

REGIONAL POTENTIAL FOR NEW AND SHARED MOBILITY

CONTEXT SPECIFIC CASE STUDIES



**BALTIMORE
METROPOLITAN
COUNCIL**



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TECHNICAL TEAM



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INTRODUCTION

The BMC Region

The Baltimore Metropolitan Council (BMC) convenes the local governments of a seven County/jurisdiction area that is home to a wide variety of land uses and scales of density. The Baltimore Regional Transportation Board (BRTB) is the Metropolitan Planning Organization (MPO) for the Baltimore region and has undertaken this research effort to understand how and if new and shared mobility services can be addressed in the development review processes to ameliorate or avoid negative impacts on the transportation systems in the region.

The region has a dense urban core in Baltimore City that is experiencing redevelopment as well as suburban town centers that are beginning to evolve into their next iterations. In addition, there are major campuses of universities, private organizations, and Federal Installations. The region is ringed by more rural places, often centered around small towns or commercial centers.

This document compiles case studies related to New Mobility/Shared Mobility and its potential within several of the region's contexts; these contexts were identified in partnership with the BRTB Technical Committee. Each of these contexts is experiencing development, redevelopment, or change in a different way. These case studies seek to provide insight as to how regulations, programs, and the development review process might change to help align the arrival or expansion of New Mobility/Shared Mobility services and modes with public goals. A separate Best Practices memo was also prepared, which compiles exemplary New Mobility/shared Mobility related policies from around the country, and summarizes the consensus State of the Practice research. In this document, "best practices" refer to practices that may be beneficial to adopt in the regionally-relevant contexts discussed in these case studies.

This effort attempted to consider a broad cross-section of contexts so that value could be provided across the region and not just in the more densely populated jurisdictions. The technical committee selected the following four contexts for case studies:

- Rural Areas and their Small Towns
- Suburban Town Centers
- Secured Industrial/Government Campuses/Facilities
- Urban Redevelopment Sites

Case Study Format

Each case study is composed of three sections:

- An overview of what is generally occurring with regards to New Mobility/Shared Mobility in each context
- A Description of the generalized state of the practice for incorporation of New Mobility/Shared Mobility in each of the case study contexts.
- A discussion of best practices for how developers provide or are required to provide New Mobility/Shared Mobility services or infrastructure through the development review process.
 - The purpose of the development-review-focused best practices section is to identify specific elements that developers are offering or that local governments are requiring of developers. Developers are often providing various New Mobility/Shared Mobility amenities not required by the development review process in order to better position their properties for financial success. We note specific examples where appropriate. We also note best practices for New Mobility/Shared Mobility requirements from local governments. These often are addressed through the development review or permitting process.
- A discussion of best practice actions that local governments can take to advance New Mobility/Shared Mobility outside the development review process.
 - This section focuses on local government actions that can encourage New Mobility/Shared Mobility practices, we note various policies, regulatory frameworks, operational principles, and infrastructure investments that can facilitate New Mobility/Shared Mobility. These efforts do not focus on the development review process but often do address some issues that are a major consideration in development review such as the required parking ratios.

Both best practices sections focus on practice-leading efforts and build from the general state of the practice articulated in the initial section of each case study.

RURAL AREAS

Rural areas, characterized by low-density development such as small commercial centers, subdivisions, and large parcels of farmland or industrial development, are not typically associated with New Mobility/Shared Mobility. The private automobile is the predominant mode of transportation and fixed route transit is often limited or may even be non-existent in this context. However, many rural areas are exploring shared mobility options and new technology to enhance these options as methods for increasing access to transportation in their communities. Rural areas within the Baltimore Metropolitan Council region include parts of Harford, Queen Anne's (Kent Island, Queenstown) Baltimore, Carroll, Howard, and Anne Arundel Counties.

New Mobility/Shared Mobility in this Context

Most types of New Mobility and Shared Mobility are not well adapted to the lower density and longer distances between destinations in rural settings. However, this section highlights some examples of the types of new and shared mobility one may find in rural areas across the country.

Carpools and Vanpools

Carpools and vanpools are not new forms of shared mobility, but both remain important, viable, and functional transportation services in rural areas. Many rural areas have access to traditional carpool matching databases at the regional or local levels, but awareness of these databases is often low among the general public. Vanpools programs found in rural areas can include those operated by a public agency, a public-private partnership, private companies, and employer-operated vanpool programs.

Demand Response and Microtransit

Demand response transit, which allows passengers to schedule specific trips in advance or on-demand and be pooled with other riders, may be found in this context; sometimes this service looks similar to vanpool, but microtransit can differ in terms of vehicles used and the public entity that operates it. Traditionally demand response transit operated by public agencies and non-profits require trips to be scheduled 24 hours or more in advance. In many rural areas, access to demand response transit is limited to persons who qualify based on specific



Rural fixed route transit service is often limited

eligibility criteria (e.g., senior citizens, persons with disabilities). Microtransit, an application-based demand response service that provides trips on-demand, has been incorporated or piloted by many types of transit agencies across the country in recent years. In rural contexts, microtransit has replaced fixed route transit in towns. Other transit agencies have transitioned their traditional demand response service to the use of microtransit applications and on-demand service.

Transportation Network Companies (TNCs) and Carshare

The prevalence of TNCs and the availability of carsharing, where members can use an app to rent a vehicle, is sporadic throughout rural settings in the United States. TNCs may only be used as a first-mile/last-mile connection to transit and often have long wait times, if they are operating in the context at all. Carsharing in rural regions may be facilitated through a variety of independent, community programs or through the private sector.

How Developers and

the Development Review Process Can Support New/Shared Mobility

Rural jurisdictions utilize several tools to include new and shared mobility in the development review process, both in the short-term and long-term. The tools to introduce and implement new and shared mobility options may be related to permitting, zoning, and other governing plans, site plan and development review, Smart Growth initiatives, larger regional goals, and requests made of developers while facilitating a dialogue with developers on required or voluntary efforts they may be willing to undertake. To the extent possible, the role of New Mobility/Shared Mobility should be considered in all development-related plans and all plans should be in sync. However, all efforts to advance New Mobility/Shared Mobility in the rural context should be context-sensitive, filling gaps in the transportation network to create a robust, multi-modal transportation system.

