Bringing Mobility as a Service to the U.S.: Opportunities and Challenges

Le Transport Urbain du Futur

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Presentation Outline

- Setting the U.S. stage
- Opportunities
- Challenges
- USDOT Mobility on Demand
- Mobility as a Service (MaaS) examples
Setting the U.S. Stage

- Personal mobility dominated by personally owned vehicles, accounting for >80% of trips
- Personally owned vehicles:
  - Produce 15% of U.S. emissions
  - Account for 30% of global oil combustion
  - Sit unused over 95% of the time
  - Consume 27% of income in U.S. median income households
- Reliance on costly personal vehicles leaves lower-income persons without access to affordable mobility

Source: Carlin, Kelly, Bodhi Rader, and Greg Rucks. Interoperable Transit Data: Enabling a Shift to Mobility as a Service. Rocky Mountain Institute, October 2015, [http://www.rmi.org/mobility_ITD](http://www.rmi.org/mobility_ITD)
Setting the U.S. Stage (continued)

7 major trends over the past 5-10 years:

- Demographic changes, with Baby Boomers and Millennials in large numbers
- Preferences for urban living and more flexible lifestyles
- WiFi, GPS, sensors and smartphones
- Anywhere everywhere connectivity
- Car driving/ownership preference changes
- Travel as part of life experiences
- Redefining transport through new street designs, service providers and systems

Setting the U.S. Stage (concluded)

Trends over the next 5-10 years:

- Synchronizing and connecting every network
- Performance-based public–private partnerships becoming the norm rather than the exception
- Diversification and consolidation of transport manufacturers and providers
- Modular, combined shared e-mobility systems to scale in urban areas
- Commercial deliveries and phased introduction of drones
- Driverless vehicles and their potential
- MaaS, with routing, booking, payment, unlocking, gamification and trading

Extent of Service Availability in U.S.

Opportunities

- Redefine “public transportation”
- Change travel modeling to account for:
  - New mode choice behavior
  - Incorporating incentives or rewards
  - Integrating technology-enabled transportation tools
  - Incorporating effects of new transportation tools – both individually and in combination
- Implement integrated payment systems (see next slide)
- Explore potential of new tools to meet mobility needs of those currently poorly served by transportation system
Integrated Payment=Improved Mobility

- Use of mobile devices driving this
  - US mobile market: 77% are smartphone owners, 75% said electronic ticketing would make travel easier and 78% expect to buy tickets via mobile device in coming year

- Mobile payment can be deployed much faster than ticketing systems

- Banks competing with other payment players

- Contactless NFC technology standard feature in mobile devices:
  - Public transport payment
  - Toll payment, allowing hands-free and payment without having to stop
  - Open payment system advantages - lower ticket issuance and distribution costs, and achieve interoperability

- Creation of mobile ticketing ecosystem in which no single entity or stakeholder group controls value chain (e.g., Open Mobile Ticketing Alliance)
Opportunities (continued)

- Provide public access to transit data (see next slide)
- Expand data available to the public
- Adopt open data and open source software policies
- Data sharing to:
  - Better understand goods and people movements
  - Predict how those movements will change in the future
- Continue development of open protocols
Data is the New Oil!

- Big, small and open data – oh my!
- Data sharing not prevalent among all transport operators, but that is changing!
- More and more open data does not mean that we understand the data
- Data often free but not always easy to find
- Insight to transport operators from:
  - Data collected from apps to understand people movement (rather than vehicles) fused with
  - Other data sources (e.g., public transport payment data)
Opportunities (concluded)

- Clarify regulations on new services, such as Transportation Network Companies (TNC)
- Encourage complementary public transportation and new mobility tools
- Make better use of existing technology and infrastructure: Rethink – Optimize – Rebuild – Build new
- People-aware not vehicle-aware systems and infrastructure (see next slide)
- Expand access to cellular networks, Wi-Fi, and electric outlets in transit stations, and aboard transit vehicles
Vehicle-aware to People-aware Systems

- **Should be:**
  - Mapping people movements and intent onto available options
  - Providing people with actionable information then use simulation and better demand modelling

- **Examples:**
  - Where pedestrians travel using pedestrian counting - Melbourne, Australia using infrared sensors
  - Bicycle awareness/counting employed to better time bicycle lights (which are typically phased for cars)

