National Association of City Transportation Officials

NACTO TRANSIT LEADERSHIP
RESOURCE PAPER
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CURB APPEAL

CURBSIDE MANAGEMENT STRATEGIES FOR IMPROVING TRANSIT RELIABILITY

O'Farrell Street, SAN FRANCISCO, CA

Cities are clearing the way for transit by taking control of their curbs. To support key transit routes, cities are increasingly taking steps to shift from curbsides dominated by "free parking" to reliable bus lanes, safe bikeways, freight loading, and public space. With transit-served streets thriving and the demand for curbside access rising, there is a growing recognition that our approach to curbs needs to make transit service reliable in an era of urban growth.

Cities now have the design tools they need to make transit more reliable, but the politics of parking too often stymie the best projects. The results of twentieth-century "first-come-first-served" parking are frustrating and wasteful: transit riders and drivers are delayed by double parking, with an especially large impact on the same vibrant, walkable streets where some of the highest bus and rail ridership is found. Without space for loading, delivery workers and for-hire vehicles are both inconvenienced and cause delays to others; people bicycling and walking are put in danger by blocked bike lanes and bad visibility; and drivers cruise for long distances to find parking. Yet these practices have been tolerated for decades, in part because of the politically charged nature of "removing parking spaces" without addressing the underlying mismatch between supply and demand.

Supporting major street design changes with a curbside management system is a way to make sure that shifts to sustainable citywide mobility do not come at the expense of quality public space or small business needs. Modern curbside policies recognize that transit is fundamentally different from adding motor vehicle capacity because it can deliver so many people to a street. These policies seek to make better decisions about curbs based on a recognition that transit and local businesses support one another. Transit riders, transit agencies, city governments, and local merchants all have a stake in more reliable transit and better public space.

This paper provides examples of how cities have successfully changed curb use to support transit. It is focused on the types of busy, store-lined streets where high-ridership transit lines often struggle with reliability. These key curbside management strategies support reliable transit and safer streets in one of two ways: either by directly making room for transit, or supporting transit projects by better managing the many demands on the urban curb.

Cities Can Improve Transit by Managing the Curb

Around North America, cities have successfully improved transit operations by using the following strategies to manage the curb:

» Shifting from Parking Lane to Flex Zone
» Clearing the Way for Transit
» Moving Loading and Access Nearby, and
» Looking Beyond the Corridor

FROM PARKING LANE TO FLEX ZONE

Cities across North America are recognizing the value of their curbsides as flexible zones. To make corridor-level changes possible, leading cities are adopting and acting on policies that prioritize reliable transit and safe bicycling infrastructure first, followed by other important uses of the curb like deliveries, passenger pick-ups, green stormwater infrastructure, and small public spaces—as well as managed parking. This policy foundation supports transit project managers and designers in making better decisions about curbside uses, and sets a clear expectation that transit is a priority in street design.

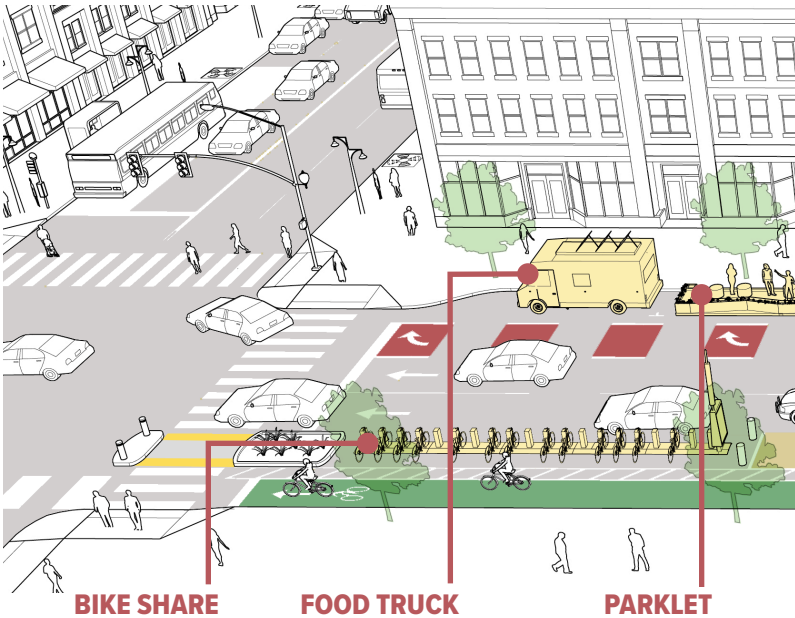
Urban curbsides have conventionally been driven by land use, with parking and loading regulations based on the immediately adjoining building: meters in front of shops, loading zones near supermarkets, no-parking areas at warehouses, unmetered parking in residential areas. But this practice assumes cars are the primary mode of transportation on a street, leaving cities to choose between local uses and mobility—because through-moving cars do little to support, and much to harm, local business and residents.

A transit-friendly method of curb allocation on downtown, commercial, and mixed-use main streets is supported by the policy framework adopted in Seattle (see right). A project manager using this method first assigns critical uses like transit stops, transit lanes, and quality bikeways—the uses that often find themselves competing for space on streets otherwise designed for motor vehicle traffic. Next, transit-and-business-supportive uses like bike share stations, commercial loading, and accessible passenger loading are assigned to the extent needed to prevent bus blockages by these uses. The remainder of the curb can be dedicated to valuable public space uses such as parklets and stormwater infrastructure, pick up and drop-off areas for for-hire and private vehicles, and

SEATTLE RIGHT-OF-WAY PRIORITIZATION

In 2016, the City of Seattle adopted new policies that define the curb lane as a "flex zone," allocating ranked curb use priorities according to street types. On commercial streets—after accommodating key infrastructure outlined in citywide modal plans—the city prioritizes uses like freight and passenger loading over metered parking. Free long-term private vehicle storage is a low priority for curbside space on key streets, and long-term, commute parking is generally not supported. These priorities give project managers assurances of policy support in making the case for localized curbside changes that support transit.[1]

	Commercial or Mixed-use Areas	Residential Areas	Industrial Areas
	Ranked Priority		
Modal Plan Priorities	1	1	1
Access for Commerce	2	3	2
Access for People	3	2	3
Public Space Activation	5	6	4
Greening	6	4	5
Private Vehicle Storage	4	5	6



depending on local land uses, a cascading array of very short term, one-hour, multi-hour, and longer-term car storage. While the exact mix of curb uses will vary, this approach to curbside priorities can ensure that transit reliability is a foremost priority in curb assignment.

