



The Role of Development Review in Shared-Use Mobility

June 2020

Table of Contents

- ABOUT THIS REPORT 3**
- KEY FEDERAL TRANSIT AGENCY (FTA) DEFINITIONS 4**
- INTERNATIONAL BEST PRACTICES AND RESOURCES 7**
- REACHING CONSENSUS ON BEST PRACTICES 8**
- ARLINGTON, VA: DEVELOPER-LED PARTNERSHIPS..... 10**
 - REGION: MID-ATLANTIC, URBAN SETTING..... 10
 - TYPE: PARTNERSHIP FOR RIDESHARING KEY PARTIES: TRANSWESTERN + ARLINGTON TRANSPORTATION PARTNERS 10
- ALEXANDRIA, VA: DEVELOPER-LED PARTNERSHIPS..... 11**
 - REGION: MID-ATLANTIC, URBAN SETTING..... 11
 - TYPE: PARTNERSHIP FOR RIDESHARING KEY PARTIES: THE CITY OF ALEXANDRIA + THE CARLYLE COMMUNITY COUNCIL..... 11
- CAMBRIDGE, MA: URBAN ZONING REQUIREMENTS 13**
 - REGION: EAST COAST, URBAN SETTING 13
 - TYPE: ZONING REQUIREMENT FOR PARKING AND TRANSPORTATION DEMAND MANAGEMENT (PTDM) KEY PARTY: CITY OF CAMBRIDGE, MA 13
- DALLAS, TX: URBAN ZONING REQUIREMENTS..... 15**
 - REGION: SOUTH, URBAN SETTING 15
 - TYPE: ZONING ORDINANCE FOR MICROMOBILITY PARKING SPECIFICATIONS KEY PARTY: CITY OF DALLAS, TX 15
- INDIANAPOLIS, IN: URBAN ZONING REQUIREMENTS 17**
 - REGION: MIDWEST, URBAN SETTING..... 17
 - TYPE: ZONING ORDINANCE FOR MINIMUM PARKING REQUIREMENTS 17
 - KEY PARTY: CITY OF INDIANAPOLIS, IN..... 17
- LOS ANGELES, CA: URBAN DATA SHARING PARTNERSHIP 19**
 - REGION: WEST COAST, URBAN SETTING 19
 - TYPE: DATA SHARING STANDARD (MDS) 19
 - KEY PARTIES: CITIES OF LOS ANGELES, CA (LEAD), SAN FRANCISCO, CA, SEATTLE, WA, AND AUSTIN, TX..... 19
- LOUISVILLE, KY: URBAN DOCKLESS VEHICLE POLICY..... 23**
 - REGION: SOUTH, URBAN SETTING 23
 - TYPE: DOCKLESS VEHICLE POLICY KEY PARTY: LOUISVILLE, KY METRO PUBLIC WORKS AND ASSETS..... 23
- SEATTLE, WA: URBAN DOCKLESS VEHICLE POLICY..... 25**
 - REGION: WEST COAST, URBAN SETTING 25
 - TYPE: PARKING SUBSTITUTION AND CARSHARING PERMIT PROGRAMS KEY PARTY: CITY OF SEATTLE, WA..... 25
- WASHINGTON, DC: URBAN PUBLIC-PRIVATE PARTNERSHIPS 28**
 - REGION: MID-ATLANTIC, URBAN SETTING..... 28
 - TYPE: PARTNERSHIP FOR RIDESHARING KEY PARTIES: HOWARD UNIVERSITY HOSPITAL, UNITED MEDICAL CENTER, THE DC MAYOR’S OFFICE, THE DC DEPARTMENT OF FOR-HIRE VEHICLES (DFHV), VIA + TRANSCO..... 28
- POST-COVID CONSIDERATIONS FOR DEVELOPMENT REVIEW + SHARED-USE MOBILITY 29**
- GROVE CITY, OH: PUBLIC-PRIVATE PARTNERSHIPS 30**
 - REGION: MIDWEST, SUBURBAN SETTING..... 30
 - TYPE: PARTNERSHIP FOR MICROTRANSIT KEY PARTIES: CENTRAL OHIO TRANSIT AUTHORITY (COTA), GROVE CITY, MORPC (MID-OHIO REGIONAL PLANNING COMMISSION), MT. CARMEL HOSPITAL + VIA..... 30

About this Report

This report was prepared by Nspiregreen, LLC and Kittelson & Associates, Inc. This work was conducted on behalf of the Baltimore Regional Transportation Board (BRTB) as a task defined in the FY 2020 Unified Planning Work Program.



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Key Federal Transit Agency (FTA) Definitions

The key terms defined below are included in the Federal Transit Agency (FTA)'s [regulations and guidance](#) for shared-use mobility, and were last updated on February 28, 2020.

Term	Meaning
Bikesharing	Short-term bike rental, usually for individual periods of an hour or less over the course of a membership (periods which can range from a single ride, to several days, to an annual membership). Information technology-enabled public bikesharing provides real-time information about the location and demand for bikes at docking stations throughout a community. [TCRP Research Report 188]
Carsharing	A service that provides members with access to an automobile for intervals of less than a day. Major carsharing business models include traditional or round-trip, which requires users to borrow and return vehicles at the same location; one-way or free-floating, which allows users to pick up a vehicle at one location and drop it off at another; and peer-to-peer (p2p), which allows car owners to earn money at times when they are not using their vehicles by making them available for rental to other carshare members. [TCRP Research Report 188]
Demand Responsive System or Demand-response System	A system of transporting individuals (other than by aircraft), including the provision of designated public transportation service by public entities and the provision of transportation service by private entities, including, but not limited to, specified transportation service, which is not a fixed route system. [49 CFR 37.3]
Fixed-route system	A system of transporting individuals (other than by aircraft), including the provision of designated public transportation service by public entities and the provision of transportation service by private entities, including, but not limited to, specific public transportation service, on which a vehicle is operated along a prescribed route according to a fixed schedule. [49 CFR 37.3]
Microtransit	IT-enabled private multi-passenger transportation services, such as Bridj, Chariot, Split, and Via, that serve passengers using dynamically generated routes, and may expect passengers to make their way to and from common pick-up or drop-off points. Vehicles can range from large SUVs to vans to shuttle buses. Because they provide transit-like service but on

