A Report on Trends of Mobility on Demand in the United States

～Part 2～

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1. Background of Interest in MOD in the U.S.

While the DOT upholds MOD related policies, local communities and public transportation organizations have been actively working on MOD related demonstration projects in several regions across the United States. Within the background of this is a rapid population concentration in urban areas and the development of digital technology, which have various impacts on society. ITS-JPO lists three factors that raised interest in MOD in their "Mobility on Demand : Operational Concept Report." They are (1) "advancements in technology," (2) "changing consumer patterns (both mobility and retail consumption)," and (3) "a combination of economic, environmental, and social forces." [1)]

The report continues:

（1）Advancements in technology

- "The growth of cloud computing, location-based/satellite navigation services, and mobile technologies
- The expansion of data availability, collection, sharing, aggregation, and re-dissemination through crowd-sourced, private, and public sector sources facilitated through application programming interfaces (APIs) and other third-party tools
- Ongoing development and deployment of advanced algorithms, machine learning, and artificial intelligence (AI), enabling on-demand and flexible route service offerings, electrification, and automation
- Advancement in augmented reality and virtual reality (VR) enabling many new forms of innovations
- The commodification of passenger travel, goods, and services driven by the growth of online commerce and app-based service offerings."

（2）Changing consumer patterns (both mobility and retail consumption)

- "Increasing demand and associated congestion, reduced funding, and the need to maximize existing infrastructure capacity
- Growing popularity of shared mobility and shared modes, such as bikesharing and ridesourcing/ TNCs
- Increased focus and growth of flexible service characteristics, such as dynamic routing, on-demand service, and a variety of vehicle sizes and types."

（3）A combination of economic, environmental, and social forces

- "A reduced reliance on brick-and-mortar retail establishments and a greater prominence of online marketplaces and goods delivery
- Heightened environmental awareness about emissions and carbon footprints
- Growth of megaregions as economic centers and transportation corridors
- Changes in land use and shifts toward urbanization and reduced interest in car ownership
- Demographic changes, such as rising life expectancies and an aging population, retiring in place
- Hyper-demand and need for instant gratification driven in part by the demand for immediate results-enabled and magnified by mobile internet and smartphone apps that can reduce or eliminate the waiting times for goods and services (e.g., taxies, restaurant tables, online shopping, etc.)-that affect most facets of our lives."

Especially in regards to populations concentrating into urban areas, these trends have been leading to a rise in demand for not only MOD but also for public transportation organizations. Furthermore, they have generated expectations for cooperation between new mobility services, such as TNC, and public transportation organizations. According to the investigative report "The Transformation of the American Commuter,[2]" which was published in November 2019 by APTA, we can particularly see this tendency among young people who live in urban areas. A concrete example of this can be found in APTA's 2018 Mobility Survey, which found that of the 1,000 participating Millennials, or those individuals who were born during the 1980s to the beginning of the 2000s, 77% of respondents replied that they think public transportation should be the center of a transportation system that includes various combinations of mobility options. We also know from this report that they expect that there will be future demand for public transportation. Furthermore, 74% of participants responded that they will use applications in the future when looking for diverse mobility options and for payments. This feedback shows increasing high expectations for MOD ／MaaS.

2. Stakeholders Needed to Accomplish MOD

The involvement of many stakeholders will be required to realize MOD. The following list of major stakeholders who have important roles to realize MOD in the U.S. are from the "Mobility on Demand : Operational Concept Report[1]". Among these stakeholders, business operators who lead MOD projects (called MOD business operators) are considered to vary depending on local situations.

For example, local governments, public transportation organizations, transit management, transit service providers, logistic service providers, and application/mobile service providers can be MOD operators.

"○ Federal Government

Many branches of the government can influence MOD, including the USDOT, Department of Energy (DOE), Department of Labor (DOL), Department of Commerce (DOC), Department of Defense (DOD), among others. These organizations, albeit from different angles, can play a role in establishing transportation strategies, policies, and legislations. They can also implement those strategies and make investments in pilot programs, and provide guidance for nationwide development of strategies put forth.

