This memo provides supplementary information, analysis, and research findings to expand upon key updated TDM Study recommendations. The memo is organized into the following sections.

Appendices

DOWNTOWN CIRCULATORS

Concept Overview

Transit circulators can be defined as specialized fixed transit routes, often served by trolley-style or otherwise-notable vehicle types, that facilitate movement throughout a downtown or business district, and often reduce parking demand (or shift it to peripheral locations) by facilitating "park once" access. Business groups and elected officials often support these services for their potential to support and signal downtown revitalization and economic development.

A recent TCRP report provides one of the most comprehensive studies of existing urban circulators, documenting the motivations for and outcomes of such services.[1] It surveyed 42 transit agencies and provided case studies of seven circulators in Baltimore, Hartford, Los Angeles, Louisville, Philadelphia, Washington D.C., and Austin. Key findings help define challenges and opportunities for establishing successful circulator services in other cities.

- **Funding and fares.** Due to the target audience (e.g. employees who do not typically rely on transit or tourists who are new to the area), free fares help attract a broader ridership. It eliminates the barrier of figuring out how to pay. Further, due to the absence of fare revenue, other stable funding

[1] TCRP Synthesis 87: Practices in the Development and Deployment of Downtown Circulators (201). Available online at http://www.trb.org/Publications/Blurbs/165166.aspx.

sources are necessary. Voluntary contributions have not succeeded in sustaining circulators in the past.

- **Branding.** A distinctive, strong brand will increase the visibility of the service, which likely targets a population that otherwise does not consider transit a viable alternative.
- **Service characteristics.** The findings emphasize frequency and simplicity over coverage. The simpler the route, the better. And, it is ok to reduce coverage (e.g. by limiting stops or deviations) to increase frequency.
- **Partnerships.** The most successful circulators have collaborative relationships with local elected officials, business representatives, and other community stakeholders, which provide important feedback on critical destinations for the route and mitigate duplicative services provided by private partners. Further, a collaborative relationship with the local transit agency supports success.
- **Access and target market.** Key to the success of circulators is the walkability of the area served—and the willingness of the local population to walk. In Dublin, wintertime may pose a barrier to people's desire or ability to access the service, however given the frequency of the service, it may provide an opportunity to foster economic development *despite* of the winter chill.

Conventional Operating Models

Grand Rapids, MI: DASH

Grand Rapids' Downtown Area Shuttle, known as DASH, is a free shuttle service that connects residents and visitors to the city's downtown core. The DASH routes originally started as parking shuttles, connecting peripheral parking lots with the downtown core. The service is marketed to drivers who park in these lots, and information is housed on the City's Mobile GR/Parking Services website. All DASH buses are branded with the DASH logo. Schedules and live buses are available online via the RapidConnect website or app. In 2016, Mobile GR/Parking Services began exploring options for providing a more traditional circulator route, serving visitors as a Park Once service that can both make remote parking options more viable, and reduce visitor tendencies to drive between downtown locations.

Figure 1

Operating Characteristics	
Service Design	Shuttle
Running Time (Round Trip)	DASH West: 28 minutes DASH North: 20 minutes
Number of Stops (Round Trip)	DASH West: 20 DASH North: 16
Fare (One-way)	Free
Service Span (weekdays)	6:30 AM – 10 PM
Service Span (weekends)	None
Frequency (weekdays)	15 minutes
Peak	15 minutes
Frequency (weekends)	N/A
Start-up Capital Costs	N/A
Annual Operating Costs	$1M +
Annual Ridership	660,000
Operating Cost/Passenger	$1.52

2022 Status

This service has been expanded in the last few years, as follows:

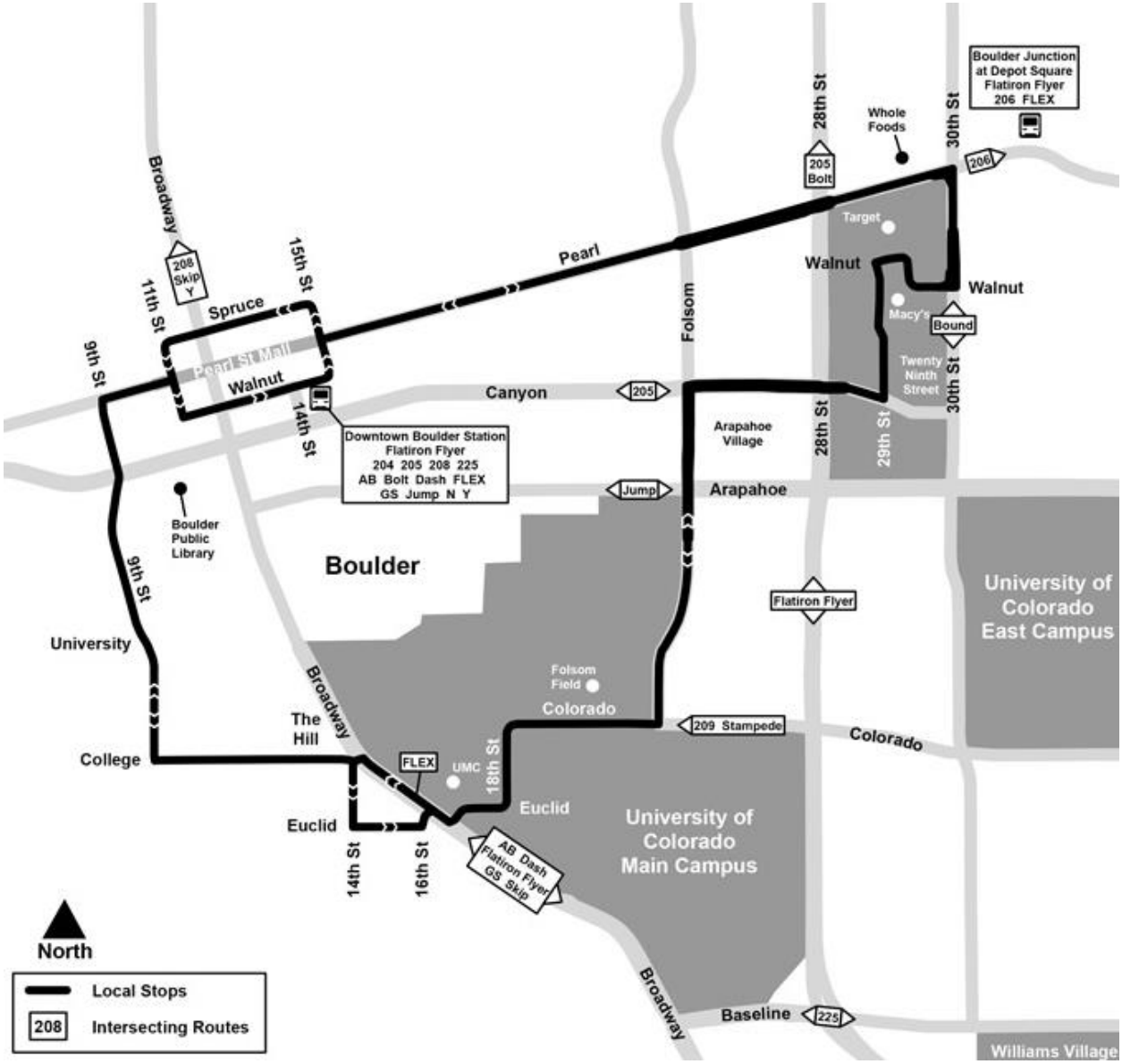
- Now operates on Saturdays, 10-10
- 6:30 - 10 weekdays, 10 to 10 weekends
- DASH North expanded to 31 stops