Term	Meaning
	a smaller, more flexible scale, these new services have been referred to as microtransit. [TCRP Research Report 188]
Mobility on Demand	An integrated and connected multi-modal network of safe, affordable, and reliable transportation options that are available and accessible to all travelers. [FTA Office of Research, Demonstration and Innovation]
Paratransit	Comparable transit service required by the Americans with Disabilities Act for individuals with disabilities who are unable to use fixed route transportation systems. [49 CFR 37.3]
Private shuttles, Employer shuttles, or Tech buses	Corporate, regional, and local shuttles that make limited stops, often only picking up specified riders. [TCRP Research Report 188]
Public transportation	Regular, continuing shared-ride surface transportation services that are open to the general public or open to a segment of the general public defined by age, disability, or low income. Public transportation does not include: intercity passenger rail transportation (provide by Amtrak, or any successor); intercity bus service; charter bus service; school bus service; sightseeing service; courtesy shuttle service for patrons of one or more specific establishments; or intra-terminal or intra-facility shuttle services. [49 USC 5302]
Ridesharing, Carpooling, vanpooling, slugging, or ridesourcing	Ridesharing involves adding passengers to a private trip in which driver and passengers share a destination. Such an arrangement provides additional transportation options for riders while allowing drivers to fill otherwise empty seats in their vehicles. Traditional forms of ridesharing include carpooling and vanpooling. This term is sometimes used to refer to ridesourcing. [TCRP Research Report 188]
Ridesourcing, Transportation network company (TNC), ridesharing, or e-hailing	Use of online platforms to connect passengers with drivers and automate reservations, payments, and customer feedback. Riders can choose from a variety of service classes, including drivers who use personal, non-commercial, vehicles; traditional taxicabs dispatched via the providers' apps, and premium services with professional livery drivers and vehicles. Ridesourcing has become one of the most ubiquitous forms of shared mobility. [TCRP Research Report 188]
Ride-splitting, Dynamic carpooling	A type of ridesourcing that allow customers requesting a ride for one or two passengers to be paired in real time with others traveling along a similar route. [TCRP Research Report 188]

Term	Meaning
Shared-Use Mobility, Shared mobility	Transportation services that are shared among users, including public transit; taxis and limos; bikesharing; carsharing (round-trip, one-way, and personal vehicle sharing); ridesharing (car-pooling, van-pooling); ridesourcing; scooter sharing; shuttle services; neighborhood jitneys; and commercial delivery vehicles providing flexible goods movement. [TCRP Research Report 188]
Specified public transportation	Transportation by bus, rail, or any other conveyance (other than aircraft) provided by a private entity to the general public, with general or special service (including charter service) on a regular and continuing basis. [49 CFR 37.3]

International Best Practices and Resources

Best practices in shared-use mobility policy are based on the findings of key recent international and domestic reports, including:

- **APA:** The American Planning Association's quarterly Planning Advisory Service report, [PAS 583: Planning for Shared Mobility](#) (2018)
- **TRB:** The Transportation Research Board's National Cooperative Highway Research Program report, [NCHRP 924: Foreseeing the Impact of Transformational Technologies on Land Use and Transportation](#) (2019)
- **WB:** The World Bank Group's Sustainable Mobility for All (SuM4All) Initiative has developed a series of Global Roadmap of Action toward Sustainable Mobility reports since 2016, including on the [Contribution of the Private Sector](#) (WB PS) and on [Universal Rural Access](#) (WB Rural). Additional online resources include:
 1. **A [collaborative stakeholder map](#)** of global transport stakeholders by objective, sector, organization type, region and sustainable development goals.
 2. **An interactive online scorecard** featuring an interactive catalogue of [182 policy measures](#), a global dashboard of [performance metrics](#) and a [customizable action plan](#) tool to achieve sustainable mobility. These tools are based off of an international [ranking system](#) for 183 countries.
 3. **A chart and report on [international agreements](#)**, commitments and partnerships for sustainable transportation.

Taken together, these institutional policy documents shed light on the following four best practices for incentivizing shared-use mobility through the development review process:

1. **Capacity Building:** Ensure staff has **access to expertise** (either in-house or through external sources) about the new technologies
2. **Flexibility:** Update plans and the language used in its regulations to make them "technology agnostic" so that they can be **applied more quickly and flexibly** as new technologies and applications arise
3. **Adaptability:** Promote a **nimble response** to new technologies as they hit the streets.
4. **Data Sharing:** Bring **new data sources** into the planning processes

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WORLD BANK GROUP

Reaching Consensus on Best Practices

The intersections between policy guidance at a domestic and international scale are summarized in the chart below:

Best Practice	Policy	Source
Data Sharing	<ul style="list-style-type: none"> • Data from the connection of shared mobility systems and smartphone applications helps local agencies: <ul style="list-style-type: none"> ○ Incorporate insight into local transportation planning and operations activities ○ Access travelers' behaviors ○ Understand how these innovative modes can help fill gaps in the transportation system. 	APA
	<ul style="list-style-type: none"> • To keep up with current technology, a public agency needs to reach out to a broader range of divisions within the same agency with technical expertise. <ul style="list-style-type: none"> ○ For private sector input, one approach is to go to the various private-sector trade groups. 	TRB
	<ul style="list-style-type: none"> • Different actors from both the mobility and digital industries should be considered. 	WB PS
Capacity Building	<ul style="list-style-type: none"> • The emergence of new mobility solutions requires building up new skills and abilities, both in the public and private sectors 	WB PS
	<ul style="list-style-type: none"> • Capacity building activities should be generally conducted through existing national or regional institutions. 	WB Rural
	<ul style="list-style-type: none"> • Public agencies should invest in personnel and other resources to manage and present data for agency use and consider: <ul style="list-style-type: none"> ○ Hiring an additional staff person who has the necessary expertise ○ Sending existing staff out for the necessary training ○ Hiring an on-call consultant ○ Establishing a PPP or an MOU/MOA with a private partner 	APA, TRB
Flexibility	<ul style="list-style-type: none"> • Policy approaches that support shared mobility, including the provision of public rights-of-way and incentive-based zoning, are a few ways that urban planners can encourage shared mobility in their communities. • Document of social and environmental impacts should be collected whenever possible. 	APA

	<ul style="list-style-type: none"> • The unique challenge of transformational technologies is to word the regulations in a way that they can continue to deliver the agency’s desired results (e.g. mobility, equity and safety) even as new technologies come out. • The language of regulations should attempt to be performance oriented, as opposed to targeting a specific technology. 	TRB
	<ul style="list-style-type: none"> • Setting technology-neutral goals is important because it helps avoid premature strategic choices, potentially leading to lock-in situations. 	WB PS
Adaptability	<ul style="list-style-type: none"> • Public-private data-sharing partnerships provide an opportunity for government agencies to help aid in infrastructure planning and investment and provide operational analysis and feedback. <ul style="list-style-type: none"> ◦ This can quickly help address activities such as congestion mitigation and emergency response. 	APA
	<ul style="list-style-type: none"> • Adopting flexible policies and plans and careful crafting of the language used in proposed regulations can help agencies adapt more quickly as technology changes and new applications show up on the street. • The agency should be prepared to frequently review and adapt its plans and procedures to keep up with rapidly changing conditions. 	TRB

Arlington, VA: Developer-led Partnerships



Region: Mid-Atlantic, Urban Setting

Type: Partnership for Ridesharing

Key Parties: Transwestern + Arlington Transportation Partners

Features	Policy Overview	Best Practices Exemplified
<p>Voluntary Partnership</p>	<ul style="list-style-type: none"> To promote carpooling, Transwestern's property managers partnered with Arlington Transportation Partners to offer Lyft Line credits to their building tenants (located on 3001 and 3003 Washington Boulevard). Property managers conduct an annual survey to determine the commuting trends and preferences of office and residential tenants. These trends are used to determine which transportation benefits to offer each year. 	<ol style="list-style-type: none"> 1. Ensure staff has access to expertise (either in-house or through external sources) about the new technologies 2. Promote a nimble response to new technologies as they hit the streets.
<p>TDM Policy</p>	<ul style="list-style-type: none"> Property managers provided their tenants with a fixed number of Lyft Line credits, which were then raffled off to the tenants' employees. <ul style="list-style-type: none"> Tenants can carpool for free anywhere within 3 miles of the building, including popular destinations like the DCA airport and the Pentagon. Carpools and vanpools are offered free, reserved parking and have been given preloaded gas cards. Bicyclists have 27/7 access to lockers and bike cages and have been given free bikeshare memberships in addition to transit passes 	<ol style="list-style-type: none"> 3. Update plans and the language used in its regulations to make them "technology agnostic" so that they can be applied more quickly and flexibly as new technologies and applications arise
<p>Policy Outcomes</p>	<ul style="list-style-type: none"> At Transwestern's two properties, which are both 95% occupied, "every tenant jumped on the opportunity to maximize their Lyft codes." "Each year, we come up with different initiatives to make this a better place to work, a better place to travel, a better place to be." - Transwestern's General Manager, Martin Flanigan 	<ol style="list-style-type: none"> 4. Bring new data sources into the planning process

Featured in: This 2019 [Champions video](#), [Champions profile](#) and [fact sheet](#) from Arlington Transportation Partners

Photo Credit: Arlington Transportation Partners

Alexandria, VA: Developer-led Partnerships



Region: Mid-Atlantic, Urban Setting

Type: Partnership for Ridesharing

Key Parties: The City of Alexandria + the Carlyle Community Council

Features	Policy Overview	Best Practices Exemplified
<p>Voluntary Partnership</p>	<ul style="list-style-type: none"> The Carlyle Community Council, which serves approximately 14,000 employees and 2,200 residents, manages an on-site Transportation Management Program. <ul style="list-style-type: none"> It works closely with the City of Alexandria's GO Alex program to provide commuting choices that reduce traffic and emissions and improve quality of life. It maintains and oversees security of the Duke Street Pedestrian Tunnel, which connects the neighborhood to the King Street Metro Station, and hosts a pit stop for the regional Bike to Work Day. The group conducts an annual survey of its stakeholders to gain feedback on improvements to its programs and services. 	<ol style="list-style-type: none"> Ensure staff has access to expertise (either in-house or through external sources) about the new technologies Promote a nimble response to new technologies as they hit the streets.
<p>TDM Policy</p>	<ul style="list-style-type: none"> Employees and residents within the council district have access to: <ul style="list-style-type: none"> Zimride Ridesharing, an online ride-matching service connecting riders and passengers Smart Benefits for transit and vanpool commutes Free shuttle service every 10 minutes from 6 – 9:30 am and 3 – 6:30 pm to King Street Metro Station, the Amtrak/Virginia Railway Express at Union Station and several residential and commercial buildings 	<ol style="list-style-type: none"> Update plans and the language used in its regulations to make them "technology agnostic" so that they can be applied more quickly and flexibly as new technologies and applications arise