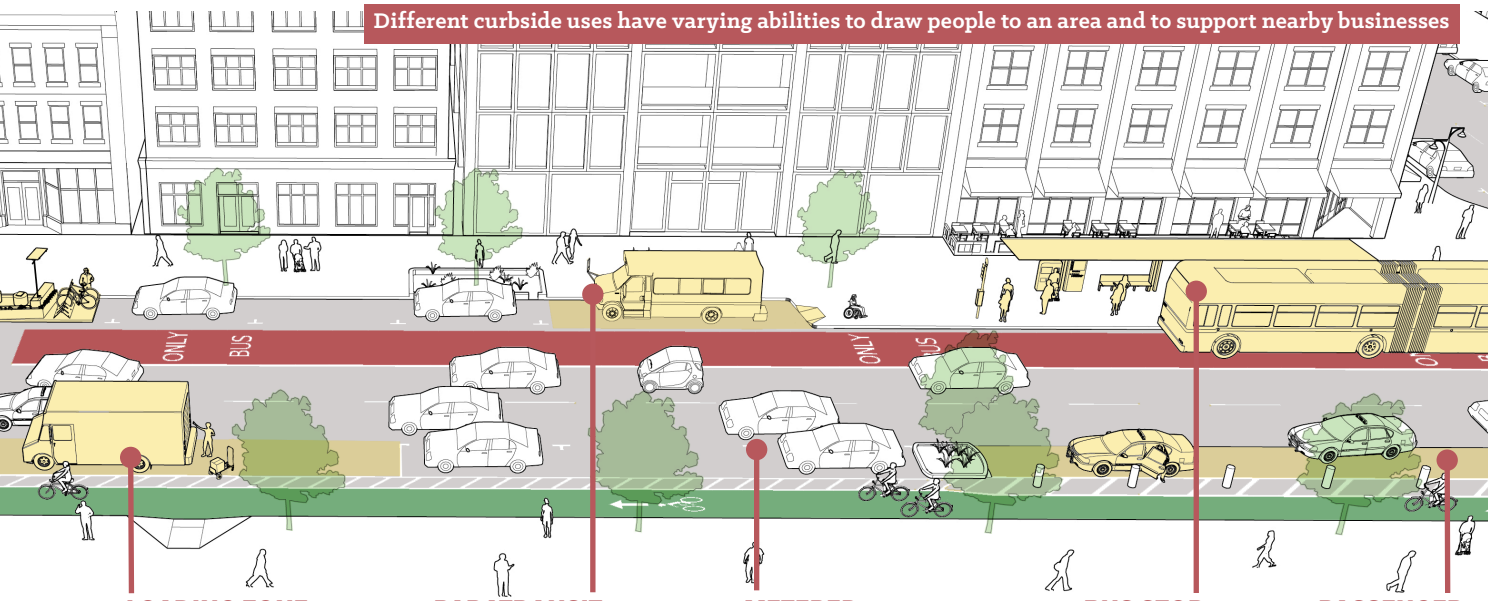
CHOOSING MEASUREMENT OVER MYTHS

Data from around North America show that repurposing parking spaces for transit priority supports businesses and mobility, but making this case with neighborhood stakeholders takes work and trust-buildling. Curbside changes can be sustained and expanded when decision-makers and stakeholders are informed about the tradeoffs involved in curbside use. Planning and outreach, combined with rigorous before-after studies, can build the business case for reducing the number of metered parking spaces, and the neighborhood case in favor of increased transit reliability.

Across a wide range of cities and land use contexts, arrival-mode surveys show that transit delivers many times more people to streets and businesses than do private cars. Arrival-mode surveys are a form of intercept survey that asks how people arrive at local businesses or to the street in general—walking, transit, biking, taxi, or private car—and whether car arrivals were dropped off, parked directly on the street being studied, or parked on a different street.[9] In Los Angeles, merchants on Cesar Chavez Street estimated 36% of arriving patrons used cars and none arrived by transit; in fact, only 7% drove and 46% arrived by transit.[10] On Nostrand Avenue in Brooklyn, surveys found that only 5% to 9% of business patrons arrived by a car parked on the street itself—while buses delivered 33%.[11] On Geary Street in San Francisco, only 6% of people surveyed on the corridor arrived by car, while 90% took transit or walked.[12] Even on transit corridors that also serve high motor vehicle traffic volumes, such as Reseda Boulevard in Los Angeles, only one-third of people arriving to the corridor used personal motor vehicles or taxis.[13] By including an arrival option of parking on the transit street or off the transit street, these surveys can provide clear evidence that reducing the number of metered parking spaces on the corridor itself will not hurt businesses. This data also demonstrates that "residential" unpaid parking on nearby streets is already supporting the business street, building a case for metering the parking on cross-streets.

Before-after data on sales tax receipts of local businesses make a compelling case for the benefits of bus improvements to businesses. On Fordham Road in the Bronx, NYC DOT replaced curbside metered parking lanes with full-time bus lanes in both directions, a dramatic change. An intensive study of local business tax receipts demonstrated that business increased 71% on the corridor, in comparison to 38% for comparable streets.[14] These findings provided support for a large program of bus priority projects that continue to change major commercial streets in New York City.