Zoning Requirements

Local governments can utilize the zoning process to gain needed New Mobility/Shared Mobility improvements. Depending on local land use plans, zoning requirements, and the type of development envisioned, local governments can enact specific New Mobility/Shared Mobility guidelines or requirements for Planned Unit Developments (PUDs), master-planned communities, or concurrency requirements (and any subsequent lift on any development moratoria through the developer payment of mitigation fees), or development in Maryland's Priority Funding Areas (PFAs). While PUDs were more typically developed to facilitate large-scale suburban and urban development or re-development, they have been used in many rural areas for the development of large master planned communities. In PUD negotiations local governments can work with developers to identify needed transportation improvements¹, considering the role that specific New Mobility/Shared Mobility options may play in supporting the economic vitality of their PUD. For example, in a mixed-use PUD a developer could consider many of the same options as they would in other land uses contexts, such as providing funding for capital or operations for internal shuttles or microtransit, incorporating the provision of transportation information in new tenant materials and in multi-family and commercial buildings, or contributing to the operations or capital needs of local non-profit or public New Mobility/Shared Mobility operators.

Require Complete, Connected Streets

Many rural communities have implemented design requirements for complete, connected streets, adopted mixed-use zoning for Main Streets, and designated growth centers and growth boundaries. These types

¹ https://www.epa.gov/sites/production/files/documents/essential_smart_growth_fixes_rural_0.pdf



Small Town Commercial Center

of regulations facilitate best practices including connecting to existing active transportation networks near their development and linking development sites to nearby activity centers, as well as supporting localized environments that are conducive to a larger spectrum of New Mobility/Shared Mobility modes. By concentrating future growth and employing the principles of traditional neighborhood design, rural communities are creating environments that are conducive for the incorporation of a variety of New Mobility/Shared Mobility modes.

In Virginia, local governments can utilize the Urban Development Area designation to require complete and connected streets. This designation allows jurisdictions to designate specific areas for future development or re-development in comprehensive plans that are sufficient to meet projected residential and commercial growth in the locality for an ensuing period of at least 10 but not more than 20 years. Development in UDAs must conform to the principles of traditional neighborhood design, including pedestrian-friendly road design and pedestrian connectivity, connection of new local streets with existing streets, mixed use neighborhoods with a variety of housing types including affordable housing, reduction of yard setbacks, and the reduction of street widths and turning radii. UDAs can be recipients of a transfer of development rights from non-developable land.² Rural communities across Virginia have utilized the UDA designation to designate areas for future growth.³

Appropriate Development Siting and Impact Assessment Criteria

Even if new development is not taking place within a designated growth area or PUD, when identifying potential sites for new residential development, developers should consider how site selection will impact future residents and commercial tenants

² <https://law.lis.virginia.gov/vacode/title15.2/chapter22/section15.2-2223.1/>

³ <https://www.vtrans.org/mid-term-planning/InteractVTrans>

transportation access and the role of New Mobility/ Shared Mobility, as well as local planning goals related to the preservation of land from intense development. Site plans for proposed development should consider how to connect to proposed, new, and future developments and transportation infrastructure such as parks and trails.

In addition, local governments can reorient their traffic impact assessment (TIA) guidelines that are typically focused solely on vehicular level of service (LOS) which generally yields wider roads. Jurisdictions could expand metrics to consider VMT, safety, or level of traffic stress for cyclists. Lancaster County, Pennsylvania recently completed Places2040, the county comprehensive plan². According to the plan, Lancaster County is 84% rural. Some of the plan's success metrics including increasing connectivity between new and existing development, increasing commute mode split and transit ridership, and reducing Daily Vehicle Miles Traveled (DVMT)⁴.

Incentives to Support Developer Provision of Service

Developers may also consider making voluntary contributions to non-profit and public New Mobility/ Shared Mobility operators, such as subsidizing or providing carshare memberships for tenants, providing dedicated on-site parking for carshares, and contributing to shuttle, microtransit, or vanpool programs that connect to their property. Multi-family residential or commercial buildings should also be encouraged to provide transportation information on-site, including information on how to use any available transit and New Mobility/ Shared Mobility options.

Strategies to foster developer support for New Mobility/ Shared Mobility may include development incentives, reduced impact fees for the provision of New Mobility/ Shared Mobility and non-SOV transportation amenities, and reductions in project cost by way of reduced automobile parking requirements as applicable. These incentives can apply to new construction, expansion, or proposed infill where the intensity of the new use will increase significantly.

Local Government/ Other Stakeholder Support of New/ Shared Mobility

Public and non-profit entities are active in New Mobility/ Shared Mobility in a rural context and provide an alternative to the private vendors or private vendors operating publicly owned systems commonly found in other land use contexts. To facilitate New Mobility/ Shared Mobility in rural areas, local governments have focused on enhancing publicly supported services such as online ride matching, one-call/one-click centers, and

4 https://static1.squarespace.com/static/554d0185e4b06fc21518e4c2/t/5cae44ca7817f7ca1208ac64/1554924767394/20181025_places2040_full-plan-final_small.pdf

supporting non-profit or publicly owned micromobility, microtransit, and vanpool services. It should be noted that the presence and affordability of broadband may be a limiting factor for these modes, and community-based new models are often designed with these factors taken into consideration.

Publicly Funded Shared Use Mobility

One of the most well-known examples of New Mobility/ Shared Mobility in a rural context is the Needles Car Share program, operated by Victory Valley Transit in partnership with Enterprise, in rural Needles, California. Currently, two vehicles are available at a central location in Needles adjacent to multiple bus stops and near the Needles Amtrak station. The vehicles are available rent at a rate of just \$5 an hour and are intended for to provide access to a car for short trips such as groceries and medical appointments.⁵ Rural bikeshare and scooter share programs found in rural areas are typically owned and operated by non-profits or local jurisdictions. Systems owned by local jurisdictions may be operated by a wide variety of department types, including libraries, health, or parks departments. Athens County Public Libraries in Ohio allows library patrons to checkout bikes for free using their library cards.⁶ In Allen County, KS, another model allows riders to check out bikes for short or long-term rentals with just an ID and a signed waiver. The Allen County effort received initial funding from Blue Cross Blue Shield of Kansas⁷. These models would permit the unbanked or individuals without smartphones to use the system and could be maintained by volunteers or other community organizations.

