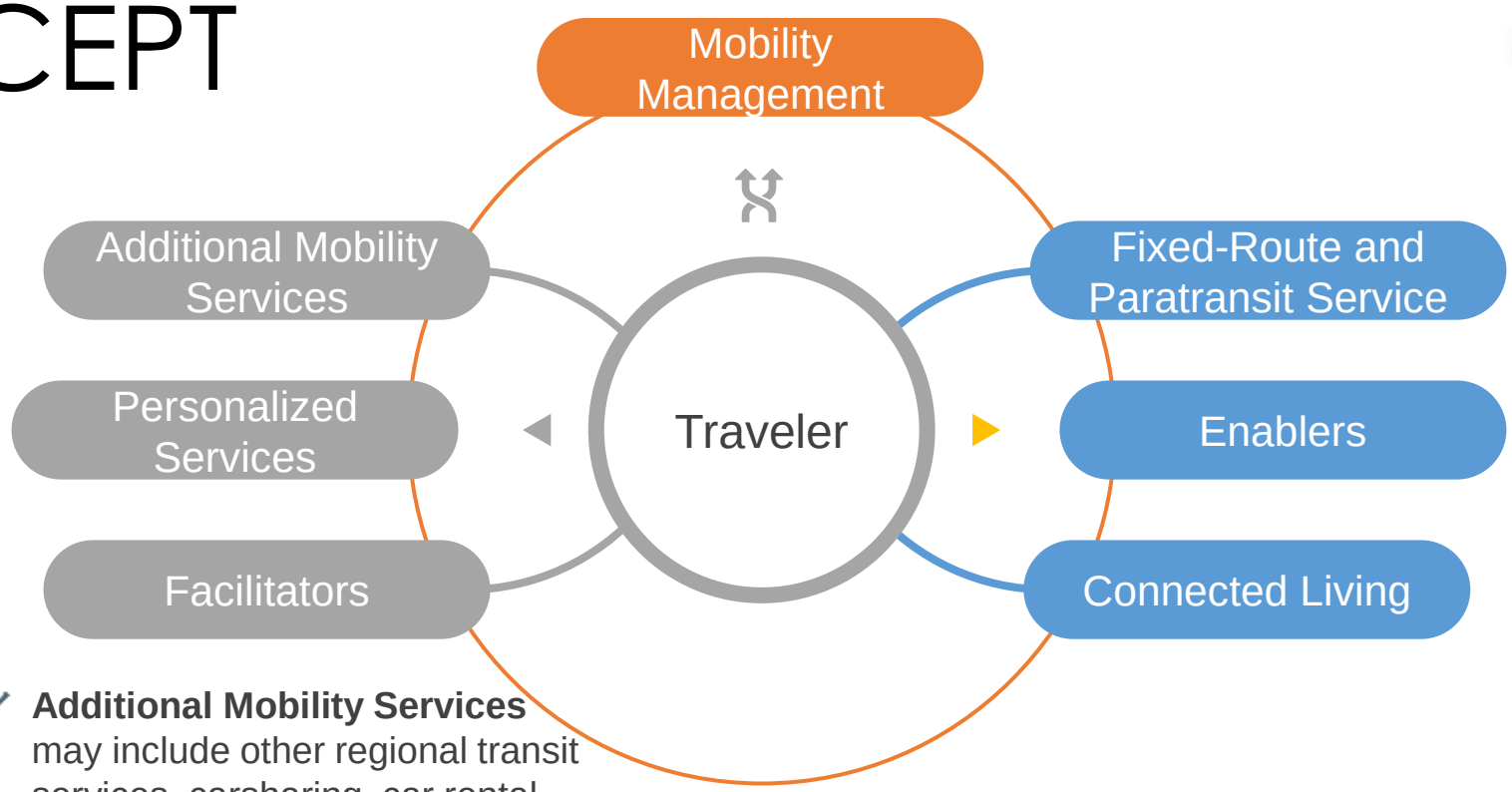
Hana Creger, Joel Espino and Alvaro S. Sanchez, "Mobility Equity Framework: How to Make Transportation Work for People," The Greenlining Institute, http://greenlining.org/wp-content/uploads/2018/03/Mobility-Equity-Framework-Final.pdf

SHARED MOBILITY STRATEGY TO BOOST MOBILITY SUPPLY IN RURAL COMMUNITIES



Source: Dwight Mengel, Tompkins County Dept of Social Services

MOBILITY MANAGEMENT CONCEPT



- **Additional Mobility Services** may include other regional transit services, carsharing, car rental, carpooling, vanpooling, etc.
- **Personalized Services** may include personalized trip planning, real-time information and booking, and service level agreement
- **Facilitators** may include open data, incentives and integrated payment

- **Enablers** may include regional service coordination, real-time transportation management and customer service
- **Connected Living** may include access to healthcare, education and government services

MOBILITY MANAGEMENT NEEDS

Technology Needs

- Multimodal trip planning, reservation and payment through **mobile applications and other means** for those without mobile devices
- Regional **real-time transportation information**
- Account-based payment system that includes **options for the unbanked**
- Operations management tools for **other mobility service providers**
- **Interfaces** with other regional mobility service providers (e.g., State DOT District Office)

Policy and Partnership Needs

- Cooperate and coordinate with **other regional mobility services** including transit, paratransit, car rental, carsharing, carpool, vanpool, etc.
- Institute **fare caps** (charge the least for a multimodal trip as is available)
- Partner with **non-transportation entities** (e.g., healthcare providers, educational institutions, local attractions)
- Establish **incentive or customer loyalty** program

Data and Reporting Needs

- **Open data** for multimodal trip planning and real-time information
- Data reflecting **trip making patterns** (e.g., origin-destination data)
- **Performance measures** for each mobility service, including how much each mobility service supports transit services
- State DOT and FTA **reporting**

GUIDING PRINCIPLES FOR MOBILITY MANAGEMENT

- **Collaboration** –ensure continual transport improvement
- **Safety** –must be consistent with region's safety goals
- **Transit** –must complement and help to satisfy needs of public transport
- **Congestion** –impact on traffic, public transport, mode choice and roadway safety
- **Sustainability** –must help attain greenhouse gas (GHG) emissions and reduction goals
- **Equitable access** –must be accessible to all people
- **Accountability** –must share data for region and public to determine services' benefits and impacts on transport, and whether or not services' meet region's transport goals
- **Labor** –must be consistent with fair labor and pay practices and policies
- **Disabled access** – must be accessible to disabled persons
- **Financial impact** –demonstrate having a positive financial impact on transport investments

Adapted from "10 Guiding Principles," https://www.sfcta.org/policies/emerging-mobility#panel-guiding-principles

MAAS IS A SOLUTION. WHAT'S THE PROBLEM?

MaaS is **not about getting rid of private cars.** Excluding private cars from multimodality would make MaaS a zero-sum game.

MaaS is **about accelerating modal shift from private cars to shared resources**

Is it realistic to think that MaaS would make people give up their cars in rural areas? At least **giving up the second car** from the family becomes an option.

How many different forms of transport you use to get where you are going is irrelevant. The **relevant factor is the private vehicle, which is and will be an essential part of the system**

In rural areas, the reason for driving is obvious: **poor or non-existing public transport** and no other services beside the taxi, which is not an option for many.

Pekka Möttö, "MaaS is a solution. What's the problem?" The Urban Mobility Daily, April 18, 2019, https://urbanmobilitydaily.com/maas-is-a-solution-whats-the-problem/#:~:text=MaaS%20does%20not%20equal%20travel,not%20equal%20travel%20chain%20either.&text=A%20multimodal%20public%20transportation%20system,not%20including%20your%20own%20vehicle.

MAAS IS A SOLUTION. WHAT'S THE PROBLEM? (2)

Solutions based on modern technology can provide **immediate, easily understandable benefits** to rural areas.

Public transport and other shared services can be **arranged on platforms more cost effectively** (and at a reasonable cost to the traveler) with demand-responsive flexible shared ride technology.

What makes the rural solutions MaaS? **Integration.** All existing services integrated in one easy-to-use application, including new demand-responsive services and sharing services

Need for multimodality means **different needs at different times**. MaaS is meant to identify the individual mobility needs and provide a multimodal solution for them.

Example: using minibuses dedicated to 1 purpose to serve others at the same time by making empty seat capacity available for other users as. Making more efficient use of the volunteer driver schemes is also one part of the synergy.

MaaS is **customer-centric**, has potential to **provide new ways of reselling, packaging, branding and pricing**, and is **technology-enabled mobility service offering**, which is more flexible and individual than traditional public transport

