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Managing access to a valuable resource.

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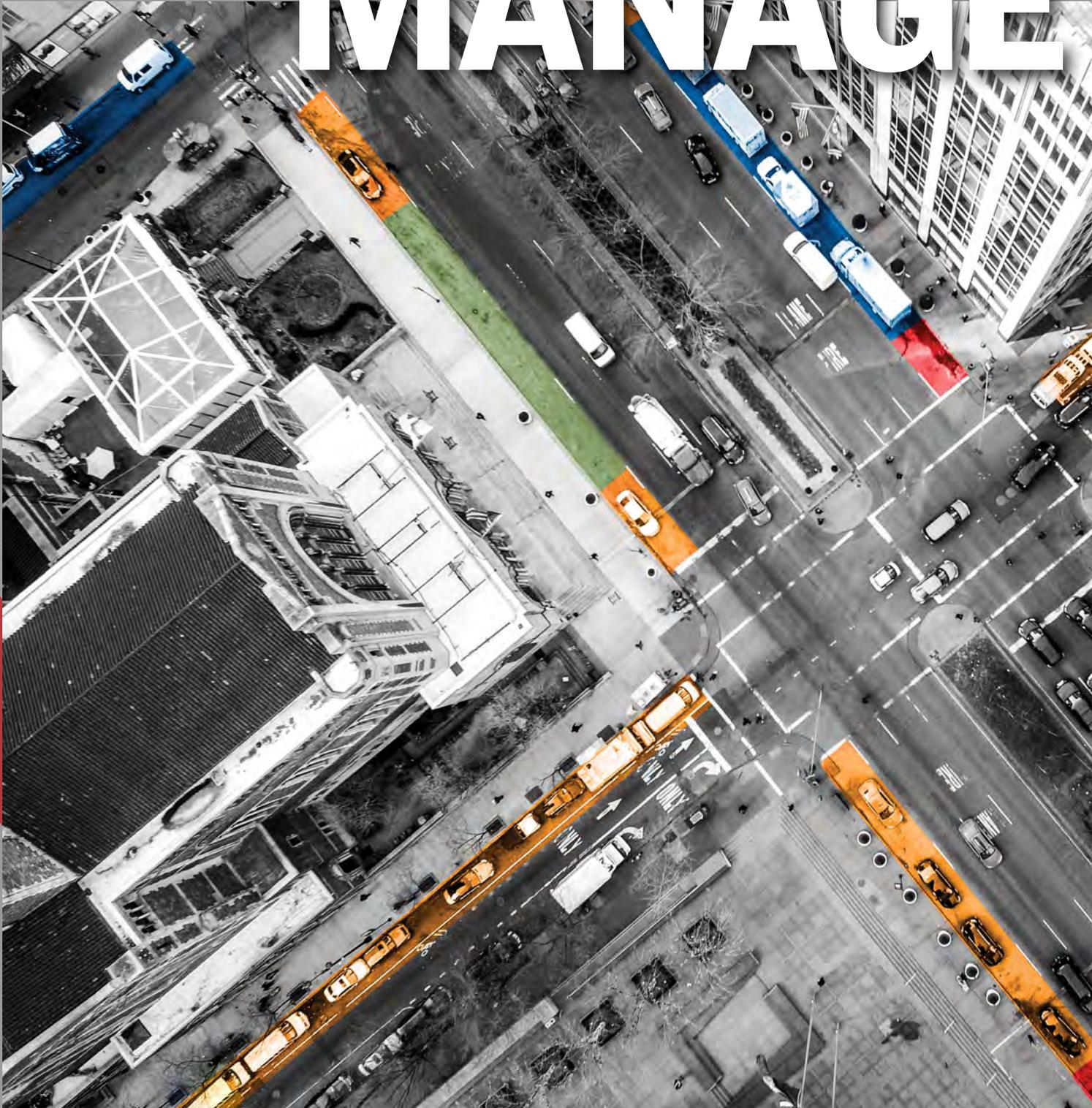
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CURBSIDE MANAGE



*Managing access to a
valuable resource.*

MENT

An aerial photograph of a city street corner. A large, modern building with a grid-like facade is the central focus. The street is busy with traffic, including cars, buses, and trucks. The image is overlaid with a large white 'MENT' text on the left side. The bottom right corner of the image is partially obscured by a blue and orange diagonal graphic element.