Mobility Information Consolidation

In addition to the new forms of shared mobility, rural communities are often at the forefront of consolidating information and access to more traditional forms of shared mobility. The Community Transportation Association of America and the Federal Transit Administration toolkit provided several illustrative case studies from across the country on implementing and/or improving one-call/one-click services, which provide a single website or customer hotline where individuals can access information on all of the transportation services in a given community. Pennsylvania's FINDMyRidePA program is a representative example of a one-call/on-click website that provides information on all available transportation options and in some instances, allows visitors to book shared-ride services directly.⁸ The Florida Department of Transportation (FDOT) Rural Vanpool Program is a public-private partnership with COMMUTE with Enterprise, a company that leases vanpools. Through the Rural Vanpool Program, COMMUTE provides vanpools on a month-to-month lease basis for groups of 7 to 15 commuters. The cost the lease includes comprehensive auto liability insurance coverage, preventive maintenance, repairs. For eligible vans originating in 29 of the Florida's rural counties that report monthly trip data to FDOT, the agency provides funding for 50 percent of the cost of the monthly vanpool lease and fuel for each van.

5 <https://vvta.org/flex/needles-car-share/>

6 <https://www.mycpl.org/bikes/>

7 <http://bikeallencounty.org/bike-share/>

8 <https://ctaa.org/ococ-toolkit/>

SUBURBAN TOWN CENTERS

Suburban Town Centers are medium-density suburban areas characterized by a high concentration of activity centers/destinations. Suburban Town Centers are often master planned communities; many of which are increasingly aiming towards gradual urbanization. Other suburban town centers arose around large concentrations of retail (such as large malls), that have attracted other commercial and residential development over the past few decades. Suburban Town Centers are typically found within the larger metropolitan regions and may be a “second city” to the major city anchoring a region. The Baltimore Metropolitan Council’s region includes suburban town centers and major shopping/entertainment centers such as Towson Town Center, Yorktown Plaza in Cockeysville, Downtown Columbia, Arundel Mills, along the Bletway, and at the edges of small towns and municipalities across the region.

New/Shared Mobility in this Context

As Suburban Town Centers attract trips from across broad areas but are often not near urban centers or have access to high-frequency transit, travel by private automobile is typically the mode chosen for trips to and in these environments today. Suburban Town Centers may have commuter rail stations or be within a relatively short distance of commuter rail and have low to medium frequency local bus service. However, access to transit services within walking distance of residential communities and office buildings is relatively rare. New Mobility/Shared Mobility modes have the potential to play a role in directly addressing first mile/last mile access to transit issues, as well as to provide new options for internal trips within the Suburban Town Center environment.

Bikeshare and Scooter Share

Bikeshare has been implemented in suburban contexts, including in the BMC region’s Howard County Bikeshare program in Downtown Columbia. Bikeshare in this context is typically owned by a public agency or non-profit, and funding for the systems may be supported by a range of community sponsors and governmental funding sources. Bikeshare operations are typically provided by a private vendor. Some suburban communities have seen privately owned and operated free-standing bikeshare services introduced on limited basis and to varying degrees of success. Scooter share demand has tended to be very



Columbia Town Center, Photo Credit: FITP

weak in the suburban context and generally has limited availability.

Carshare

Carsharing is predominately found in the nation’s largest cities today, but it is worth considering how carsharing models may fit into future development in Suburban Town Centers in the coming decades. Many of the individuals living or working car-free or car-light in these settings today cannot afford a car. Particularly as many Suburban Town Centers seek to urbanize, providing access to occasional vehicle use will help make it more practical for new residents and workers to forgo bring a private vehicle to these centers.

TNCs

Among all New Mobility/Shared Mobility modes, TNCs are the most likely to be found in suburban town centers and suburban areas today. TNC usage in the late 2010s was concentrated in dense metropolitan areas, and within many of the nation’s largest cities (e.g., Boston, Chicago, Los Angeles, Miami, New York, Philadelphia, San Francisco, Seattle and Washington DC), the use of TNCs was greater than the use of taxis by the end of the decade. However, in suburban areas traditional taxis

remained slightly more used than TNCs¹.

Microtransit

Microtransit, an application-based demand response service that provides trips on-demand, has been introduced in suburban contexts with a variety of goals, from expand the existing transit service areas or enhance coverage of an existing service area, to provide first mile/last mile service to the transit system, and as an alternative service model to fixed route transit in areas with low ridership. A number of transit agencies across the country have partnered with private microtransit providers, both through contracts with full-service microtransit providers that plan and implement systems, and with software-only providers that allow agencies to operate service with their own vehicles and drivers. Transit agencies are increasingly focused on lower density areas that may not be able to well support fixed route service as key candidates for the introduction of microtransit. Some Suburban Town Center developments operate their own on-demand or scheduled shuttle/vanpool service, especially where there's opportunity for a direct connection to regional transit.



Columbia Town Center, Photo Credit: FITP

How Developers and the Development Review Process Can Support New/Shared Mobility

TDM requirements and agreements related to the Planned Unit Development process are typically where developers in Suburban Town Centers are most likely to encounter requirements related to the provision of New Mobility/Shared Mobility. In this context, developers may contribute to capital or operations for New Mobility/Shared Mobility modes (including space for carsharing or pick-up/drop-off zones), subsidize tenants' transit passes or bikeshare or carshare memberships, and fund and ensure transportation information provision on-site, e.g., real-time transit and New Mobility/Shared Mobility information screens. Developers may also be asked to designate curbside pick-up/drop-off space, dedicate safe infrastructure/space for micromobility (especially bikeshare), including connecting residential areas/buildings with activity centers, and designate preferential carpool/vanpool spaces and electric vehicle charging spaces.

Broaden Assessment of Impacts in Development Review Process

The development review process in suburbs, often including Suburban Town Centers unless they are specifically master planned, is often focused on vehicle LOS which tends to focus mitigations on road widenings.