UNIVERSAL MOBILITY AS A SERVICE

Why? Result of our 2-Class Transportation System

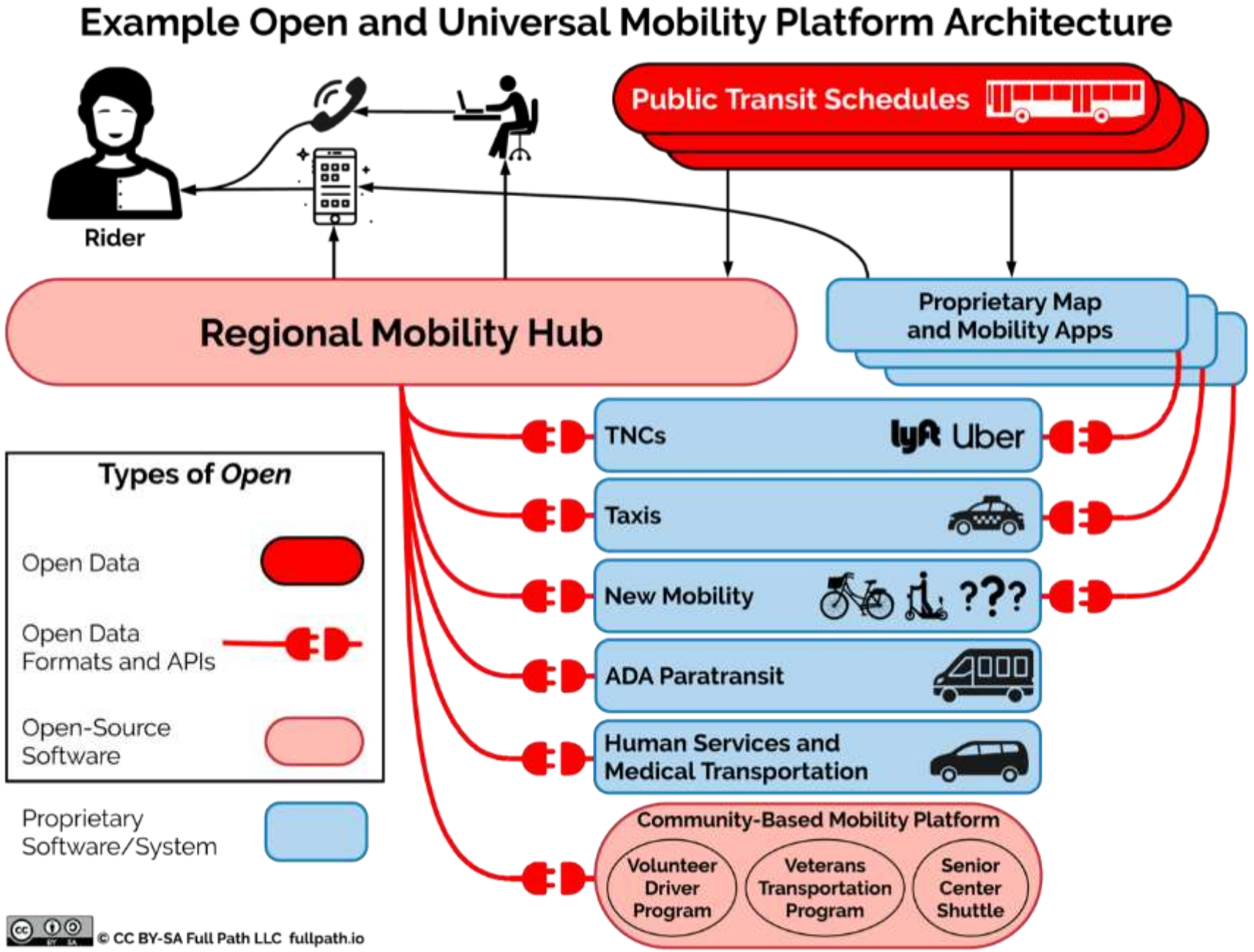
- Advance reservation requirements
- Inadequate funding & programmatic rules => trip and trip purpose limits
- Unreliable pick-up/drop-off times
- Jurisdictional boundaries become arbitrary barriers
- Fragmentation
- Inefficiency due to rules & regulations

What: Universal MaaS

- A single, integrated network of traditional and non-traditional services that together serve EVERYONE
- Universal Design
- With or without AVs
- One stop shopping
  - Easy Discovery
  - Easy Booking
  - Easy Mode Transfers
  - Easy Payment

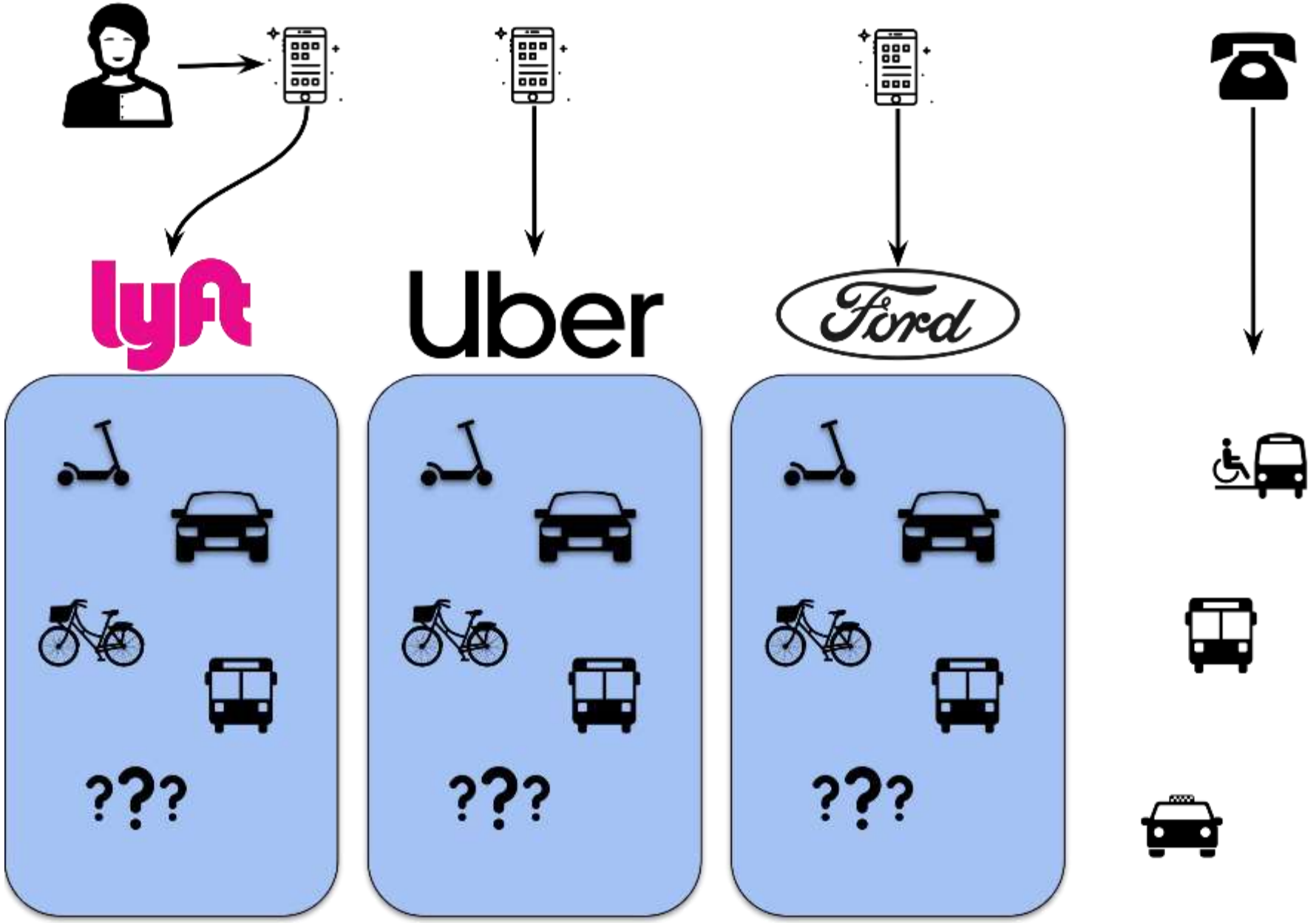
From Jana Lynott, AICP, Senior Policy Advisor, "Universal Mobility as a Service," International Conference on Demand Responsive and Innovative Transportation Services, Tuesday, April 16, 2019, Baltimore, MD

An Open Platform Future



From Jana Lynott, AICP, Senior Policy Advisor, "Universal Mobility as a Service," International Conference on Demand Responsive and Innovative Transportation Services, Tuesday, April 16, 2019, Baltimore, MD

A Walled Garden Mobility Future

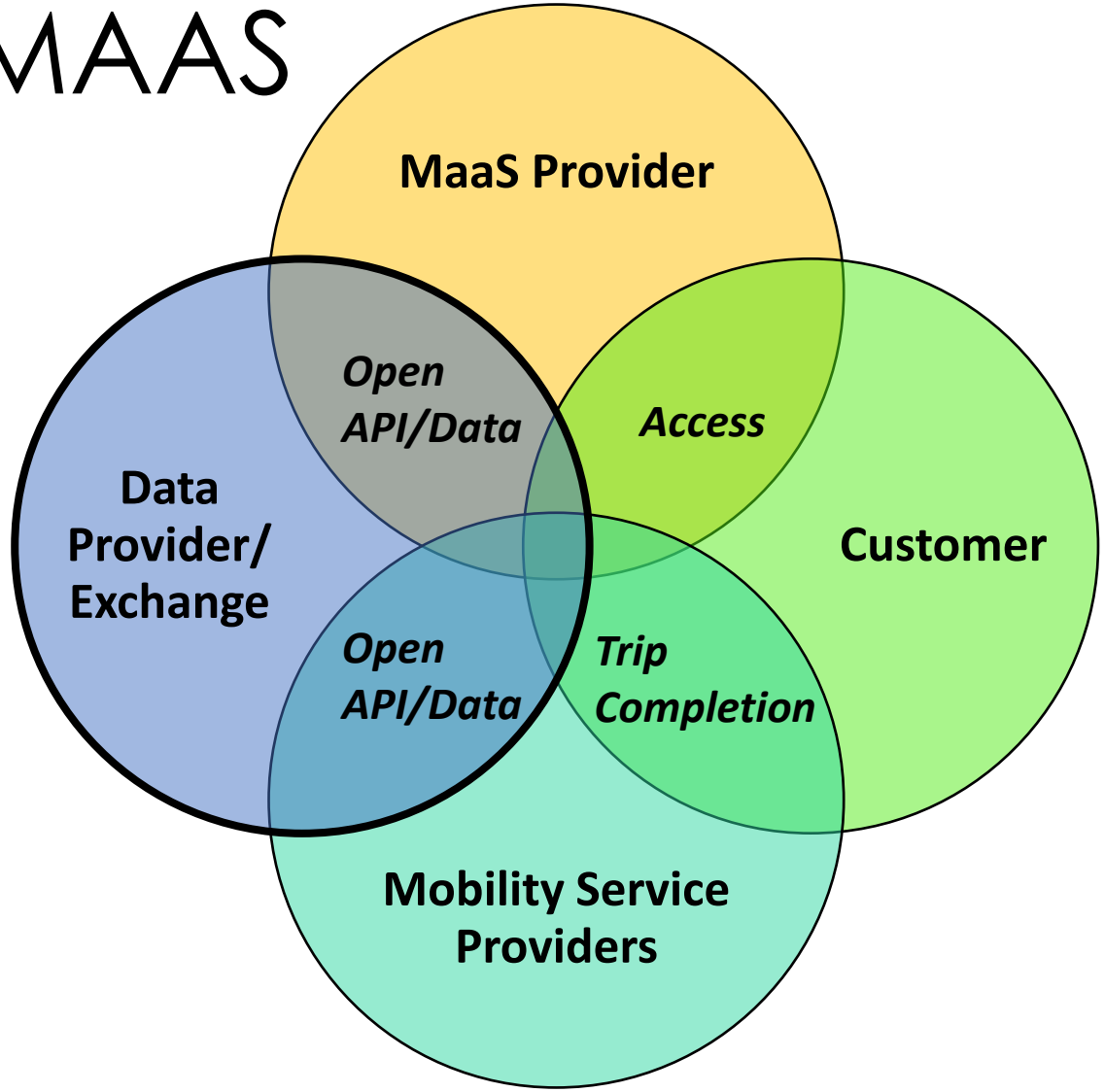


From Jana Lynott, AICP, Senior Policy Advisor, "Universal Mobility as a Service," International Conference on Demand Responsive and Innovative Transportation Services, Tuesday, April 16, 2019, Baltimore, MD

