

Mobility on Demand (MOD) Business Models Elements

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16. Abstract <p>The abundant growth of on-demand transportation—or, mobility on demand (MOD)—such as electric shared scooters and ridesourcing, underscores the acceleration of change in the wider transportation world. This report examines the component parts, the elements that comprise a business model for the private mobility services and innovative procurement practices used by their public partners.</p> <p>Understanding the business models underlying MOD can help public agencies assess which transportation challenges these offerings are best equipped to address, and which might be less appropriate applications of these emerging services. The current report will provide a granular description of business models, differentiating on mode and revenue source, which assists in assessing whether a particular business model addresses various transportation challenges.</p>					
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Chapter 1. Introduction

Background

The abundant growth of new ways to get around and to access and pay for mobility resources, such as electric shared scooters and ridesourcing, underscores the acceleration of change in the transportation world. This report examines the component parts, the elements that comprise a business model for private mobility providers, and innovative procurement practices used by their public partners.

Understanding the business models underlying mobility services can help public agencies assess which transportation challenges these offerings are best equipped to address, and which might be less appropriate applications of these emerging services. This report provides a granular description of business models, differentiating on mode and revenue source, which helps to assess whether a particular business model addresses various transportation challenges.

What is a Business Model?

Over the past three decades, the term “business model” has been used increasingly in consulting and academia. The term rose to prominence during the dot-com boom as a means to describe the structures of a wide variety of firms that challenged conventional strategies. (Birkinshaw & Ansari, 2015)

More specifically, a business model captures the nature of a supplier’s relationships to its customers and to other suppliers of goods and services that contribute to its products. It is the outline of how a company positions and sustains itself in the marketplace. These dynamic relationships react to changes in the market and to the behavior of other parties, including regulators, public agency partners, and other market participants. A company that can successfully navigate changes to any of these elements might plan better for the future and position itself better in a competitive marketplace.

A mobility service business model can be broadly characterized by the primary commercial relationship that it constitutes (e.g., Business-to-Consumer (B2C) or Business-to-Government (B2G)) and in more detail by such elements as the mode (e.g., bicycles, scooters, vehicles for hire), value proposition, customer base, partnership mechanisms, and revenue sources. This more granular detail is useful for assessing how a business model might address a particular transportation challenge, and derives from the terminology in which companies and products are examined and understood in business and financial literature. This report differentiates between mode and revenue source to describe the business model and ties it to the primary commercial relationship.

Not every business based on a given vehicle type is going to function the same way. Bikeshaing is a good example of a single mode that has multiple business models with differing implications for meeting public needs and transportation challenges.

Modes and Business Models are Distinct

The mobility-on-demand (MOD) marketplace—defined as the commodification of passenger travel, goods, and services driven by the growth of online commerce and app-based service offerings, leading to the emergence of a form of e-commerce—has affected the traditional structures of the transportation sector. (Michalk & Ag, 2015) Major innovations in technology disrupt the existing business models causing evolution of the existing modes, or the creation of a new shared mode.

Not every business based on a given vehicle type is going to function the same way. Bikesharing is a good example of a single mode that has multiple business models with differing implications for meeting public needs and transportation challenges. For example, in one business model, bikesharing may use fixed facilities (docks) that are placed at known locations in the public way, usually after discussion and negotiation with the public entity that controls that right of way. In another model—dockless—the service has no fixed facilities, with GPS-equipped bikes picked up or parked wherever it may be convenient to users. In terms of revenues, bikesharing may be paid for by users through annual subscriptions or on a pay-as-you-go basis; non-user revenue sources may include local, state, or federal grants, sponsorship, and advertising. A governmental agency may or may not be involved in direct management of the service. Though early bikesharing was often owned and operated by nonprofit entities, it has evolved into operations being primarily run by for-profit entities and sometimes governmental agencies. In terms of revenues, bikesharing may be paid for by users through annual subscriptions or on a pay-as-you-go basis; non-user revenue sources may include local, state, or federal grants, sponsorship, and advertising. A governmental agency may or may not be involved in direct management of the service. Though early bikesharing was often owned and operated by nonprofit entities, it has evolved into operations being primarily run by for-profit entities and sometimes governmental agencies.

Project Overview

This report is part of a project whose main objective is to identify and analyze innovative business models where mobility service providers, transportation operators and managers, and transit agencies partner to collectively deliver better service to travelers, while mutually benefiting from the partnership. This project aims to help USDOT address barriers to advancing innovative mobility services and business models.

This project will result in the following key deliverables in the form of research and analysis reports:

- Task 2: Assessment of Current MOD Business Models –links current transportation challenges to emerging MOD business models.
- Task 3: Business Models Elements Report – defines and describes the specific elements needed to structure a successful business model or partnership for MOD solutions, to address challenges identified in the previous report.
- Task 4: Scenario Planning Template and Example – provides guidelines on applying scenario planning to business models identified in the previous reports.
- Task 5: Synthesis report – synthesizes key findings, lessons learned and recommendations from the previous tasks.

Purpose and Objective

Task 2: *Business Model Assessment* introduced the concept of a business model and how business models apply to private mobility providers in the mobility on demand (MOD) sector. The Business Model Assessment examined how a public agency might use business models to align MOD operations to common public goals, such as congestion mitigation, improved mobility, and improved paratransit service.

This report, Task 3: *Business Models Elements Report*, examines in detail how the particular elements of a MOD business model behave both in isolation and with each other. The purpose of the report is to develop a framework of elements of business case or partnership models that will assist future MOD deployers shape effective solutions for their particular transportation challenges.

The Elements

Though increasingly diverse, the actors in the MOD marketplace follow similar business models. They share an underlying logic of how their interdependent activities deliver value to customers and how those activities create a profit. The value includes the identification of customers and creation of a value proposition, while the profit considerations are primarily concerned with revenue, operations and necessary partnerships or regulation. This report highlights fundamental considerations for each element, and identifies and explains the diversity of approaches taken by companies in the current MOD marketplace. The business model elements, and how they relate to MOD, are shown in table 1.

Table 1. Mobility on demand business model elements.

Business Model Elements	Description	Illustrative Examples
Customer Base	For a business to succeed, it needs to identify the various segments of its customer base and attract, and retain them	<ul style="list-style-type: none">• Participants in a peer-to-peer marketplace• Transit agencies• Transit users

Business Model Elements	Description	Illustrative Examples
Value Proposition	For a service to gain customers and scale up, it needs a value proposition, i.e., what it is offering that is new, different, or better	<ul style="list-style-type: none"> • Convenient rides at market rates • Affordable first/last mile connections • High-tech, on-time paratransit • One-stop, multimodal information in no-cost app
Capitalization and Revenue	MOD is often funded with venture capital. In addition to venture capital, other revenue streams may also be involved	<ul style="list-style-type: none"> • Venture, start-up financing • State and federal grants, subsidies, contracts • Sponsorships and vehicle advertising • Users, riders and members • Innovative funding, such as public agency development of spin-off enterprises that continue to provide funds to the agency for new projects • Revenue-sharing between partners
Operational Characteristics	Transportation modes can operate in the mobility space in several ways	<ul style="list-style-type: none"> • One mode • Multiple modes • Mobility-as-a-Service

Business Model Elements	Description	Illustrative Examples
Partnership and Regulation	Whether from launch or after agencies begin to regulate them, agencies and providers should consider whether mobility services and transit can complement each other to achieve modeshift away from single occupancy vehicles	<ul style="list-style-type: none"> • Early comprehensive regulation • Ad hoc regulation • Contracts • Non-exclusive regulatory permits or franchises • Open call for unsolicited proposals • Traditional bid process • Grant-funded community-led mobility networks

The remainder of the report addresses each of the elements above.