While vehicle traffic is an important consideration in

¹ <http://www.schallerconsult.com/rideservices/automobility.htm>

suburbs, local governments can broaden their review of transportation impacts to also consider connectivity for bicyclists and pedestrians as well as New Mobility/Shared Mobility. Local governments can also add assessment for bicycle and pedestrian access so that these travel modes are on equal ground with vehicle traffic. This approach considers vehicle travel needs while also enabling decisions regarding impacts to be made without only focusing on a single travel mode. The review can also consider the layout of the site. Specific site design elements such as the location of driveways or the inclusion of space for New Mobility/Shared Mobility facilities can play a significant role in determining if and how significant the transportation impacts from a development site might be. Best practices include siting driveways away from the main entrance for users who walk to the site or access the site from the street. This minimizes vehicle conflicts with pedestrians. Similarly, reserving space for New Mobility/Shared Mobility services at or near the main entrance allows easy site access for New Mobility/Shared Mobility users of the facility.

Capital Improvements and Operational funds to Support New Mobility/Shared Mobility

As a broader set of impacts are identified, capital funds can be requested to construct facilities that directly and indirectly support New Mobility/Shared Mobility. Broadly speaking, new mobility users access buildings as pedestrians. So, focusing on pedestrians capital improvements, even for roadway links that are not immediately adjacent to the site could facilitate New Mobility/Shared Mobility. Local governments can also directly request the New Mobility/Shared Mobility equipment or services. This effort should generally be addressed through a robust TDM program.

Transportation Demand Management Requirements

Local governments may also consider robust TDM requirements. Fairfax County, Virginia obtains TDM commitments, including commitments to fund and operate private shuttles, provide carshare spaces and memberships to tenants, and to fund bikeshare stations, from developers through its use of Virginia's unique proffers system. While Maryland does not use a proffer system, Virginia's zoning structure negotiates development approval conditioned upon meeting specific negotiated conditions². The County negotiates with developers to mitigate the traffic impacts of development. Developments that generate a need for a Virginia Department of Transportation (VDOT) Traffic Impact Analysis, which are required for rezoning proposals that have a peak hour vehicle trip generation of over 250 vehicles per hour for commercial development and 100 vehicles per hour for residential development³, require TDM proffers in Fairfax County. The TDM Guidelines are structured in three levels: full, moderate, and light, with each level determined by the estimated number of trips that are generated by the project, the project location, and the project's proximity to transit. It is important to note that developments located in Tysons Corner, one of the most well-known Suburban Town Centers in the country, are subject to the "full" level of TDM requirements, regardless of predicted trip generation. This is in recognition of the need to implement the maximum number of conditions to facilitate the transition of the area from a suburban to future urban center, as well as the proximity to the Metrorail system's Silver Line.

Transportation Demand Management District

Establishing demand management districts allow communities to systematically fund TDM measures for a broad area. Boulder, Colorado has a long history of robust engagement with developers through its transportation demand management requirements⁴. This City applied this experience in the redevelopment of a new transit-oriented community in a formerly industrial and rail-use oriented area, which is today known as Boulder Junction. This developing Suburban Town Center is 160 acres, with 1,000 housing units built or proposed, 1.8 million sq. ft. commercial, home to a campus of Google and a number of other major local employers and served by the central Depot Square Station (a multi-modal transit center out of which a bus rapid transit line with service to Denver is operated).

In the planning for Boulder Junction, the city established a goal of achieving 45 percent of all trips taken by private automobile with 55 percent of all trips made by walking, biking, carpooling, transit, or to be completely avoided through telecommuting or compressed work schedules during the peak period. To achieve this goal they

2 <http://drpt.virginia.gov/media/1245/fairfax-county-long-range-tdm-plan.pdf>

3 http://www.virginiadot.org/projects/resources/Administrative_Guidelines_TIA_Regs7.11.pdf as of October 30

4 <https://bouldercolorado.gov/transportation/boulder-junction-3>

created the Boulder Junction Transportation Demand Management District, in which new developments in the TDM District are given a trip generation allowance, which is the maximum number of vehicle trips that can be generated at peak hours. The City of Boulder and local TMA Boulder Transportation Connections work with developers to develop TDM plans that include a number of measures to achieve their trip generation allowance goals. All workers and residents in the district also receive an annual transit pass that provides unlimited rides on local transit, a 50 percent discount on a bikeshare system annual membership, which includes an unlimited number of 60 minute rides between stations, and a free application and \$25 in driving credit for the for the local car share system. These benefits are funded through property taxes, which could be increased for the purpose of funding additional demand management measures should the trip reduction goals not be met.

While the City and TMA works with each developer individually, the trip-reduction targets are analyzed for the entire area as opposed to individual developments. After three years post-occupancy in the first phase of development, the area was only producing 58 percent of predicted trips versus 45 percent reduction goal.

Local Government/ Other Stakeholder Support of New/ Shared Mobility

With Suburban Town Centers, local governments are frequently working towards a long-term transition of existing suburban, auto-oriented land uses that are currently significant trip generators and destinations, and retro-fit these centers to mixed-use, multi-modal, and ultimately higher density land uses. Local governments utilize a variety of policy, capital investments, and operational subsidies to realize these goals.

Reduce Parking Requirements

The number one factor in reducing auto usage—and in turn facilitating adoption of New Mobility/Shared Mobility—is reducing the availability and attractiveness of parking. Developers should be naturally predisposed to build less parking, since it is so expensive, but most cities have ordinances requiring a minimum amount of parking based on the size of the development, and lending requirements from financial institutions to the development community often require or incentivize high parking ratios. The city of Austin, Texas, amended its zoning code to reduce minimum off-street parking requirements by 20 spaces for every car-sharing vehicle provided. By contracting with car2go, Austin developer Lincoln Ventures reduced parking by 160 spaces. At about \$35,000 per structured parking space, that equates to about \$5.6 million in reduced development costs. In about three years, the Austin program eliminated the need for about 1,100 parking spaces, saving developers

over \$38.5 million⁵.