Different curbside uses have varying abilities to draw people to an area and to support nearby businesses



LOADING ZONE
20 deliveries/day supporting $10,000 in daily sales per block

PARATRANSIT & ACCESSIBLE LOADING
Serving 19% of the US population[5]

METERED PARKING SPOT
15 vehicles/day[6, 7, 8]

BUS STOP
1,000 riders/day

PASSENGER DROP-OFF ZONE
100 passengers/day

CLEARING THE WAY FOR TRANSIT

Having the option to make small reductions in curbside parking can make or break a transit project. Short queue jumps lanes, turn pockets or approach lanes that clear cars from the transit lane, and visible approaches for protected bike lanes are common design tools. On the most in-demand streets, the strongest transit plan sometimes calls for moving all or most loading and parking off the street. Whether for better bus lanes, bikeways, or expanded public space and sidewalks, a plan for regulating the remaining parking is crucial to success.

PRIORITIZING TRANSIT AT CRITICAL LOCATIONS

Dedicated space for transit can sometimes best be implemented by repurposing sections of curb. Short curbside transit lanes are especially significant in the context of 4-to-3-lane conversions and other projects that reduce the total number of motor vehicle lanes. These designs are proven to improve pedestrian (and therefore transit rider) safety, and provide an opportunity to give transit a peak-period advantage by using short curbside lanes.

Right turn pockets are a powerful tool when used judiciously. Transit lanes are frequently blocked by right-turning vehicles. On a street with curbside parking next to the transit lane, clearing a few parking spaces to add a short right turn pocket may slightly lengthen the pedestrian crossing distance compared with installing a curb extension, but can remove an otherwise significant source of transit delay.

A red bus lane with turn pocket, SAN FRANCISCO, CA

Transit signal priority is a powerful tool that works best when buses can approach the intersection in their own lane. For streets without full-length dedicated bus lanes, short curbside transit lanes or queue jumps at intersections can cut bus travel time significantly, especially in combination with signal priority measures.

RAINIER AVE ROAD DIET, SEATTLE, WA

On Rainier Avenue in Seattle, SDOT converted a four-lane street to one lane each way with center left turn lanes and parking. To keep its frequent bus service moving in this new configuration, a right turn only lane with bus queue jump was installed at a key intersection. Buses are detected as they approach the intersection, and a right turn phase is activated to clear right-turning vehicles out of the combined right-turn-only-except-buses lane. This feature allows the bus to move ahead of the queue of through-moving vehicles, converting a previous slow point for transit into a point where buses gain an advantage. Despite removing motor vehicle lanes on a street with about 20,000 vehicles per day, peak bus travel times improved by 3 minutes in one direction and held steady in the other, while general traffic travel times increased by only about one minute in both directions—all while dramatically enhancing conditions for those who live and travel along the corridor.[15]


Rainier Ave before, SEATTLE, WA

Rainier Ave after lane conversion, SEATTLE, WA

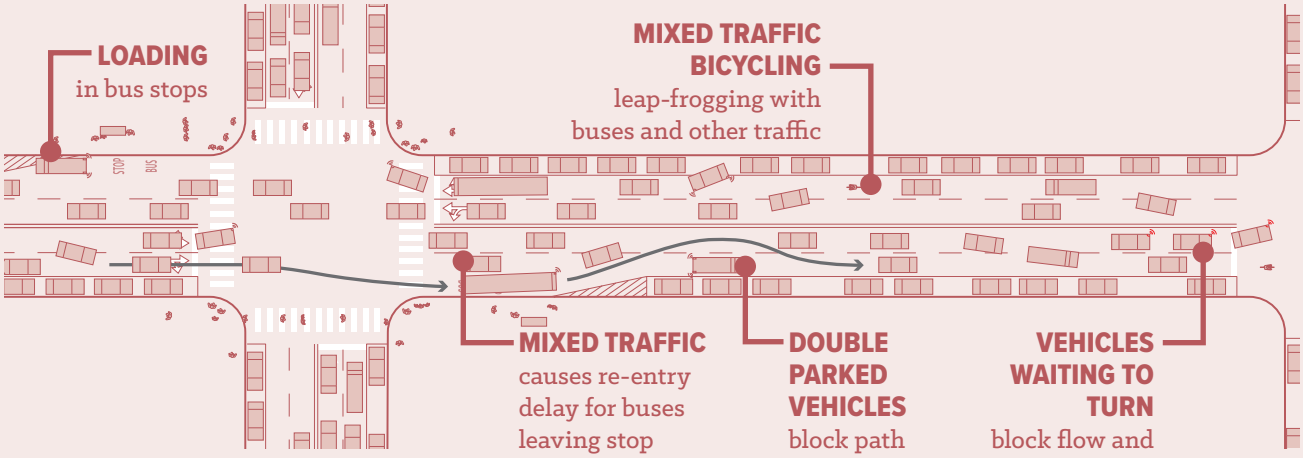
MAKING ROOM FOR TRANSIT AT PEAK PERIODS

The relatively common configuration of a two-lane street with parking has few transit priority options that do not involve repurposing a parking lane.

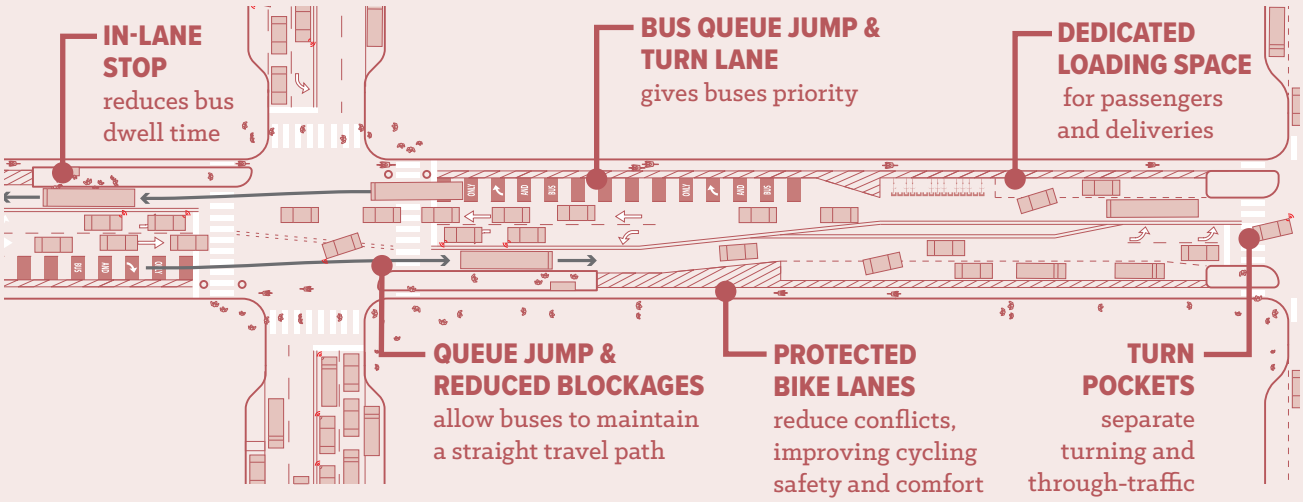
Longer peak-period transit lanes can be used to extend the transit queue jump lane at peak periods, becoming loading or parking at off-peak times but preserving queue jump approaches all day. This arrangement may be especially relevant on streets where several transit lines converge, resulting in very high peak-period bus volumes.