By Charley DeBow and Mike Drow, CAPP

Curbside management is the collection of operating concepts, techniques, and practices that enable a municipality, university, or any entity to effectively allocate the use of their curbs and other high-demand areas. While the curb has been managed for decades, in the past 10 years, it has become more crowded as new users and alternative-transportation services require access to it.

Many professionals and consultants have proposed various approaches to manage the curb (in this article we will use the term “curb” to represent any area with a high demand of use.) Many ideas, technologies, and methods are being introduced and tested to support the multitude of curb management needs. In addition, parking and mobility professionals, public transit agencies, city planners, delivery services, transportation engineers, and private businesses are all very interested in ensuring their respective curb access needs are considered and prioritized fairly against others.

Why Manage the Curb Now?

The curb has been managed for decades, since long before the concept of curb management even existed. Seventy years ago, the competition for curb access was limited—taxi stands, parking and no-parking zones, and bus stops described the main sources of demand. In the 1980s and '90s, the growth of package delivery services such as UPS and FedEx dropping off packages in a busy city increased the demand for curb access. In the past five years, the demand for curb access has exploded as many new businesses require access; this includes app-based ride-sharing/hailing services such as Uber and Lyft; shared economy delivery services like UberEats, DoorDash, and GrubHub; the expansion of Amazon into delivery services; the use of private shuttles; and many other kinds of uses. It is not just the street side of the curb either—the sidewalk side has seen a rise in demand from scooters and bikes and from restaurants and cafes expanding their footprints by placing tables on the sidewalk.

This demand for access is overloading the curb. The increase in demand highlights several points municipalities, universities, and other operators need to consider to address the overloading:

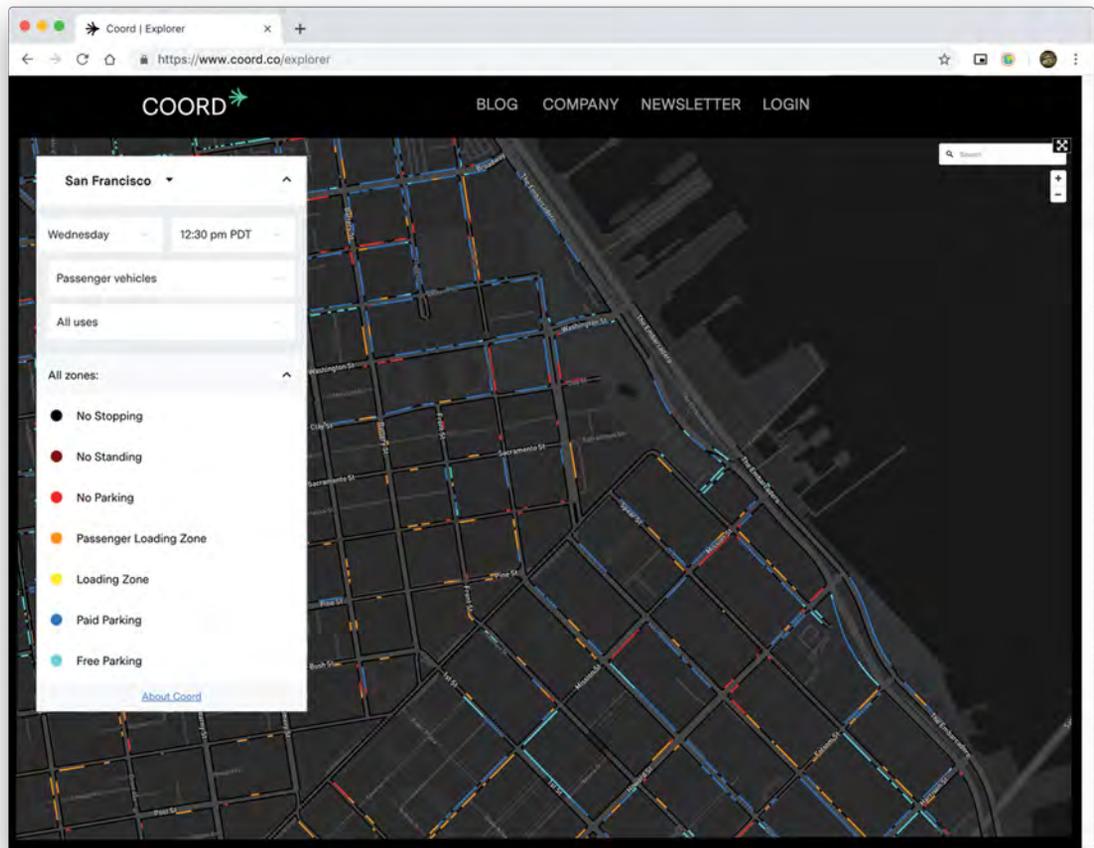


Figure 1: Sample Mapping the Curb View

COORD.CO

- Not all curb uses are currently regulated.
- The curb has value, but that value is not always collected from all curb users.
- Validating authorized versus non-authorized access to the curb is a challenge.
- Operationally communicating and enforcing regulations to various curb users is important.

Addressing high demand will identify conflicting policies that affect access to the curb and price differentials that create unintended consequences of use (and misuse) of it.

As already mentioned, one should not just think of the physical street curb when implementing curb-management practices—any area in high demand can benefit from the same practices and methods. Where might high demand areas exist? Think about the airport terminal with ride-shares, taxis, limos, hotel shuttles, and car rental shuttles dropping off at the terminal entrance; or a hotel driveway with valet, taxis, and ride-shares; a retail parking area with valet, ride-share, and delivery trucks; or event centers with buses, ride-shares, taxis, and limos.

Understand the Curb

The ability to manage a resource effectively requires an understanding of the resource in the first place. In the case of the curb, understanding the resource means mapping the curb (or

high-demand area), identifying the users, and defining the rules.

Mapping the curb is essential to launch any effort to manage it. An effective program starts with collecting an inventory of its curb (high-demand areas) and understanding how it is used. The inventory includes collecting:

- Actual location of the curb areas.
- Current regulations applied to the curb, such as no-parking zone, loading zone, bus stop, fire hydrants, parking areas, etc.
- Signage that exists and the message on each sign (no parking, parking restrictions, delivery zone, etc.).
- Existing fixtures (meters, cameras, bus stop shelters, bike lanes, scooter corrals, etc.).
- Existing uses (bike stations, parklets, and sidewalk café permits).

Presenting the collected information in a geographic information system (GIS) (or map) is especially insightful; see Figure 1. Storing the data in a GIS will enable better sharing of the information with third parties that need access to the information. But don't overlook the potential of a simple spreadsheet to collect basic information on your curb if you are starting from nothing.

Just as an entity needs to inventory its curb, it also needs to inventory its users. More specifically, the current users and the future desired users of the curb. Users can be categorized into several types as shown in Figure 2.

As user types are identified, an entity will want to understand how each user type affects access to the curb. Does the user type need a large section of the curb (food truck versus delivery zone)? Do the user types use the curb for a long time in each visit (park a car versus passenger loading area)? When does the user need access? Does the use create safety hazards for others?

Merging user-type needs with the curb inventory information allows an entity to understand how the user types interact and/or conflict with each other. Through this analysis, an entity will determine how the actual use varies by street—one side of a city block can be very crowded while just around the corner, ample curb is available for use.

As the user types and their needs are identified, conflicts between their access needs and timing will become apparent. During rush-hour periods, is there a conflict with dedicated bus lanes and identified passenger loading and unloading for ride-share services and taxis? A program may want to determine whether the user type is an on-demand service, corporation, or individual/citizen to influence pricing and how much access is granted to each user type. All the information collected about the user types becomes instrumental in defining policies and regulations as well as defining appropriate allocation of access to various user types.

With the inventory of users and curb complete, an entity can define the rules for the curb. The first step is to define the objectives for the overall curb-management program. In many cases, there will be a couple of objectives that require an entity to balance

Rome wasn't built in a day; neither will a curb management program be.

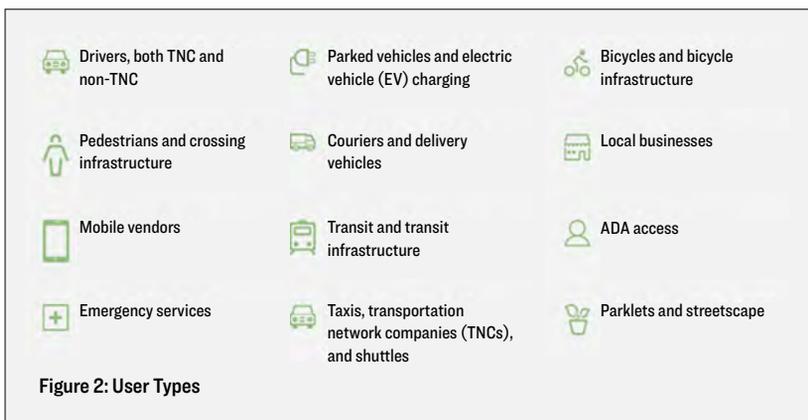
its approach; include a wide range of professionals and departments in the discussion. If you are a municipality or university, the parking, transit, city planner, event planner, and public safety departments should have a seat in the discussion. As each objective is defined, a measurable and quantifiable target or goal must be set. Without measurable targets, an entity will not