Multi-modal Transportation Infrastructure

Given the predominately auto-oriented nature of today's Suburban Town Centers, re-designing existing infrastructure to accommodate multi-modal uses will be critical to enabling the use of a variety of New Mobility/Shared Mobility modes in the future. People who want to bike more are often dissatisfied with existing infrastructure, and many people would ride bicycles more if they had protected bicycle infrastructure⁶. Enhanced walking and cycling infrastructure is needed to increase adoption of micromobility in the suburbs. Governments should also consider the role that roadway technology (e.g., connected signals) and multi-modal accommodations can play in addressing failing intersections, in lieu of focusing on exclusively roadway solutions that would otherwise make driving more attractive while also negatively impacting access for New Mobility/Shared Mobility and active transportation modes.

As is the case in rural settings, implementing and/or improving one-call/one-click services, which provide a single website or customer hotline where individuals can access information on all of the transportation services in a given community. Pennsylvania's FINDMyRidePA program is a representative example of a one-call/one-click website that provides information on all available transportation options and in some instances, allows visitors to book shared-ride services directly.¹ The Florida Department of Transportation (FDOT) Rural Vanpool Program is a public-private partnership with COMMUTE with Enterprise, a company that leases vanpools. Through the Rural Vanpool Program, COMMUTE provides vanpools on a month-to-month lease basis for groups of 7 to 15 commuters. The cost the lease includes comprehensive auto liability insurance coverage, preventive maintenance, repairs. For eligible vans originating in 29 of the Florida's rural counties that report monthly trip data to FDOT, the agency provides funding for 50 percent of the cost of the monthly vanpool lease and fuel for each van. FDOT uses FTA Section 5311 grant funding to fund the Rural Vanpool Program.

Subsidize Shared Use Mobility

Local governments can subsidize various New Mobility/Shared Mobility services. Bikeshare systems are a prime example of New Mobility/Shared Mobility gaining popularity in suburban contexts. In the first year of Capital Bikeshare operations in Montgomery County, Maryland, there was a network of 14 stations spread out across the county. Ridership was around 35,000 in its first year, which exceeded modeled expectations⁷. The county elected to expand the number of stations and now

5 <https://urbanland.uli.org/development-business/developers-reduce-parking-via-car-sharing/>.

6 <https://peopleforbikes.org/blog/here-are-the-first-ever-national-findings-about-interested-but-concerned-bikers/>

7 <https://bethesdamagazine.com/bethesda-beat/moco-says-capital-bikeshare-exceeded-revenue-projections-in-first-year/>.

has over 80 Capital Bikeshare stations in five different geographical areas, showing that the larger the reach of the network, the greater the return on investment.

Many transit agencies have piloted the use of TNCs to provide first mile/last mile access to transit in lower density parts of their services areas. For example, the Pinellas Suncoast Transit Authority (PSTA) of the St. Petersburg, FL, area, has a partnership program with TNCs called Direct Connect that allows riders to be picked up or dropped off from anywhere within 800 feet of a designated bus stop and receive a fare discount of \$5 for a TNC or taxi ride or \$25 off a wheelchair-accessible taxi ride. The Direct Connect services enables the agency to provide access to transit for areas they would otherwise be unable to serve. Microtransit has also been used in suburban settings. One example of a suburban microtransit pilot is in Los Angeles County, California, where LA Metro partnered with microtransit company Via beginning in 2019 to offer shared rides within a designated geofence. The origin or destination of the trip must be a metro station. Trips initially cost \$1.75, the same as the metro fare, but were made free six months into the pilot. This pilot is designed both to reduce auto dependency and increase transit ridership⁸.

Mobility Hubs

A mobility hub is a physical location where multiple shared mobility modes, such as microtransit, carshare, micromobility, and transit, can be accessed. Often, local governments fund these facilities or portions of them. Hubs also have resources that support the use of such modes, like bike parking, bike repair tools (air pump or multitool, e.g.), real-time information, and wayfinding. Ultimately, Mobility Hubs could help support a car-free or car-light lifestyle in an otherwise car-dependent context. LA Metro has a guide to mobility hub best practices; while some of the practices may be better suited to an urban context, LA Metro's "Neighborhood Mobility Hub" typology may be analogous to the Suburban Town Center context.

Curbside Management

Local governments can also establish standard curbside management approaches (like parking requirements or pick-up/drop-off zones) and new/shared mobility options (like bikeshare or scooter share) in the development of these large activity centers, to support the use of New Mobility/Shared Mobility in Suburban Town Centers. These areas may be undergoing a longer-term transformation from suburban to urban in form anyway and embracing innovation in transportation may support that transformation. Bellevue, Washington, a suburb of Seattle that is home to a number of large tech industry employers, was selected in late 2019 as the recipient of a grant from the Smart Cities Collaborative to pilot curbside management techniques, technologies, and develop best practices. The city's downtown area has a number of competing curbside uses, including private employer shuttles, TNCs, transit priority lanes, bikeways, and on-street parking.

8 <https://la.streetsblog.org/2019/10/09/six-months-in-metro-via-mobility-on-demand-pilot-is-an-expensive-flop/>.

REDEVELOPING URBAN PARCELS

Within the urban areas of the Baltimore region, there are locations where the redevelopment of large, important, and catalytic parcels can be leveraged to align New Mobility and Shared Mobility with public goals.

New/Shared Mobility in this Context

The urban redevelopment context refers to parcel redevelopment within an urban area that typically increases density through mixed-use or commercial development. This type of context is suitable for all major categories of new mobility services, including micromobility services (dockless scooters, dockless bikeshare, and station-based bikeshare systems), TNCs, car/vanpool programs through both public entities and institutions, round-trip and one-way carsharing systems, and both app-based delivery and just-in-time commercial freight delivery services. Density of land use is the key for the viability of this wide range of services. For instance, micromobility trips are viable in this environment due to higher densities and thus the large demand for short-distance trips. Similarly, the viability of all of these types of services is supported by the high concentrations of demand and turnover in dense, urban areas, which enable sustainable operating economics for shared fleets. Given these conditions, new mobility services can operate at their greatest levels of supply and convenience in urban areas compared to other contexts.