A part-time exclusive bus lane, CHICAGO, IL

Before: Unorganized streets cause friction between vehicles and reduce transit reliability due to blockages.



After: Organizing a street and curbside allows more efficient traffic flow & operations for both transit and general traffic.



MOVING LOADING AND ACCESS NEARBY

Buses, rail, and bikes use curb space for very short amounts of time per rider, but need space on main streets. Freight loading, for-hire passenger access, carshare, drop-offs and pick-ups in private cars, and short-term car parking are also important activities, but can be moved down the block or around the corner from destination buildings on a transit street.

Demand for loading space forces transit and bikes into congested general travel lanes.

On a commercial street, it is usually impossible to accommodate all potential curbside uses immediately in front of their destinations. Instead, in high demand locations, cities ultimately need to ask users to trade proximity for time.

Trucks and taxis loading in the right lane can cause major delays for transit. As the number of deliveries grows, and as the number of for-hire vehicles on city streets has increased, loading activities are increasingly noted as causes of lane blockages.[16, 17] Providing commercial loading zones at the right time of day and at the right price can make deliveries easier and less expensive for businesses, in addition to keeping trucks out of the way of transit. For taxis and for-hire vehicles, designated loading spaces at high-traffic destinations, especially during business hours, can relieve blocking from double-parking. Curbside flex zones can also provide accessible loading spaces.


Protected cycle track with passenger loading island, SEATTLE, WA

TRADING PROXIMITY FOR TIME AT THE CURB

Most curbside users do not need to park immediately in front of a specific building. Recognizing this, cities can assign curb space to uses based on feasible distances from their destination, reserving the curb on main streets for very short-term uses. Some delivery drivers making multiple deliveries in one area will favor a slightly longer walk to destinations if they are given dedicated spaces and can park for longer; some businesses, even those making deliveries of perishable food, prefer the "park once and walk" model to the alternative of parking illegally at a destination.

Surveys of nearby businesses and institutions are a way to identify freight and private-passenger loading needs, potentially finding patterns that curb space allocation based solely on land use might not identify. Forming partnerships with local business, delivery services, and other street users can be important to collecting data that allows planners to determine how to best accommodate loading and deliveries without blocking other street users.

On Nostrand Avenue in Brooklyn, NYC DOT conducted surveys of local merchants, finding that some preferred relatively nearby loading zones for short delivery times of 30 minutes or less, while others would accept loading zones farther away if longer loading times were available.[18] Similarly, drivers seeking on-street parking can be diverted to metered spaces on side streets, where they may be charged less. These changes free up space on the transit street, supporting projects in which a curb needs to be fully cleared for transit lanes.

The increasing use of direct-to-consumer freight has increased the already significant presence of freight loading on urban streets. Freight loading zones in dense residential areas, in addition to conventional commercial loading zones, can help relieve the pressure on transit stops and reduce bus blockages. Cities can also design wider bikeways that support package and food deliveries by bike, can create reservable loading zones that allow freight companies to "park and walk" instead of driving door to door, and should explore off-peak freight delivery incentives for busy mixed-use environments.

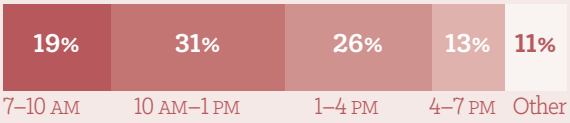
COMMERCIAL LOADING AND DELIVERY ZONES IN BROOKLYN

Cities can deter double parking by creating effective freight and delivery zones by working with adjacent businesses to address their needs. The implementation of the B44 Select Bus Service route, opened on Nostrand Avenue in Brooklyn in 2013, provided an opportunity to manage freight and delivery activity on the busy commercial corridor. Double parking on the street was a significant problem for bus operations, despite having a existing peak-period curbside bus lane.

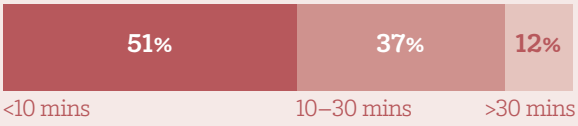
NYC DOT surveyed Nostrand Ave merchants to ask where they would prefer loading zones with varying levels of restrictions: one loading zone per block with a 1-hour time limit; a spot in front of a particular business with a 15-minute time limit; or a spot on a side street available all day.