Benefits for Intended Audience

By defining business model elements and delineating the considerations behind them, this report is broadly intended to serve as a useful resource for transportation agencies and local, regional, and State governments, as well as their partners, wishing to understand the structure of new approaches and partnerships and ultimately shape more effective deployment of MOD strategies and MOD partnerships. In the short term, this report (Task 3) and Task 2 will inform the considerations of scenario planning in Task 4.

Report Overview

The MOD Business Model Elements report breaks down the business model to its component parts and illustrates how mobility services address each element. The different approaches show the ways that mobility providers assemble a business model. Though discrete, a business model requires consideration of all of the following elements throughout the life of the operation.

- Chapter 2 examines the *customer base*. A business model must identify its actual users, and does this through segmentation. It is here where private mobility providers and public agencies might determine whether a mobility service is competitive or complementary to transit.
- Chapter 3. A *value proposition* is, at its most basic level, what a product offers the market.
- Chapter 4. Any service must find *capitalization* to start up, and *revenue* to sustain its operation. This chapter also considers funding from public sources.
- Chapter 5. *Operational characteristics* refers to what the mobility service looks like when it is implemented, from an infrastructure-dependent operation to an app that aggregates options.
- Chapter 6 discusses the range of regulations, how each might work to obtain a public good from the MOD operation, and whether a public-private partnership (P3) might be used to the same ends. Also discussed are the procurement mechanisms most likely to sustain a P3.

Key Definitions

This report draws on business model literature to expand upon the categories of modes and revenue models used as examples in the framework developed in USDOT's *MOD Operational Concept Report* (Shaheen et al., 2017) and in SAE International's Standard J3163, *Taxonomy and Definitions for Terms Related to Shared Mobility and Enabling Technologies* (2018). This framework characterizes the primary commercial transaction underlying the business relationships between service provider and consumer, such as business-to-consumer (B2C) or business-to-government (B2G). This paper provides a deeper analysis of the intersection of particular modes and revenue models under the broad categories defined thus far in published literature.

While the above referenced documents provide a complete set of definitions of terms used frequently in shared mobility and MOD literature and parlance, this section includes definitions of terms (often abbreviated) used frequently in the report. These definitions have been largely adapted from SAE International's *Taxonomy and Definitions of Terms Related to Shared Mobility and Enabling Technologies*. (2018) Citations from other sources are noted below. For a definition of business models, refer to chapter 2.

- **Bikesharing** provides users with on-demand access to bicycles at a variety of pick-up and drop-off locations for one-way (point-to-point) or roundtrip travel. Bikesharing fleets are commonly deployed in a network within a metropolitan region, city, neighborhood, employment center, and/or university campus. Users access bicycles on an as-needed basis for one-way (point-to-point) or roundtrip use. The majority of bikesharing providers cover the costs of bicycle maintenance, storage, and parking.
 - Station-based or **docked bikesharing** kiosks typically are unattended, concentrated in urban settings, and offer one-way station-based access (bicycles can be returned to any kiosk). 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.
 - Free-floating or **dockless bikesharing** offers users the ability to check-out a bicycle and return it to any location within a predefined geographic region. Bikesharing provides a variety of pickup and drop-off locations.
- **Carsharing** offers members access to vehicles by joining an organization that provides and maintains a fleet of cars and/or light trucks. These vehicles may be located within neighborhoods, public transit stations, employment centers, universities, etc. The carsharing organization typically provides insurance, gasoline, parking, and maintenance. Members who join a carsharing organization typically pay a fee each time they use a vehicle.
 - **Round-trip carsharing** requires users to borrow and return vehicles at the same location. Multiple carshare vehicles or groups of vehicles may be available within just a few block radii, while in lower density areas, round-trip carshare vehicles are strategically placed to capitalize on locations that have higher demand, such as pockets of dense housing, rail stations, and employment centers.
 - **Peer-to-peer (P2P) carsharing** is a brokerage model where the vehicles for P2P carsharing are provided by owner-members who make available to renter-members their privately owned vehicles available for sharing. The carsharing provider provides the application-hosting and on-board vehicle technology necessary for operation.
 - **One-way carsharing** includes two types:

- In **free-floating carshare**, a fleet of one-way vehicles can be located and reserved by app, then picked up or parked at any legal parking spot within a specific geographic zone (often an entire municipality).
- In **point-to-point carsharing**, users park at any of a number of designated locations, either on-street or off-street. (Shared Use Mobility Center (SUMC), Learning Center, forthcoming).
- **Courier network services (CNS)** provide for-hire delivery services for monetary compensation using an online application or platform (such as a website or smartphone app) to connect couriers using their personal vehicles, bicycles, or scooters with freight (e.g., packages, food, etc.) CNS are also referred to as flexible goods delivery.
- **Microtransit** is defined as a privately or publicly operated, technology-enabled transit service that typically uses multipassenger/pooled shuttles or vans to provide on-demand or fixed-schedule services with either dynamic or fixed routing.
- **Mobility on demand (MOD):** according to the USDOT MOD is “an integrated multimodal network of safe, carefree, and reliable transportation options that are available to all.”
- **MOD marketplace:** The commodification of passenger travel, goods, and services driven by the growth of online commerce and app-based service offerings, leading to the emergence of a form of e-commerce.
- **Ridesharing** (also known as carpooling and vanpooling) is defined as the formal or informal sharing of rides between drivers and passengers with similar origin-destination pairings. Ridesharing includes vanpooling, which consists of 7 to 15 passengers who share the cost of a van and operating expenses, and may share driving responsibility.
- **Ridesourcing** services are prearranged and on-demand transportation services for compensation in which drivers and passengers connect via digital applications. Digital applications are typically used for booking, electronic payment, and ratings.
- **Scooter sharing** allows individuals access to scooters by joining an organization that maintains a fleet of scooters at various locations. Scooter sharing models can include a variety of motorized and non-motorized scooter types. The scooter service provider typically provides gasoline or charge (in the case of motorized scooters), maintenance, and may include parking as part of the service. Users typically pay a fee each time they use a scooter. Trips can be roundtrip or one way.
 - **Dockless eScooters** The users of these vehicles, also called “kick scooters,” stand (with either a foot rest or seat) on the scooter, which has smaller wheels than an e-bike—typically less than 16 inches. They begin the trip under human propulsion with a kick, which they can choose to either continue to use, or opt to throttle via electric motor.
 - **Privately operated**, these systems are accessed via an app on the user’s smartphone. The scooters contain all of the electronics and locking mechanisms, and can be tracked by the user, provider, and, if relevant, the regulating agency. (Portland, 2018)
- **Shared mobility** is defined as the shared use of a vehicle, motorcycle, scooter, bicycle, or other travel mode; it provides users with short-term access to a travel mode on an as-needed basis, or use by multiple people at the same time.
- **Shuttles** are shared vehicles (typically vans or buses) that connect passengers from a common origin or destination to public transit, retail, hospitality, or employment centers. Shuttles are typically operated by professional drivers, and many provide complementary services to the passengers.
- **Taxi services** provide prearranged and on-demand transportation services for compensation through a negotiated price, zone pricing, or taximeter (either traditional or GPS-based). Passengers can

schedule trips in advance (booked through a phone dispatch, website, or smartphone app), street hail (by raising a hand on the street, standing at a taxi stand, or specified loading zone), or e-hail (by dispatching a driver on-demand using a smartphone app).