How Developers and the Development Review Process Can Support New/Shared Mobility

Developers can support new mobility in an urban context by providing infrastructure and access. This may include designing streets, curbs, and parking areas to meet the specific needs of new mobility (such as scooter parking zones, bikeshare docking stations, ridehailing pickup and dropoff spots, or carshare parking spaces),



Ongoing Urban Infill Construction

other supporting transportation infrastructure (such as protected bike lanes, active transportation parking/amenities, etc.), arranging mobility service provider partnerships, and offering service subsidies or negotiated discounts that provide access to new mobility services. A best practice to ensure developers advance these approaches is for cities to adopt outcomes-based TDM ordinances with requirements pertaining to investments in specific service types and the achievement of clear travel behavior targets.

Given current conditions in many localities, the development review process offers the primary mechanism by which local governments can require developers to provide or support new mobility infrastructure. A very effective mechanism for local governments to require new mobility support is through zoning; yet given the nascency and rapidly evolving nature of new mobility, there are limited examples of zoning codes that include new mobility requirements. Thus, this section focuses on identifying the appropriate development review process to gain or support New Mobility/Shared Mobility services and equipment, centering the development review process on the features

that are important to urban places, and using TDM to gain needed mitigations.

Utilize a Special Exception Process to Gain Mitigations and Amenities

As an alternative to by-right zoning requirements, large cities often provide for a special exception site plan option within their zoning ordinance; this special exception, granted for individual site plans, allows a developer to bypass zoning if they meet certain requirements. For example, Arlington County, VA permits special exception site plans that “allow for site-specific flexibility in development form, use and density, beyond what is permitted by-right,” including large mixed-use developments near a Metro stop. The special exception process allows developers to negotiate the elements they include in the conditions of approval depending on what they identify as community needs. This negotiation process provides developers with an opportunity to expand upon by-right transportation requirements in the zoning ordinance that often do not address new mobility needs.

In Arlington County, Metropolitan Park Phases 6 and 7/8, also known as the initial phases of the Amazon headquarters, provides a recent example of how new mobility requirements can be incorporated into the conditions of approval for a development. As a result of the negotiations in the special exception process, the conditions of approval included bike lane enhancements, the installation of a 15-dock Capital Bikeshare station and the operations and maintenance costs for 10 years, and either a transit stipend or bikeshare or carshare memberships for tenants. In anticipation of the evolving nature of shared mobility systems, the legal conditions note that “in the event the bikeshare system is dissolved and not in use in Arlington County, the Developers shall contribute to [Arlington County] the equivalent of the operations and maintenance costs of the last year the system was operational, including inflation... for the balance of 10 years.”²

Focus Assessment of Impacts on Livability and Urban Mobility

in highly urbanized areas, the roadway network tends to operate at or near capacity in the peak hours of vehicle travel. As such, evaluation of vehicle LOS with site impacts often yields failing results. Instead of focusing on mitigating failing vehicle conditions, which tends to yield wider roads, local governments can focus their review of transportation impacts on livability and urban mobility needs. Focusing on metrics related to bicycle and pedestrian site access focuses the review on necessary connections to the transportation network. This evaluation may also consider evaluation of mobility that considers access to new mobility travel modes. This evaluation can also consider the layout of the site. Specific site design elements such as the location of driveways or the inclusion space for new mobility facilities can play a significant role in determining if and how significant the transportation impacts from a



Developed Parcels and Surface and Structured Parking in Harbor East, Baltimore

development site might be. Best practices include siting driveways away from the main entrance for users who walk to the site or access the site from the street. This minimizes vehicle conflicts with pedestrians. Similarly, reserving space for new mobility services at or near the main entrance allows easy site access for new mobility users of the facility.

Require Transportation Demand Management (TDM) plans and monitoring

A formally approved TDM plan or a fixed/points-based suite of strategies can be incorporated as a requirement into the approvals process for new and reuse development proposals. As such, this mechanism limits the effect of such a program to new or significantly expanded development. TDM commitments include a collection of programs that work collectively to change how, when, where, and why people travel and reduce reliance on single-occupant (SOV) trips. TDM strategies include a range of biking, walking, transit, and carpooling incentives that can range from infrastructure, to more advanced information campaigns and financial incentives. In recent years, many cities have incorporated the provision of new mobility memberships, stipends, and/or parking into their TDM requirements.

For instance, the San Francisco SHIFT TDM ordinance framework is a points-based menu of options that allows developers to select from a pre-approved list of TDM measures. Each measure is assigned a point value based on their expected, relative, demand-reduction effectiveness. The City uses a formula based on the land use type and number of proposed parking spaces to determine a minimum points-total requirement for each proposed development. The developer can select as many measures as needed from the menu of 66 options to accumulate the required number of points. The menu includes two new mobility options: provide bikeshare

1 <https://building.arlingtonva.us/permits/site-plan/>
2 https://arlington.granicus.com/MetaViewer.php?view_id=2&event_id=1376&meta_id=190915

membership (1 to 2 points) and provide carshare parking and membership (1 to 5 points, more points given for higher levels of participation). This menu-based approach could be expanded to include additional new mobility options, which could assigned higher points value to incentivize commitment to new mobility.

Menu-based programs typically include active monitoring and reporting components to ensure compliance with implementation commitments. Over the life of a development, a combination of self-reporting and monitoring (by City staff and/or a Transportation Management Association (TMA) ensures that approved commitments are maintained.

Local Government/ Other Stakeholder Support of New/ Shared Mobility

Outside of the development review process, other stakeholders, including local governments and employers, can support and subsidize new mobility in an urban context through a variety of regulatory mechanisms and incentives, as discussed below. For new mobility to succeed in an urban context, local governments must develop adaptive, flexible regulation that accounts for changing industry dynamics and implement street design to accommodate new mobility devices and vehicles. Critical policy areas and capital improvements include parking, curb management, mobility hubs, and alternative review processes. Local governments could eliminate vehicle parking minimums while requiring bicycle parking and infrastructure, implement curb management policies that accommodate flexible uses, and partner with transit agencies and private partners to establish mobility hubs. It is also possible for local governments to take a stronger, more direct regulatory approach to pursuing New Mobility/Shared Mobility features that require these element for all development.