Boulder, CO: The Hop

The Hop has been operating as a free, high-frequency circulator since 1994. It was implemented to encourage the use of transit between several activity centers within central Boulder. The route helps to ease parking demand in key areas, makes it easier to get around these areas without a car. It is currently one of a set of nine branded local transit routes (also Skip, Jump, Bound, Dash, Stampede, Buff, Climb and Bolt)

The service operates as a loop with headways every 7 to 10 minutes. It runs Monday through Friday from 7 AM to 10 PM, Saturday from 9 AM to 10 PM and Sundays/holidays from 10 AM to 6 PM, and serves major bus stops including Downtown Boulder, 29th Street Retail District, University Hill, University of Colorado, and Boulder Junction.

Figure 2 The Hop Route



Ridership has been slowly decreasing since 2003, despite the high demand of travel between student housing and University of Colorado and increased investment in service. The Hop offers the highest frequency of any Regional Transit District bus, but is only the fourth-most productive route (where productivity is ridership relative to hours of service provided, or cost to operate). The City attributes this to the majority of the ridership only occurring between the short segment between the 29th Street Mall and CU. For many people, The Hop route only competes time-wise against walking, cycling, or driving on the straight segments, but not around the full loop.

Furthermore, the Hop is not being used, as had been expected, for last- or first-mile connections to intercity transit routes. Only 9% of Hop riders report transferring to or from another transit route in 2016. Additionally, there is a mismatch between the city's development trends and the shape of the loop since the route was created in 1994. Boulder workers and students live further away from the center of the city than they used to, so the loop does not serve as high as a population as it could. The Hop additionally does not

connect to the main downtown commercial area very well. The CU's Late Night Black route, along with RTD's Dash and Skip routes, more directly serves the route between CU and downtown.

Figure 3 Operating, Performance, and Funding Characteristics of Hop in Boulder, CO

Operating Characteristics	
Service Design	Circulator
Running Time (Round Trip)	35 minutes.
Number of Stops (Round Trip)	Inbound: 22 Outbound: 15
Fare (One-way)	Free
Service Span (weekdays)	7 AM – 10 PM
Service Span (weekends)	Saturday: 9 AM – 10 PM Sunday / holidays: 10 AM – 6 PM
Frequency (weekdays)	10 minutes
Peak	7 minutes
Frequency (weekends)	18 – 30 minutes
Start-up Capital Costs	N/A
Annual Operating Costs	$2.5 million
Annual Ridership	800,000
Operating Cost/Passenger	$6.88

2022 Status

This service has been expanded in the last few years now making 31 inbound stops and 25 outbound stops. It also has transitioned to a fare-based service, at a rate of $3 per ride.

Duluth, MN: Port Town Trolley

The Port Town Trolley provides service between destinations of Canal Park, Bayfront, the HART District and downtown Duluth during the summer months, from June 1st to Labor Day. It operates seven days a week, every 20 minutes from 11:30 AM to 7:00 PM, and every 30 minutes from 7 PM to 11 PM. On Sundays and Labor Day, it only operates until 10:30 PM. The trolley is a bi-directional loop with just under 30 stops.

Figure 4 Port Town Trolley Route

The Port Town Trolley was put into place as an option to expedite movement between downtown Duluth and the Canal area with aims to reduce congestion. It is primarily targeted towards tourists as a way to avoid driving in the downtown area during the summer season. In Duluth Transit's 2008-2009 Vision Update, the route was recommended as a way to expand on the already-existing trolley to include the hospital area and more of Downtown Duluth. The route has been crucial in that it relieves traffic and parking shortages near the waterfront during the heavy-tourist months.

The main users of the Port Town Trolley are summer tourists looking for rides along the waterfront, downtown, and through the Canal Park area. Because of this, DTA has learned that on-time performance is a critical aspect to making sure tourists who are not familiar with the transit system are able to ride easily. Duluth ridership has been decreasing since 2013, as shown in Figure 5.

Figure 5 Annual Duluth Ridership 2010-2016

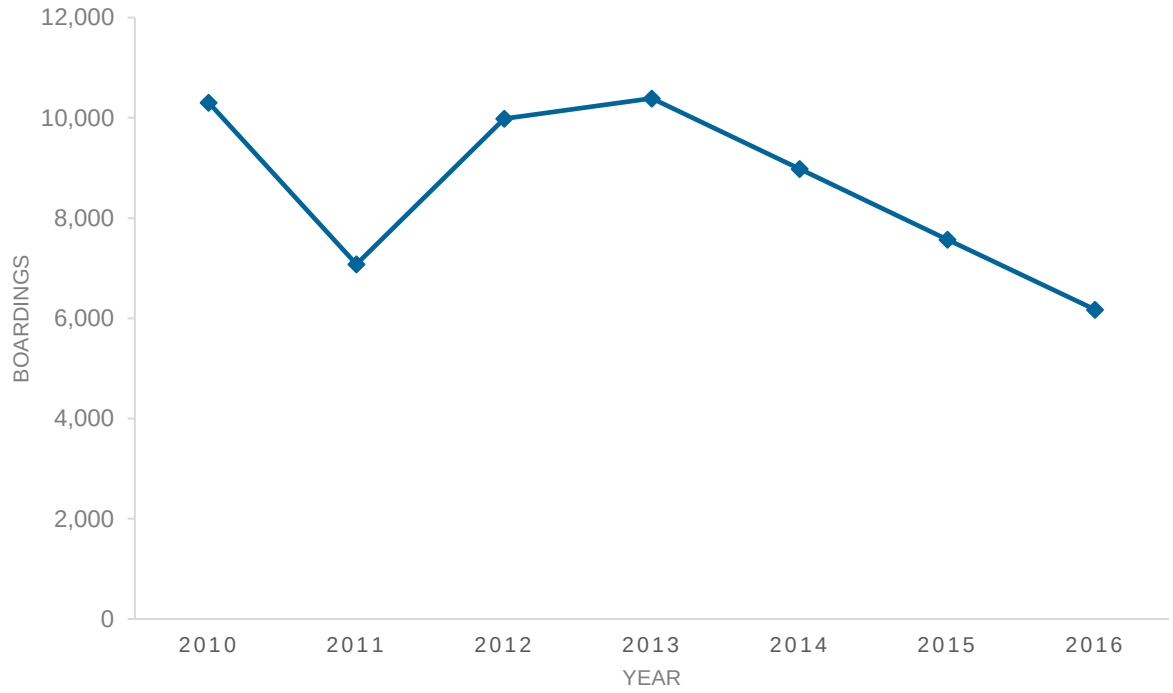


Figure 6 Operating, Performance, and Funding Characteristics of Hop in Boulder, CO