GREATER DAYTON REGIONAL TRANSIT AUTHORITY MAAS FRAMEWORK

Goals:

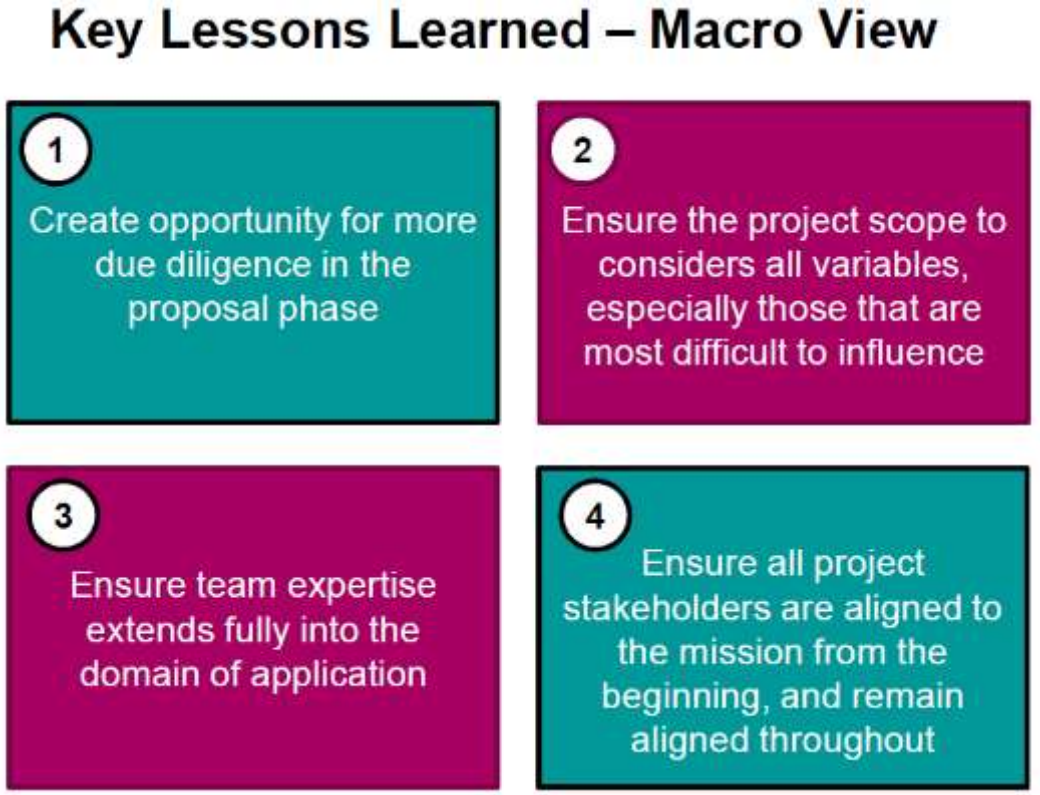
- Seamless Regional Mobility Ecosystem
- Equitable Access
- Open Data
- Integrated Payment
- *"All mobility providers will collaborate with us delivering one unified mobility network via Dayton MaaS platform"*



Adapted from Santosh Mishra, IBI Group and Nick Mantia, RTA, "Mass Transit to MaaS Transit: Are We Ready?" presentation to 2018 APTA Fare Collection/Revenue Management & TransITech Conferences, https://www.apta.com/resources/mobility/Documents/DaytonRTA_FarePaymentSolsSys.pdf

MICHIGAN MOBILITY CHALLENGE - RIDES-A-GOGO MOBILITY COORDINATION PROJECT

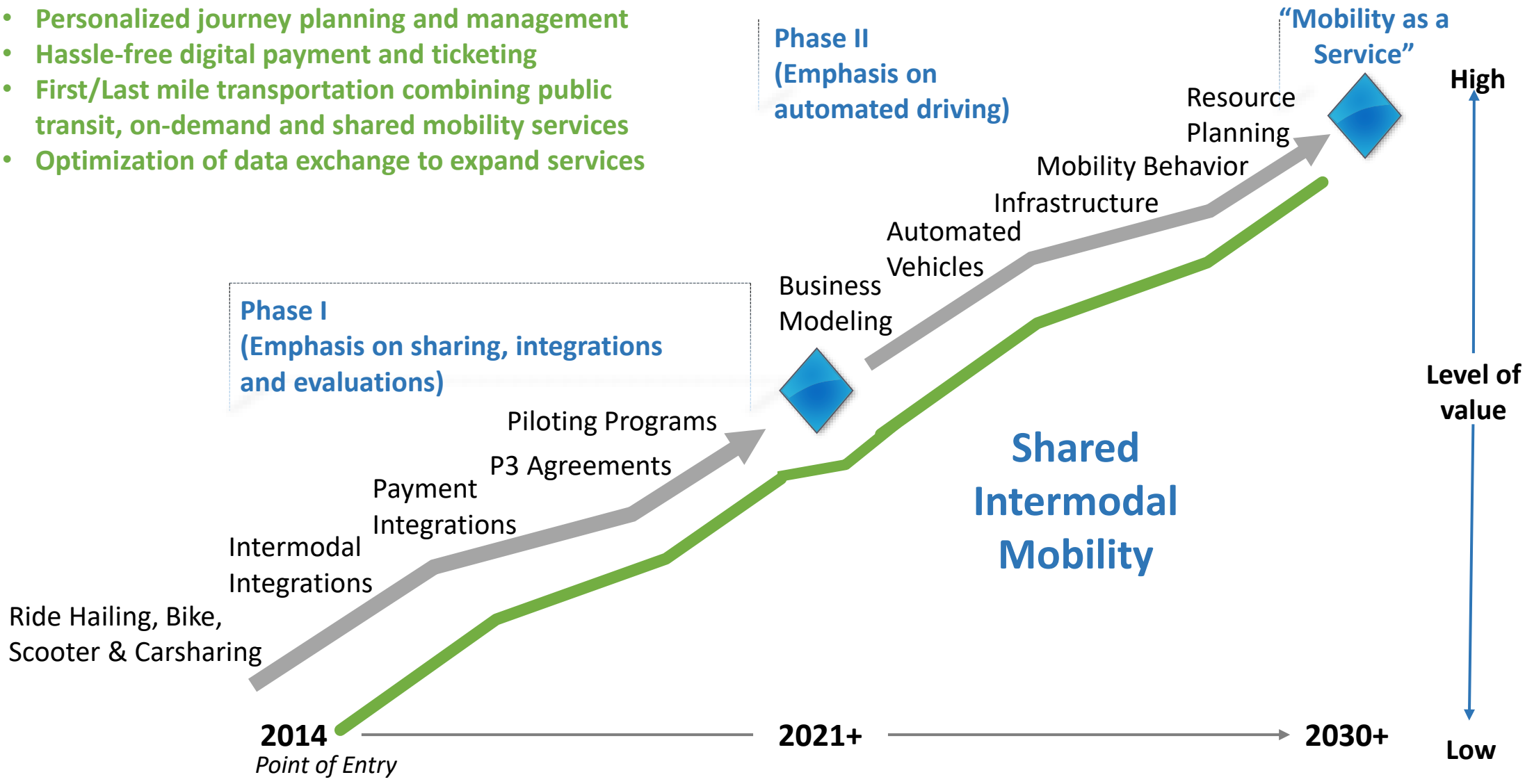
- 3 transit agencies: Bay Area Transportation Authority (BATA), Benzie Bus and Allegan County Transportation
- Many lessons learned:
  - Software and Technology Integration
  - Regional Participation and Agency-Specific Needs
  - Creating Something from Scratch vs. an Off the Shelf Product
  - Budget and Scope
  - Start-up vs. Corporate
  - Customization and Flexibility



Potential MaaS Development Cycle: Example from Dallas Area Rapid Transit

MaaS Definition

- Personalized journey planning and management
- Hassle-free digital payment and ticketing
- First/Last mile transportation combining public transit, on-demand and shared mobility services
- Optimization of data exchange to expand services

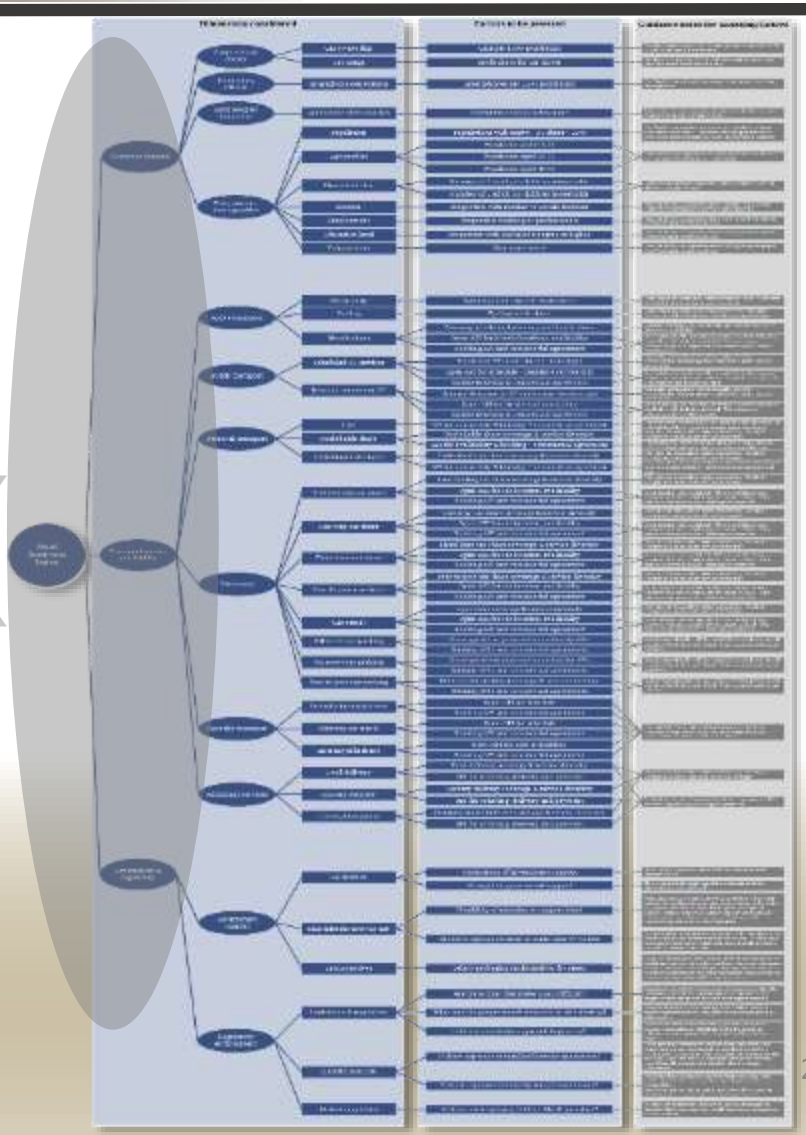


Source: Roland Berger – Global Strategy Consulting Firm

We built a tool to assess market readiness…

MaaS Readiness Index

- Customer demand
- Transport service availability
- Government and regulatory



Andrew Somers, “Mobility as a Service,” 23rd World Congress on Intelligent Transport Systems, Session ES10, Melbourne, Australia, 10-14 October 2016.