**Management
+ Oversight**

- A Transportation Management Program (TMP) Coordinator staffs an **office on-site** to easily:
 - **Distribute** program information
 - **Assist employers 1:1** in developing shared-use mobility policies and programs for their employees
 - **Coordinate** with and promote policies and programs with municipal and regional transit authorities
 - **Facilitate** and promote bikesharing and bicycling as a commuting alternative

4. *Bring **new data sources** into the planning process*

Featured in: the 2013 City of Alexandria, VA's staff report on [Transportation Management Plan Special Use Permits](#) in the zoning [code](#), and in the Carlyle Community Council's current [Transportation Options](#) webpage

Photo Credit: Carlyle Council / Facebook

Cambridge, MA: Urban Zoning Requirements



Region: East Coast, Urban Setting

Type: Zoning Requirement for Parking and Transportation Demand Management (PTDM)

Key Party: City of Cambridge, MA

Features	Policy Overview	Best Practices Exemplified
<p>History and Extent</p>	<ul style="list-style-type: none"> Cambridge's Parking and Transportation Demand Management (PTDM) Ordinance was first adopted in 1998 and, after monitoring, evaluation and community input, made permanent in 2006. The PTDM zoning requirement applies to all non-residential property owners who propose to add parking (for small projects, with 5-19 total parking spaces, and for large projects, with 20 or more total parking spaces). <ul style="list-style-type: none"> Today, PTDM projects now cover the commuting activities of nearly 40,000 employees (or 30% of all employees in Cambridge, MA) and approximately 10,000 students in graduate and primary school. 	<ol style="list-style-type: none"> Ensure staff has access to expertise (either in-house or through external sources) about the new technologies Promote a nimble response to new technologies as they hit the streets.
<p>Zoning Policy</p>	<ul style="list-style-type: none"> All PTDM projects must commit to a 10% reduction from 1990 levels of single-occupied vehicles (SOVs), based on Census Tract Journey to Work data or other baseline measures for non-employee groups. Bi-annual occupancy counts of driveway ins/outs, car parking and bicycle parking is required of large facilities to confirm the validity of their annual modal-split surveys of employees, visitors and/or patrons single-occupancy vehicle (SOV) rate. <ul style="list-style-type: none"> Monitoring and reporting requirements begin approximately one year after the new facility is occupied to show whether the mode-split targets have been achieved. Prior to zoning code enforcement, city staff engages property owners to develop additional reasonable PTDM measures to promote non-single-occupancy vehicle (SOV) travel in a mutually cooperative process. 	<ol style="list-style-type: none"> Update plans and the language used in its regulations to make them "technology agnostic" so that they can be applied more quickly and flexibly as new technologies and applications arise

	<ul style="list-style-type: none"> • Large projects' PTDM Plans include: <ul style="list-style-type: none"> • A commitment for a numeric reduction in the percent of people accessing the project via single occupant vehicle (SOV). • The implementation of TDM measures, which include sponsoring a bikeshare station, subsidizing bikeshare memberships and providing real-time transit information screens. • Small Project PTDM Plans include: <ul style="list-style-type: none"> • A commitment to implement at least three TDM measures which are not subject to the annual reporting requirements of large projects. 	
Policy Outcomes	<ul style="list-style-type: none"> • PTDM mode-split surveys had response rates of 60% or greater from large projects in 2018. • Thirty-six of the monitored projects, or 88%, met their PTDM mode-split commitments for 2018. • Projects meeting their mode-split commitments all showed lower SOV driving rates than projected. • The 5 projects that did not meet their mode-split commitments in 2018 have agreed to make progress towards their PTDM goals. Factors contributing to these mode-split challenges included: <ul style="list-style-type: none"> ○ Properties with an excess or over-supply of parking spaces had an imbalance in their employee-to-parking space ratio. ○ Properties developed at least a half-mile from rapid transit had higher rates of single-occupancy vehicle use compared to other large projects surveyed in 2018. 	4. <i>Bring new data sources into the planning process</i>

Featured in: this December 2019 [staff report](#) from the City of Cambridge's Transportation and Public Utilities Committee and on the Community Development Department's [current website](#).

Photo Credit: Marek Slusarczyk / Alamy Stock Photo

Dallas, TX: Urban Zoning Requirements



Region: South, Urban Setting

Type: Zoning Ordinance for Micromobility Parking Specifications

Key Party: City of Dallas, TX

Features	Policy Overview	Best Practices Exemplified
<p>History</p>	<ul style="list-style-type: none"> Dallas' Zoning Ordinance No. 30936, Article X, was adopted in 2018 to amend the “Streets and Sidewalks” provision of the legal code to permit and regulate dockless vehicles. 	<ol style="list-style-type: none"> Ensure staff has access to expertise (either in-house or through external sources) about the new technologies Promote a nimble response to new technologies as they hit the streets.
<p>Zoning Policy</p>	<ul style="list-style-type: none"> Safety requirements for dockless vehicles: <ul style="list-style-type: none"> Each device must include an identification tag and an active GPS monitoring system. The reimbursement of city expenses incurred to address or abate any ordinance violations. Helmet usage for all minors. Design requirements for dockless vehicles: <ul style="list-style-type: none"> Maintain a minimum width of 48-inches in parking sidewalk clearance, which does not impede vehicle or pedestrian access. Prohibit parking devices on private property without permission of the owner, in areas without sidewalks or where sidewalks are less than 96 inches in width. Ban of parking devices within five feet of a crosswalk or curb ramp and in ways that impede or interfere with other modes, building entryways, and Americans with Disabilities Act (ADA) access. Accommodate a “wide range of users” within their dockless vehicle fleet. 	<ol style="list-style-type: none"> Update plans and the language used in its regulations to make them “technology agnostic” so that they can be applied more quickly and flexibly as new technologies and applications arise