Mobility on Demand Business Models

The MOD marketplace was created through computing and communication technologies. Innovations in these arenas have driven the expansion of modes and the start-up/launch stage for a tremendous variety of companies. (Michalk & Ag, 2015) These start-ups might be non-profit or driven by the venture/private market.

The business may need to adapt its model to the rapid proliferation of its service in the public space (which tends to attract regulators) and/or the arrival of a competitive marketplace (the commodification of its service). While public agencies have used the contractual terms of P3 as a means of regulation—such as with dockless e-scooters—some “pilot projects” are also used as a way to reset the regulatory regime.¹ This stage is often used more proactively for P3 projects and programs. For instance, agencies have worked with carsharing companies to create carsharing stations in transit parking lots for first mile/last mile trips. Microtransit P3s also can extend service where there is not enough density for a fixed route.

The most recent trend appears to be a shift toward mergers and acquisitions of mobility companies, resulting in a lateral integration of services that can then be bundled. (Johnson, 2010 and Ovans, 2015) Some observers of mergers and acquisitions in technology sectors suggest that companies acquire others for their intellectual property. The merger prompts another round of innovation—essentially an immediate tactical return to the start-up/launch stage, with perhaps strategic benefits. (Han, Jo & Kang, 2018) For example, in acquiring the bikesharing company Motivate, the ridesourcing company Lyft now owns multiple modes. While it lacks the public transit modes of a true mobility-as-a-service (MaaS) environment, the larger private mobility providers are creating multi-modal apps for their users. Public agencies in other countries have used their broad reach to create MaaS environments that bundle public transit and private services.

Just as this report has borrowed the terminology of Johnson and Ovans to describe the overall business model approaches, this report also uses the framework developed in USDOT’s *MOD Operational Concept Report* (Shaheen et al., 2017), and subsequently expanded in SAE J3163 (2018), to characterize the primary commercial transaction underlying the business relationships between service provider and consumer (which these two documents term “MOD Business Models”), as shown in table 2.

¹ Santa Monica, California, which is where Bird scooters’ headquarters is located, is perhaps the best example. They did not have the definitions and requirements needed for a regulatory regime. The city passed an emergency ordinance to regulate the mode. It then created a pilot program to permit operation of shared e-scooters within a program that defines mobility devices broadly to include bikesharing, as well as modes it tries to anticipate. See, “Emergency Ordinance and Pilot Program for Mobility Devices, Santa Monica, California, 2018,” <https://learn.sharedusemobilitycenter.org/overview/emergency-ordinance-and-pilot-program-for-shared-mobility-devices-santa-monica-california-2018/>

Table 2. Mobility on demand business models.

Business Model	Definition
Business-to-Consumer (B2C) Services	B2C services provide individual consumers with access to business-owned and -operated transportation services, such as a fleet of vehicles, bicycles, scooters, or other travel modes. These services are typically provided through memberships, subscriptions, user fees, or a combination of pricing models.
Business-to-Government (B2G) Services	B2G services offer business-owned and operated transportation services to a public agency. Pricing may include a fee-for-service contract, a per-transaction option, or some other pricing model. Microtransit providers often use this business model in their P3 partnerships
Business-to-Business (B2B) Services	B2B services allow businesses to purchase access to business-owned or government-owned and -operated transportation services, either through usage fees or a fee-for-service. This type of service is typically offered to employees to complete work-related trips. First/Last mile MOD partnerships for suburban work destinations (reverse commutes) have employed this model
Peer-to-Peer Mobility Marketplace (P2P-MM)	P2P-MM services offer a marketplace—usually as an online platform—to facilitate transactions among individual buyers and sellers of personally owned and operated mobility services, in exchange for a transaction fee. Peer-to-peer carsharing services, such as Getaround and Turo, are the most prominent examples of this model

Business Model	Definition
Peer-to-Peer Goods Delivery Marketplace (P2P-GDM)	<p>P2P-GDM services include courier network services, such as apps providing for-hire delivery for monetary compensation using an online application or platform (such as a website or smartphone app) to connect couriers using their personal vehicles, bicycles, or scooters with goods (e.g., packages, food, etc.)². This can include two types of services:</p> <ul style="list-style-type: none"> • Peer-to-Peer (P2P) Delivery Services: P2P delivery services are apps that enable private drivers to collect a fee for delivering cargo using their private vehicles. Food delivery and other courier services use this model. Ridesourcing companies have also expanding into this model for delivery partners using non-sharing modes (bikes, scooters, etc.) • Paired On-Demand Courier Services: Paired on-demand courier services are apps that allow for-hire ride services to also conduct package deliveries. Ridesourcing companies have a delivery option for drivers, though they cannot operate concurrently
Fractional Ownership	<p>Fractional ownership allows individuals to sub-lease or subscribe to access a motor vehicle or other travel mode owned by a third party. These individuals have “rights” to the shared service in exchange for taking on a portion of the ownership expense. Far less common than the other models, fractional ownership allows users to buy into a “library” of vehicles to be used for various purposes. Automobile manufacturers have experimented with the model</p>

² Note: Although these goods-delivery services are listed as P2P, there is a question as to whether this might better fit a business-to-consumer (B2C) model, with the delivery persons as independent contractors, which more closely resembles the B2C model of ridesourcing companies.

Chapter 2. Customer Base

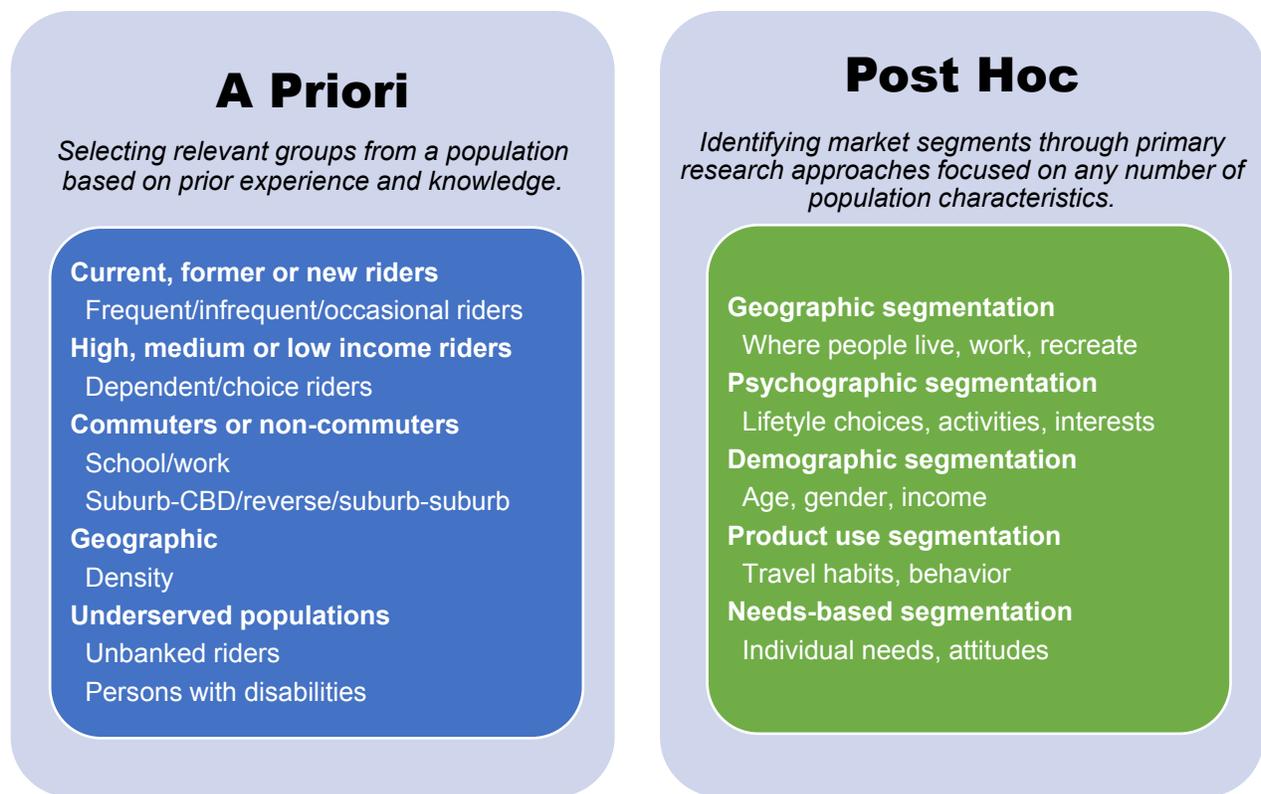
From the perspective of an MOD business model the customer base is simply the group of users who repeatedly use the network.