KEY PERFORMANCE INDICATOR EXAMPLES

	Ecological effects	Economic effects	Societal effects
Societal level	e.g. ”Transport’s release of greenhouse gases”	e.g. ”Society’s cost for transport”	e.g. ”Accessibility to transport”
Organizational level		e.g. ”The service’s profitability”	e.g. ”New jobs”
Traveller level	e.g. ”Number of trips per individual and month”	e.g. ”Monthly cost for an individual’s trips”	e.g. ”Perceived accessibility to destinations like work”

Ref: Karlsson et al. 2019

RESOURCES

- USDOT ITS JPO, ***MOD Webinar #6: Micromobility Marketplace: Integration, Integration, Integration,*** *June 17, 2020*, https://www.pcb.its.dot.gov/t3/s200617_MOD_Series_6_Mobility_Marketplace_Integration.aspx
- Carol Schweiger, "Bringing Mobility as a Service to the U.S.: Accessibility Opportunities and Challenges," white paper prepared for the National Aging and Disability Transportation Center (NADTC), https://www.nadtc.org/wp-content/uploads/Bringing-Mobility-as-a-Service-to-the-US-Accessibility-Considerations-Final.pdf
- MaaS Alliance Library, https://maas-alliance.eu/library/
- "Main challenges associated with MaaS & Approaches for overcoming them," MaaS Alliance, https://maas-alliance.eu/wp-content/uploads/sites/7/2019/02/Main-challenges-pdf.pdf
- Ranjit Godavarthy, Jill Hough, Sean Libberton and Russell Koff,"Opportunities for State DOTs (and others) to Encourage Shared-Use Mobility Practices in Rural Areas," Prepared for National Cooperative Highway Research Program, Transportation Research Board, Project No: NCHRP 20-65 Task 76, http://onlinepubs.trb.org/onlinepubs/nchrp/2065/Task76Report.pdf
- Andrew Somers and Hany Eldaly, "IS AUSTRALIA READY FOR MOBILITY AS A SERVICE?" ARRB Conference, 27th, 2016, Melbourne, Victoria, Australia, http://155.212.5.248/Presto/search/SearchResults.aspx?q=TWFhUyByZWFkaW5lc3MgaW5kZXg%3d

RESOURCES (CONT'D)

- Bosch, "MMC SPLT Rides - Lessons Learned," Michigan Mobility Challenge, May 8, 2020, https://www.michigan.gov/documents/mdot/MMC_Lessons_Learned_SPLT_Bosch_v3_690567_7.pdf
- Jenni Eckhardta, Lasse Nykänena, Aki Aapaojaa and Petri Niemib, "MaaS in rural areas - case Finland," *Research in Transportation Business & Management 27* (2018) 75–83, https://www.sciencedirect.com/science/article/pii/S2210539518300403
- Hana Creger, Joel Espino and Alvaro S. Sanchez, "Mobility Equity Framework: How to Make Transportation Work for People," The Greenlining Institute, http://greenlining.org/wp-content/uploads/2018/03/Mobility-Equity-Framework-Final.pdf
- Taxonomy of Shared Mobility – SAE JA3163, https://www.sae.org/standards/content/ja3163/
- VTT Technical Research Centre of Finland Ltd, "Mobility as a Service (MaaS) in rural context," https://nordicroads.com/mobility-service-maas-rural-context/

THANK YOU!

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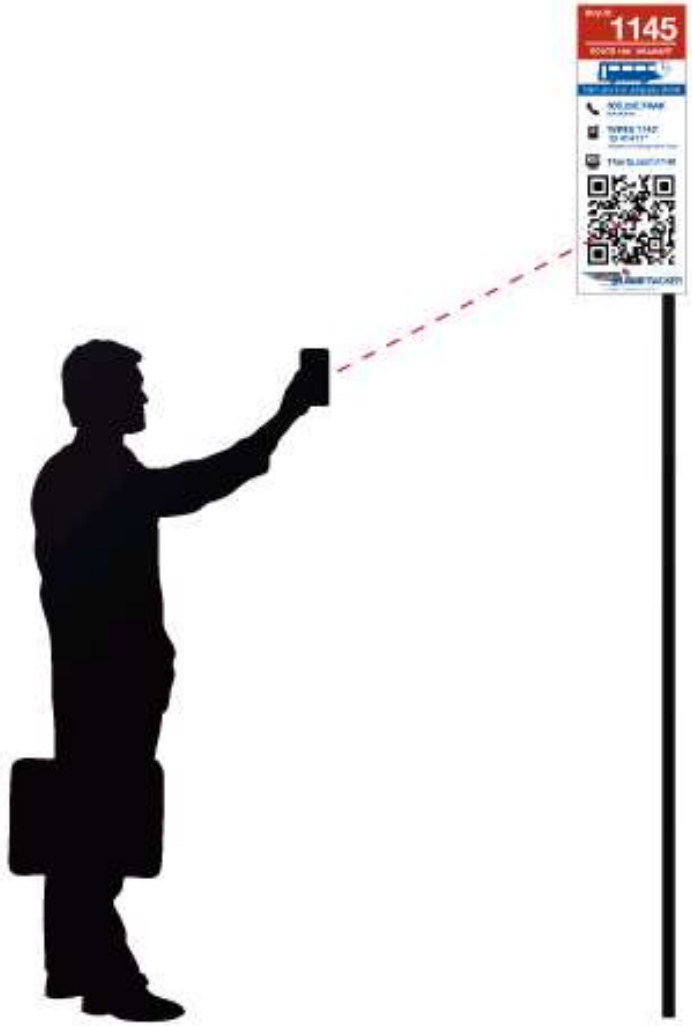


Developing Mobility-as-a-Service

Serving Small Urban & Rural Communities

Tompkins County, New York

N-CATT: Rural Mobility-as-a-Service Webinar: July 9, 2020

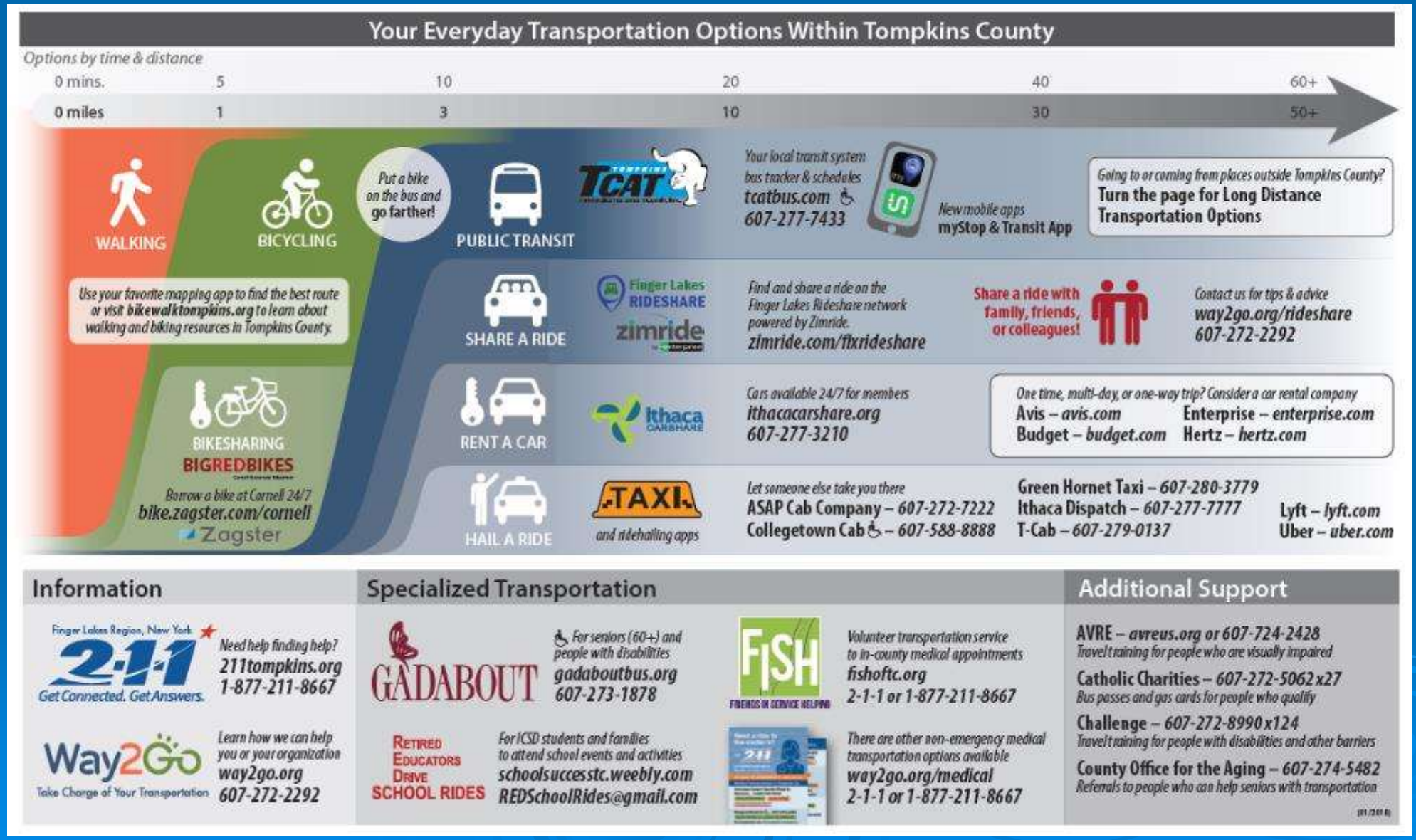
Mobility-as-a-Service

- Combine multi-modal trip planning, customer service and integrated mobility services to meet customer needs.

