

REGULATING CURB SPACE:

Developing a framework to understand and improve curbside management

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This paper summarizes the findings of a full report provided to the Philadelphia Mayor's Office of Transportation and Utilities and participating peer agencies entitled *Regulating Curb Space: A Look at Curbside Management in 8 Major US Cities*. (Zalewski, 2011).

1 ABSTRACT

2
3 This paper explores the existing state of curbside management in large American cities
4 and seeks to provide policymakers a framework for structuring future curbside management
5 decisions. Curbside management, the way cities regulate and allocate curb space, has a major
6 impact on the functioning of cities. Management policies differ widely across the country,
7 reflecting decades of locally developed rules and regulations. In 2011 the Philadelphia Mayor's
8 Office of Transportation and Utilities, on behalf of the National Association of City
9 Transportation Officials (NACTO), interviewed 8 major cities on how they manage curb space.
10 These interviews, along with a review of relevant literature, provide a snapshot of existing
11 practice.

12 This paper is organized into three parts. The first section discusses the policy
13 considerations associated with major curbside uses. The second section provides an overview of
14 how the cities surveyed manage their curbside spaces. The final section discusses three models
15 for curbside management.

16 Most cities utilize the Incremental Model of curbside management. Under the
17 Incremental Model, transportation agencies gradually append existing practice over time to
18 respond to new pressures. This model is now challenged by two emerging alternative methods of
19 curbside management. The first, the Framework Model, uses comprehensive planning
20 methodology to produce a curbside management plan for an area. The second emerging model,
21 The Performance-Pricing Model, uses price as the regulatory agent of curb space. The three
22 models provide communities strategies for keeping curbside management policies in pace with
23 ever changing needs.
24
25

26 1. BACKGROUND

27
28 In dense urban cores, curb space is a scarce resource that faces demands from a number of
29 users. Policymakers rely on curbside management to allocate and regulate curbside space. While
30 the term curbside management may strike one as transportation jargon, management policies have
31 a direct impact on how we move around and experience cities. The use of curb space impacts
32 road congestion (1), business vitality, urban aesthetics (2) and even pedestrian safety and comfort
33 (3). In many communities issues like parking and curb cuts have become major political concerns
34 (4) (5).

35 While much has been written on specific curb uses like parking and freight loading, few
36 have looked at curbside management as a whole. There is a need to holistically evaluate curbside
37 management; curbside uses work within a larger system and providing for one use often restricts
38 another.

39 Richard Epstein, a legal scholar at the University of Chicago, argues that the ongoing
40 evolution of how cities allocate curb space echoes aspects of Demsetz's theory of property rights
41 (6). Demsetz, reflecting on the *Tragedy of the Commons*, states that as competition for resources
42 intensify, society transitions from a common ownership structure to private ownership. Curb
43 space is largely considered a good held in the commons, but as competition for curb space
44 increases, communities are developing more complex systems of ownership and regulation. As
45 more users demand access to the curbside, cities have evolved their policies away from free and
46 unrestricted use. The diverse ways cities manage curb space, along with the political sensitivity
47 around curbside management, illustrates that we have yet to resolve how to best manage our
48 curbside spaces.

49 The idea for this paper originated out of a discussion among National Association of City
50 Transportation Officials (NACTO) member cities at the 2011 Transportation Research Board

1 Conference. NACTO members expressed interest in learning more about the state of curbside
2 management in major cities across the US. In the winter and spring of 2011, the Philadelphia
3 Mayor's Office of Transportation and Utilities (MOTU) interviewed transportation officials in the
4 following cities: Baltimore, Boston, Chicago, New York, Philadelphia, San Francisco, Seattle and
5 Washington DC. Due to time restrictions, this is not an exhaustive list of all NACTO members
6 but includes a range of cities that share similarities to Philadelphia.

7 MOTU held semi-structured interviews with transportation agencies in all eight cities.
8 The interviews focused on the following curbside uses: on-street metered parking, residential
9 permit parking, commercial loading, surface transit stops, intercity bus stops, curb cuts and
10 specialty uses such as parklets and on-street bicycle parking. While the list represents the bulk of
11 curbside uses, some uses such as food trucks were not included in the study.