	<ul style="list-style-type: none"> • Maintain a 24-hour hotline for customer service, advertised on every vehicle, and maintain a staffed operations center. • Adhere to any municipal parking zones for dockless devices delineated with paint or decals 	
Policy Outcomes	<ul style="list-style-type: none"> • Within approximately a month of implementing the ordinance, all but two dockless bikesharing companies left Dallas with an estimated total of 3,500 bicycles. • During this same timeframe, one new electric scooter sharing company entered the market and one dockless bikesharing company began transitioning its fleet to scooters. 	<p>4. Bring new data sources into the planning process</p>

Featured in: this April 2019 [policy toolkit](#) from researchers at UC Berkeley as well as the City of Dallas' [current website](#) and [zoning code](#).

Photo Credit: Klyde Warren Park

Indianapolis, IN: Urban Zoning Requirements



Region: Midwest, Urban Setting

Type: Zoning Ordinance for Minimum Parking Requirements

Key Party: City of Indianapolis, IN

Features	Policy Overview	Best Practices Exemplified
<p>History</p>	<ul style="list-style-type: none"> The City of Indianapolis updated their Consolidated Zoning and Subdivisions Ordinance, Section 3, in August 2019 to include new provisions to reduce minimum parking requirements as part of a larger citywide rezoning effort started in 2015. 	<ol style="list-style-type: none"> Ensure staff has access to expertise (either in-house or through external sources) about the new technologies Promote a nimble response to new technologies as they hit the streets.
<p>Zoning Policy</p>	<ul style="list-style-type: none"> Developers can reduce their minimum parking requirements by up to 35% through implementing transportation demand management (TDM) strategies, specifically: <ul style="list-style-type: none"> 4 off-street parking space reductions for each shared vehicle, carpool, or vanpool space provided. Each shared space counts toward the minimum number of required parking spaces. 2 off-street parking space reductions for each electric-vehicle charging station provided. Each charging station counts toward the minimum number of required parking spaces. 1 to 5 off-street space parking reductions for every five bicycle parking spaces provided in excess of the required bicycle parking spaces (or where no bicycle parking is required). 30% reduction in off-street parking requirements if the developer builds within a quarter-mile of a sheltered public transit stop or corridor. 	<ol style="list-style-type: none"> Update plans and the language used in its regulations to make them “technology agnostic” so that they can be applied more quickly and flexibly as new technologies and applications arise

	<ul style="list-style-type: none"> • 10% reduction in off-street parking requirements if the development is between a quarter-mile to a half-mile of a transit stop or corridor. 	
Policy Outcomes	<ul style="list-style-type: none"> • The Department of Public Works annually announces participants and projects through the Indy Neighborhood Infrastructure Partnership, a voluntary partnership of developers, schools and community associations regarding the design and construction of multimodal transportation projects. 	<p>4. Bring new data sources into the planning process</p>

Featured in: this April 2019 [policy toolkit](#) from researchers at UC Berkeley as well as the City of Indianapolis' [current website](#).

Photo Credit: F11 Photo / Adobe Stock

Los Angeles, CA: Urban Data Sharing Partnership



Region: West Coast, Urban Setting

Type: Data Sharing Standard (MDS)

Key Parties: Cities of Los Angeles, CA (lead), San Francisco, CA, Seattle, WA, and Austin, TX

Features	Policy Overview	Best Practices Exemplified
<p>History</p>	<ul style="list-style-type: none"> As of December 2018, ten U.S. cities require operators to provide data using the Mobility Data Specification (MDS): Austin, Detroit, Kansas City, Miami, Minneapolis, Portland, Seattle, San Francisco, Santa Ana, and Santa Monica. <ul style="list-style-type: none"> Denver is also considering requiring operators to use MDS and has worked with operators to identify a data format. In Fall 2018, Detroit announced a partnership with NACTO and Shared Streets, a nonprofit developer of tools for transport data, to pilot a new standard for real-time dockless mobility data using data from Lime and Bird. 	<ol style="list-style-type: none"> Ensure staff has access to expertise (either in-house or through external sources) about the new technologies Promote a nimble response to new technologies as they hit the streets.
<p>Zoning Policy</p>	<ul style="list-style-type: none"> MDS is a data and API standard that allows the city to gather, analyze, and compare real-time and historical data from shared mobility service providers. <ul style="list-style-type: none"> MDS includes data on: mobility trips (and routes), location and status of equipment (e.g. available, in-use, and out-of-service), and service provider coverage areas. The specification also serves as a measurement tool that helps enable enforcement of local regulations, which can be shared between public agencies. 	<ol style="list-style-type: none"> Update plans and the language used in its regulations to make them “technology agnostic” so that they can be applied more quickly and flexibly as new technologies and applications arise
<p>Policy Outcomes</p>	<ul style="list-style-type: none"> The City of Los Angeles has established five short-term and long-term policy goals and actions for MDS. Goal #1: Build a solid data foundation <ul style="list-style-type: none"> Short-Term Actions (0–2 years): 1. Inventory available data. 2. Create 	<ol style="list-style-type: none"> Bring new data sources into the planning process