Operating Characteristics	
Service Design	Shuttle/Circulator
Running Time (Round Trip)	40 minutes
Number of Stops (Round Trip)	25-28
Fare (One-way)	Free
Service Span (weekdays)	11:30 AM – 11 PM
Service Span (weekends)	Saturday: 11:30 AM – 11 PM Sunday: 11:30 AM – 10:30 PM
Frequency	30 Minutes
Start-up Capital Costs	$600,000
Annual Operating Costs	$160,000
Annual Ridership	6,172
Operating Cost/Passenger	$25.29

2022 Status

The $0.50 fee for the trolley was eliminated for a time but then brought back, along with a $4 day-pass option.

On-Demand Circulators

Pickup | Austin, Texas

In June 2017, Via launched a new service—branded Pickup—in partnership with Capital Metro in Austin. The agency wished to rethink its existing public dial-a-ride service in a mixed-use area of the city. By removing the current two-hour advance booking requirement, Capital Metro hoped Via's platform could help increase ridership and rider satisfaction. Through Via's customized rider app, customers can request a ride from and to anywhere within a predetermined five square-mile zone. Capital Metro provides the vehicles—Pickup-branded cutaways—and drivers, while Via provides the technology platform, including the rider and driver apps, an operations control center, and training for Capital Metro staff.

Figure 7 Pickup by Capital Metro (Austin, TX)

Source: Capital Metro

2022 Service Metrics

- $1.25/ride, daily/weekly/monthly passes also work
- 11 service areas in Austin and suburbs, 5 with Saturday service
- Weekday services hours: 7-7
- Saturday service hours: 10-6
- Service aims for pickup within 15 minutes

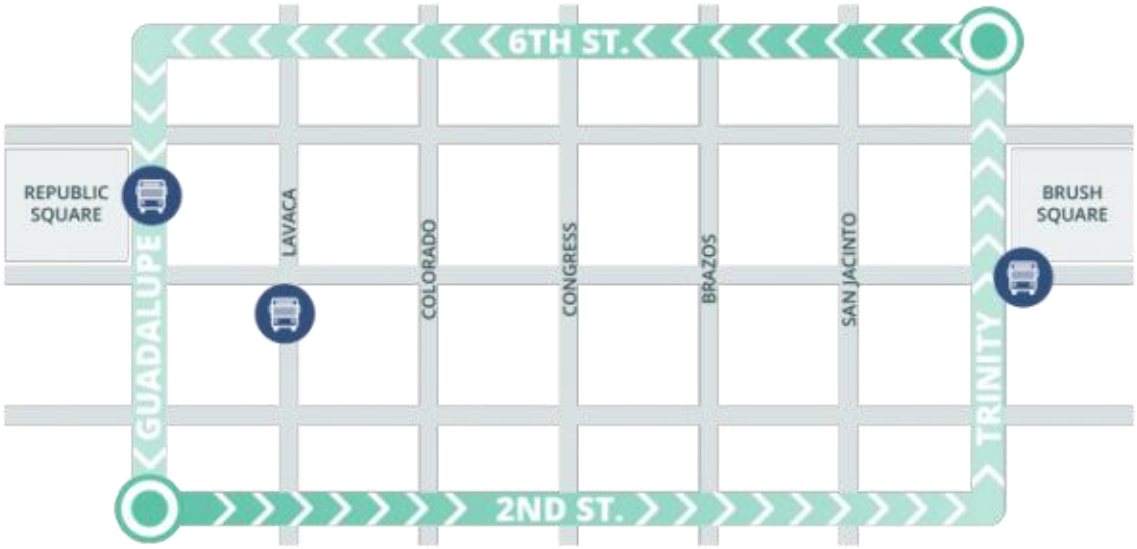
The RideScout Route | Austin, Texas[2]

In June 2015, RideScout, a mobile trip planning app company, launched the "RideScout Route"—a free Downtown Austin circulator six-week pilot funded by RideScout. RideScout (now a part of Moovel) wanted to test the viability of a several different downtown circulator routes. It tested a fixed-route service with designated stops and fixed-route service with customer hailing; it tested open-air Electric Cab vehicles for four weeks and 20-passenger Ford Sprinter vans with R&R Limousine & Bus for the last two weeks. RideScout experimented with peak and off-peak operating models. The first week only 30 riders used on the electric shuttles; by the third week, as word spread, 350 riders took advantage of the service.

RideScout ended the six-week pilot with good information and data to provide public sector leaders. They found that ridership was higher on the electric vehicles than the Ford Sprinters, likely due to the fact that riders noticed the adapted golf cart vehicles more than the typical passenger vans, which blend in with the urban environment. Without fares, they also found that customers were confused about proper tipping behavior, and eventually added messaging to the vehicle specifying a tip was not expected.

The Austin Chamber of Commerce, together with Rocky Mountain Institute, used the findings to release an RFP to private vendors looking to serve downtown and the nearby Market District. Chariot was selected and operated the service using a similar fixed-route to the original RideScout Route.[3]

Figure 8 RideScout Route (Austin, TX)



Source: KXAN

2022 Service Metrics

- No longer operational

[2] http://kxan.com/2015/06/25/ridescout-route-brings-back-downtown-transit-options/, http://www.statesman.com/news/local/switching-partners-ridescout-teams-with-limo/gqaxQ1bs1tYxxyHclXydnI/, https://www.austinchronicle.com/news/2015-07-17/public-notice-dog-week-of-summer/

[3] Interview with RideScout's former Executive Director of Mobility Solutions, Meg Merritt

- Downtown Austin Alliance initiated a Downtown Circulator Study, completed in 2021.
- The report showed that a circulator is viable in downtown Austin and proposed 2 alignments, one entirely downtown (A, 8 stops), and one connecting to the south side of Lady Bird Lake (B, 9 stops).
- Annual operating costs for route A is estimated at $2.08 million, and route B at $3.2 million.
- Startup costs are $120,000 and $135,000 for each respective route.
- The study recommended no fare for the service and 5-10 minute headways

The Downtowner | Manhattan Beach, CA[4]

The City of Manhattan Beach launched a free electric vehicle shuttle service pilot program in January 2017. In order to ride, users must download the "Downtowner" app and select the Manhattan Beach service area. Passengers can be picked up or dropped off anywhere within the designated three-square-mile service area. The Downtowner operates six vehicles daily between 11 a.m. and 11 p.m. Each vehicle seats up to six passengers and is equipped with iPads playing informational videos about the city, announcements, and local advertisements. The Downtowner is free to customers and sponsored by local businesses and the Chamber of Commerce. Advertisements are displayed inside and outside of the shuttles. Drivers also receive tips.