12 This paper, summarizing findings from MOTU's report, hopes to both discuss the current
13 state of curbside management and provide frameworks for understanding how curbside decisions
14 are made. To do so the discussion is broken into three parts. The first section will outline the
15 important considerations among major curbside uses. The second section will discuss the existing
16 state of practice. Finally, the third section will outline three models for structuring curbside
17 management. While this report cannot define what the most successful or ideal curbside
18 management policy is, it hopes to provide decision makers a framework to better understand the
19 complex nature of curbside management and how we may structure future policy.
20
21

22 **2. FACTORS INFLUENCING CURBSIDE MANAGEMENT**

23
24 Curbside management can be complicated to implement and oversee. Policymakers face
25 establishing regulations for a number of uses, each with their own private demands and public
26 value. The NACTO city surveys and a review of existing literature, helped illuminate the multi-
27 variable nature of curbside management. The following section hopes to give a reader a succinct
28 overview of the factors impacting major curbside uses and their users.
29

30 **Parking**

31 On-street parking is often the most contentious and public aspect of curbside management. In
32 urban cores the struggle with parking comes down to supply and demand. Like with the other
33 curbside uses, the demand for on-street parking frequently outstrips the availability of curb space.
34 Policymakers respond to this problem by creating two sets of policies, one targeted toward
35 promoting turnover and one targeted toward preserving parking for residents.

36 Turnover focused policies deal with increasing the availability of parking in areas of high
37 demand such as business centers or retail corridors. While cities are limited in providing more on-
38 street parking, regulations promoting turnover in-effect increase the supply of parking spaces.
39 Generally, there are two strategies for promoting turnover: time limits and pricing. Most cities
40 restrict on-street parking times depending on adjacent needs. For example, in Baltimore time
41 limits are increased from two to four hours in some areas to accommodate evening demand from
42 restaurants. While time restrictions are fairly common, experts like UCLA economist Donald
43 Shoup argue that such restrictions are unnecessarily complicated to monitor and enforce, and
44 instead pricing should play the leading role in regulating turnover. Higher meter rates have been
45 proven to encourage turnover that results in decreased illegal parking and congestion; Pasadena,
46 an early adopter of performance pricing, achieved higher turnover, lower occupancy levels and
47 increased parking revenue after adopting new on-street pricing structures in the 1990s (7). While
48 low meter rates may benefit the lucky few who find a space, many drivers are forced into higher
49 price off-street parking, or deterred from making the trip altogether.

1 For residents, parking policies have a different focus. According to a study conducted by
2 San Francisco County, residents are largely concerned with the availability and convenience of
3 on-street parking near their homes. (8). To preserve on-street parking for those living in the area,
4 cities can establish Residential Parking Permit (RPPs) programs. Since most RPPs are either free
5 or charge a nominal annual fee, permits often out number parking supply (9). Nonetheless, they
6 remain politically popular. In Philadelphia widespread community support has driven the spread
7 of RPPs to new parts of the cities. Of all the cities surveyed, only New York has no RPP program
8 in place.

9 **Loading**

10 The provision of loading zones is another important part of curbside management. Loading zones
11 primarily impact two user groups: delivery recipients and urban freight operators. Municipal
12 loading policies work to provide businesses with access to deliveries, while minimizing the
13 impact of urban freight on traffic congestion and parking supply. A 2008 study by the
14 Philadelphia Center City District listed delivery trucks as the largest contributor to congestion on
15 downtown streets. (10).

16 Cities employ a number of common strategies for managing loading and deliveries. Many
17 of the cities surveyed had time of day loading zone restrictions. In Philadelphia, loading zone
18 restrictions along the Walnut Street retail corridor require businesses to receive deliveries before
19 10am. The city considers time limits along the street a win for both businesses and delivery
20 companies. The restrictions provide delivery companies a clear window to operate in front of
21 businesses without monopolizing curb space when parking demand is at its peak. NYC DOT is
22 currently piloting a similar program along Church Avenue in Brooklyn (11).