- a wish list for other data sets and prioritize. 3. Implement a data analysis **bench contract** and grow internal analytics capacity. 4. Develop a roadmap for new data resources.
 - Mid-Term Actions (3–5 years): 1. Make the data easier to use with **data dictionaries** and other tools. 2. Adopt APIs [application programming interfaces] + other tools to **streamline sharing**.
 - Long-Term Actions (6+ years): 1. Leverage data to manage a more flexible transportation system with **public and private** service providers.
 - Goal #2. Leverage tech plus design for a better transportation experience
 - Short-Term Actions (0–2 years): 1. **Code the curb** to optimize access. 2. Develop **customer-centered** requirements for public services. 3. Integrate **real-time data** and tech into urban design and planning processes. 4. Publish data on **EV charging** station locations. 5. Advance **fleet conversion** to greener fuel.
 - Mid-Term Actions (3–5 years): 1. Create a **unified wayfinding** program. 2. **Route transit** by demand where suitable. 3. Expand **ExpressPark** citywide. 4. Introduce a portal for employers to manage **transit benefits**.
 - Long-Term Actions (6+ years): 1. Create a **universal fare** system for Los Angeles.
 - Goal #3. Create partnerships for more shared services
 - Short-Term Actions (0–2 years): 1. Develop a shared mobility action plan. 2. Form a multi-discipline mobility **assessment team**. 3. Designate an **innovation pilot** project manager.

- Mid-Term Actions (3–5 years): 1. Bring **sharing to City Hall** through car sharing, bike sharing, and carpooling platforms. 2. Launch a **mobility lab**.
 - Long-Term Actions (6+ years): 1. Implement mobility-as-a-service [**MaaS**].
- Goal #4. Establish feedback loops for services and infrastructure
 - Short-Term Actions (0–2 years): 1. Create a user experience **working group**. 2. Investigate new tools for the **ongoing evaluation** of infrastructure conditions. 3. Engage the **entire community** on infrastructure condition assessments. 4. Partner and support a **marketing** campaign on shared mobility.
 - Mid-Term Actions (3–5 years): 1. Streamline LADOT **online content** and launch a project **dashboard**. 2. Prepare the **workforce** for changes driven by innovation in transportation technology. 3. Adopt a **multimodal smart fare** system.
 - Long-Term Actions (6+ years): 1. Develop a methodology to move towards infrastructure-as-a-service [**IaaS**].
- Goal #5. Prepare for an automated future.
 - Short-Term Actions (0–2 years): 1. Develop a **business plan** for a city-owned automated fleet. 2. Create a **dedicated staff** position focused on connected and fully autonomous vehicle technologies. 3. Implement **blind spot detection** systems for public transit vehicles. 4. Expand City of LADOT connected bus technologies fleet-wide. 5. Invest in lane markings that enhance effectiveness of lane departure **warning and prevention** systems.
 - Mid-Term Actions (3–5 years): 1. Create better access to ATSAC

(central traffic control system) data and enhance **transparency** of network prioritization for planning. 2. Develop a fully autonomous vehicle road network along transit and enhanced vehicle networks. 3. Launch a data-as-a-service [**Daas**] program to provide real-time infrastructure data to connected vehicles.

- Long-Term Actions (6+ years): 1. Convert the public transit vehicle fleet to fully autonomous [AVs].

Featured in: this 2019 [NCHRP 924 Report](#) as well as this April 2019 [policy toolkit](#) from researchers at UC Berkeley.

Photo Credit: Sean Pavone / Shutterstock

Louisville, KY: Urban Dockless Vehicle Policy



Region: South, Urban Setting

Type: Dockless Vehicle Policy

Key Party: Louisville, KY Metro Public Works and Assets

Features	Policy Overview	Best Practices Exemplified
<p>History</p>	<ul style="list-style-type: none"> After the first electric scooters arrived in Louisville, KY as a pilot program in July 2018 for eight scooter operators, a zoning ordinance was established in September 2018. This ordinance regulates electric scooters as well as bikeshare for university students and downtown workers and residents. 	<ol style="list-style-type: none"> Ensure staff has access to expertise (either in-house or through external sources) about the new technologies Promote a nimble response to new technologies as they hit the streets.
<p>Dockless Vehicle Policy</p>	<ul style="list-style-type: none"> Micromobility operators are required to make periodic efforts, at least twice a year, for community outreach and required to inform non-users about proper behavior, including how a non-user may report parking or operations related issues to the company. <ul style="list-style-type: none"> Public safety information campaigns must occur each time the operator's fleet is notably expanded, to be determined by Metro. Education and marketing materials, as well as engagement with low income, minority, non-English speaking, and zero-car populations is strongly preferred Micromobility operators must make a good-faith effort to provide non-smart phone options to access the system. Distribution zones are established by the city to ensure that no singular zone is intentionally over-served or underserved. Operators must comply with zone requirements. Two types of parking areas are defined. Dockless vehicles must be deployed before 7:00 am daily and placed in their approved locations: <ul style="list-style-type: none"> A "preferred parking location" which refers to any designated, unmarked 	<ol style="list-style-type: none"> Update plans and the language used in its regulations to make them "technology agnostic" so that they can be applied more quickly and flexibly as new technologies and applications arise

	<p>area to which operators deploy or relocate micromobility.</p> <ul style="list-style-type: none"> • A “Designated Group Parking Areas” (DGPAs) refer to marked areas on the right of way to facilitate the orderly and consistent parking of dockless micromobility devices. 	
<p>Policy Outcomes</p>	<ul style="list-style-type: none"> • Micromobility operators are required to meet quarterly with Metro to discuss their compliance with the zoning ordinance. • Shared data is periodically collected from micromobility operators, including: 1. Point location, 2. Dockless Vehicle identification number, 3. Type of vehicle (standard or electric) and 4. Battery Level (if electric). Micromobility operators also issue a monthly report on the: <ul style="list-style-type: none"> ○ Total number of rides for the previous month, per day and total miles ridden ○ Total number of vehicles in service for the previous month ○ Location and performance of all preferred and designated parking areas ○ Number of vehicles removed from service ○ Operator staffing levels ○ Customer Service Cases, including complaints registered ○ Vandalism Incidents ○ Crash reports (to include injury/fatalities) ○ An aggregated breakdown of customers by gender and age monthly. 	<p>4. Bring new data sources into the planning process</p>