- San Francisco Metropolitan Transportation Authority - “level of traffic stress” based on physical / lateral separation, auto lane width, bicycle facility width, adjacent traffic speed, facility blockages, intersection crossings, and terrain
Vehicle-aware to People-aware Systems (continued)

- Still struggling with traveler information – whether:
  - Crowdsourced (e.g., Moovit) or from
  - Comprehensive/integrated system for multiple regional operators (e.g., Triplinx in Toronto)
- Do not always monitor information provided to the public
- Focus on personalized mobility (one person’s way of traveling will not be the same as the next person’s)
Challenges: Institutional

- **Existing institutional environment key factor:**
  - Have institutions worked together or coordinated before?
  - Do application vendors provide open solutions and share information with their competitors?
  - Changes may be necessary within participating organizations

- **Participating organizations may conduct business in a different way:**
  - Reorganization or change in way service is operated and dispatched, and way that customer service is structured
  - New tools for operations and customer service staff, meaning individual roles and responsibilities may change.

- **From a traveler perspective:**
  - Access to more information with which they can make more informed choices
  - Help travelers make trips that they may not have made
  - Implications of decline in or even the demise of taxi companies in places where low-income, disabled, and older persons rely on taxis, including wheelchair-accessible taxis, for lifeline services
Challenges: Institutional (continued)

- Financing necessary for technology procurement, implementation, and on-going operations and maintenance
- Changes required to the existing institutional environment in the location(s)/region(s)
- Coordination with other providers and agencies in order to jointly procure systems and/or exchange data and information
- Lacking ITS technical experience - this can relate to either human or computer resources
- Changes needed in the technology vendor community to successfully develop and implement new systems
Challenges: Operational

- Many transit agencies operate independently and do not coordinate their services
- Changes in the way agencies schedule and operate their services
- Provide transit services under an array of policies and objectives from different governmental and regulatory agencies, while trying to satisfy the needs of the traveling public simultaneously
- Interface(s) among existing and proposed technology
- Role of each agency and their operations in both the entire transportation system and in MaaS ecosystem
- Changes caused by deployment of MaaS
Challenges: Technical

- Old (and perhaps unintelligent) infrastructure in location/region – how to incorporate this into MaaS physical and logical architecture
- If technology fails, how to manually perform MaaS functions
- Travelers without credit accounts cannot necessarily access new MaaS services
- Travelers without mobile device capable of functions needed to interact with MaaS applications - “information equity”
- Automation of functions - alienate agency staff as well as customers, thus benefit of technology may not be realized
- Nature of existing ITS/technologies and ability to use or integrate these with new technologies
- Lack of technical guidance and information for agency staff
- Lack of ITS infrastructure, especially in rural areas
USDOT’s Mobility on Demand (MOD)

- Long term strategic vision for a multimodal, integrated and connected transportation system
- Concept which imagines *mobility as a commodity and a service*
- Conceptual notions of MOD:
  - Promotes choice in personal mobility
  - Leverages emerging and existing technologies, and big data capabilities
  - Encourages multimodal connectivity and system interoperability
  - Promotes new business models that improve service quality

Source: Jamie Pfister, Federal Transit Administration, “FTA Mobility on Demand (MOD) Program,” presentation at American Association of State Highway and Transportation Officials (AASHTO) Standing Committee on Public Transportation (SCOPT)/Multi-State Transit Technical Assistance Program (MTAP), Winter Meeting, December 3, 2015
Guiding Principles of MOD Vision

- System Integration of existing MOD products and services; development of new will be considered
- Partnership Driven - evidence of commitment to support MOD both technically and institutionally
- Innovative Business Model where individually proven products can partner to collectively deliver better service to travelers
- Equity of Service Delivery - Demonstrate and promote unique role transit holds in providing equitable service for all potential travelers
MOD Enablers

- Connected Vehicles & Infrastructure
- Innovative First & Last Mile Solutions
- Standards & Interoperability
- Automation & Emerging Technology
- Mobile Technology & Payment Systems
- Data Management & Urban Analytics
- Strategic Business Models & Partnering
- Policy & Practice
MOD Focus Areas

1. User-Focused Mobility Services
2. Demand Response Operations
3. Delivery & Logistics Systems
4. Data Interoperability
5. Shared-Use Mobility
6. Management & Operations
MOD Challenges and Opportunities