The service is intended for locals and visitors in downtown Manhattan Beach. Proximity to the beach and other tourist attractions generate more activity than current parking supplies can handle. The Downtowner is a response to growing parking and traffic congestion concerns in the downtown area.

During the first five months of the pilot program, more than 28,000 riders used the service and the self-reported wait time was 12 minutes. In July 2017, the service was officially extended for an additional 12 months. City staff will begin researching grant funding that could help offset city costs.

[4] http://www.dailybreeze.com/general-news/20170719/free-downtowner-shuttle-service-extended-in-manhattan-beach

Figure 9 The Downtowner (Manhattan Beach, CA)

Six-seat Downtowner vehicle (Source: Daniella Segura, TBR News)

2022 Service Metrics

- No longer operating
- Pilot ended after 10 months

FRED | San Diego, CA[5]

Free Ride Everywhere Downtown (FRED) is an electric-powered shuttle that serves a 2.5-mile service area around downtown San Diego. The effort is led by Civic San Diego and the Downtown San Diego Partnership.[6] Users can request a ride by downloading The Free Ride smartphone application and inputting their current location and desired destination. Alternatively, users can flag down a shuttle along the route without the smartphone application. FRED shuttles operate seven days per week:

- 7 a.m. to 9 p.m., Monday through Thursday
- 7 a.m. to midnight, Friday
- 8 a.m. to midnight, Saturday

[5] https://www.sandiego.gov/mayor/news/releases/mayor-announces-launch-of-downtown-circulator-program, http://sandiegodowntownnews.com/gaslamp-quarter-premieres-new-parking-options/, http://www.sandiegouniontribune.com/business/sdut-downtown-shuttle-free-2016aug08-htmlstory.html, http://www.businessinsider.com/hamptons-free-ride-shuttle-service-2017-7

[6] Civic San Diego is a nonprofit corporation created by the City of San Diego to replace the redevelopment agency. The Downtown San Diego Partnership is a nonprofit organization serving as the leading advocate for the revitalization and economic health of Downtown San Diego.

- 9 a.m. to 9 p.m., Sunday

During the initial launch, FRED operated 15 five-passenger vehicles, with the expectation that the fleet would grow to 20 vehicles within the first year. Drivers receive benefits and $14.66 an hour, not including tips. The average wait time for a ride is about seven minutes.

FRED serves downtown San Diego residents, locals, and tourists. It aims to fill the transportation gap for short, free rides that traditional public transit and ride-hailing companies cannot fill. In Downtown San Diego, the service allows people to travel to and within the parking-constrained commercial district without a car.

Initial funding comes from $500,000 in downtown parking meter revenues. Revenue is also generated from private sponsorships in the form of advertisements, both inside and on the outside of the vehicle. Eventually, the city hopes to support the service solely through ad revenue. Up to $2 million over five years has been earmarked with more funds available, if needed.

Within the first six weeks of the program, over 20,000 people signed up for the app. Each week yielded an average of approximately 4,000 rides.

Figure 10 Free Ride Everywhere Downtown (FRED), San Diego, CA

Sources: The Coast News; OOPM Creative

2022 Service Metrics

- Program funded through at least April 2023
- $1.2 million annual operating cost

- M-Th 7-9, F 7-10, Sat 8-10, Su 9-9
- downtown service area
- rides can be ordered through an app or flagging down a vehicle on the street
- 20 vehicle fleet, each vehicle fits 6 passengers
- 2019 ridership was 275,000, 136,000 in 2020, 182,000 in 2021.

Public-Private Partnerships

DC Circulator| Washington, DC

The DC Circulator is a fixed route, frequent all-day system that operates 6 standing routes and 1 seasonal route. Originally established in 2005, the Circulator has always operated as a public-private partnership, initially between the Washington Areas Metropolitan Transit Authority (WMATA) and First Transit from 2005 to 2018, when RATP Dev took over as the private operator, and the District of Columbia Department of Transportation (DDOT) took over the public oversight role.

The Circulator operates with 10-minute headways and a fixed fare of $1 per ride, although there have been several very popular fare-free pilots, and popular support remains high to reinstate fare-free rides. The system has a fleet of 81 clean diesel, hybrid, and fully electric 40-foot buses. Passenger capacity on the buses ranges from 71 to 80.

DDOT and RATP Dev have a strong working relationship, holding regular weekly meeting to discuss system operations, and frequent coordination to address customer complaints.

Top reasons why downtown circulators/shuttles fail

- **It's faster to walk**. In a small city, the "remote" parking garage is only 3 or 4 blocks from the heart of downtown. Even if the wait for the circulator is only 5-10 minutes, most people can walk to their destination in that time.
- **It's too expensive to do it "right."** In order to attract riders, the circulator must be "ultra-frequent," such as every 5 minutes. This requires multiple buses and drivers.
- **It's even more expensive than that.** In order to attract riders you need a separate circulator for each garage. Otherwise, you take riders on a tour of multiple parking garages that is much slower than walking. So you need the multiple buses and drivers on multiple routes.

- **It runs empty.** The "ultra-frequent" service needed to attract riders will carry only a few riders on each trip, only in the heavier direction (like toward downtown in the morning,) and only during the busiest hours. In the lighter direction, and in the lighter hours, it could run almost completely empty.
- **It looks empty.** It looks like more of a failure than it actually is.

Keys to increasing the potential success of a downtown circulator

- **Serve more than downtown.** It should serve more than just parking and downtown. It should connnect attractions just a bit too far to walk from downtown. Like, in Traverse City, consider Old Town, the Warehouse District and, perhaps further). Note: this is still costly, but it's less likely to run empty.
- **Serve more than DDA garages**. Encourage use by people who use other parking throughout the service area; #8 and #9 combined create a "park once" option for people with multiple reasons to be in the service area.
- **Integrate with BATA routes.** It may be possible to reconfigure BATA's routes so multiple routes connect each garage to downtown. Then, the circulator can be used to beef up the frequency of BATA routes, and riders can take the first vehicle that arrives (BATA or circulator). The combined service is likely less costly than using the circulator alone.