Approach Considerations

The basic metric of a customer base in a business model is a market segment, which is comprised of the people or organizations that are similar in terms of how they respond to a particular marketing mix. Market segmentation is the identification of groups of customers, or market segments that have similarities in characteristics or in needs who are likely to exhibit similar purchase behavior and/or responses to changes in the marketing mix (TCRP Report 36). When a business takes an undifferentiated—sometimes called “mass market”—approach, its product or service is intended to meet the needs of all potential customers uniformly. This approach was the dominant model in the early-industrial economy where the focus was achieving economies of scale, with the classic example being the Ford Model T. As the industrial economy matured during the 20th century, so did the ability to specialize and establish competitive advantage by better capturing particular market segments, either through one smaller group—a niche focus—or multiple segments. Today, hyper-segmentation has been formalized and is the basis of modern marketing. (Tedlow, 1993)

Market segmentation follows a three-step process of segmentation, targeting, and positioning (STP):

1. **Segmentation:** A preliminary step in segmentation is for a business to identify, at a high-level, whether to focus on consumer markets or business markets—the latter of which would also encompass government markets. A consumer market, or a B2C business model consists of individuals or households who utilize goods or services for private consumption. A business to government market, B2G or business-to-business (B2B), purchases goods or services for operations of the business or the governmental entity. (Shaheen et al, 2017; SAE J3163, 2018) Historically, the process of segmentation has taken two forms: pre-determined (a priori) or market-defined (post-hoc). A priori involves selecting certain groups from a population based on known characteristics and determining "segments" based on prior experience and knowledge. Post-hoc utilizes primary research to identify customer segments sharing similar qualities. Examples of these approaches are noted in figure 1.



Source: Leidos

Figure 1. Graph. Market segmentation approaches.

2. **Targeting:** The next step in the STP process is the selection of a primary target market that is intended to best align with a product or service. Secondary target markets can include those that are smaller, but represent future growth potential or maintain disproportionate influence due to volume, frequency, or consistency of purchases. (Applebaum, 2004) Considerations when selecting target markets often include a given segment's size and growth. One way of looking at this is to understand whether the serviceable available market is large enough to be profitable and whether it is growing or declining. (Cummings, 2018) Another feature is a target market's "structural attractiveness," or how crowded the competitive landscape is, i.e., whether there are substitute products and whether a product or service can successfully differentiate.
3. **Positioning:** The last step in the three-step process of market segmentation is to identify the degree to which a target market aligns with organizational objectives and whether it can be engaged with the available financial and organizational resources. This last point addresses the final step in the STP process, positioning, which largely focuses on mechanisms of marketing to a target market. This can include the channels of communication and relationships with customers. Communication can be handled internally or externally, while relationships can be handled directly or passively. Direct relationships involve personal assistance is provided over the course of a transaction. The passive approach is a self-service model in which customers are primarily supplied with a tool or automated platform. (Osterwladner and Pigneur, 2010)

Illustrative Examples

There is significant debate as to whether MOD complements or cannibalizes public transit ridership. (Hall, J.D., Palsson, C., & Price, J., 2018) While in the aggregate the modes might compete for the customer segment, an agency can choose how to approach these to either permit the operation, regulate to better achieve public goals, or partner with the private mobility providers to aim for similar goals. In the cases where the mobility provider is not directly competing for the transit rider segment, the public agency might still partner with the private mobility provider to achieve some of the stated public goals.

- Customer segments among businesses:** One example of identification of market segments beyond a B2C context is between carsharing, ridesourcing, and courier networking services. Maven, a venture of General Motors (GM), initially started as a B2C carsharing service in 2016. GM, which has used Maven as a means to explore MOD business models, identified a target market among drivers for ridesourcing companies such as Uber and Lyft, and in 2017, began offering short-term vehicle rentals for commercial use by individuals under the “Gig” program. It later expanded its offering to the growing peer-to-peer goods delivery marketplace (P2P-GDM) which includes courier network services, such as apps providing for-hire delivery for monetary compensation using an online application or platform (such as a website or smartphone app) to connect couriers using their personal vehicles, bicycles, or scooters with goods (e.g., packages, food, etc.). (SAE International, 2018) GM has continued to segment this market of “gig economy” workers through its company-owned channels targeting drivers in courier networking service companies, such as GrubHub for meal deliveries, Instacart for groceries, Roadie for packages, and even HopSkipDrive for the transportation of underage riders. ([Business Insider, 2017](#))
- Customer segments among public transportation riders:** Prior to launching Indego docked bikeshare in Philadelphia, planners engaged in a two-phased analysis to identify the geographic target market for bikeshare stations and ridership in peer European cities. The planners included proximity to Southeastern Pennsylvania Transportation Authority (SEPTA) rail stops as a factor in selecting sites for kiosk stations where bikes can be rented and returned. (Krykewycz, G., Puchalsky, C., Rocks, J., Bonnette, B. & Jaskiewicz, F., 2010) Indego continues to target SEPTA riders and positions itself as a complementary mode through strategic placement of stations and targeted advertisements through the service provider, B-cycle. (Philadelphia Bikeshare Strategic Plan, 2013)
- Customer segments among transportation providers:** Microtransit, or dynamically routed shuttle service for on-demand or scheduled trips, has taken several forms since it first appeared in 2014. Some ventures, such as Lyft Shuttle and Chariot, both owned the vehicles and hired drivers, and directly served fare-paying customers on a B2C basis. Others, such as Transloc, shifted away from B2C models by segmenting, positioning, and directly marketing their services to public agencies seeking alternatives to resource-intensive fixed-route service in low-ridership service areas. Transloc currently provides the scheduling, dispatch, and routing platform for agency-operated service in a number of markets, including first/last mile focused services for the [Orange County Transportation Authority](#) and [Central Contra Costa Transit Authority](#), as well as paratransit for the [San Joaquin Regional Transit District](#). (SUMC, 2017)