Why Tompkins County, NY?

- Homegrown idea. First presented on June 19, 2010.
- Extensive Mobility Management Programs
- Shared-use mobility services & non-profit mobility sector
- Public transit & County support. Collaborative culture.

Family of Mobility Services

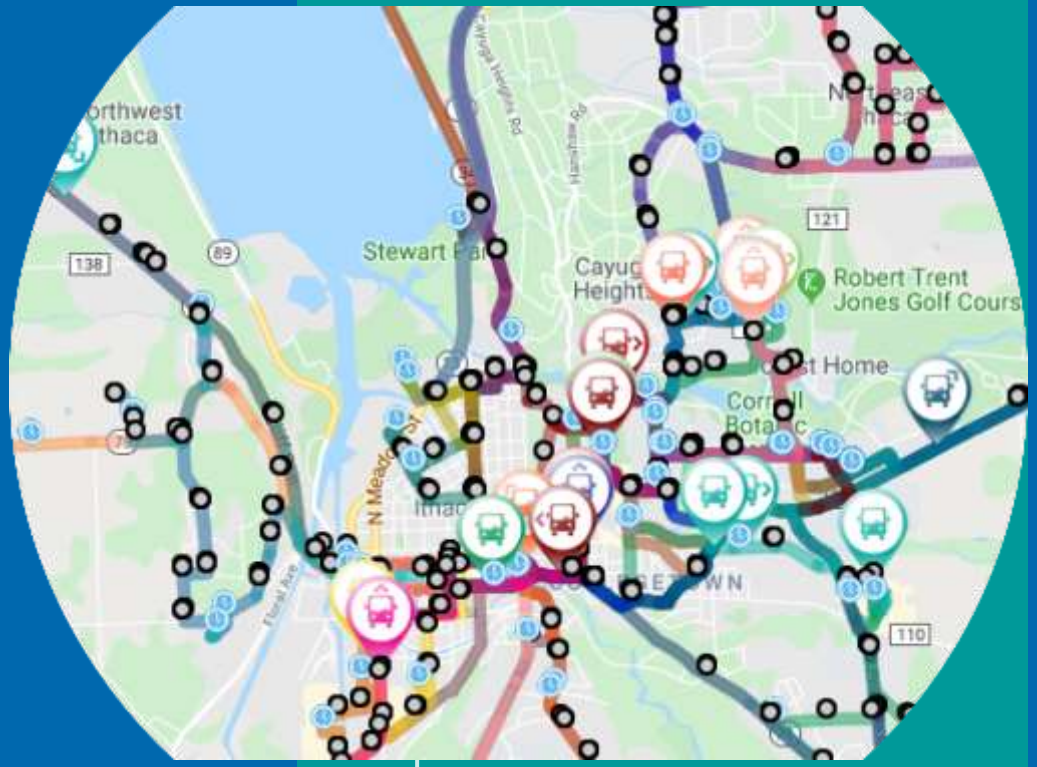


MaaS Phase 1

- Multi-Modal Trip Planning
- Rural Mobility Services
- Multi-Modal Customer Service

MaaS Phase 2

- Member Organization
- Financial Services
  - Annual Mobility Budget
  - Monthly Payments
  - Include third-party payments for trips and subsidies.



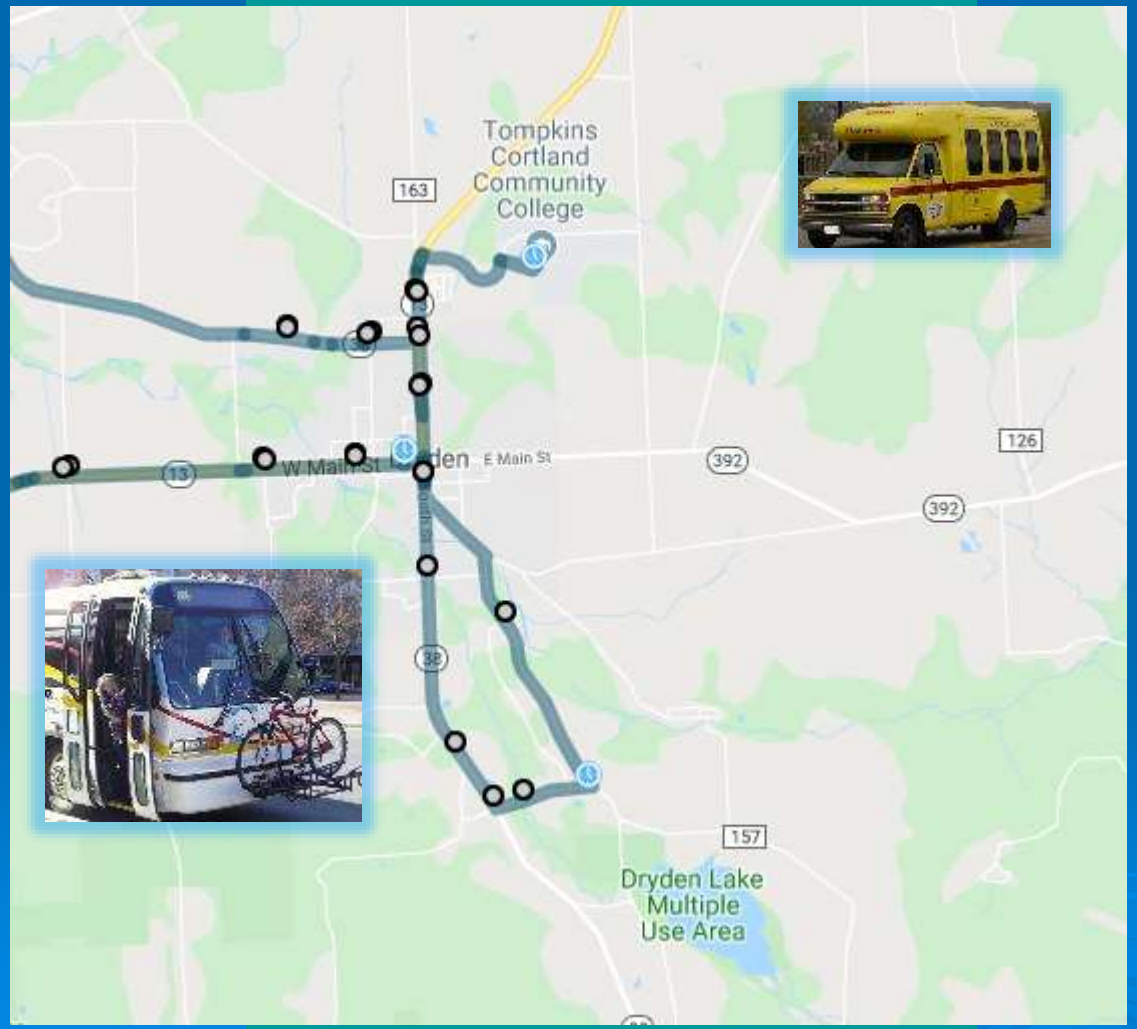
Multi-Modal Trip Planning

- Bus Services:
  - Intercity
  - Commuter
  - Local (TCAT)
- Shared-Use Services
  - Ithaca Carshare
  - Bikeshare
  - Paratransit (Gadabout)
  - Taxi
  - TNC’s (Lyft & Uber)

Increase Supply of Rural Mobility Services

1. Volunteer Transportation Services
2. Rideshare (Carpooling)
3. TCAT First/Last Mile Service Pilot (T-Connect)

TCAT First Mile/Last Mile Pilot 2019-2022



People may schedule a ride, by app or phone call, to a minibus from their residence in rural areas transfer seamlessly to a TCAT bus.

Created an app will to determine if service is available within the time and destination parameters submitted and will display the closest matching trips. App continuously informs bus operators and passengers of trip status.

County mobility management program conducts public outreach, surveys, and rider education for the before, during and after the pilot.

Multi-Modal 24/7 Customer Service

- Way2Go Mobility Education
- MaaS Information & 24/7 Customer Service Center
  - Ithaca Carshare & 211 Information & Referral
  - App and Phone
- Enhanced Guaranteed Ride Membership
  - Rescue from Trip Failures

Watch Way2Go Videos:

Five Fabulous Ways
Aging, Driving and Family Conversations
Ithaca Carshare Basics
Taxi Basics
TCAT Bus Basics
TCAT Bus Basics for Wheel Chair Users
Transit App Tools
Using the Bus Bicycle Rack
Wheelchair Users You've Got Options
Why and how to share more rides

Way2Go Resources and Videos are available in Spanish and Chinese.
Recursos en español
中文资源

MaaS Phase 1 Pilot Business Model Canvas

Key Partnerships

Transport Providers:

- ✓ TCAT
- ✓ Gadabout
- ✓ Ithaca Carshare
- ✓ FISH (Volunteer Transportation)
- ✓ Taxis
- ✓ Bikeshare
- ✓ Carpools/Rideshare
- ✓ TNCs

Other stakeholders:

- ✓ County DSS
- ✓ Way2go
- ✓ ITCTC (MPO)
- ✓ Go Ithaca!