MONITORING FOR PERFORMANCE-BASED MANAGEMENT

Concept Overview

Performance-based curb management is reliant upon effective performance monitoring – a regular series of data collections to track availability and utilization conditions, to in turn inform pricing and. Benefits of this approach include:

- More convenient and reliable parking experience for visitors, which can help improve public perception of a district
- Demonstrates "good government" stewardship of public assets, promoting efficiency, and improved user satisfaction with better information, parking availability, and ease of payment
- Improves access by other modes: Better parking availability reduces parking search times and traffic enhancing transit speed and reliability, and safety for people walking and cycling
- Decreases greenhouse gas emissions: Less circling means fewer emissions
- Improves neighborhood commercial vitality and access: People can more reliably access commercial, retail areas

Performance-based parking does require significant and regular data collection so that rate-setting and performance metrics are accurate and reflective of current on-the-ground conditions. These metrics may include, but are not limited to:

- Hourly occupancy by block

- Average duration of stay by block and posted time limit
- Rates of non-compliance
- Levels of meter and mobile-payment transactions
- Citation rates

At a minimum, this data should be collected annually.

Examples

Seattle, WA: Performance-Based Parking Pricing Program

Seattle has used a performance-based model to price on street parking since 2010. The program goals in Seattle are to:

- Help customers reliably find parking within walking distance of their destinations
- Reduce emissions and lessen traffic congestion from drivers circling in search of parking
- Increase access to businesses by ensuring turnover of parked cars

Seattle currently adjusts on-street parking rates three times per year across its 19 paid parking areas, impacting over 1,100 paid spaces. Seattle also prices parking dynamically by time of day. Morning rates are in effect from 8 AM to 11 AM, afternoon from 11 AM to 5PM (extended to 6 PM in areas without evening rates), and evening from 5 PM to 8 or 10 PM, depending on the area. Dynamic pricing throughout the day allows the city to manage parking supply at a finer grain and takes into account the land use patterns and needs of local businesses within a given parking district.

Per city code on street parking rates must be between $0.50 and $5.00 per hour. Rate changes are guided by the following policy

- If occupancy is over 85%, increase rate by $0.50/hour, if over 100%, increase rate by $1.00/hour
- If occupancy is between 70% and 85%, rates do not change
- If occupancy is below 70%, decrease rate by $0.50/hour

Seattle publishes an annual parking report, which summarizes pricing and occupancy data from the previous year as well as any significant policy or programmatic changes.

See: SDOT Annual Parking Reports

Portland, OR: Performance-Based Parking Management

Portland established a performance pricing program in 2016 with the goals of increasing parking availability and managing on-street parking more efficiently.

Currently, hourly rates in Portland vary from $1 to $2, depending on the location. The Council approved rate range is between $1 and $5.

Current policy for rate adjustment, set in 2018, dictates the following:

- Meter rates should be **reduced**
  - If the observed peak occupancy for a district is less than 65%
- Meter rates should be **increased**

- If the observed average peak occupancy for the district exceeds 85%, AND
  Average occupancy reaches or exceeds 85% during 3 or more hours during the day, AND
- Average occupancy reaches or exceeds 70% during 5 or more hours during the day, AND
- Annual on-street meter and SmartPark pay station transactions have not decreased since the last meter rate increase

FLEX USE LOADING ZONES

The following provides a more expansive overview of this concept, which is identified as a Quick Win recommendation in the update to the TDM Plan.

Concept Overview

Flex zones, or variable regulations, create dynamic curb space that is responsive to need by allowing different uses access to the same space at different times of day. For example, on prime commercial streets, early-morning loading zones might be balanced with regulations that shift the same curb zone to short-term parking at midday, and potentially to passenger pickup/drop-off space during evenings. Flexible loading zones could also allow for multiple users to occupy the space throughout the day, such as a shared passenger and commercial loading zone.

Flex zones can also vary seasonally as the weather dictates behavior and travel patterns. For example, in the summer space can be reserved for a circulator stop of passenger pick up and drop off near restaurants, shops, and other attractions space where demand is highest. In the cooler, quieter months, this space could transition to parking or commercial loading. Flexible infrastructure can reduce competition for the right-of-way and allow multiple modes to take advantage of the same space at alternating times. Thoughtful design of infrastructure and space can ensure that all impacted/accommodated modes see benefits, while, in many cases, dedicated infrastructure for one mode may be preferred.

Design & Infrastructure Considerations

Flex zones, as with other loading and unloading curbside spaces, require enough space to be efficient. Specific considerations include the following:

- Commercial loading zones should be designed with the following space parameters:
  - 8′ wide preferred, 7′ minimum, located within parking lane.
  - At corners, 20′ long minimum for one parallel parking space. 50′ long preferred, if no parking between crosswalk and first parking stall.
  - If midblock, 22′ long minimum.
  - 40′ long minimum for spaces expected to accommodate a delivery truck or two passenger vehicles
- Loading zones should be placed so that they don't obstruct visibility of crosswalks, either at intersections or midblock locations.
- Trees should not be planted in furnishing zones adjacent to loading zones.

MOBILITY HUBS

Concept Overview

Mobility hubs combine points of access to distinct components of the local/regional multimodal network, often including services and programs that operate independently of each other – the placement of a City-provided bike rack and a shared bike or scooter corral installed adjacent to a BATA bus stop, for example – to facilitate seamless transfers between these services and programs that, when effectively combined, reduce travel dependence on personal autos. The mobility hub concept originated as branded public spaces designed and programmed to integrate travel modes with information to guide trip planning and mode-selection. The first mobility hubs were largely focused on addressing "first-mile/last-mile" gaps, particularly related to connections to and from mass transit services. Providing immediate access to taxis, car-share services, and bike parking/networks gave those alighting buses and trains reliable options for completing their trips. Likewise, these options provided a range of options for getting to stops and stations without driving oneself and having to secure parking.

Information Kiosk at Branded Mobility Hub in Bremen, Germany

Image Source: www.carsharing.de

The concept has proven broadly useful, however, to call attention to points of intersection between two or more non-driving travel modes and to make it as easy as possible to access these modes, including transferring from one to another. As emerging mobility options increasingly diversify travel options in more places, and as technology makes it increasingly easier to find immediate information on and access to these options, informal mobility hubs are emerging across many of our communities. A bus rider who hails a Lyft ride upon receiving notice of a bus delay is one example of an informal mobility hub in action. Nonetheless, opportunities to create distinctive public spaces by co-locating points of access to these modes and

enhancing these spaces with information and marketing, can create important opportunities to reduce driving trips and parking demand in places like downtown Traverse City.