Remove Vehicle Parking Minimums

Often zoning codes requires a minimum number of parking spots based on the development size are based on a decades-old understanding of how people get around and only reinforce rates of auto usage. It was this reasoning that led Buffalo, New York to abolish parking minimums in 2016, the first US city to do so. Instead, Buffalo developments of more than 5,000 square feet will require parking analysis that factors in alternative transportation options in the area. Employing the use of other demand management tools, such as parking cash-out laws like California's long-standing version and the version recently passed in Washington, D.C., can provide an incentive to employers to purchase fewer parking spaces in their leases while also providing an incentive to employees through cash or transit/active transportation benefits provided in lieu of a company parking space that can be used for commuting via other modes³.

3 <https://ww2.arb.ca.gov/resources/documents/>

Require Bicycle Facilities

In a robust urban environment, all development above a certain size could provide bicycle-supportive amenities for all buildings users. The building code or zoning code could be adjusted or a local ordinance could be passed to require both bicycle parking as well as elements such as changing rooms, showers, and bicycle fix-it stations that include elements such as tools, air pumps, equipment, etc. that are needed for minor bicycle maintenance. The required facilities would vary with the type of land use. For residential facilities, bicycle parking and fix-it facilities are most important. Whereas for commercial or office uses, parking, fix-it, changing rooms, and showers are typically necessary. Requiring these facilities for new buildings can be a relatively simple change for the appropriate code. However, retrofitting buildings can prove to be difficult. Yet, these facilities remain necessary for users of the building, even through the building may be old. A well-reasoned and equitable approach, will allow a local government to achieve mode split goals for non-auto modes at minimal capital or operations cost to the local or state government.

Curb Management Policy

With many competing demands for curbside space (e.g. TNC pickup/drop-off, new mobility infrastructure, bike lanes, loading zones, transit lanes, outdoor seating, disabled parking, green and electric vehicle infrastructure, etc.), curb space can be prioritized based on City goals, context, and need. As development increases, cities could develop curb management policies to help prioritize which curb side functions will best meet the needs of the corridor and adjacent land uses. These policies can build on existing research from the ITE Curbside Management Practitioners Guide (2018) and NACTO's Curb Appeal: Curbside Management Strategies for Improving Transit Reliability (2018). NACTO presents an approach to reframe City management of what is typically considered a parking lane into a Flex Zone. A flex zone uncouples the curb from parking as its primary function and prioritizes curb use based on the street type and transportation plan priorities, and then layers in local land use.

Long-term flexibility is important as new mobility options expand and additional development occurs and changes in travel modes over time results in changes to curb use. A policy that can adapt to future change allows cities to respond to changes in demand for curb space. One approach is to include a curb-use assessment in the development process so that new developments can pay a fee to assess the need for changes to the curb regulation on the block. An "opt-in" approach, used by San Francisco, allows businesses to request commercial loading, passenger pick-up and drop-off, and customer parking (less than 30 minutes) and pay a fee to have the curb changes installed.

Mobility Hubs

In an urban context, new mobility services offer the potential to help bridge the first mile/last mile gap - a barrier that often discourages potential riders from using transit because a stop or station cannot be easily

californias-parking-cash-out-law and <https://ggwash.org/view/76333/dc-parking-cash-out-pay-you-walk-bike-transit-2020>

accessed from home, work, or other locations. Many transit riders must contend with the first mile/last mile challenge; the easier it is to access the system, the more likely people are to use it. To address this issue, transit stops can be leveraged as mobility hubs – designated areas that offer a means to combine a variety of new and existing mobility services and amenities such as ride-hailing loading zones, commuter shuttle stops, real-time transit information, electric vehicle charging stations, transit pass sales kiosks, bike and car share parking, and secure bike lockers, all in one site, providing robust connecting services for transit riders.

Allow Higher Density by Right in Appropriate Areas

The zoning and permitting process can be very difficult for projects pursuing relatively high levels of density,

in particular when compared to adjacent areas even when the area is appropriate for greater density. Zoning processes can take extended time and inhibit the benefits the new or redevelopment may provide for the area. While a special exception process can gain needed New Mobility/Shared Mobility elements, it is not the only approach urban areas may use. Local governments can consider making additional density a by right use in areas with robust transit service and dense, walkable neighborhoods in concert with a robust set of TDM and bicycle requirements. By requiring TDM and bicycle facilities by code, the local government can gain the necessary facilities that would be realized in a special exception process without the difficulty of the special exception process. This approach reduces the time to deliver the projects, allowing the benefits of the project to be realized by the community more quickly.



Baltimore Waterfront and Downtown Development

SECURED INDUSTRIAL/ GOVERNMENT CAMPUSES/ FACILITIES

New/Shared Mobility in this Context

The secured industrial/governmental campus/facility context refers to a homogenous employment, educational, or military campus that may be enclosed or secured. The concentration of demand within defined campus areas means that a range of new mobility services have the potential to operate successfully within these campus settings, even when they are located outside of dense urban areas. The range of services that may be viable in these locations includes shared micromobility (bikes and scooters), car share, TNCs, microtransit, and someday, autonomous shuttles. However, access to certain new mobility services may be limited in this context by limitations campus owners choose to place on entry, pickup, and dropoff by commercial vehicles and parking by commercial providers. For that reason, new mobility services often require a direct contractual partnership with the campus provider to obtain permission to operate within the campus right-of-way. Typically, new mobility services on campuses are curated by the campus owner who procures providers that meet the mobility needs they have identified for their campus. Furthermore, most shared micromobility services in this context operate as closed campus-only systems, such as a fleet of e-bicycles, to enable easy access between campus destinations.

Often, these contexts have external service that facilitate movement to and from the campus. Some campuses have shuttling services or special bus routes that take employees directly to the campus from a set pick-up point in a more distant location or from a relatively close transit station. These services are often fully funded by the campus but some local governments may fund services, in particular those services that connect to transit stations. The campuses may also be served by New Mobility/Shared Mobility services outside the gates as well. Many campuses are well served by bikeshare facilities outside the gates and depending on the location of the campus can be served by scooter share, car share, or TNCs also.



Bike share on Nike campus. Photo Credit: Bike Portland

How Developers and the Development Review Process Can Support New/Shared Mobility

Campuses present unique opportunities to manage local travel demand, with a single entity having substantial, direct control over local land use patterns and transportation systems and services. As a result, campuses have more levers they can pull to affect

travel patterns and evaluate internal tradeoffs tied to campus development decisions, including decisions about transportation capital and site design investments. The following examples illustrate how new mobility in a campus context can be supported within the development review process through broad TDM and monitoring requirements for external trips, provision of mobility service inside the campus, the development of design guidelines, and the use of on-campus technology pilots.