Key Activities

- ✓ Partnerships
- ✓ Community education
- ✓ MaaS Call Center
- ✓ Marketing & Guaranteed Ride Sales
- ✓ Pilot Evaluation

Key Resources

- ✓ Existing customer base (Carshare & TCAT)
- ✓ 211 Info/Referral
- ✓ Community transportation education (Way2go)

Value Propositions

- ✓ Multi-modal trip planning
- ✓ Rural Mobility Services
- ✓ Multi-modal Customer Service
- ✓ Guaranteed ride
- ✓ Data Privacy Policy & Security

Customer Relationships

- ✓ Concierge Service 24/7
- ✓ - Trip Planning / Service Information
- ✓ - Customer Services
- ✓ Feedback to mobility operators

Channels

- ✓ Website / Phone App
- ✓ Phone calls
- ✓ Office visits
- ✓ Human Services / Social Services Agencies

Customer Segments

- ✓ Public transit users
- ✓ College students
- ✓ Carshare members
- ✓ Families
- ✓ Seniors, people with disabilities, and low-income
- ✓ People who do not drive or own a car
- ✓ Eco-friendly, anti-GHG
- ✓ Public & Human Services Clients
- ✓ Community-minded rural residents

Cost Structure

- ✓ Staff salaries
- ✓ App Design, Tech Procurement Plan/Consultant
- ✓ Development, Operations, Data Collection for Evaluation
- ✓ Overhead (rent, utilities, insurance, IT, etc.)

Revenue Streams

- ✓ Customer service fee
- ✓ Guaranteed ride annual membership fee
- ✓ Federal IMI Grant (3/16/2020)
- ✓ Other Federal& State grants

Business Risk

As of June 2020, on a scale of 0-10 (low–high risk), this is how we rate our risk for Phases 1 & 2.

- Phase 1: 3 (low risk) We know exactly what we want the multi-modal trip planning & customer service app to do. We will be able to organize the customer service center.

- Phase 2: 8 (high risk) Many unknowns and much work needed to create robust, secure financial management policies & operations to be successful & sustainable. There's opportunities for partnership with an individual mobility account system under development.

2020-2021 Funding

- FTA Integrated Mobility Innovation (IMI) Program
  - $820,000 awarded to County on 3/16/2020

- NYSERDA (New York State Energy Research & Development Authority)
  - $205,000 awarded to TCAT Transit System for first/last mile pilot program as 20% non-federal match.

Lessons Learned

1. Split MaaS into two phases.
   - We created Phase 1: multi-modal trip planning, support first/last mile project, & multi-modal customer service, including a call center.

2. Select a lead agency for Phase 1.
   - County Transportation Planning will lead Phase 1 starting in September 2020. The local MaaS team will then meet formally to develop the project.

3. Advance innovative practices in rural mobility and service delivery.
   - We need to expand the supply of service in rural communities, including volunteer transportation, carpool, first mile/last mile service and guaranteed ride.
   - We will work with public sector & non-profit human service agencies to improve mobility service for clients.

4. Don’t overpromise.
   - Under-promise and over-deliver. Assist customers with trip-failures.
   - Trust building is core value proposition for a MaaS start-up.

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Tompkins MaaS Team

Ecosystems of Shared Mobility in the San Joaquin Valley

Caroline Rodier, Ph.D.
Institute of Transportation Studies, UC Davis
N-CATT Webinar
July 9, 2020

Overview

- San Joaquin Valley
- Motivating Problem
- Community-Based Planning Study
- Mobility as a Service (MaaS)
- Next Steps for MaaS

California’s San Joaquin Valley

Geographic Background

Unique Farmland

Farmland of Local Importance

Grazing Land

Confined Animal Agriculture

NonAgricultural and Natural Vegetation

Semi-Agricultural and Rural Commercial Land

Vacant or Disturbed Land

Rural Residential Land

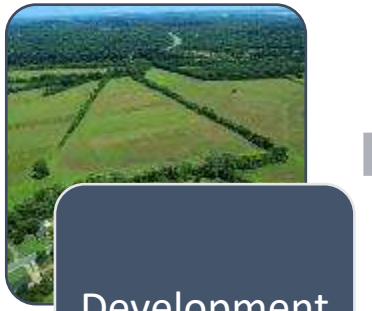
"The food basket of the world."

Economically and Environmentally Disadvantaged Communities

Access, Poverty and Emissions in Rural California

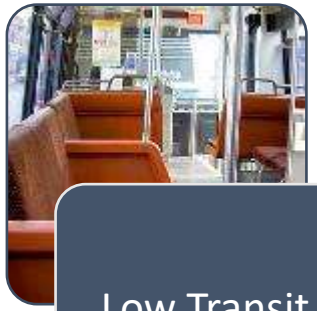
The Problem

Challenges to Rural Transit Service



Development Patterns

Long Travel Distances



Low Transit Ridership

High Transit Costs

Low Transit Service

Rural Households Living in Poverty


Dispersed Development Patterns
Long Travel Distances
Criteria & GHGs emissions
Few Travel Alternatives
Increased Auto Ownership

Community Based Planning to Support Alternatives to Personal Car Ownership

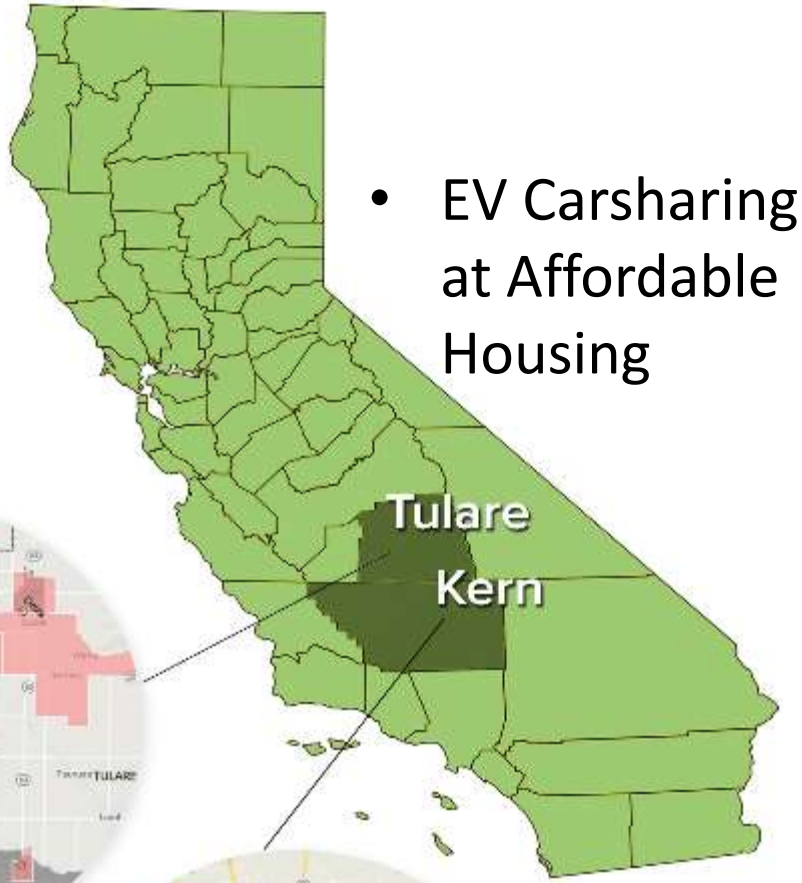
Origin Story

Community-Based Planning

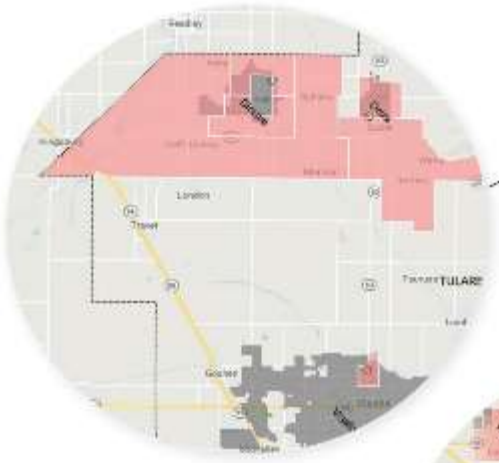
- Engagement and data analysis
- Inventory accessibility challenges:
  - Intercity transit service gaps
  - High service costs + Low farebox
  - Low auto ownership levels
- Identify new technology and shared mobility alternatives
- Evaluate alternatives:
  - Reduce service costs
  - Improve access
  - Support high-quality fixed-route transit
  - Reduce auto ownership and emissions

Geographic Locations of Pilots in the San Joaquin Valley

- MaaS
- Volunteer Rides



- EV Carsharing at Affordable Housing

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VOGO

Volunteers on the Go

- Free rides to residents by volunteer drivers
  - Trips begin/end in disadvantaged rural areas
  - And not served by transit
- As volume of rides grow, so does ridesharing
- Volunteer reimbursed @ IRS rate round trip
- Local non-profit (MOVES): recruit and trains drivers
- The Volunteer Transportation Center: Back-office, dispatch, routing
- Reserved up to 2 days in advance via MaaS