Whether Simple or Complex, Mobility Hubs Optimize Access to Key Mobility Options

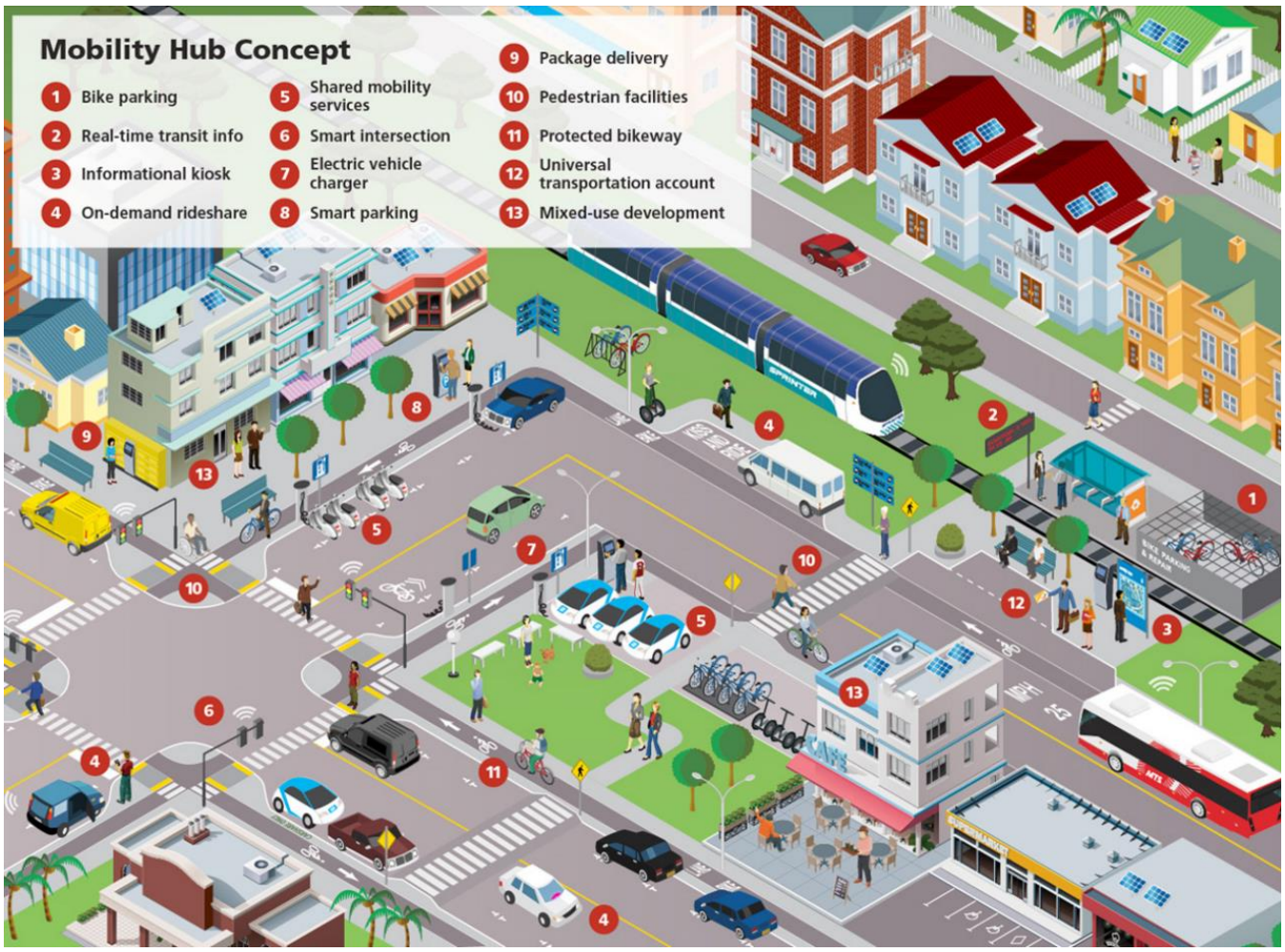


Image Source: SANDAG

Mobility hubs can include a variety of multimodal infrastructure components customized for their location within the transportation network, and they can range from simple to complex in their range of features. Beyond mobility connections, mobility hubs can provide a sense of place and community connection, which may include access to food and drinks, as well as proximity to public facilities and/or amenities. For the purposes of this document, the term "mobility hub" refers to any intentional co-location of two or more publicly accessible travel modes within a public space or facility.

Design & Infrastructure Considerations

Designing mobility hubs depends heavily on the surrounding context and the mode of transportation that is placed at the hub. Regardless, mobility hub services and devices should not impede mobility of other modes,

such as walking. Specific design and infrastructure considerations for the elements that may be located at mobility hubs include:

- Bikeshare and scootershare stations should be located:
  - 1.5′ from back of curb if not adjacent to parking; 3′from back of curb when adjacent to parking.
  - 3′ from building or building frontage while maintaining a 5′ minimum pedestrian access route.
  - 10′ from a building doorway.
  - 3′ from all street furniture or fixed objects including trees and vegetation, light poles, benches and other bike racks as well as accessible (ADA) parking spaces.
  - 5′ from a marked crosswalks and driveways.
  - 10′ from a fire hydrant, fire call box, police call box or other emergency facility.
  - 3′ from the front and 15′ from behind a designated bus stop sign post.
- Hubs may be located on-street in the clear space where motor vehicle parking is prohibited or in place of parking.
- Avoid placing hubs within streets that have high traffic volumes/speeds.
- Vertical barriers, such as flex posts, precast curbs, or planters should be used to restrict motor vehicle encroachment on on-street docks and corrals.
- Mobility hub elements should be oriented so they can be accessed from the sidewalk or a protected on-street area.

PUBLICLY OWNED SHARED MOBILITY

Concept Overview

Shared mobility is a shared transportation service where bicycles or e-scooters are available for public use through short-term rental. Bike and scooter share provide a low-cost transportation option that is ideal for short trips. It also offers a low barrier to entry for individuals to incorporate active transportation into their routine. Shared mobility is proven to help lower VMT, reduce carbon emissions, and improve public health. Shared mobility can operate independently or in tandem with other mobility services like public transit to create a seamless public transportation network.

Examples

Metro Bike | Austin, TX

MetroBike was established in December of 2013. The system is owned by the City of Austin and operated by the local 501(c)(3) non-profit Bike Share of Austin. Funding partners include Whole Foods, SXSW, Downtown Austin Alliance, the Austin Chronicle, Austin Parks Foundation, Austin Community College, and others. In 2020, the MetroBike was also integrated with CapMetro, the local transit operator. The MetroBike system includes 75 stations and a fleet of 700 bikes, 500 traditional and 200 electric bikes. It is a docked system, and all trips must begin and end at a docking station.