be able to manage progress toward the goals or communicate the success of its curb management activities. A few categories to consider:

- Mobility objectives: improving traffic flow and/or the ability of people to move from place to place (e.g., reduction in single-occupancy vehicle trips, higher transit ridership, reduced traffic delays).
- Parking objectives: the ability to park vehicles in accordance with local user needs (e.g., 85 percent occupancy target for a retail area).
- Revenue objectives: efficiently capturing the value of the curb from various user types and meeting budget objectives.
- Balanced and fair access objectives: the desire to support users' ability to access the curb.

With objectives defined, an entity should review its current regulations, policies, operating practices, and pricing structures. How many current rules and policies support the defined objectives? Many entities have not recently reviewed their rules, regulations, and policies. In addition, it is very likely that existing rules do not support newly defined objectives. Now is a good time to update those rules and policies to support the objectives and resolve conflicts.

During the effort to revise the rules and policies, an entity should try to future-proof its rules, policies, and regulations by making them adaptable so simple updates can be made without significant bureaucratic activity. As an example, when establishing rules or policies related to pricing and payment options, do not include the specific rate or specific method of payment in the rule or policy. Instead, have the rule or policy reference another document that can be changed from time to time. The adaptability allows an entity to more quickly adjust its curb management program to meet changing access demand requirements.



Not a Good Rule:

Parking on Main Street will be charged at \$1.25/hour and fees will be collected at the on-street meter.

Options for Future Adaptable Rules:

1. Parking on Main Street will be charged at the rates defined in the City’s Paid Parking Policy Document (attached schedule). Rates may be altered within that schedule by city staff at the discretion of the parking manager. The fees will be collected via means that are accessible to the general public.
2. Parking on Main Street will be charged at a rate between \$1 and \$4 based on the discretion of the parking manager. The chosen rate will be based on a review of data and the goal of managing demand to maintain open space availability during peak conditions. The fees will be collected via means that are accessible to the general public.

When developing a program’s objectives, try not to take on too much too early. Instead, start simple with a few critical objectives and build success. As the saying goes, Rome wasn’t built in a day; neither will a curb management program be.

When curbs are mapped (inventoried), users and their needs are identified, and objectives are defined by collaborating with various groups, it is time to start managing the curb.

each other. As parking and mobility professionals, it is our duty to manage this chaotic space.

Figure 3 depicts what curb management is balancing. The goal is to effectively and efficiently provide access to the identified users, who access the specific curb areas using different modes of transportation. The program’s ultimate purpose is to distribute curb access considering the value or trade-off that varies for each combination of user/mode/area.

As an example, a delivery service that wants to use a specific curb on a busy street during rush hour may not be permitted to do so as it will impede traffic flow during rush hour. However, if the delivery service were permitted to perform delivery services on the busy street, a specific area may need to be defined to minimize impact to traffic flow while charging the delivery service a premium fee for that access. If the delivery service were to use a side street one block away from the busy street, fees for access may be much less or eliminated altogether. Similarly, a person parking all day in an area where high parking turnover is desired will likely have to consider the cost of staying too long at the risk of paying exorbitant fees. The intent of the high cost is to dissuade the person from staying longer than the desired parking objectives.

Figure 3 also identifies the various value and trade-offs curb management programs consider when evaluating users’ access needs. By understanding the value and trade-off considerations for a specific user, a management program can balance the desire for access to the curb with cost and convenience to ensure a proper allocation of the access occurs to all users.

Knowing the user types, their access needs, and their value and trade-off considerations, an entity can implement a curb management program to achieve defined objectives. A typical program will contain the following components:

1. Allocate use.
2. Integrate fragmented data.
3. Monitor use.
4. Communicate the rules.
5. Enforce the curb.
6. Report and analyze.