Featured in: this October 2018 [Press Release](#) and [policy guidance](#) from the City of Louisville, KY

Photo Credit: Practical Wanderlust

Seattle, WA: Urban Dockless Vehicle Policy



Region: West Coast, Urban Setting

Type: Parking Substitution and Carsharing Permit Programs

Key Party: City of Seattle, WA

Features	Policy Overview	Best Practices Exemplified
<p>History</p>	<ul style="list-style-type: none"> In 2011, the Seattle city council directed the Seattle Department of Transportation (SDOT) to “set rates to achieve approximately one or two open spaces per block face throughout the day” to ensure that visitors to neighborhood business districts could find a parking spot near their destination. SDOT may “both raise and lower rates in different areas as appropriate to meet the occupancy target.” The City of Seattle also created a pilot program of multimodal transportation mitigation payment program to test new policies in the South Lake Union and the Northgate neighborhoods under the State Environmental Policy Act (SEPA). The Seattle Department of Transportation (SDOT), with consultant assistance, developed this pilot along with the Department of Planning and Development and the Department of Construction and Permits. 	<ol style="list-style-type: none"> Ensure staff has access to expertise (either in-house or through external sources) about the new technologies Promote a nimble response to new technologies as they hit the streets.
<p>Program Policy</p>	<ul style="list-style-type: none"> Parking Substitution Program: Seattle's municipal code allows developers to reduce a development project's required total parking up to five percent by providing parking for a city-recognized carsharing program. The ordinance reduces the number of required spaces by one space for every parking space leased by a carsharing program. Specifically: <ul style="list-style-type: none"> The property owner and the new mobility operator must file an agreement with Seattle and receive approval. The agreement must also be recorded with the deed. (Seattle Municipal Code, § 23.54.020) 15% or a 3 parking space reduction in for every carsharing space for developments with 20 or more parking spaces. 	<ol style="list-style-type: none"> Update plans and the language used in its regulations to make them “technology agnostic” so that they can be applied more quickly and flexibly as new technologies and applications arise

	<ul style="list-style-type: none"> • Up to 40% or a 1.9 space reduction in the required parking for every carpooling space. • Up to 20% or a 6 space reduction for every vanpool purchased or leased by an applicant for employee use (or equivalent vanpool fee purchase by a public agency)(City of Seattle, 2019) • Under the Designated Space Carshare Permit program, carshare operators can apply for a permit that allows vehicles to be parked in designated on-street or private parking areas. Permits cost \$300 annually for unpaid parking spaces or \$3,000 annually for paid parking spaces. • Under the Free-Floating Carsharing Permit program, operators can apply for permits to park vehicles at any legal paid parking space in the city without payment or time restrictions. Each free-floating carsharing permit costs \$1,730 annually. 	
<p>Policy Outcomes</p>	<ul style="list-style-type: none"> • Permit holders for both carsharing programs must meet the following requirements: <ul style="list-style-type: none"> ○ Demonstrate within two years of beginning operations that they serve the entire city: <ul style="list-style-type: none"> ▪ Operators may be requested to provide documentation on the number and location of vehicles) ▪ Annual reports are required on carsharing fleet characteristics, membership (including demographics), and on- and off-street locations ○ Conduct an annual membership survey during the first two months of each permit year and submit the summary results to the city ○ Provide vehicle data to the Transportation Data Collaborative (TDC) at the University of Washington through an API. Data includes point location, vehicle identification numbers, vehicle types, fuel level, and engine type • There has been an 11% reduction in single-occupant vehicle trips since the Seattle's 	<p>4. Bring new data sources into the planning process</p>

Commute Trip Reduction Ordinance (City of Seattle, 2017).

- In 2019, downtown Seattle only had **26% driving-alone** commuters, representing a growth of 6,000 new drivers from 2010-2019, compared to more than 82,000 new commuters from 2010-2019 who took alternative modes (transit (46%), carpooling and vanpooling (9%), walking (7%), telework (6%), and bicycling (3%)).
- Since 2010, **triple the amount** of employees now work **remotely or shifted** their schedules to avoid peak-hour commutes (6% of downtown Seattle commuters surveyed in 2019).

Featured in: this [chapter](#) of “Parking and the City” by Dr. Donald Shoup (UCLA), this 2019 commuter survey, this 2015 [TIGER Grant](#) request for the Northgate neighborhood, and the [city website](#) on parking and carsharing.

Photo Credit: Practical Wanderlust

Washington, DC: Urban Public-Private Partnerships



Region: Mid-Atlantic, Urban Setting

Type: Partnership for Ridesharing

Key Parties: Howard University Hospital, United Medical Center, the DC Mayor’s Office, the DC Department of For-Hire Vehicles (DFHV), Via + Transco