Pricing options for MetroBike are as follows:

- Pay as you ride: $1.09 to unlock + $.023 per minute
- Day pass: $12.99 for unlimited trips up to 60 minutes within a 24-hour period
- Weekend pass: $19.49 unlimited trips up to 60 minutes within a 72-hour period
- Monthly pass: $11 + $15 one-time activation fee for unlimited trips up to 60 minutes
- Annual pass: $86.60 for unlimited trips up to 60 minutes

There is an additional fee of $4/30 mins for any trip over 60 minutes.

CDPHP Cycle | Albany, NY

CDPHP *Cycle!* is a bikeshare program offered through the Capital District Transportation Authority (CDTA) in partnership with CDPHP, a local health insurance company based in Albany. The system has over 400 bikes at more than 80 station in Albany, Watervliet, Schenectady, Troy, Cohoes, Saratoga Springs, and the Lake George/Glens Falls area. CDPHP Cycles is a peak season service only, operating annually from April to November. The system does have docks, but bikes do not have to be left at specified parking locations.

Pricing options include:

- $5 hourly plan, prorated by minute
- $15 monthly plan, which includes 60 minutes of ride time per day
- $55 seasonal plan, which includes 60 minutes of ride time per day
- Half price plans for students
- Discounted plans are available for CDPHP members

Spokies | Oklahoma City, OK

The City of Oklahoma City launched its Spokies docked bike share program in May 2012. The Spokies program was initially funded with an Energy Efficiency and Conservation Block grant administered by the City of Oklahoma City's Office of Sustainability. This grant was designed to promote energy efficiency, including alternative methods of transportation.

Spokies has been part of EMBARK, the region transit authority in Central Oklahoma, since August 2014. In June 2019, Spokies launched Spokies DASH with the assistance of a Congestion Mitigation and Air Quality (CMAQ) grant supported by ACOG, Downtown OKC, Colony Partners, and Uptown 23rd.

The Spokies fleet includes 60 pedal-only bikes and 53 E-bikes, added in 2022 and funded by a federal TAP grant. User fee options include:

- Annual Pass: $120/year, includes 40 minutes of ride time/day. Ride time exceeding 40 minutes per day are charged usage fees of $0.12 per minute for E-bikes and $0.06 per minute for pedal-only bikes.
- Monthly Pass: $20/month, includes 40 minutes of ride time per day. Ride time exceeding 40 minutes per day are charged usage fees of $0.12 per minute for E-bikes and $0.06 per minute for pedal-only bikes.

- Day Pass: $12, includes 4 hours of ride time to be used in a 24-hour period. Ride time exceeding 4 hours (240 minutes) are charged usage fees of $0.15 per minute for E-bikes and $0.12 per minute for pedal-only bikes.
- Walk-up - Unlock a bike for $1. Riders pay $0.15/minute for E-bike and $0.12/minute for pedal-only bikes.

PEDESTRIAN SAFETY BEST PRACTICES

Concept Overview

The recommendation to Adjust Meter Schedules, to focus more on evening peaks and provide more free parking during early mornings should be a revenue-positive change that could create a meaningful increase in the DDA's parking fund income. It is suggested that an optional implementation step would be to capture that new revenue to fund winter sidewalk clearance/maintenance activities, to ensure that downtown remains walkable during all seasons. This could include:

- Clear obstructions from sidewalks, curb ramps, and crosswalks
- ADA requires at least 36 inches of clear passageway
- Use of salt or gravel to reduce slip hazards
- City ordinance on snow clearance time frame, BID hires contractor to maintain

Examples

Expanded Sidewalk Snow Clearance | Marquette, MI

The Marquette DDA significantly expanded its downtown parking meters following a 2012 Downtown Parking Study that found a large share of downtown's on-street parking was occupied by downtown merchants and employees, as well as a general willingness among downtown visitors to pay for parking if it was convenient and consistently available. To help build support for this change, the MDDA agreed to use the increase in meter revenue to pay for sidewalk snow clearance during winter months, helping to maintain downtown's walkability during winter months. A 2020 update to the 2012 parking study found that there was significant support for both the snow clearance and the meters that helped fund it among downtown's retail business owners.

Snow Center Website | Cambridge, MA

The city of Cambridge maintains a web page[7] that serves as an information repository for all things snow-related, including updates on parking bans, transit service and delays, city snow removal policies, and other resources. The website also allows residents to report snow-related hazards on streets, sidewalks, bike lanes, and bus stops.

[7] https://www.cambridgema.gov/snow

Sidewalk Snow Support Pilot | Grand Rapids, MI

The City of Grand Rapids operates a limited scope sidewalk clearing pilot program, modeled after similar programs in East Grand Rapids and cities in Wyoming. The program began in 2020 will continue through at least April 2023. The program area covers 164 of the city's 922 miles of sidewalks. 80% of pilot sidewalks are on major roads, and 20% are on neighborhood streets. The purpose of the program is to make is easier for residents to clear their sidewalks after heavy snow events, and focuses on neighborhoods with high community need, where there are high concentrations of seniors, people with low-incomes, high levels of pedestrian traffic, and large populations of school children, among other factors. Snow support is provided after a storm resulting in at least 3 inches of accumulated snow.

REVISING PARKING REQUIREMENTS

Eliminating Parking Requirements

Parking requirements dictate the minimum number of parking spaces that a developer must build in conjunction with a new project. Parking requirements generally correlate to land use and building square footage, and are outlined in a city's zoning code. There is movement across the US to reduce or eliminate minimum parking requirements, either in defined areas like a downtown district, or citywide. This wave of policy change is heralded by numerous benefits, most notably to support economic development, downtown revitalization, and small business growth, and to address the rapidly increasing cost of housing.[8]

Key Benefits

Benefits of reduced or eliminated parking requirements include

- Lower costs for new commercial and residential development, promoting new business growth and making housing more affordable. Surface parking generally costs between 5,000 and 10,000 per space to build, and these costs are most often passed along to the consumer in the form of higher commercial or residential rent.
- Improved environmental sustainability, with less impervious cover creating stormwater runoff and management concerns.
- Promote the use of alternative transportation modes like transit, walking, and biking, which reduces congestion and improves public health.