Allocate Use

Allocating curb access to various users is accomplished with the distribution of permits. A permit is

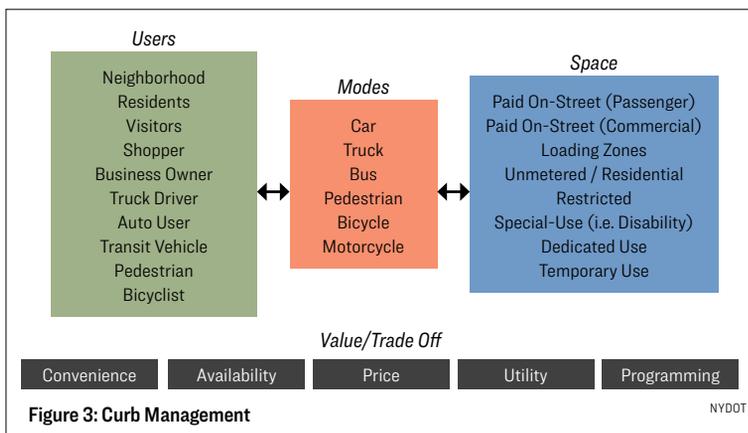


Figure 3: Curb Management

Manage the Curb

The results generated from understanding the curb are critical to establishing a program to effectively manage the curb. The curb is a programmable, fluid space within the larger transportation system where multiple users, modes, and governing practices are at play with

not necessarily a physical credential; it is when an entity grants access to a specific curb (or area) at a specific time of day for a specific use and collects a fee as appropriate. Sometimes this is done through a monthly (or other period) permit issuance process, or the allocation may be managed with an on-demand transaction capability, similar to a meter. The need to future-proof regulations is key, especially in how payments could be collected. For example, FedEx may have a permit to park in a loading zone but pay a fee for each curb interaction. This could be done in real time with a parking app, auto-billing through license plate recognition (LPR) or directly from FedEx technology. Loading zones could be priced based on time of day or location.

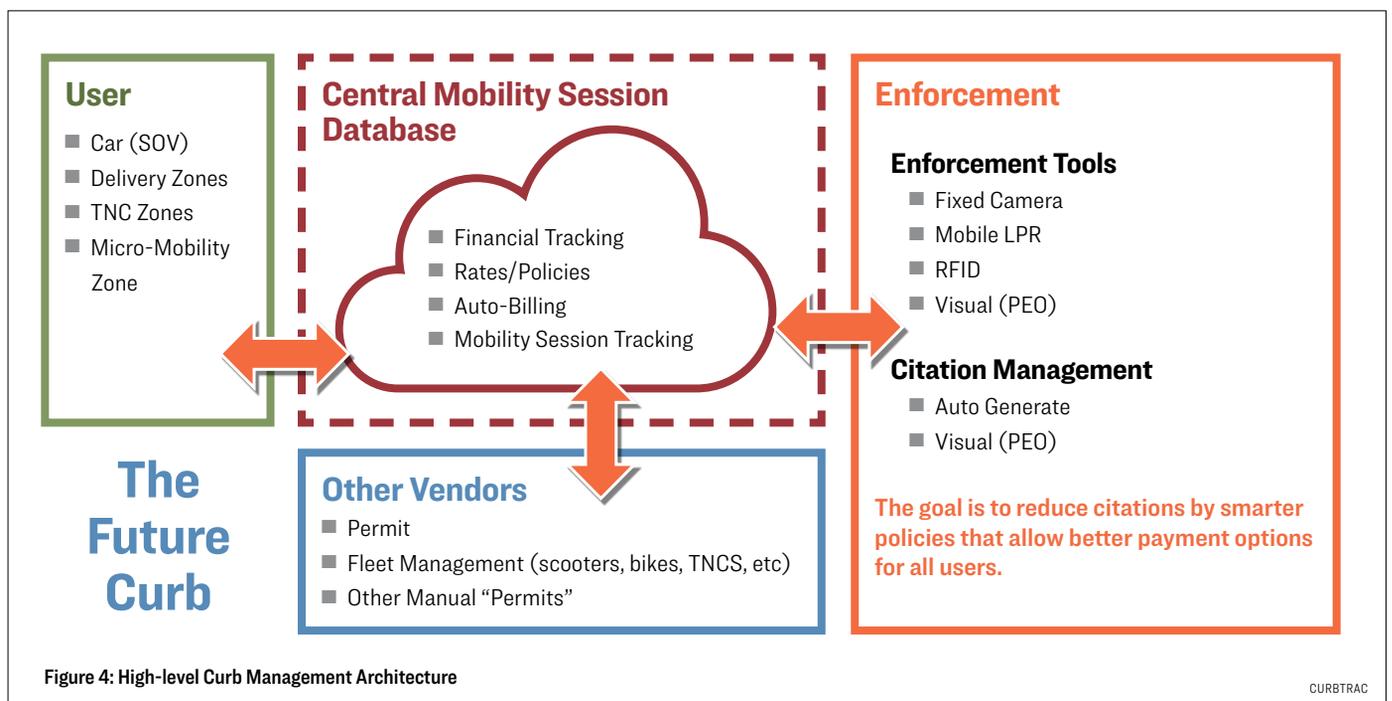
As an entity's curb program expands, it will migrate from static allocation methods to more dynamic ones, where a system is monitoring the current availability on the curb and demand for access from various users and reallocates access to users to achieve the entity's objectives. The rise of virtual credentials, LPR systems, RFID capabilities and other means to identify users, along with electronic and mobile payments, will make it easier for a program to allocate access to the curb on a variable basis.