NYC DOT was able to deploy delivery zones to best balance the needs of businesses with other street users.[19]

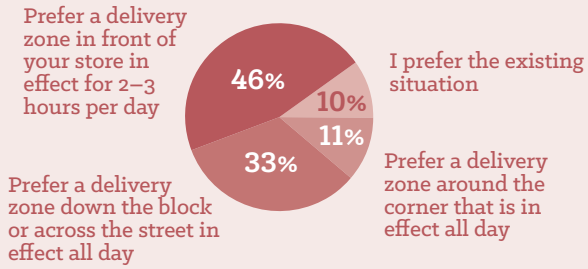
Timing of merchant deliveries



Delivery duration on Nostrand Ave



Nostrand Ave delivery zone requests



UNBLOCKING THE LANE BY INCREASING AVAILABILITY

Bus lanes work when they are not blocked. The same is true of buses in mixed traffic, where the right lane is frequently regarded as a drop-off zone. Double-parking, cruising for parking, and other side effects of an undermanaged curb delay transit riders, as well as bicycle and car users. Transit lanes with automated enforcement have been shown to reduce travel times for buses and private motor vehicles, in part because of the reduction in lane blockages by double parked and illegally parked vehicles.

To reduce blockages of buses by double-parked vehicles, curbside regulations can put a price or a time limit on convenience. The mismatch between supply and demand for both business-oriented and residential parking is at the root of bus-blocking spillover, and is also a cause of the sometimes-intractable politics around parking. Near transit-oriented neighborhood main streets from Pasadena, CA to Brooklyn, New York, almost half of local motor vehicle volume has been found to be cruising for parking.[20] Parking and loading availability can be improved—and bus blockages can be decreased—through a combination of curb space assignment, time limits, and carefully set meter rates that reflect changes in demand over the course of a day. All these tools are parts of a system that provides space where it is most needed, reduces the time spent by each private vehicle cruising and at the curb, and shifts trips to transit by helping equalize the marginal cost of trips.[21]

Time Limits

Transit-blocking parking activities such as double-parking or bus-stop parking are often associated with short errands, or with private and for-hire-vehicle passenger loading. For this reason, short-term parking and loading zones, often unpriced, are effective in combination with priced longer-term metered spaces. Allowing 10 to 15 minutes of occupancy, these spaces allow for increased turnover and curbside availability without the need for higher metered rates.

Short-term spaces can also be priced if total demand still outstrips supply on a street. Progressive parking charges, where the rate for the second 15 minutes is more expensive than for the first 15 minutes, create a financial incentive for drivers to park for short periods of time. This system is also easier to enforce than a true 15-minute time limit.

Cheaper or longer-term parking needs are more easily accommodated on streets away from the busiest destinations. In Berkeley, CA, two tiers of metered parking are used, with "Premium" spaces charging a higher rate for 2 hour parking, and "Value" spaces charging a lower rate for up to 8 hours of parking.

Demand-Based Pricing

Charging lower parking rates in off-peak periods and low-demand locations, and higher rates at peak times and high-demand locations, is a simple strategy to reduce cruising and double-parking. In New York City, the ParkSmart program introduced higher afternoon rates ($4 an hour) for parking along highly-used neighborhood retail streets, versus $2 per hour off-peak, resulting in a small reduction in cruising and double-parking.[22] Time-of-day pricing creates a transparent price signal to drivers about the value of the curb.

Using occupancy data lets cities adjust metered rates to respond to changes in curb demand over time. In Seattle, data on parking occupancy is collected annually for each of the city's 30 paid parking areas. Rates are adjusted up or down in line with occupancy targets and other performance metrics.[23]

Dynamic pricing is distinct from these periodic adjustment methods, and instead matches parking prices to demand on a real-time basis. Using real-time sensor or video-collected occupancy data, parking pricing can be adjusted hourly or even more frequently, providing greater precision in matching demand to supply. With or without dynamic pricing, occupancy sensors provide real-time information, including parking rates and availability by block, that can be pushed to display boards and apps to let drivers make decisions about where to park.[24]

Setting Occupancy Targets

Setting a target occupancy rate and a maximum price are key management tools in curbside pricing, and these will need to be balanced with one another based on goals for the street. A maximum occupancy rate of 80% (one in five spaces available) to 90% (one in ten spaces) leaves one or two spots open on each block, "optimized" for convenience and to reduce cruising. 95% occupancy or higher is normal on many transit streets, even at off-peak times; achieving availability of even one in twenty metered spaces is a challenge at peak times. Setting meter prices high enough to free up parking spaces is not a stand-alone method of curbside management. In some locations, curbside demand is so high that the market-clearing price would be difficult to defend; if a parking space is valued at astronomical sums by potential users, it may have more value in a public space use rather than as parking.

Dedicated short-term parking or loading zones should have lower target occupancy rates than metered parking. It may be necessary to set occupancy targets of 50% to 75% for freight loading, reflecting a goal of keeping lanes clear rather than a goal of always using the curbside as intensively as possible.

SF*PARK* DYNAMIC PARKING PILOT

San Francisco's dynamic parking pilot project, SF*park*, showed the benefits that can result from improved parking management. With meter rates set to achieve a 60–80% target occupancy, drivers in the five pilot areas experienced a 43% drop in time required to find a parking spot. Double parking fell by 22%, helping speed buses by 4–5% along the corridors. Additionally, VMT in the areas dropped 30%, traffic volumes fell 8%, meter compliance improved, and parking turnover increased.[25]

USING AUTOMATED ENFORCEMENT

Enforcement of curbside and transit lane regulations are essential to implementing a curbside plan, especially on commercial or other high-demand corridors. But manual enforcement is expensive and not usually sufficient to eliminate transit blockages. In contrast, automated enforcement, which is consistent, predictable, and unbiased, is demonstrated to improve the efficiency of the entire street, and strongly preferred.

In New York City, pole-mounted license plate readers are used to enforce transit lanes; in San Francisco, bus-mounted cameras provide clear evidence of unauthorized vehicles blocking a bus lane. In both cities, tickets are issued to the vehicle registrant rather than the driver, and are civil violations like other parking tickets. Cameras capture only exterior views of the vehicle, addressing civil liberties concerns.

For offset transit lanes that require drivers to enter a transit lane to parallel park or bus lanes that double as turn lanes, violations can be issued based on photo captures over time, such as with two photos capturing the same vehicle in the transit lane over two blocks. Automated parking enforcement is also effective against double-parking in mixed traffic lanes.