○ State and Local Authorities

These include regional and local governments, city municipalities, metropolitan planning organizations (MPOs, refer to "About MPO" mentioned in this report later.), and local authorities. These entities play a role in implementing policy and regulations, issuing permits, managing public transport in the region, and improving transportation operations. They also provide strategic urban planning and traffic planning, and are responsible for the local infrastructure.

○ Public Transit Agencies

These include all the agencies that provide public transportation including city buses, trolley buses, trams (or light train), rapid transit (metro, subway), ferries, and paratransit. These can take leading roles for network for MOD.

○ Transportation/Traffic Managers

These include transportation management centers that monitor the operations, allocate resources as necessary, and respond to the needs of the network.

○ Transport Service Providers

These include bikesharing, car rentals, carsharing, ridesourcing, TNC, and microtransit and paratransit service providers.

○ Logistics Service Provider

These include logistics management and goods delivery providers who manage and run the flow of goods and materials from origin to destination, in addition to handling inventory, warehousing, packaging, security, and dispatching functions.

○ Apps and Mobile Service Providers

These are third-party ICT services and providers enabling on-demand service, mobile ticketing, payment, and navigation services.

○ Consumer

These are the ultimate end users of MOD services who affect the system by the type of demand and requirements

they have."

Regarding the current MOD verification tests performed in the U.S., there are many cases of organizations that have received subsidies from the federal government. Thus, many public transportation organizations and local communities operating rail and buses, including light rail, have leading roles on the tests. For current MOD verification tests led by public transportation organizations, there are many examples of them cooperating with transit service providers, such as TNC. Furthermore, these transit service providers have been key players for MOD/MaaS projects, such as by establishing their own private MaaS platforms. These transit service providers offer various modes beyond TNC. The followings are the definitions of the major modes. [1)]

From the " "Mobility on Demand : Operational Concept Report" :

"○ Bikesharing

In bikesharing systems, users access bicycles on an as-needed basis for one-way mobility and/or roundtrips. Dock-based (station-based) bikesharing kiosks are typically unattended, concentrated in urban settings, and offer one-way or round trips station-based service (bicycles can be returned to any kiosk). On the other hand, dock-less (free-floating) bikesharing offers users the ability to check out a bicycle and return it to any location within a predefined geographic region. One of the merits of bikesharing compare to owning an own bike is that it provides a variety of pickup and drop-off locations and you can only use when you need to. Most bikesharing operators cover the costs of bicycle maintenance, storage, and parking. Generally, trips of less than 30 minutes are included within the membership fees. Users join the bikesharing organization on an annual, monthly, daily, or per-trip basis.

○ Carpooling

A formal or informal arrangement where commuters share a vehicle for trips from either a common origin, destination, or both, reducing the number of vehicles on the road.

○ Car Rental

Services or companies that rents cars or light trucks typically by the day or week. Traditional rental car services include storefronts requiring an in-person transaction with a rental car attendant. However, rental cars may also employ "virtual storefronts," online allowing unattended vehicle access similar to carsharing.

○ Carsharing

Programs or services which users can use cars owned by multiple users as they need.

Typically, the carsharing operator provides insurance, gasoline, parking, and maintenance. This is a program where individuals have temporary access to a vehicle without the costs and responsibilities of ownership. Individuals typically access vehicles by joining an organization that maintains a fleet of cars and light trucks deployed in lots located within neighborhoods, public transit stations, employment centers, and colleges/universities. (One type requires renting and returning at a certain parking space (usually for round trips). For the other type, users can return cars in any parking spaces on the public street. (It can be used for a one-way trip as well.) Generally, participants pay a fee each time they use a vehicle.

○ Microtransit

A privately owned and operated shared transportation system that can offer fixed routes and schedules, as well as flexible routes and on-demand scheduling. The vehicles generally include vans and buses.