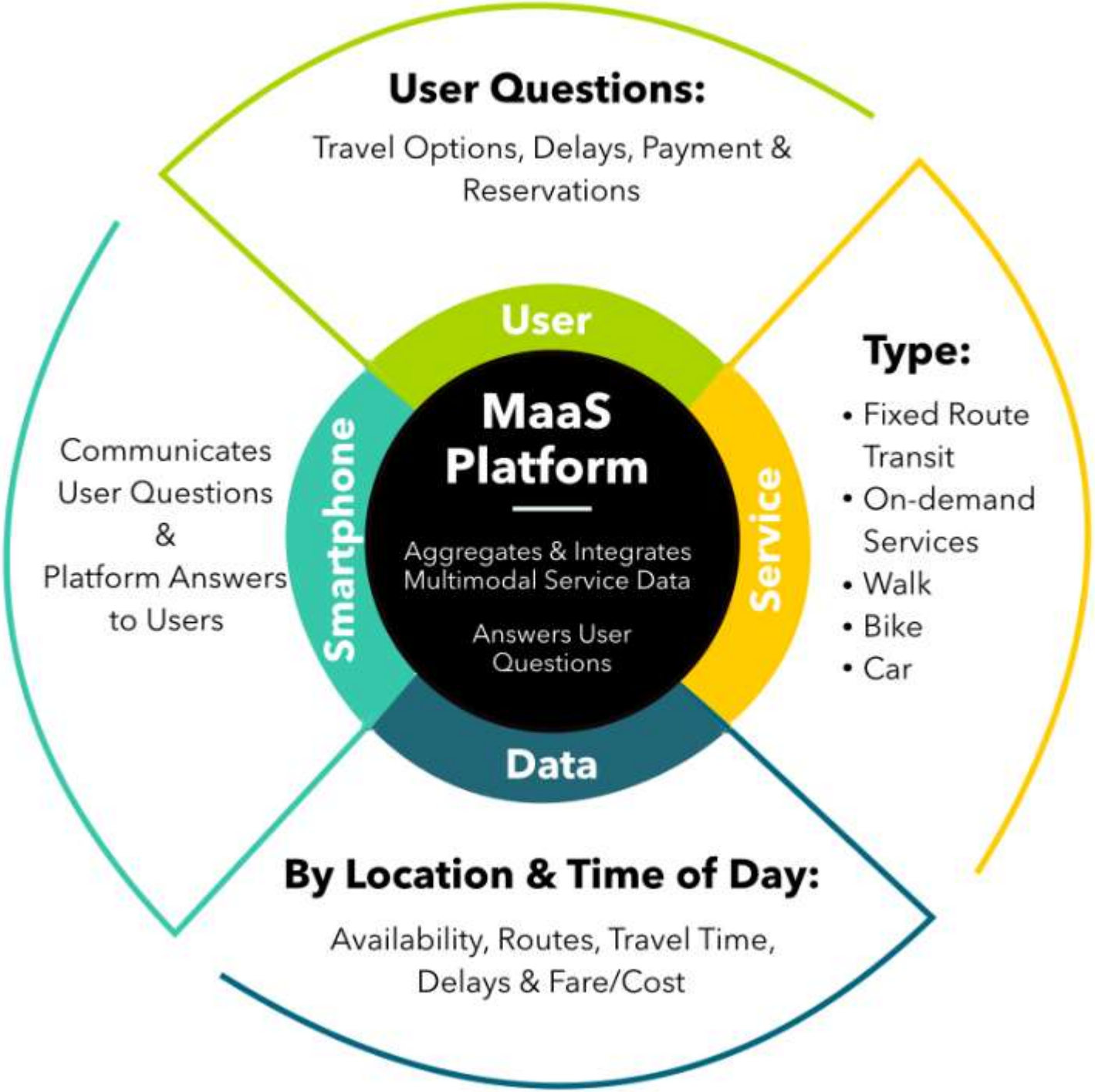
Mobility as a Service or MaaS

Our Case Study Perspective

What is a MaaS system? User Perspective

User Needs	MaaS Answers
Best way to get from A to B?	Rank multimodal options by time and cost.
Arrival time?	Real-time modal information
Space available?	If yes, then reserve.
Pay now?	If yes, then pay.

What is MaaS?
System Perspective



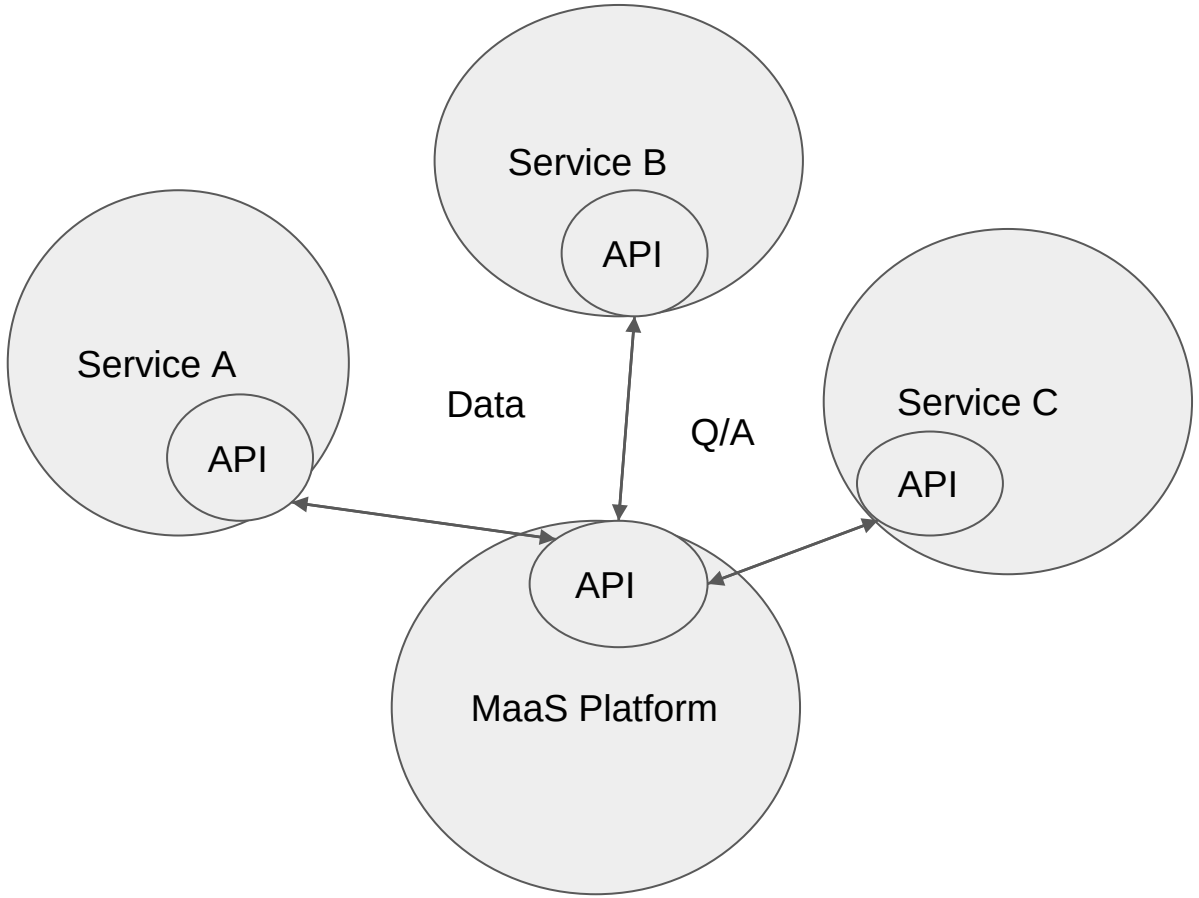
How do computers communicate?

By using open APIs or application program interface:

- Request and receive data
- Ask questions and
- Receive answers

Efficient integration requires standard data and open API:

- Work in progress



Private MaaS in US

- Uber and Lyft Apps
  - Include services they operate
  - Transit included in some major urban areas
  - User preselects mode:
    - ride-hail
    - carsharing
    - electric scooter or bike
    - transit
  - Current can’t plan a trip with a combination of modes, but they are working on it
    - e.g., e-bike to transit to ride-hail from A to B

The Verge 4/11/18

Potential of Public MaaS

- **All Available Services** →
  - Combined to provide more choices
  - Minimize travel time and cost given user need
- **Public Facing Platform**
  - Lower barriers to market entry, especially to small local providers
  - Increase service supply
  - Lower cost through more competition
- **Individual accounts and codes**
  - Allow for promotions
  - Easy application of subsidies for special groups (i.e., disabled, seniors)

- Fixed Route Bus and Train
- Ridehailing (Uber, Lyft, and Taxi)
- On-demand ridesharing (Microtransit, Wave)
- Scheduled ridesharing (Volunteer Rides, Car/Vanpools)
- Vehicle Sharing (Car, Bike, Scooter)
- Open Seats on Specialized Shuttles (Healthcare and Retirement)
- Walk
- Personal Bike and Car

Vamos: Short Term Goals

- Increase awareness of transit services
- Integration of transit services
  - Across transit agencies
  - Fixed-route with DRT (dial-a-ride, deviated transit, microtransit)
  - Transit with community-based shared mobility (VOGO, Miocar)
- VOGO and DRT Reservations
- Streamline transit payments and subsidies

Vamos Status Today

- Transit planning with Open Trip Planner (14 transit agencies):
  - ✓ Fixed transit
  - ✓ Demand-responsive transit (dial-a-ride and deviated shuttles)
  - ✓ Microtransit (VanGO!)
  - ✓ Walk access (with turn by turn instructions)
  - ✓ Real-time arrival and departure when available
- Bicycle trip planning
- VOGO reservations

Local Transit and Regional Agencies Involved

SAN JOAQUIN COUNTY

- San Joaquin Regional Transit District (RTD)
- City of Escalon
- City of Manteca Transit
- Ripon Blossom Express
- City of Lodi GrapeLine
- City of Tracy Tracer

STANISLAUS COUNTY

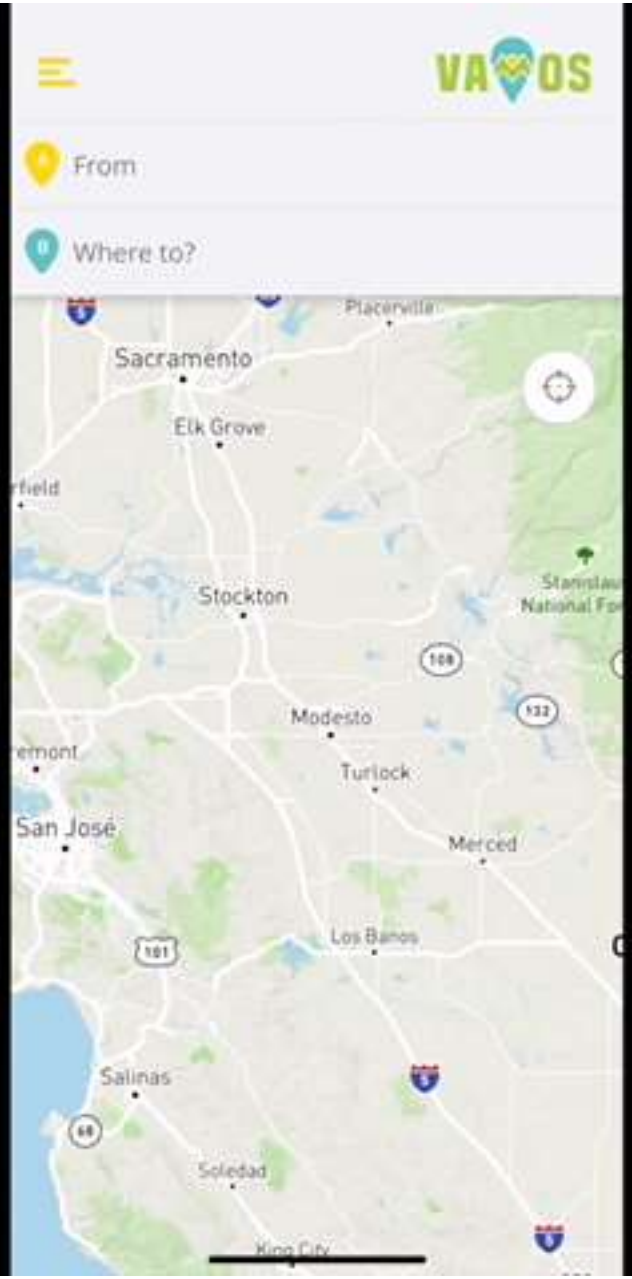
- Stanislaus County Public Works - Transit (StaRT)
- MOVE Stanislaus
- Modesto Area Express (MAX)
- Modesto Area Dial-A-Ride
- City of Turlock Transit
- Ceres Dial-A-Ride (CDAR)