- First/Last Mile Solutions
- Paratransit/Demand Response Services
- Integrated Fare Payment
- Trip planning
- Open Data/Data Sharing
- Land Use and/or Service Planning
- Equity and accessibility
- Evolving definition of Public Transportation?
- Performance Metrics (e.g., Ridership)
- “The 3 Rs” – Rules, Requirements and Regulations
MaaS in the U.S.: Joint Venture in Silicon Valley

- Reduce private auto usage
- “Mobility Aggregator” gathers all services into unified smartphone app with
  - Easy fare payment
  - One-stop billing
  - Integrated employer subsidies
- Dissolve boundaries between modes
- Provide more customer-centered experience while improving efficiency of entire transport system
- Aspire to accelerate software integration between mobility apps and employer programs
Joint Venture Goals and Action Plan

- **Goals:**
  - Make it more convenient for anyone, anywhere, at any time to have a competitive option to driving alone
  - Measurably increase mobility, convenience and productivity
  - Reduce stress, congestion and GHG emissions
  - Make mobility service software more interoperable and better integrated
  - Break down barriers that reduce user convenience

- **Action Plan:**
  - Pursue an entrepreneurial, lean startup approach with a series of pilots, technology accelerations and hackathons
  - Explore ways to provide faster, more reliable employee commutes
  - Maintain and expand our regional MaaS partnership with selected cities, agencies and major employers
Silicon Valley Context: auto-centric

Versus Finland’s MaaS effort:

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<th>Transit-centered Helsinki</th>
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“Silicon Valley is insane. We charged for parking in New York, so we should charge here.”
– VTA Genl Mgr Nuria Fernandez (ex NY MTA COO)
Comprehensive Commute Trip Reduction

Enterprise CTR software + smartphone Mobility Aggregation
Employer pilots: Incentives and/or parking charge ➔ shift mode
Gap filling (electric scooter/bike, Lyft Driver Destination, etc)

Pricing public policy: City Councils, SVLG/BAC 101/Caltrain, MTC, etc
Seamless public transit – cross county lines, fare structure
Infrastructure – HOV4 freeway lane? HOV4 El Camino lane?

Innovative business model /
6 way “win” for main stakeholders
Enterprise CTR: Commute Benefits Integration

Automate calendar-filling

- Hard: SOV v. HOV v. bike
- “Well-solved in 2017.”
Mobility Aggregation
RideScout, MoovIt, Transit App, Urban Engines, Xerox (GoLA), etc

One Seamless App
Multimodal trip planning.
Customer-centered. Pay like Clipper.

Mobility Operator

100 UNIVERSITY PALO ALTO
TO
190 S. MURPHY SUNNYVALE

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Joint Venture
SILICON VALLEY
San Francisco Municipal Transportation Agency: Access Over Ownership

Traditional
I own and use my own transportation

Trending
I own my transportation and/or access shared mobility options

Near Future
I access a menu of mobility options to meet my needs

Suburban
Urban Core
Urban Core
Rural
Rural

Source: Timothy Papandreou, Director, Office of Innovation at San Francisco Municipal Transportation Agency (SFMTA), @tpap_
Multiple modes, little or no integration; multiple payments, multiple bookings, etc.

Privately-Owned Vehicles

Public Transit, Rail, Bus, Ferry

Regional & Intercity Services: Rail, High-Speed Rail, Air

Shared Fleet Vehicles

Employer Shuttles, Jitneys

Commercial Deliveries

Taxi, Limousine & Transportation Network Companies

Source: Timothy Papandreou, Director, Office of Innovation at San Francisco Municipal Transportation Agency (SFMTA), @tpap_
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A complete customer focused experience

Mobility Minutes for a Mobility Menu

Source: Timothy Papandreou, Director, Office of Innovation at San Francisco Municipal Transportation Agency (SFMTA), @tpap_
Is Mobility minutes the next big trend....

1.0 Public Operators & Information

1.2 Diversification Private Operators & Info providers

2.0 Consolidation of Providers, Operators & Data Aggregators

3.0 Mobility Minutes for local, regional, international travel

$150 My City Plan
1000 city minutes
100 Rideshare min
100 Carshare min
400 Transit min
400 Bikeshare min
Walking Credits
Share Minutes

$500 My Travel Plan
300 Flying minutes
700 City minutes

Concept: Timothy Papandreou

Source: Timothy Papandreou, Director, Office of Innovation at San Francisco Municipal Transportation Agency (SFMTA), @tpap_
References

Thank You!

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