Setting Fines

In setting fines for transit lane or parking violations, the lowest effective fine should be used. Data from multiple cities shows that, in most contexts, consistently enforced but relatively low fines are sufficient to deter violations from non-commercial users. Several cities use higher fines in downtown districts—for example, fines for parking infractions are 50% higher in Pittsburgh's Downtown and Oakland business districts compared to the rest of the city—or charge higher fines to commercial users with repeated infractions.[26]

Equity in Enforcement

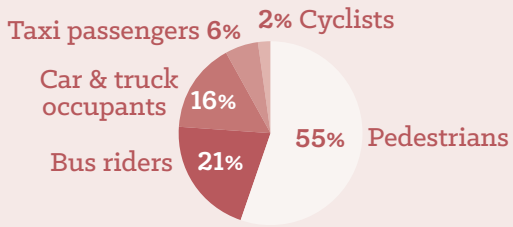
The consistent, predictable, and unbiased nature of automated enforcement is a large part of what makes it effective. Areas where automated enforcement is in use should be publicly announced and clearly marked. Fees, fines, and payment instructions should be prominently noted in online and print materials in multiple languages.

As with all transportation-related enforcement, procedural steps with substantive checks must be taken to ensure that people of color and people in lower-income neighborhoods are not subject to disproportionate enforcement. For civil violations, such as parking, cities and states should look for ways to reduce the financial and legal impact of enforcement, especially among people for whom fines and legal penalties carry and outsidzed burden. For example, several cities have created ticket diversion programs for a wide array of civil offenses. New York State, the City of Minneapolis, and several other states and cities allows certain offenses to be dismissed if drivers participate in a relevant driver education program.

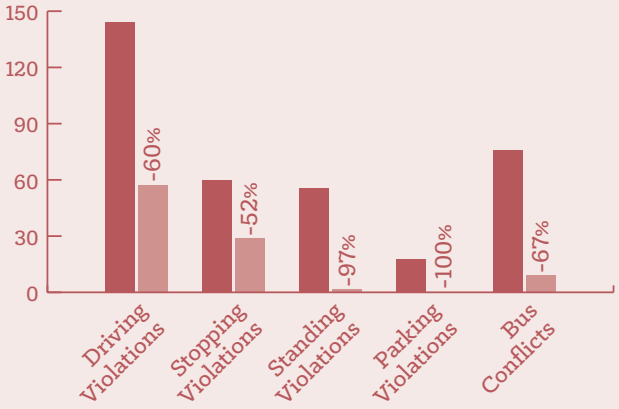
RED BUS LANES IN CHICAGO

Applying color to bus lanes can be effective in deterring intrusion from other vehicles. In Chicago, red colored curbside bus lanes were installed in 2015 as part of the Loop Link project. Madison Street is an important transit corridor—bus riders compose 21% of street users—and improving bus speed and reliability for transit riders had a large cumulative effect. Compared to the previous condition—a designated bus lane without red color—after conditions showed substantial decreases in moving and stopping violations, and a near-elimination of standing and parking violations.[27]

How people move along Madison Street



Violations per hour on Madison Street before and after red bus lane installation



Bus stop with red bus lane and curbside bike lane

LOOKING BEYOND THE CORRIDOR

Putting curbside change into a neighborhood context helps cities move from talking about parking loss to talking about tradeoffs, and is a more realistic approach to understanding how curbs are used near busy transit streets. And priced parking permits change the otherwise-impossible math of parking in dense neighborhoods, removing a source of driver frustration and paving the way for sustained change on the street. In downtowns and other core areas, communicating the time and money cost of parking, and gradually reducing the total amount of on-street parking is a powerful lever cities have to improve transit reliability and competitiveness at the same time.

Transit projects that make heavy demands of the curb need to be planned beyond the specific street. Managing curbsides at a neighborhood scale makes it possible to assign curbside uses that don't need to be directly in front of a destination, and planning for access beyond the corridor makes it easier to reassign parking on a corridor.

Area-Wide Availability

Parking reductions can be flashpoints in transit projects but can be mitigated by addressing and discussing parking on an area-wide level. For example, contextualize parking options by explaining it as the total number of spaces within a short walk of the street in question—a few blocks, 1000 feet, or a 5-minute walk. If paid or shared off-street spaces are available to the public or business patrons, include them in the analysis. This "walkshed" approach to parking is fair—transit riders are also expected to walk ¼ to ⅓ of a mile in most cases—and increases the likelihood that drivers will walk between stores rather than driving to multiple sites along the corridor, and key spaces can be reserved for those who need nearby parking or loading zones, like people with disabilities.

Include Off-Street Options

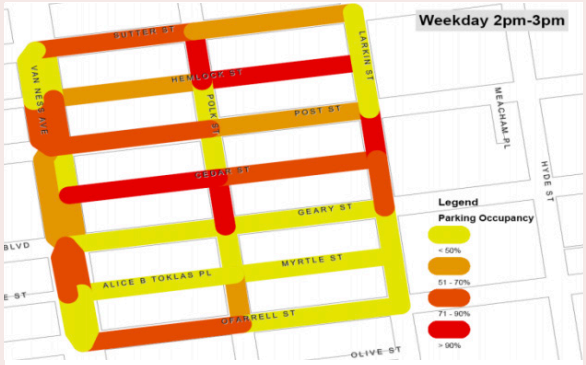
In many downtowns and key transit corridors, most parking is off-street, but much of this parking is not managed in line with city goals. An ongoing parking study found that only 9% of parking spaces in downtown Austin are on-street, and off-street occupancy is rarely above 80%. Yet off-street parking is often off-limits to the general public. These findings are helping Austin change its parking paradigm.[28]

Cities can replace on-street parking with shared accessory parking open to businesses and residents. Both large garages and small parking lots behind stores are available in some transit corridors, and by letting this private accessory parking be used for both residents and businesses, cities can decrease the pressure to provide curbside parking. In Hoboken, residents can lease parking in city-owned garages at a reduced rate if they drive their car to work daily, leaving space for other users between 10AM and 4PM. This "Monthly Limited" parking rate has made 50 additional parking spots available during the day, and raises nearly $40,000 additional parking revenue annually.[29]