REGIONAL RAIL

- AMTRAK
- ACE commuter

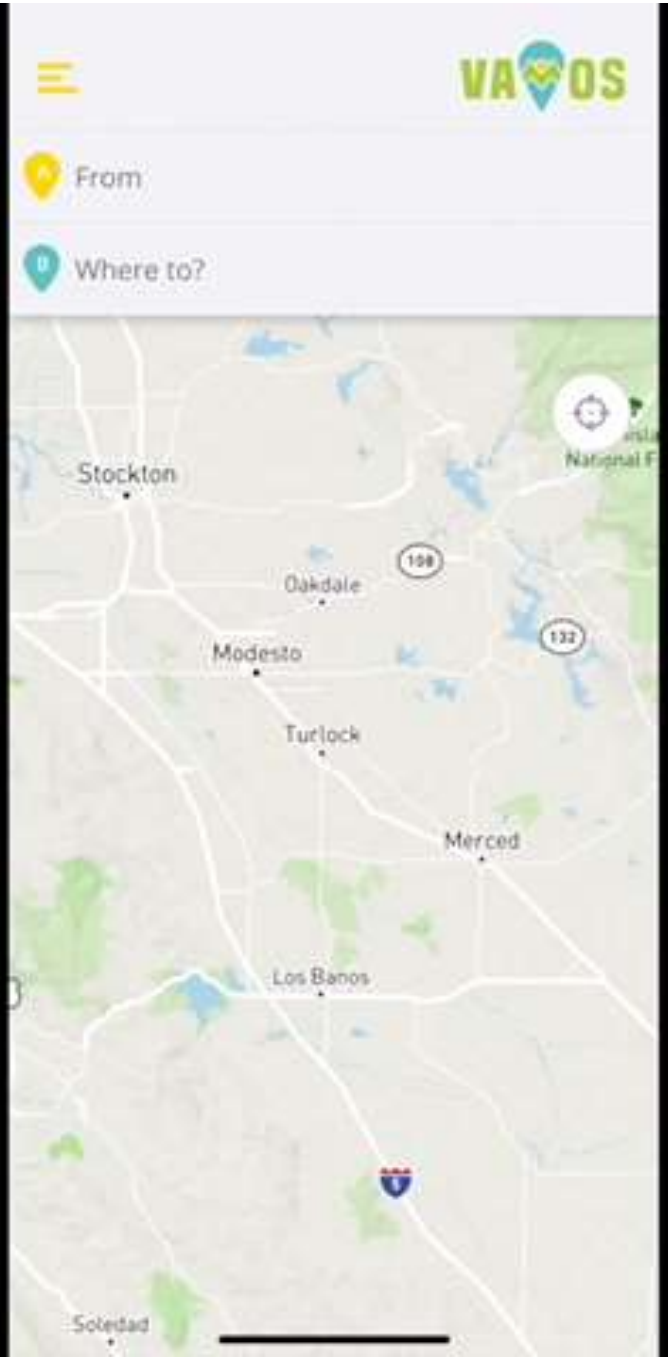
Inter-County Transit Trip Plan

- Stockton to Modesto
- Real time MAX bus info
- Plan trip now or in advance
- Turn by turn walk directions



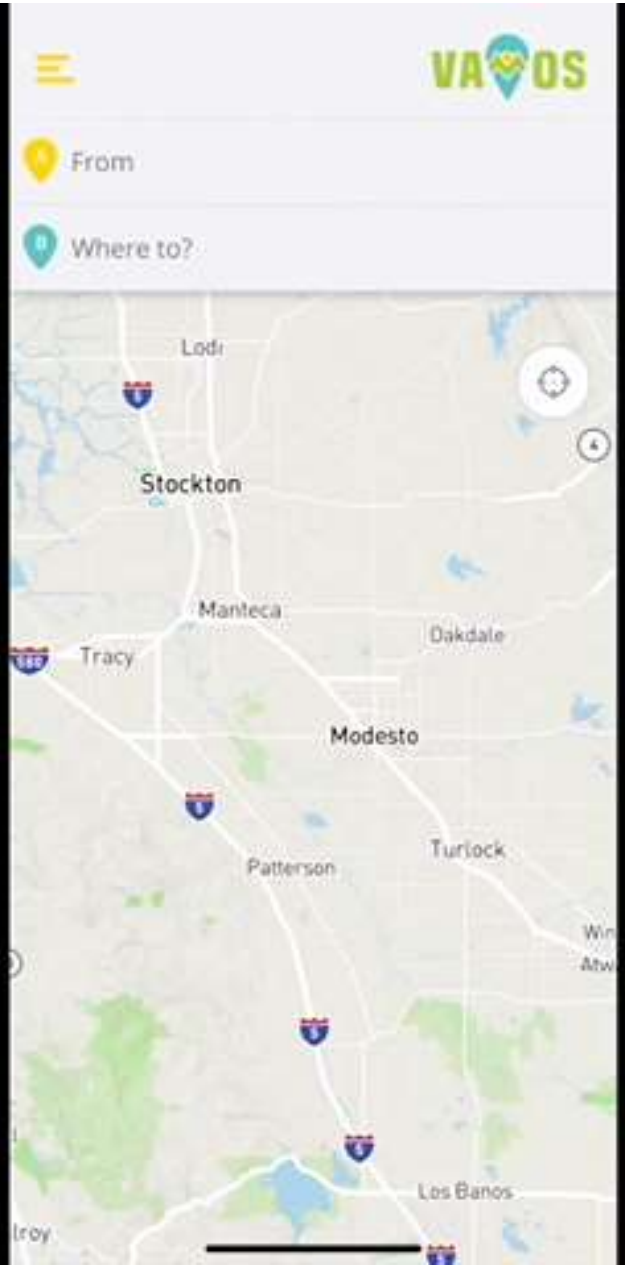
Manteca, San Joaquin County

- Microtransit service: VanGO!
- Bike route and directions

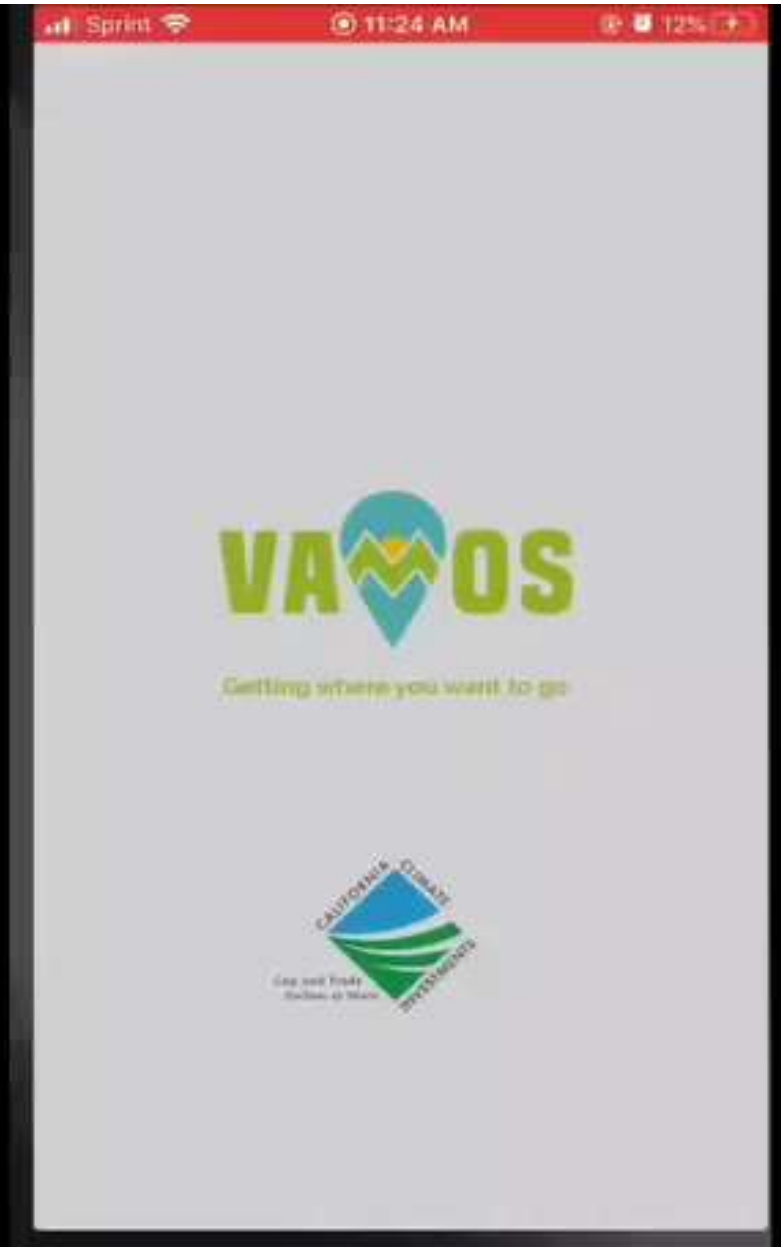


Riverbank to Modesto, Stanislaus County

- Deviated shuttle, bus with real-time info, and walk combo
- Bike route and directions



VOGO Reservations



Next Steps for Vamos…

With funds from the FTA's Innovative Mobility Initiative:

- Integrate fare payment with transit planning
- Standardize integration (data and APIs) with other mobility services (e.g., carsharing, ridehailing, microtransit)
- Evaluate feasibility of implementing MaaS with rural collective.
  - The cost of implementing MaaS may be reasonable for a major city but not for individual small rural communities.

Project Partners!

Thank you!

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