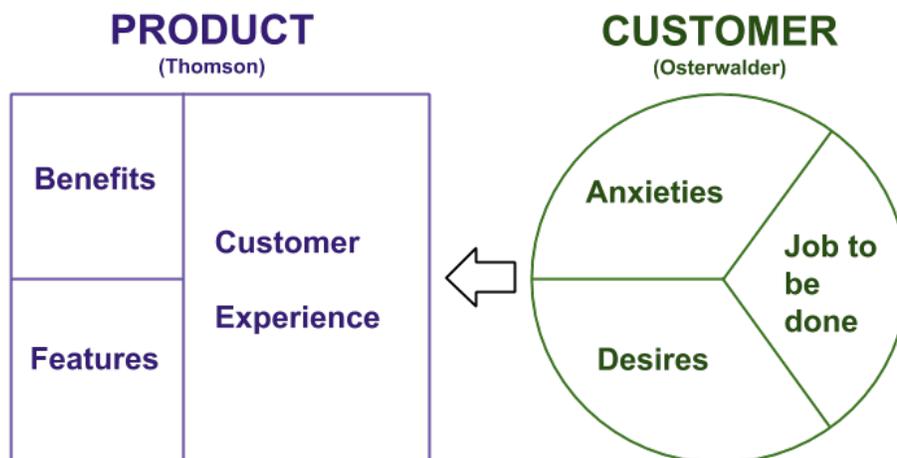
Chapter 3. Value Proposition

Concurrent with (and sometimes before) the customer-base consideration, the way in which the service or product of a business solves a problem or offers some form of benefit to a given customer must be considered. One common way to frame this process is as the formation of a value proposition—a succinct statement of the benefit customers can attain through a product or service. (Golub et al, 2000)

Approach Considerations

A firm that brings new technologies or products and services to market is offering a value proposition that satisfies an entirely new set of needs that customers previously did not perceive. Otherwise, a firm must make a value proposition by offering an improvement to some market service already available to a customer base. Strategies include leveraging quantitative improvements, such as offering lower price, unit cost, exposure to risk, or greater efficiency. Value can also take on more qualitative dimensions by responding to customer feelings around design, usability, or branding. (Osterwalder and Pigneur, 2010)

In their seminal book *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*, Osterwalder and Pigneur use “canvases” to chart complex concepts, such as the value proposition, on a single sheet. For a value proposition, they use thought exercises that pair the products and services to tasks that a customer must complete (figure 2).



Source: <https://www.peterjthomson.com/2013/11/value-proposition-canvas/>

Figure 2. Graph. Value proposition canvas.

Opposite these points should be a list of tangible and intangible aspects of a product or service and how they ultimately address a given job or support a benefit. Osterwalder and Pigneur pose three degrees of a fit that a value proposition should pass before forming the basis of a business model:

- A **problem-solution fit**, or conceptual phase, is achieved when there is at least a reasonable match between a product and service and these dimensions of an identified customers base.
- A **product-market fit**, or prototype phase, is achieved when research can validate the underlying assumptions of a value proposition and that it has potential to gain traction in the market.
- A **business-model fit** is achieved when there is evidence from market research or prototype that indicates that a value proposition can be embedded in a profitable and scalable business model.

Public agencies take on a number of jobs that have historically posed challenges such as, for example, providing fast and convenient service over a wide variety of land use contexts or providing mobility for people with disabilities. On-demand service providers have built their value propositions around unmet consumer demand for features such as convenient trip planning and payment platforms that provide transparent price structures and lower-cost service than available in the taxi market. In recent years, P3s have emerged between public agencies and on-demand providers that leverage an overlap in customer bases to advance a public goal. Examples include (Schwieterman, 2018):

- Incentives to broadly encourage connections between ridesharing and transit service or to fill gaps in the transit system through discounts and other financial incentives.
- Development of smartphone trip planning applications that encourage combining ridesharing and transit options on the same trip.
- Efforts to mitigate parking shortages or forestall the need for investments in parking lots in downtown districts, areas of public assembly, transit stations, and other locations.
- Programs to promote mobility for travelers with impairments, including the elderly and disabled, which serve as alternatives to conventional paratransit service.

Illustrative Examples

The following examples illustrate specific ways that P3s serve value propositions that address public goals:

- **Value from convenient rides at market rates:** One of the challenges for any network-based public transit system is how to operate in a lower density environment or serve underserved areas with limited resources. In areas where demand is lower, ridesharing can be used in places where fixed-route transit could not operate on a cost- or time-efficient basis. One example is the Livermore Amador Valley Transit Authority, which has historically provided limited service to the small city of Dublin (pop. 46,000) near San Francisco's East Bay Area through the bus provider WHEELS. In an effort to provide easy, affordable transportation options to underserved city residents while mitigating congestion, the agency created the Go-Dublin! program in 2016. Under the program, the city and WHEELS subsidize 50 percent of the cost of shared rides on the ridesourcing companies' ridesharing services UberPool or Lyft Line, or the DeSota cab company. The city extended the pilot, which is still active as of writing this report. (SUMC, 2017)
- **Value from affordable first/last mile connections:** Related to the fundamental question of low-density and underserved areas is the question of first mile/last mile connection to existing high-capacity transit service. In a similar arrangement as Dublin, the Phoenix Public Transit

Department partnered with Lyft in 2017 to provide rides to and from designated zones around 500 Valley Metro bus stops. The pilot was directed to the lower-density northern and southern-most parts of Phoenix where feeder service ran at low-frequency during limited hours. Under the pilot, which ended in 2018, Lyft would provide users \$5 off their first four rides while the agency would provide a 20 percent discount to qualifying rides. (SUMC, 2017) These partnerships tend to serve more as travel training and promotion of a type of trip than as a long-term program. However, if successful, they might encourage mode shift.

- **Value from tech-enabled, efficient paratransit:** ADA paratransit is currently the most expensive service per trip for most transit agencies, generally only available with a day-before reservation as required by the Federal Transit Administration, and sometimes not available at the desired times due to high demand. The Massachusetts Bay Transportation Authority's RIDE On-Demand program aims to increase access for persons with disabilities at a lower cost through subsidized trips on Uber, Lyft, or the taxi provider, Curbed. Each company uses a different operational model to fulfill rides on wheelchair accessible vehicles (WAV), with Lyft utilizing traditional shuttle service and Uber supplying WAV taxi vehicles to its drivers. (SUMC, 2018)
- **Value from one-stop multimodal trip planners:** Most modes in the MOD ecosystem potentially replace single-occupancy vehicle trips, which both reduces congestion and provides additional mobility options to riders. Smartphone applications used for trip-planning can reduce friction in planning non-SOV trips, offering visibility to transit, active transportation infrastructure, and shared modes in a way that was not available before (Shaheen, S., Cohen, A., Zohdy, I., & Kock, B., 2016). One example is the Open Trip Planner (OTP), originally developed by TriMet in Portland as a means to facilitate connections to bicycle infrastructure for riders on public transit. While successfully implemented in the Portland area, interest in OTP has extended beyond its originally intended geography. Without a more robust geocoding platform, however, the trip planner has proved difficult to scale to other markets. TriMet also wants to incorporate shared modes and pedestrian networks to provide a more complete suite of travel options. The partnership leverages the expertise of Moovel, a trip planning vendor, as well as the Mapzen Pelias geocoder, to create a seamless digital user interface. (SUMC, 2017)

Chapter 4. Capitalization and Revenue

After a value proposition of a product or service is matched with a customer segment, the next concern in a business model is how that relationship can be turned to a profit. The underlying revenue model is perhaps the most significant component of a private sector business model, and ultimately differentiates it from a public agency's goals and operations. This section discusses the range of revenue models used by mobility services.