Committing revenue from parking in a corridor or district to fund transportation management strategies—including alternatives to driving or neighborhood streetscape improvements—can be an effective method to gain support for modifying parking fees and regulations, as the benefits of parking fees are clearly visible to street users. In Portland, meter revenue from the Lloyd District has provided funding for discounted transit passes for employees at 20 businesses, reducing drive-alone rates by 25%.[30]

ACCESS TO PROXIMATE PARKING IN SAN FRANCISCO

When proposing projects that include reassignment of on-street parking on a corridor, SFMTA employs a small radius to better contextualize actual impact to local motor vehicle access. When discussing design options for San Francisco's Polk Street, SFMTA showed ample parking availability nearby, allowing bike lanes to be installed while retaining 90% of parking within a one-block radius of the street.[31]



On-street parking occupancy, SAN FRANCISCO, CA[32]

Ultimately, reducing a destination area's parking supply supports transit growth. Over time, reducing the number of non-resident parking spaces in a neighborhood with good transit access will support a shift to transit riding. Cities have instituted parking maximums in new development or charge for some forms of off-street parking in dense or transit-rich areas. These changes reduce the expectation of private motor vehicle use in a growing city.

PAID PERMIT PARKING

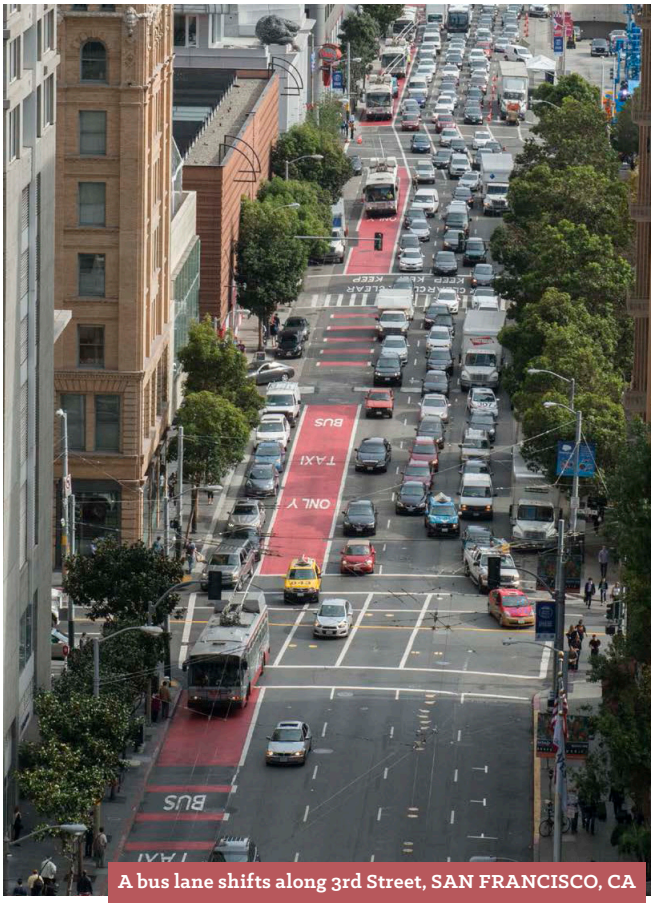
The politics of parking removal or reallocation are substantially different in cities where permit parking is the norm, potentially easing the way for transit improvements.

Paid permit parking and other zone-based programs give residents or institutional users the opportunity to purchase a permit to park in a given zone. These programs are usually designed to reduce commute vehicle use and the demand for on-street storage parking. By restricting parking times or parking duration for vehicles without permits, permit parking can reduce the number of vehicles being driven to a specific area. Tying permit parking distribution to annual transportation demand management goals can further contribute to VMT reduction goals and boost the attractiveness of transit. Permit parking is an especially attractive policy option for neighborhoods with some employment destinations where some amount of commute or park-and-ride activity would occur if parking spaces were unregulated.

Charging for parking permits is important to achieving these goals by avoiding "bundling" parking with residency or enshrining on-street parking as an automatic benefit of residency. The City of Toronto sells central-city residents a parking permit that can be used only within a small zone of a few blocks, and guarantees overnight parking availability within that zone. The program incentivizes the use of already-existing off-street parking, and disincentivizes the ownership of multiple cars, by charging more for second on-street spots and avoiding selling permits if off-street parking is available.[33]

PLANNING FOR THE FUTURE

The demands placed on curbsides will continue to change as technological and business practices change, but cities will remain in the position of determining how curbsides are allocated, and whether transit is sustained and improved as a result. The introduction of automated vehicles may increase the number of curbside passenger drop-offs while diminishing the importance of on-street parking, leading to reductions in conventional curbside parking. If for-hire vehicle travel becomes significantly less expensive per mile, curbsides on transit streets will be under significant and immediate pressure. As the rise of for-hire vehicles has demonstrated, regulating the curb is an indispensable component of a successful urban street management strategy. Cities that begin prioritizing transit in curbside regulation today will be one step closer to managing curbs in a way that incentivizes transit and shared autonomous vehicle use rather than single-occupancy or zero-occupancy vehicle travel.