Transportation Demand Management (TDM) and Monitoring for External Trips

Similar to other contexts, campus developments must adhere to a local government's development review process and associated TDM requirements for moving employees to and from the campus. TDM requirements provide an opportunity for the local government to set parameters and control the trips within a larger campus environment. Campuses are typically held accountable to more stringent TDM requirements due to their larger populations and higher trip demand to, from, and within these areas. Through TDM programs, campus developments are often required to provide a range of services and/or subsidies that support new mobility and multimodal infrastructure that facilitates trips to/from campus boundaries. This may include the provision of shuttle or transit services to the campus along with the accompanying infrastructure that may be necessary. Capital investments may also include facilities to serve bicycle and pedestrian connections to the campus.

Campuses are also unique in that they typically have long-term ownership over their property, whereas a private developer might only be involved in a project for the short-term. Given the longer-term ownership, campuses have the capability to conduct ongoing monitoring and reporting, as well as updates to their TDM plans to continue to support evolving transportation services.

On-Campus Mobility

Campuses often need additional mobility services within the campus. Many campuses, including employment and educational campuses, provide bikeshare stations and/or memberships as a component of their internal circulation plans. The University of Denver (DU) was the first university in the U.S. to host a modern bikeshare station with the opening of Denver B-cycle station on campus in April 2010. Since 2006, DU has prioritized sustainability throughout its decision-making processes, which has manifested in a significant focus on campus transportation issues, including the goals to reduce SOV trips and to shift more trips to transit, carpool, biking, and walking. Thus, the provision of bikeshare is just one piece of a larger, comprehensive approach. Given that DU owns and manages a large swath of land, the campus can provide complementary transportation infrastructure and services that support new mobility investments.

Design Guidelines

A developer can coordinate with a local jurisdiction to develop design guidelines that govern the development on the project site. The Downtown West development

in San José, California, which will be a Google campus, is working with the City to develop detailed design standards for a range of design controls, including circulation, streetscape, and access. The Downtown West Mixed-Use Rezoning and Development Plan states that “the standards and guidelines would balance flexibility to allow for innovation and evolution with confidence in the delivery of high-quality buildings and public realm.”¹ Such guidelines provide an opportunity for a developer to put forth and codify a vision for new mobility, which could include design guidelines around bicycle and micromobility networks, flexible curb space to accommodate pickup/drop-off zones for TNCs or micromobility infrastructure, mobility hubs, and/or car share spaces.

On-Campus Technology Pilots

Campuses are also useful laboratories to test advanced technological approaches to mobility, specifically for autonomous vehicles. A handful of corporate and university campuses in the U.S. have partnered with government agencies to test autonomous vehicle technology on-campus. Aberdeen Proving Grounds is among ten proving ground pilot sites that the U.S. Department of Transportation designated for automated vehicle testing. Other examples include pilot programs in North Carolina and Rhode Island. In North Carolina, NC State partnered with the North Carolina Department of Transportation to conduct a six-month pilot for an autonomous vehicle shuttle called Connected Autonomous Shuttle Supporting Innovation (CASSI)². In Rhode Island, Rhode Island Department of Transportation (RIDOT) launched a multi-agency effort, soliciting providers and researchers to test the technology and shape a public-private partnership framework. TRIP includes a number of pilot sites, including Quonset Development Corporation and potentially a pilot shuttle in the Olneyville neighborhood that would connect to the train station in downtown Providence, filling a current lack of transit services. The pilot is part of the State of Rhode Island's Transportation Innovation Partnership (TRIP) initiative, which aims to ensure the state manages emerging mobility technologies in a responsible, sustainable, and equitable manner, using partnerships, research, and test projects. Pilots such as these provide an opportunity to learn about and improve upon autonomous vehicle technology while safely providing campus mobility services.

1 <https://www.sanjoseca.gov/home/showdocument?id=43691>

2 <https://transportation.ncsu.edu/cassi/>

Local Government/ Other Stakeholder Support of New/ Shared Mobility

Outside of the development review process, local governments, can support and subsidize new mobility in a campus context through a variety of mechanisms. To foster the growth of new mobility, local governments must develop adaptive, flexible regulation to allow on-site/community pilots and to account for changing industry dynamics. In addition, local governments can carefully and selectively fund and subsidize various capital improvements and New Mobility/Shared Mobility services to support the campus.

Allow Flexibility in Policy and Regulatory Requirements

Campuses are inherently unique places, often the only type of location within the boundaries of a local government. This makes appropriate regulation difficult as it is difficult for local governments to anticipate the needs of the campus as well as area stakeholders. In general, local governments can allow the campus flexibility in the regulatory process to address potential needs and impacts. Specifically, local governments can implement policies and/or facilitate partnerships

to allow micromobility on campus, coordinate with transit or microtransit services to establish services that get people to/from campus, and develop digital policy to enforce geofencing and other deployment requirements. Furthermore, due to the more predictable travel patterns and control over a large swatch of land, campus environments provide an opportune setting for trial and experimentation with transportation systems, such as autonomous vehicles. Local government policy can encourage implementation of new approaches by providing streamlined approvals process.

Selectively Subsidize Multimodal Capital and Operations

Campuses tend to have large numbers of employees who need to access the site. This creates difficulty for the transportation network to accommodate the demand. Local governments can selectively subsidize transit capital investments and operations funding to encourage transit use by campus users as well as bicycle and pedestrian connections to the campus. It is important that local governments thoroughly review the campus plan to understand what level of transit investment is needed and should verify the operational needs of the campus so that the campus is not unnecessarily subsidized by the local government. Potentially, local governments could provide some level of funding that can be paired with funding from the campus developer to fund these capital and operational improvements. Local governments should carefully consider the economic and social value of the campus before committing to any subsidy to confirm that the benefits from the subsidy outweigh their cost.



Fort Carson, TX is considering autonomous shuttles to connect to the DFW Airport Campus. Photo Credit: Tribune News Service