Integrating Fragmented Data

As parking and mobility professionals know, the amount of data available to manage an operation is growing in leaps and bounds. The challenge is the ability to collect the data, analyze it, and make decisions that improve operational performance. An effective curb management program requires the ability to collect data from many different sources, not all of which are in the control of the parking and mobility professional.

Figure 4 shows a high-level architecture of systems involved in curb management.

A curb management program will need the ability to share data with its users to communicate status of activity (FedEx delivery truck location and status, Uber/Lyft driver activity, parking pay station and mobile payment activity), share information about changes to the curb (construction, etc.), and confirm access permissions. There will be third-party partners with data that are valuable to managing the curb program, such as weather, construction status, mass transit status, and traffic flow information, to name a few. This type of information will allow a curb management program to optimize and adjust its allocation of access to the users based on changing conditions.



In addition, a curb management program needs to share its data with other platforms and technology; consider digital signage to communicate current operating restrictions or pricing. An entity may share data with a mapping app to communicate real-time status or changes to users.

Figure 5 provides a sample of common data integrations.

In an effort to reduce the amount of investment and time necessary to integrate various data sources, IPMI is working with the Alliance for Parking Data Standards (APDS) to develop a global standard to share parking related data. APDS is developing a consensus-built, international standard that establishes a common language for data elements and definitions in the parking, transportation, and mobility sectors. More information about the standards, including access to the data standard documents and the mission of APDS, can be obtained at allianceforparkingdatastandards.org.

Figure 5: Common Data Integrations

- Parking Access Revenue Control Systems (PARCS)
- Parking Meters
- Transit Management
- Parking Guidance
- Occupancy Counts
- Enforcement Handhelds
- Booting / Towing
- Mobile Payment
- License Plate Recognition (LPR)
- Merchant Validations
- Analytics
- Sensors (Video pucks, BLE)
- Reservation Services
- Contract Parking Permits
- Delivery Services
- App-Based Ride Share
- Bikes / Scooters
- Map Apps
- OEM
- Charging Station
- Signage

Monitor Use

The well-known management axiom “what gets measured gets managed” holds true for curb management programs.

When the curb management program has allocated access to various users, it needs to monitor activity to ensure efficient operation. Luckily, there are many technologies and methods available to support monitoring:

- Manual logging: simple activity of a person with a clipboard counting vehicles and activity events at the curb. How many ride-share vehicles used the passenger loading zone? How many cars are parked on the street? What is the average length of stay for a delivery? While manual logging does not provide consis-

tent data, the data sample can provide useful insight to a curb management program just getting started.