A bus lane shifts along 3rd Street, SAN FRANCISCO, CA

NOTES & SOURCES

1 Seattle DOT, "Seattle 2035, Transportation Element." Accessed via: https://www.seattle.gov/Documents/Departments/OPCD/OngoingInitiatives/SeattlesComprehensivePlan/Seattle2035_Transportation.pdf

2 Based on data from NACTO cities.

3 Mayyasi, Alex, "Food Truck Economics." Accessed via: https://priceonomics.com/post/45352687467/food-truck-economics

4 Smart Growth America, "Parklet Policy Primer." Accessed via: https://www.smartgrowthamerica.org/app/legacy/documents/parklet-policy-toolkit.pdf

5 US Census, "Profile America Facts For Features, 25th Anniversary of Americans with Disabilities Act." Accessed via: https://www.census.gov/content/dam/Census/newsroom/facts-for-features/2015/cb15-ff10_ada2015.pdf

6 San Francisco CTA, "San Francisco On-street Parking Management and Pricing Study." September 2009. Accessed via: http://www.sfcta.org/sites/default/files/content/Planning/ParkingManagementStudy/pdfs/parking_study_final.pdf

7 Boston Transportation Department "Access Boston 2000–2010; Parking Management on Major Corridors." Accessed via: https://www.cityofboston.gov/transportation/accessboston/pdfs/parking_management.pdf

8 Shoup, Donald C., "The High Cost of Free Parking." Chicago: Planners, American Planning Association, 2011.

9 These surveys can be geared to people on the street generally, toward business patrons specifically, or to employees or people connected with a particular institution such as a school. See the NACTO *Intercept Survey Toolkit* for more details: https://nacto.org/interceptsurveytoolkit/

10 Great Streets LA, "Benchmarking Great Streets: César Chávez Avenue." Accessed via: https://static1.squarespace.com/static/55ef7adce4b064e46224893b/t/57dc7d36f5e23162d7c5cc0d/1474067831204/GSB_report-pre_CD14.pdf

11 NYC DOT & MTA, "Nostrand Avenue / Rogers Avenue Select Bus Service." Presentation. September 20, 2011. Accessed via: http://www.nyc.gov/html/brt/downloads/pdf/201109_brt_nostrand_cac4.pdf

12 San Francisco Examiner, "Contrary to merchants, most take transit or walk to Geary Boulevard." June 30, 2017. Accessed via: http://www.sfexaminer.com/contrary-merchants-assertions-take-transit-walk-geary-boulevard/

13 Great Streets LA, "Benchmarking Great Streets: Reseda Boulevard." Accessed via: https://static1.squarespace.com/static/55ef7adce4b064e46224893b/t/57dc80a9725e257371487818/1474068660857/GSB_report-pre_CD12.pdf

14 NYC DOT, "The Economic Benefits of Sustainable Streets." Accessed via: http://www.nyc.gov/html/dot/downloads/pdf/dot-economic-benefits-of-sustainable-streets.pdf

15 Seattle DOT, "Rainier Pilot Project Evaluation." February 2017. Accessed via: http://www.seattle.gov/transportation/docs/rainier/RainierAveS_BeforeAfter.pdf

16 "Cities Seek Deliverance from the E-Commerce Boom". Andrew Zaleski, CityLab, April 20, 2017. Accessed via: https://www.citylab.com/transportation/2017/04/cities-seek-deliverance-from-the-e-commerce-boom/523671/

17 "SFPD: Uber, Lyft account for two-thirds of congestion-related traffic violations downtown." San Francisco Examiner, September 25, 2017. Accessed via: http://www.sfexaminer.com/sfpd-uber-lyft-account-two-thirds-congestion-related-traffic-violations-downtown/

18 NYC DOT & MTA, "Nostrand Avenue/Rogers Avenue Select Bus Service." Presentation. September 20, 2011.

19 NYC DOT, "B44 SBS on Nostrand Avenue Progress Report." June 2016. Accessed via: http://www.nyc.gov/html/brt/downloads/pdf/brt-nostrand-progress-report-june2016.pdf

20 Shoup, Donald C., "The High Cost of Free Parking." Chicago: Planners, American Planning Association, 2011.

21 Shoup, Donald, "Cruising for Parking." Access, Spring 2007. Accessed via: http://shoup.bol.ucla.edu/CruisingForParkingAccess.pdf

22 NYC DOT, "PARK Smart Greenwich Village Pilot Program – Results." June 2009. Accessed via: http://www.nyc.gov/html/dot/downloads/pdf/parksmart_gv_results_july09.pdf

23 Seattle DOT, "Annual Report 2017: On-Street Paid Parking Occupancy." September 2017. Accessed via: http://www.seattle.gov/transportation/parking/docs/SDOT_AnnualReport2017.pdf

24 LA Express Park. Accessed via: http://www.laexpresspark.org/

25 San Francisco MTA, "SFpark Pilot Project Evaluation." June 2014. Accessed via: http://sfpark.org/wp-content/uploads/2014/06/SFpark_Pilot_Project_Evaluation.pdf.

26 Pittsburgh Parking Authority, "List of Infractions." Accessed via: http://apps.pittsburghpa.gov/ppa/Infractions1.pdf

27 Chicago DOT and Chicago Transit Authority, "6-Month Experimentation Progress Report, Red Colored Pavement for Transit Only Lanes." September 2016.

28 Downtown Austin Alliance, "Downtown Austin Parking Strategy." Accessed via: http://www.downtownaustin.com/sites/default/files/DowntownParkingBriefingBook_Part1.pdf

29 City of Hoboken, "Hoboken Announces "Monthly Limited" Garage Parking option For Residents." Accessed via: http://hobokennj.gov/2010/12/hoboken-announces-monthly-limited-garage-parking-option-for-residents/

30 Portland Bureau of Transporation, "Net Meter Revenue and Permit Surcharge Funds." Accessed via: https://www.portlandoregon.gov/transportation/article/643756

31 San Francisco Municipal Transportation Agency, " Polk Streetscape Project: Frequently Asked Questions." Accessed via: https://www.sfmta.com/sites/default/files/projects/2016/Updated%20FAQ%20v9%2010.04.2016_0.pdf

32 San Francisco Municipal Transportation Agency, "Polk Street Parking Study." Accessed via: https://www.sfmta.com/sites/default/files/projects/PolkParkingOccupancyandTurnoverStudy.pdf

33 City of Toronto, "Parking Permits." Accessed via: https://www1.toronto.ca/wps/portal/contentonly?vgnextoid=cd4c4074781e1410VgnVCM10000071d60f89RCRD

PHOTO CREDITS

SFMTA Photo Library: Pages 1, 4, 11

Seattle DOT: Pages 4, 6

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Bike Walk Lincoln Park: Page 6

Chicago DOT: Page 9

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