Approach Considerations

Seed and venture capital remain common mechanisms for capitalization of mobility services. Smaller-scale ventures in their early stages usually draw on seed funding from banks and angel investors. The use of venture capital generally denotes larger-scale investments in the tens of millions of dollars, generally for correspondingly larger-scale deployments. This is distinct from private equity as a means for capitalization, which is largely focused on established, publicly listed companies as a means for transfer of ownership. Grant funding from the public sector or non-governmental organizations (NGOs) can act as a substitute or complement to seed funding, depending on the degree of alignment with public goals.

While these are common mechanisms for mobility services in the beginning, the companies must ultimately rely on long-term predictable, sustainable, and efficient revenue streams. Revenue streams are generally either transaction-based from one-time use of a product or service, or reoccurring for ongoing access:

- **Transaction:**
 - The traditional sales model, in which a company sells a product or service to a customer for a one-time fixed price. Variations of this model can vary according to whether the customer base is an institution (B2B, B2G) or the consumer market (B2C).
 - Brokerage model, where companies or individuals that act as an intermediary between two parties charge a brokerage fee for their services.
 - Pay-as-you-go, where a company charges the customer for the use of its product or service based on usage. A sub-designation of this may be fractionalization, or use of a shared service in which revenue is then split, most common in P2P business models.
- **Reoccurrence:**
 - Subscriptions, where the company charges the customer for the regular and consistent use of its product or service.
 - Advertising, in which a company charges others to advertise their products using their media.
 - Product to service or licensing, where a company charges for the use of its intellectual property. A variation might include “freemium” models in which basic access to intellectual property is available without charge as a means to attract a potential customer base to a more advanced (and directly monetized) service.

- Leasing or rentals, in which the customer pays to get exclusive access to the product for a time-bound period.
- Bundling model, where goods and services are packaged together.

Illustrative Examples

The first two examples illustrate two distinct mechanisms of start-up financing—private and public investment, respectively. The following examples illustrate the wide range of non-exclusive revenue streams that can supplement this start-up financing and help sustain operations:

- **Capitalization through start-up financing:** The Chinese dockless bikeshare company Mobike was founded in 2015 with the goals of simplifying the bicycle rental process and providing a low-cost service for urban travelers making short, one-way trips. Through \$3 million in seed funding, Mobike built a manufacturing plant for its custom-designed bikes and began trial operations in several Chinese cities, operating on a pay-as-you-go basis. Mobike officially launched as the country's first private bikeshare service in 2016. Their bikes were lighter and less expensive than the typical docked bike models in the US and did not require the off-street stations that required balancing. Because of this, the company was able to quickly scale operations. (Cao, 2018; Liu, Shen, & Zhu, 2018; McKenzie, 2018) Through several funding rounds, Mobike raised more than \$1 billion dollars from an international consortium of venture capital firms and multinational electronics manufacturing company, Foxconn. By the end of 2017, Mobike was operating in 170 cities across five countries, despite continuing to struggle with sustainable revenue through its rentals or data platform (Yin and Tan, 2017). By early 2019, Mobike had pulled out of all of its international markets, and now operates exclusively in China where its parent company Meituan operates a wide range of transportation services. (Liao, 2019)
- **Capitalization through grants, subsidies and contracts:** The BlueLA carsharing service launched in Los Angeles in 2018 with 100 shared battery electric vehicles stationed near chargers in select disadvantaged communities (DAC) across the city. By focusing on disadvantaged communities, the program was able to leverage California Air and Resource Board (CARB) Low Carbon Transportation program funds, where proceeds from the State's Cap-and-Trade Program are allocated to reduce the burden of pollution in low-income neighborhoods. This public investment was supplemented by \$10 million in private investment from the French OEM, Bolloré. Pricing is based on a three-tier system that prioritizes access for low-income residents and during its first year offered discounts for the second and third hours of rentals. Due to stipulations of its state funding, BlueLA is limited to operations in DACs as opposed to higher income areas that would otherwise be viable areas of expansion. To supplement its revenue, BlueLA plans to open its charging infrastructure to private vehicle owners and sell electricity from vehicle batteries back into the grid. (SUMC, 2018)
- **Capitalization and revenue through sponsorships and advertising:** While station-based bikesharing uses a mixture of pay-as-you-go and subscription-based user fees, the main sources for capitalization and additional revenue are sponsorships and advertising. (Shaheen S. A., Martin, Cohen, & Finson, 2012) Citi Bike in New York, which signed a multi-year, \$41-million-dollar contract with Citibank in exchange for naming and system branding, is an example of title sponsorship used for system-wide operational expenses. On a smaller scale, revenue for system expansions can come from dedicated advertisement space at individual sites. (Philadelphia Bikeshare Strategic Plan, 2013)
- **Revenue through users, riders and members:** Most carsharing services derive revenue from a mixture of fees related to registration or membership, pricing based on the type of vehicle rented, as well as the time and/or distance traveled during the rental. (Remane, G., Nickerson, R., Hanelt, A., & Tesch, J., 2016) In this sense, they use a hybrid subscription and pay-as-you-go model. Hourcar

began in 2005 as a non-profit, round-trip carsharing service providing hybrid vehicles across Minneapolis-St. Paul, Minnesota. Over thirteen years of operation, Hourcar expanded to 60 vehicles based on monthly membership fees of its 2,300 members and rental fees. In 2017, Hourcar unveiled plans to more than double its fleet and transition to an all-electric, point-to-point, free-floating service through the buildout of a network of charging stations. The expansion was made possible by a \$4-million-dollar commitment by the regional utility provider, Xcel Energy, for the charging network and an additional \$4 million through federal funding. (Hourcar, 2018)

- **Revenue through spin-off enterprises:** Revenue streams for automobile original equipment manufacturers (OEMs) have typically been based on B2C and B2G asset-sales and leasing. The German OEM Daimler started the free-floating carshare service Car2go in 2008 as a means to leverage an underutilized asset—in this case, its line of underperforming Smart cars—to expand its brand to a different segment of consumers. (Ferraro, et al. 2015) Car2go continues to operate on a pay-as-you-go by the minute basis, augmented by membership signup fees. Through the newly opened Daimler Mobility Services division, the company founded the trip planning platforms, Mytaxi in 2009 and Moovel in 2013. Both cater to different markets—one European and one primarily in North America—but have spanned B2B, B2G and B2C models.
- **Revenue sharing:** Revenue sharing remains a staple feature of the peer-to-peer mobility marketplace (P2P-MM). Member-owners of services like Getaround and Turo leverage a combination of brokerage and product-to-service business models by providing short-term vehicle access to member renters, minus a transaction fee, through their mobile and desktop platforms. By leveraging vehicles from member-owners, these companies eliminate one of the main upfront costs associated with network expansion and may be more viable in lower-density settings. (Movmi, 2018)
- **International models:** While the international MOD networks operate under different regulations, some of the innovative partnerships and revenue structures might be instructive for exploration. The FHWA Global Benchmarking Program Report, *Shared Use Mobility: European Experience and Lessons Learned* (FHWA, 2019) highlighted what it called “boundary-defying public-private partnerships and contracting methods” (10). The section on innovative funding examined RATP in France, Deutsche Bahn in Germany, and Wiener Stadtwerke in Austria. RATP Dev is a sort of public venture capital firm, funding innovative mobility solutions. Deutsche Bahn Digital Ventures (DBDV) is an arm of Deutsche Bahn rail company, which is a private company wholly held by the German federal government. It also serves as a VC firm, and forms partnerships with companies. Finally, the Wiener Stadtwerke GmbH in Austria works with municipalities to implement innovative mobility projects.