○ Transportation Network Company : TNC ／ Ridesourcing

Services provided by TNC (also known as "ride-sourcing" and "ride-hailing") offer prearranged and on-demand transportation services including payment system for compensation, which connect drivers of personal vehicles with passengers. Smartphone mobile applications provided by TNC are used for booking, ratings (for both drivers and passengers), and electronic payment. There are a variety of vehicle types that can be offered by these services including: sedans, sports utility vehicles, vehicles with car seats for children, wheelchair accessible vehicles, and vehicles where the driver can assist older or disabled passengers.

○ Scooter Sharing

Programs or services which users can use scooters owned by multiple users when they need. Typically, the scooter

operator provides gasoline, parking, and maintenance. Thus users gain the benefits of a private scooter without the costs and responsibilities of ownership. Generally, participants pay a fee each time they use a scooter. They can be roundtrip, one-way, or both. (Electronic scooters, which do not require gasoline, are usually used in the U.S. So called "dock less type" which can be rented and returned in any places in the designated area is common.)"

3. Defining MPO

In cities in the U.S with populations over 50,000, it is required that a Metropolitan Planning Organization (MPO) lead and work with state Departments of Transportation and public transit operators to make a policy for extensive urban area transportation planning. Regarding these planning process for metropolitan transit, the FTA and FHWA are dually in control based on Title 49, Chapter 53 of "Public Transportation" in Sec. 5303 (49 U.S.C. 5303 : Metropolitan transportation planning[3]) and Title 23, Chapter 1 of "Federal-Aid Highways" in Sec. 134, (23 U.S.C. 134 : Metropolitan transportation planning[4]). Furthermore, in rural areas, state governments plan transit by collaborating with local communities away from metropolitan areas along with public transit operators. The legal basis for this structure is defined in Title 49, Sec. 5304 (49 U.S.C. 5304 : Statewide and nonmetropolitan transportation planning[5]) and Title 23, Sec. 135. (23 U.S.C. 135 : Statewide and nonmetropolitan transportation planning[6]).[7]

Transit plans that a MPO develops should contribute to projects, strategies, review, and implementation of services to solve the following subjects (quoted from Planning Factors)[8]:

① "support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
② increase the safety of the transportation system for motorized and nonmotorized users;
③ increase the security of the transportation system for motorized and nonmotorized users;
④ increase the accessibility and mobility of people and for freight;
⑤ protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
⑥ enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
⑦ promote efficient system management and operation;
⑧ emphasize the preservation of the existing transportation system;
⑨ improve the resiliency and reliability of the transportation system and reduce or mitigate storm water impacts of surface transportation;
⑩ enhance travel and tourism."

Among these, "④ increase the accessibility and mobility of people and for freight" and "⑥enhance the integration and connectivity of the transportation system, across and between modes, for people and freight" are related to MaaS, the topic for this report.

References

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2) "The Transformation of the American Commuter", report by APTA (November 2019) https://www.apta.com/wp-content/uploads/Resources/resources/reportsandpublications/Documents/APTA-Transformation-of-the-American-Commuter.pdf (Accessed : 2020/6/9)
※Field survey about mobility in the U.S. by National Academy of Sciences and Research and Policy Development Department.
3) United States Code, Title 49, CHAPTER 53 - PUBLIC TRANSPORTATION, Sec. 5303 https://www.govinfo.gov/app/details/USCODE-2011-title49/USCODE-2011-title49-subtitleIII-chap53-sec5303 (Accessed : 2020/6/9)
4) United States Code, Title 23, CHAPTER 1 - FEDERAL-AID HIGHWAYS, Sec. 134 https://www.govinfo.gov/app/details/USCODE-2017-title23/USCODE-2017-title23-chap1-sec134 (Accessed :

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5) United States Code, Title 49, Sec. 5304

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(Accessed：2020/6/9)

6) United States Code, Title 23, Sec. 135

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7) FTA HP, "Transportation Planning",

https://www.transit.dot.gov/regulations-and-guidance/transportation-planning/transportation-planning

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8) 23 U.S. Code § 134.Metropolitan transportation planning

https://www.law.cornell.edu/uscode/text/23/134 (Accessed：2020/6/9)