Case Studies

Fayetteville, AR

In 2015, Fayetteville became one of the first cities United States to eliminate minimum parking requirements for commercial building citywide, giving businesses and developers the freedom to determine how much parking their customers truly needed. The change helped spur the redevelopment of several historic sites across the city into restaurants and mixed-use buildings that otherwise would not have been feasible due to

[8] For more on this trend and its impacts: Nov 2022 Next City Article

the high cost of parking construction. It has also increased foot traffic in commercial areas, as visitors are more able to easily walk between businesses.

South Bend, IN

In early 2021, the South Bend City Council voted to eliminate minimum parking requirements citywide, expanding on previous policy that removed parking requirements in its downtown only. South Bend had already eliminated parking requirements for its downtown, but Motivations behind the policy change were to eliminate burdens on small businesses and attract new investment to the area. Previously, small businesses had to apply for a zoning variance to build fewer parking spaces, which cost both the businesses and the city government time and money to develop, submit, review, and approve applications.

Setting Maximum-Parking Limits

Parking maximums define the maximum amount of on-site parking that would be approved for each land use in a development proposal. Maximums seek to ensure that parking is not oversupplied and incentivize developers to plan for alternative transportation modes. Parking maximums can also increase development density, improving area walkability and multimodal functionality in support of the TOD concept.

The original concept of a parking maximum focused on defining a hard cap on a development's on-site parking supply, with no/minimal exceptions. Today, many cities choose to establish a more flexible form of maximum, in which one or more options are available to provide more parking. The most common exceptions made available through such an approach are:

- The provision of shared, or public, parking
    - Example: Transit Oriented Development (TOD) Districts (Charlotte, NC)
- The provision of mobility improvements or TDM commitments
    - Example: Aspen, CO
- The payment of a fee toward a public mobility or TDM investment fund
    - Example: Columbia Pike form-based code (Arlington County, VA)

Key Benefits

Parking maximums can yield the following benefits:

- Facilitating and encouraging higher development densities
- Preventing oversupply of parking
- Reducing traffic congestion by reducing induced parking demand
- Reducing housing costs by reducing the potential impact of excess parking supplies on rent prices
- Reducing housing costs by increasing potential housing density
- Emphasizing the expectation of reduced parking needs in the affected TOD area

Benefits Specific to Flexible Maximums

The following benefits are specifically associated with flexible parking maximums:

- Making lower maximums more viable, allowing codes to clearly indicate the preferred amount of parking for land uses in key growth areas

- Providing strategic flexibility to developers, minimizing the risk of shifting development activity away from these areas
- Generating public benefit when developers choose to provide more parking, commensurate with how much more parking they provide

Case Study: Flexible Maximums in TOD Districts (Charlotte, NC)

Charlotte's new Transit Oriented Development Districts code – adopted in 2019 and covering the majority of the city's South End neighborhood – includes an incentive to provide public parking, by **limiting the amount of on-site parking that can be provided** for most land uses (Maximum Vehicle Parking Spaces) **but allowing developers to include more parking if a significant share of the parking will be available for public use**, as described below:

- Visitor parking in multifamily residential development can exceed the maximum by 10 spaces, or 10% of the number of dwelling units on-site, whichever is greater.
- Supplies can exceed the maximum by up to 50% if any one of the following conditions are met:
  - 10% of the total number of spaces are provided for public use 24 hours a day and seven days a week.
  - 20% of the total number of spaces are provided for public use as shared spaces available from 8:00 a.m. to 6:00 p.m., Monday through Friday.
  - 20% of the total number of spaces are provided for public use as shared spaces available from 6:00 p.m. to 8:00 a.m., seven days a week

This policy encourages new projects to include parking that can help meet the longstanding and expanding public parking supply deficit in South End, particularly in a market where many developers are likely to seek approval for supplies that exceed the "maximums" now allowed in these districts. Because the City offers this flexibility, rather than emphasizing a hard cap on parking that can be provided, it was able to adopt "maximums" that are significantly lower than what can typically be adopted for a hard-cap maximum. The lower maximum combined with flexibility that is tied to a desired public good (in Charlotte's case public/shared parking) both signals to developers what the City considers to be an appropriate (rather than maximum) amount of parking is for each use, and defines the concessions it wants from developers if a higher supply is to be approved -- public parking, to encourage more efficient, resilient parking facilities.

MEETING PARKING REQUIREMENTS VIA MOBILITY IMPROVEMENTS

The growth of active transportation shared mobility over the past several years (including biking, scooter share, car sharing programs, and ride-hailing apps) provides opportunities for people to have access to fast and convenient modes of transportation without needing to own and store a personal vehicle. Incentivizing and promoting the use of active and shared mobility leads to less demand for on-site parking and provides opportunities to reallocate the parking footprint to other uses. The prevalence of ride-hailing services in

certain communities, for example, may increase demand for exclusive loading and unloading zones at a site rather than a parking space.

Bicycle Examples

Folsom, CA

The City of Folsom, a city of about 75,000, allows for the reduction in vehicle parking requirements if development provide additional secure bicycle parking over and above the minimum bike parking requirements.

- One vehicle space may be reduced for every three additional bicycle spaces provided up to a maximum of 2% of required parking. The provision of end of trip shower/locker facilities for developments at least 100 employees reduces required spaces by 2% or 5 spaces, whichever is greater.
- There is also reduction opportunities through the provision of preferred parking spaces to employees participating in carpool or vanpool. The reduction for this measure is one required space per every carpool/vanpool space up to a maximum of 2%

Dallas, TX

Dallas boasts comprehensive bicycle-based parking reductions for off-street vehicle parking. Specific reductions are based on bicycle parking class. Dallas allows up to a 10% reduction of required off-street parking.

- A reduction of one vehicle parking space is permitted for every six Class I bicycle parking spaces (e.g., racks for short-term use). Required bicycle parking does count towards parking reduction. A minimum of 20 off-street parking spaces must be required to receive parking reductions
- A reduction of one space for every four Class II bicycle parking spaces (e.g., secure lockers for long-term use)
- Reductions May not exceed 5% of total required off-street parking spaces.
- An additional 5% reduction of total off-street parking requirements may be granted by providing showers, lockers, and changing facilities for bicycle riders. This provision does not apply to retail or personal service land uses.

Shared Mobility Examples

Chandler, AZ

Chandler encourages the installation of passenger loading zones to meet demand for passenger drop-off and pick-up areas generated by ridesharing vehicles

- Municipal code allows a 10% reduction of parking requirements per each passenger loading zone up to a maximum of 40%
- 1 loading zone space may be counted per 50,000 sq. ft. for commercial uses

Austin, TX

Austin has several off-parking reduction incentives for developers to install active and shared mobility infrastructure, such as:

- Reduction of up to 10% if shower facilities are provided
- Reduction of 20 spaces for each car-sharing space provided on site.

These and other incentives can be combined to reduce parking requirements up to 40%.