Chapter 5. Operational Characteristics

Operational characteristics of a business model address the activities through which a value proposition is delivered to a customer base, as well as what resources and costs are key to supporting those activities.

Approach Considerations

Financial resources commonly include available lines of credit and other sources of capitalization previously discussed. Physical resources encompass all inventory and other tangible assets in a firm. For a mobility provider, this might include equipment in a production or supply chain, vehicles, real estate, or right-of-way access. Intellectual resources are the opposite of physical resources—intangible elements that encompass intellectual property, such as the algorithm behind an app or a proprietary vehicle design. Human resources generally denote labor arrangements within a firm. For mobility services, human resources are generally split between management-level employee labor and contracted system operators, such as drivers or fleet rebalancers. Labor conditions for the latter group, like a number of other “gig economy” workers, has remained a point of contention and has raised conversations around the full lifecycle costs of the MOD marketplace.

These resources also represent costs to an organization, either fixed over a given period or variable in proportion to output. Costs that are variable can benefit from economies of scale and decrease on a per-unit basis with increases in production, while fixed costs can benefit from economies of scope when an organization leverages its resources to offer a wider array of services or products. In essence, an organization seeks to gain efficiencies as it scales-up or, in MOD, adds a complementary mode to its operation.

Illustrative Examples

The first two examples are infrastructure-driven operational models that deploy a physical resource and are often able to reduce costs through economies of scale and can, in turn, focus capitalization on wider deployment. Operational models that are more product-driven, such as mobile apps, inherently require greater emphasis on human resources since many key activities revolve around marketing and customer engagement. As mobility services mature they have expanded to other modes through mergers and acquisitions. Increasingly, they are joining both public and private entities in the third operations model, which provides access to the wider mobility marketplace through a single platform.

- **Operations focused on a single mode:** Dockless e-scooters appeared seemingly overnight in cities around the US and Canada in 2018. Like ridesourcing, this form of shared mobility has created much public dialogue. Operating on largely the same B2C business model as the dockless bike systems that were introduced on a wide scale in the US the year before, e-scooter companies like Bird offered an alternative for short trips in urban areas with GPS enabled units available on a pay-as-you-go basis through mobile platforms. Notably, they appealed to a potentially different customer base through their less physically intense model. The use of battery-enabled scooters, however, requires the company to

spend large sums on the human resource for a network of independent contractors to collect and charge scooters overnight. (Irfan, 2018; Wilhelm, 2018) By using a single physical resource, the cheap-to-manufacture stand-up “kick scooters,” Bird was able to deploy large numbers of units in a short amount of time through over \$1 billion dollars in private equity and venture capital funding. (Crunchbase, 2019)

- **Operations focused on multiple modes:** In 2012, the non-profit Motivate was awarded a contract for the purchase, installation, and operation of a station-based bikeshare system in Chicago. Like its peer station-based networks, Divvy has operated with a mix of subscription, pay-as-you-go and sponsorship revenue through title-sponsorship from Blue Cross/Blue Shield and station-level advertisements, with additional support the Chicago Department of Transportation via Congestion Mitigation and Air Quality Improvement (CMAQ) Federal funds. After Motivate’s acquisition by Lyft in 2018, it announced a strategy to dramatically expand its fleet and transition many of the new vehicles to dual-function (docked and lock-to dockless) e-bikes. The move, which was also pursued in Motivate Twin Cities market, was in part a strategy to reach other customer bases. Dockless fleets were more likely to reach infrequent riders while the station-based, subsection-oriented model often catered to commuters. As dockless e-scooters have demonstrated, the addition of electric pedal-assistance offers value to a segment of potential users deterred by the existing model. The dockless e-bikes will feature lock-to functionality for situations where stations are full, while 15 percent of existing stations will be retrofitted to include charging capabilities. The deployment is poised to take advantage of Divvy’s existing mobile application, while the lock-to functionality is anticipated to mitigate the need for a substantial scaling of seasonal re-balancers.
- **Operations focused on mobility-as-a-service (MaaS):** MaaS entered the MOD vernacular in 2014 through pilots in Germany, Sweden, and Finland. MaaS offers digital platforms that facilitate real-time trip planning and payment for a suite of private and public modes of service. For the public sector and other mobility services, MaaS platforms market their value as filling gaps in the transit network, reaching different customer bases through a wider suite of options and offering a means of entry to the MOD marketplace. (Falconer et al., 2018) Instead of a brokerage or pay-as-you-go revenue stream, MaaS ventures are notable for the use of hybrid subscription-based access to bundled packages providing varying levels of flexible use. While some MaaS ventures have been led by the public sector in an effort to complement service on an open platform, most have been through private companies overseeing the integration of public and private modes on a proprietary app. MaaS Global’s Whim, a for-profit Finnish venture, remains the most notable provider, giving users access to a set number of trips per month on public transit, regional rail, microtransit, carsharing, car rental, taxis and bikesharing. (FHWA, 2018)

Chapter 6. Partnership and Regulations

The changing MOD business models affect MOD public-private partnerships and how they address the challenges public agencies face with providing transportation services in their jurisdictions. Public agencies must decide between a mix of regulating MOD operations and entering into partnerships with providers to best meet public goals. Understanding the business models that MOD businesses use will assist public agencies and private companies in understanding potential partnerships for addressing mobility challenges. Below are the details of both regulations and partnerships that might inform these decisions.

Approach Considerations

When a value proposition sufficiently overlaps with public goals, formalized partnerships through contracts or other means can help establish mutually beneficial arrangements. For a mobility provider, this might offer the benefit of reducing operational costs, bolstering a revenue stream, expanding a customer base, and ultimately scaling operations. A properly structured P3 involves sharing financial risk. (Miller, 2017) An additional level of risk is added to the partnership when the private mobility service is a start-up that might not have capacity to implement and operate the project.

When a new mode or technology enters a market, particularly larger deployments of B2C products and services, regulations provide a way to reconcile its value proposition with the public interest, often by providing parity to standards in place for business models. The degree to which regulations affect a private mobility service can vary according to mode, size of deployment, and other circumstances. For public entities, regulatory leverage is primarily at the public right of way. This can be enforced through management of travel lanes, curb space, or other public facilities. In other circumstances, this can involve regulation of fleet size or service geography. In practice, the agencies have found reaching agreement over data sharing—whether for trip planning (real time data) or enforcement and planning (historic data)—to be a stumbling block. (SUMC, 2019)³

The administrative level through which regulatory decisions should be made has been the subject of considerable attention through the broader conversation around state-level, preemptive authority over localities. (DuPuis et al 2018)

³ Datasharing is, as of the publication of this paper, an unresolved subject. Regardless of the type of procurement, the agency and private provider should each be clear about their expectations regarding data sharing as they approach negotiations. The white paper cited, *Objective-Based Data Needs Assessment and Data Sharing Approaches in Mobility Partnerships*, offers details on the contemporary state of data-sharing agreements.

Illustrative Examples

The first two examples broadly illustrate the approaches taken towards regulation when there is an insufficient overlap between the mobility provider's value proposition and the public goals. Following these are various mechanisms through which partnerships have occurred when common goals are more immediately clear.