Features	Policy Overview	Best Practices Exemplified
<p>Voluntary Partnership</p>	<ul style="list-style-type: none"> In response to the COVID pandemic, the Mayor’s office partnered with the Department of For-Hire Vehicles (DFHV), Via and Transco, to expand the DC Neighborhood Connect app to include the entire District, Prince George’s County and part of Montgomery County, MD. <ul style="list-style-type: none"> Before the pandemic, this microtransit service only served Wards 4,5 and 8 in Washington, DC. 	<ol style="list-style-type: none"> Ensure staff has access to expertise (either in-house or through external sources) about the new technologies Promote a nimble response to new technologies as they hit the streets.
<p>Ridesharing Policy</p>	<ul style="list-style-type: none"> Health care workers pay a \$3 flat-rate off-peak fare for rides in one of 11 microtransit vehicles between 9:00 pm and 1:00 am <ul style="list-style-type: none"> Public transit options during these hours were already limited and have been reduced further during the COVID pandemic. To allow for social distancing, there is a maximum of 3 passengers per ride. Corner pickups allow for quick and efficient shared trips without any detours, fixed routes or schedules. <ul style="list-style-type: none"> Health care workers enter a ride code provided by their hospital using the D.C. Neighborhood Connect app (iOS and Android) from their smartphone. 	<ol style="list-style-type: none"> Update plans and the language used in its regulations to make them “technology agnostic” so that they can be applied more quickly and flexibly as new technologies and applications arise
<p>Policy Outcomes</p>	<ul style="list-style-type: none"> “We fully support Mayor Bowser’s actions to provide safety guidelines that enable critical transportation for those dedicated individuals doing essential work. We are excited about the expansion of this transportation option with Via to serve those who are providing essential medical services and care to District residents.” - DFHV Director, David Do 	<ol style="list-style-type: none"> Bring new data sources into the planning process

Post-COVID Considerations for Development Review + Shared-Use Mobility

Microtransit Expansions	Washington, DC expanded its Via and Transco services into more neighborhoods	LA Metro expanded its Via service area to include medical centers, grocery stores and pharmacies, and instituted only solo rides to promote physical distancing
Dockless Mobility Implications	Spin launched a free 30-minute ride program for essential workers in Washington, DC and Detroit, MI	In Baltimore, the locations where dockless vehicles traveled shifted dramatically from the central business district to locations near hospitals and along rail transit routes

Covid-19 has had mixed impacts on New Mobility and Shared Mobility. Reduced comfort with public transportation during the pandemic has undoubtedly shifted some trips from buses and trains to dockless scooters and bikes, as well as to ride hailing services and microtransit vehicles. This has not, however, completely offset the loss of revenue from the overall decrease in travel. This revenue reduction has resulted in several mergers and acquisitions, notably Lime and Jump merging.

The pandemic conditions have revealed some strengths of the modes – space efficiency without the close quarters of transit – and some vulnerabilities in the business models. While the privacy implications are still hotly debated, it is also potentially possible that the app-based nature of the services could allow for contact tracing, should a microtransit or TNC user contract the virus.

Grove City, OH: Public-Private Partnerships



Region: Midwest, Suburban Setting

Type: Partnership for Microtransit

Key Parties: Central Ohio Transit Authority (COTA), Grove City, MORPC (Mid-Ohio Regional Planning Commission), Mt. Carmel Hospital + Via

Features	Policy Overview	Best Practices Exemplified
<p>Voluntary Partnership</p>	<ul style="list-style-type: none"> Central Ohio Transit Authority (COTA) has partnered with Grove City, MORPC (Mid-Ohio Regional Planning Commission), Mt. Carmel Hospital, and Via to launch an on-demand microtransit service, COTA Plus. <ul style="list-style-type: none"> COTA Plus' 1-year pilot had a reported startup cost of \$360,000. Soft launch by Mayor and COTA, including a demonstration with lawmakers and Mt. Carmel hospital staff before launching a paid marketing campaign. The COTA Plus partnership was spurred by Columbus, OH winning the US Department of Transportation's Smart City Challenge in 2016. 	<ol style="list-style-type: none"> 1. Ensure staff has access to expertise (either in-house or through external sources) about the new technologies 2. Promote a nimble response to new technologies as they hit the streets.
<p>Microtransit Policy</p>	<ul style="list-style-type: none"> Microtransit pilot has enabled access to Southpark Industrial Park, Mid-Ohio Foodbank, Mt. Carmel Hospital, businesses on SR 665 in conjunction with a recent COTA bus expansion. <ul style="list-style-type: none"> Expansions of the microtransit zone and funding partnerships are planned The six-passenger vehicles are operated by COTA drivers and can be used to connect passengers with any destination of their choice within the program service area (for a base fare of \$3) or designated COTA transit lines (for free). <ul style="list-style-type: none"> With an average 7-minute wait time, rides can be reserved via an app or phone call. Weekly or daily passes are available, with reduced fare options. <ul style="list-style-type: none"> Vouchers for hospital staff are being considered. 	<ol style="list-style-type: none"> 3. Update plans and the language used in its regulations to make them "technology agnostic" so that they can be applied more quickly and flexibly as new technologies and applications arise

	<ul style="list-style-type: none"> • Discounted fares available for seniors, and free fares are available for COTA transfers, students and children. • COTA Plus' microtransit app was designed with future integration with Smart Columbus' multimodal transit app in mind, which could happen as early as 2020 or 2021. <ul style="list-style-type: none"> • WiFi and outlets are available in buses. • Grove City's current population of 42,403 residents and 1,200 businesses is projected to grow by 1,000,000 by 2050 	
Policy Outcomes	<ul style="list-style-type: none"> • Nearly 30-35 trips per day, more than 1,000 downloads of app and 600+ accounts in a city of 42,403 people <ul style="list-style-type: none"> ◦ More than 1,500 rides between July 15- November 1, 2019 • A 4.9-star rating, over 3 million total impressions through marketing campaign and 7,528 clicks. • "There is increased demand for greater mobility options across many of our Central Ohio communities, including Grove City." <ul style="list-style-type: none"> - COTA President and CEI Joanna M. Pinkerton 	4. <i>Bring new data sources into the planning process</i>

Featured in: this 2019 [presentation](#) to the regional planning commission by the local COTA transit authority and also in this 2019 State Scoop [blog](#) post. A summary of COTA's transit expansion prior to the implementation of this microtransit pilot is summarized in this 2018 [report](#) on improving mobility in the capital region by the Greater Washington Partnership. Photo Credit: Indian Trails Neighborhood Watch