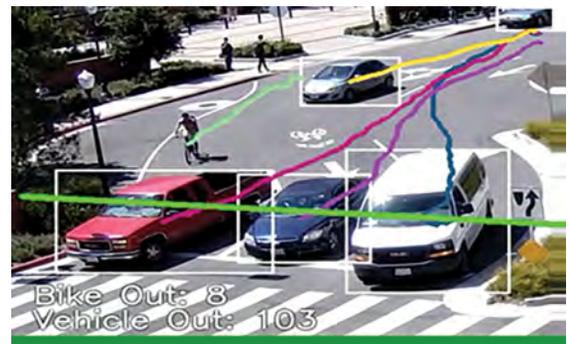
- Derived monitoring: taking data from various payment methods to approximate current activity at a curb. An example is assuming that a paid transaction at a meter or via a payment app is equal to a parking or curb event. This allows a curb program to gain more real-time data on actual activity at the curb. It is not perfect, but it does provide more visibility than manual logging.
- Actual monitoring: using a variety of technology methods to detect the presence of vehicles and activity. Technology methods such as space sensors to detect stopped vehicles, cameras connected to video analytics, LPR, RFID, or Bluetooth to validate virtual permits are just a few examples.

Communicate the Rules

The most well-planned curb management program will be ineffective unless the users and general public understand the rules and steps necessary to access the curb. Communicating the rules, pricing, and expectations is critical.

In the beginning, users may be concerned about their ability to obtain access to the curb or frustrated that they have to pay for access. Each curb management program needs to have a clear communication plan to the users and the general public explaining the objectives of the program and how a user can access the curb (how to receive permission). Specific messages should focus on the various rules and policies, various curb restrictions, how to obtain permission to access the curb, and payment methods. It is worthwhile to also explain the value and trade-off considerations for various user types so they understand how their activity affects others.

The communication plan should leverage websites, mobile platforms, and curb signage. While mobile apps



and phone-based mapping services can provide detailed customized instructions to each user, signage is still a very effective way to communicate. With physical signs the information is always present when the users arrive at the curb. As programs are launched, having a plan to ensure your rules, practices, and pricing are clearly communicated is critical.

Enforce the Curb

Enforcement is vital to ensure the rules are followed. During the past several years, many technologies have been deployed that enable the enforcement of rules and policies related to curbs. This includes video analytics technology to support automated red-light enforcement systems and vehicle speed enforcement on roadways, LPR tools to verify credential holders are in the proper parking areas, and Bluetooth and RFID tags.

These same technologies can be deployed to support the enforcement of your curb regulations. The changing technologies also highlight another reason to establish adaptable rules and policies. Consider the opportunity to send citations electronically via email, rather than paper tickets, which many municipalities require to be placed on the vehicle at the time of the violation. Another potential change is how users pay for access: What if a delivery truck service that currently receives five tickets a week for illegal parking were able to pre-pay for monthly access to a specific section of the curb? The program benefits by better controlling where the delivery truck stops, and the delivery service reduces its costs in processing the fees. (Paying five tickets per week is more administrative work than buying one permit per month).

In addition, though enforcement technology, the curb program will be able to track compliance and report issues to the delivery service when it needs to adjust driver behavior or risk losing access to the curb for abusing access.

Which technology best fits the needs will depend on the users, how the program allocates access to the curb, and the program's objectives.

Reporting

As previously mentioned, what gets measured gets managed. Each curb management program needs to report on its performance against its objective goals. If objectives are not being achieved, adjustments should be made to improve performance. This may require a change in pricing, how users are allocated access to the

curb, or more global changes in policies and rules. As changes are made or new ideas tested, the reporting system will provide visibility into performance and results to determine if the changes are successfully moving the program toward its objectives.

A reporting capability will also identify changing user trends and access demand. Being aware of changing needs will enable a program to adapt to its users' needs more quickly. The downside of modern reporting tools is the vast access of data and reports. The program should focus on the critical metrics to achieve your objectives; be careful not to become overwhelmed with thousands of reports and millions of data points. Refer back to your objectives and identify the critical metrics that inform whether the program is progressing toward success.

When developing a curb management program to manage a street face, hotel driveway, airport garage or roadway, event site, or even a downtown parking facility, remember the following five points:

1. Map the curbs—where are they and what rules currently exist?
2. Define the objectives of the curb management program and the desired uses of the curb.
3. Inventory the potential users, their needs, and the trade-off/value propositions.
4. Implement tools to allocate access, monitor use, collect fees, and enforce the curb program.
5. Be flexible—look at the data and results and adjust to achieve the curb management program's objectives.

Good luck and don't forget to share what you learn.

We are all learning curbside management best practices and methods together. 

This article is a summary of the information shared in the 2019 IPMI Technology Committee presentation focusing on curb management, offered at #IPMI2019 and state and regional associations around the country.



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