- **Early comprehensive regulation:** TNCs, supported by venture capital, disrupted the taxi industry by outsourcing vehicles and drivers to independent contractors who provided their own vehicles. This outsourced the most significant operational expense generally absorbed by transportation providers. (Novak, 2012) While this has enhanced mobility options for consumers, debates continue about the degree to which TNCs are drawing riders away from more efficient forms of transportation and contributing to congestion, as well as the conditions and requirements for its contracted labor. (Feigon & Murphy, 2018; Schaller, 2018) In 2018, the New York City Council passed a sweeping legislative agenda that involved capping the number of ridehailing vehicles authorized in the city, which had grown from 60,000 to 100,000 vehicles in three years, as well as a minimum pay standard for drivers. While the moves are intended to last for 12 months in an attempt to study their impact, Uber has filed suit with the New York Supreme Court to overturn the regulations. (Verge, 2019)
- **Non-exclusive regulatory permits:** A group of TNCs—Easy Taxi, Cabify, Yaxi and Uber—launched in Mexico City as early as 2013, circumventing regulations governing taxis and public transit providers by establishing themselves as private service. While this technically prohibited pickups on the public right of way, in practice these were not enforced. After riots from *colectivo* and taxi drivers the following year, the national Mexican antitrust commission and a city's innovation division delivered a set of policy recommendations to the Mexico City mayor based on roundtable discussions with TNC and incumbent services. Recommendations ranged from collecting data to measure congestion impacts and reforming taxi regulations. Ultimately, the city regulation took some of these into account, allowing TNCs to remain "private transportation services" with permission for pickup on the right of way, but requiring annual vehicle registrations and a variety of standards around environmental and safety features of the vehicles. (ITDP, 2019)
- **Ad hoc regulations:** While matters of vehicle safety standards are set at the federal level, Congress and the National Highway Transportation and Safety Administration (NHTSA) have largely abstained from regulatory action on autonomous vehicles (AVs). Google deployed some AVs on a limited basis in 2009 and legislation was first passed in Nevada in 2011. While research and development of AVs has received substantial capital support from investors, for the most part the technology has not been available on the market. That year, the Nevada Assembly passed legislation that authorized AVs on public roads and directed the Department of Motor Vehicles to adopt rules for a specialized AV driver's license. Other states have since followed, with actions mostly to introduce clarity and promote the development of pilots (see table 3).

Table 3. Autonomous vehicle State legislation. (NCSL, 2019)

No Action	Authorization for Funding/Study	Truck Platooning	Authorization for Testing	Authorization for Full Deployment
Alaska	Delaware	Alabama	Connecticut	Arizona*
Iowa	Hawaii	Arkansas	Maine	California*
Kansas	Idaho	Indiana	Massachusetts	Colorado
Maryland	Illinois	Kentucky	New York	District of Columbia
Missouri	Louisiana	Mississippi	Ohio*	Florida*
Montana	Minnesota	South Carolina	Utah	Georgia*
New Hampshire	New Mexico		Virginia	Michigan*
New Jersey	North Dakota		Washington*	Nebraska*
Oklahoma	Oregon			Nevada*
South Dakota	Pennsylvania			North Carolina*
Rhode Island	Wisconsin			Tennessee*
West Virginia	Vermont			Texas*
Wyoming				*Does not require human operators

- Traditional bid process:** In early 2018, the Ohio Department of Transportation released an RFP for a one to three year AV demonstration pilot. (ODOT, 2018) The pilot was for an AV shuttle operating in downtown Columbus, providing free rides between four stops. The contract was awarded to the Michigan-based company, May Mobility. (Columbus Dispatch, 2018) By setting the terms of the service to be provided through a detailed RFP—for instance, by requiring access to detailed trip data for performance and safety evaluation—this model can effectively function as a regulatory tool itself.
- Unsolicited proposals:** Since early 2016, the Office of Extraordinary Innovation housed within LA Metro has utilized an unsolicited proposal policy. Instead of the traditional RFP and bid process, the agency allows firms to submit conceptual proposals for partnerships or contracts. Proposals are evaluated by committee for the degree of fit with the agency’s operational and strategic goals. If selected, proposals are invited for demonstrations or contracting. In early 2018, LA Metro awarded \$800,000 to three vendors for six-month microtransit demonstration pilots. After six months, each vendor—RideCo, NoMad and Transdev—will submit data and summarize their findings in a report addressing the potential feasibility of their service on a larger scale. (OEI, 2018; Govtech, 2018)
- Community-led mobility networks:** In 2017, Tompkins County, New York received funding through the Federal Transit Administration to pursue a community-led MaaS demonstration project in a largely rural setting. The proposal was novel in that the MaaS structure would be facilitated through its Way2Go community mobility education program, taking a low-tech approach through the creation of a call-center to schedule demand responsive service on a network of private, non-profit, and volunteer driven transportation services.

Chapter 7. Conclusion

The study and use of business models rose to prominence in response to the rapidly changing business environment of the past generation. Technology start-ups played a central role in creating the dynamic and disruptive business environment. A business model is a powerful tool for understanding MOD. Jurisdictions and agencies that understand the relevant business models are better equipped to decide how to regulate and/or partner with these innovative modes.

A business model captures the nature of the mobility provider's relationships to its customers and to other suppliers of goods and services that contribute to its service. In practice, the business model serves as the outline, consisting of the elements discussed above, of how the mobility provider positions and sustains itself in the MOD marketplace. Each of the elements reacts to changes in the market and to the behavior of other parties, including regulators, public agency partners, and other market participants. An underlying assumption of the business model is that the most competitive companies are those that can adapt to changes within the elements.

Business model theorists insist that each element should be considered at all points of a firm's life. A mobility provider most likely considers the elements while launching or entering a new market roughly in the order discussed above:

- **Customer base:** For a business to succeed, it needs to identify the various segments of its customer base, and attract and retain them. These customers can come from any of the existing modes. Transit agencies and local governments will need to consider how to engage private services in partnerships and regulations that best support their planning goals.
- **Value proposition:** For a service to gain customers and scale up, it needs a value proposition stating what it is offering that is new, different, or better. Public agencies take on a number of jobs that have historically posed challenges—for example, providing fast and convenient service over a wide variety of land-use contexts and providing mobility for people with disabilities. On-demand service providers have built their value propositions around unmet consumer demand for features such as convenient trip planning and payment platforms that provide transparent price structures and lower-cost service than available in the taxi market. In recent years, P3s have emerged between public agencies and private mobility services that leverage an overlap in customer bases to advance a public goal.
- **Capitalization and revenue:** MOD is often funded with venture capital, although other revenue streams can be involved. In addition to the usual financial details, all parties should be aware of the timing of funding rounds for a start-up when negotiating the risk-sharing components of a partnership.
- **Operational characteristics:** Transportation modes can operate in the mobility space in several ways. Private mobility providers need to anticipate how jurisdictions might respond to a disruptive mode in the right-of-way.
- **Partnership and regulation:** Whether from launch or when they become a noticeable presence in the public right-of-way, public agencies may begin to regulate MOD. Regulations are a way to reconcile what is determined as a public good—equal access, etc.—with the private market. Usually around this point, public and private parties decide on whether a partnership or continued operation under regulation is the correct course of action.

A public agency might eventually be involved with or be influenced by each of the elements, but usually approach the MOD business model by starting with possible intervention as a regulator or public partner in a P3. An agency that deliberately identifies a mobility provider's business model elements is in a better position to make an informed decision regarding regulation of and possible partnership with a private mobility provider.

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