23 Like with parking, cities can use pricing strategies to encourage greater turnover of
24 commercial vehicles. Washington, DC introduced metered commercial loading along K Street to
25 discourage vehicles from parking for extended times in the loading zones. While meters charge a
26 nominal fee, the need to refill the meters frequently led to greater turnover and a reduction in
27 illegal parking along the corridor (12). The introduction of metered commercial parking in
28 Midtown Manhattan reduced dwell times from 160 minutes to 45 minutes while dramatically
29 decreasing occurrences of vehicles blocking the travel lanes (13)

30 Even with tools like metered loading and time restrictions, many of the surveyed cities
31 expressed ongoing problems with illegally parked delivery vehicles. Urban freight has proved
32 tough to manage partially because of the nature of urban freight systems and the users who rely
33 on them. France has led the study of urban freight management through the French National
34 Institute for Research on Transportation and Safety (INRETS); INRETS's national urban freight
35 study concluded that freight movement changes little regardless of location or existing policy
36 (14). Delivery companies operate on logistic models that may be incompatible with existing
37 regulation (ibid). Delivery trucks typically start from satellite locations on the urban fringe, with
38 multiple destinations before returning to a depot at the end of the workday. For operators,
39 breaking up delivery routes is often uneconomical, and firms may choose to bare the cost of fines
40 instead of comply with the law (15). New York City has gone as far as allow large delivery firms
41 to expedite the fine process by providing direct billing, with UPS alone paying \$18.8 million in
42 fines for fiscal year 2005 (16).

43 The needs of delivery recipients at times also conflict with existing delivery regulations.
44 To plan for commercial loading, policymakers must consider how business type, delivery
45 frequency and delivery size relate to one another. According to a study conducted by the
46 University of Westminster in London, delivery times vary widely by type of business.
47 Supermarkets needed between 45 and 60 minutes per delivery, while convenience stores required
48 under 15 minutes for most deliveries (17). The study found that type of business had a major
49 impact on frequency of deliveries; bars and florists required multiple deliveries per day while dry
50 cleaners only received a handful of deliveries a week. (18). Small commercial spaces without
51

1 storage space may require frequent deliveries; as a strategy to reduce commercial traffic,
2 Barcelona requires businesses to have storage space for at least one day of inventory (19).

4 **Transit Operators**

5 Transit stops are a frequently overlooked curbside use. In cities like Philadelphia, where bus stops
6 are located at every corner of a route, the space devoted to the stop can exceed 14% of a given
7 block's curb space. In most cases, transit stops are fixed curbside uses, with stop locations and
8 size dictated by transit agencies. In city's with multiple transit operators, policymakers can work
9 with agencies to consolidate stops. New York City's Select Bus Service (SBS) may illustrate the
10 most innovative use of curbside space for transit in America. Along the Fordham Road SBS line
11 portions of the curb space convert from parking to a bus lane during peak hours.

13 **Intercity Bus Operators**

14 Intercity buses have a minor but growing impact on curbside management. Over the last five
15 years the industry has seen rapid growth (20), especially in the Northeast and Midwest. As most
16 bus companies choose to pickup and drop off passengers in the urban core, cities have struggled
17 to accommodate these buses. While the buses provide new affordable mobility options, their
18 operations contribute to congestion on the street and overcrowding and litter around stops. Cities
19 like Boston and Washington DC have been able to restrict buses from using public curb space,
20 forcing operators to relocate to bus terminals or surface parking lots. Other cities, including New
21 York and Philadelphia, are still working on how best to regulate curbside operators.

23 **Curb Cuts**

24 Curb cuts impact curbside management by restricting the amount of curb space available for
25 public use. The construction of curb cuts to access private garages can equate to the privatization
26 of curb space by taking a public on-street space and replacing it with a private off-street space. In
27 some cities, policymakers have viewed excessive curb cuts as detrimental to the urban
28 environment and walkability. Cities like Los Angeles and San Francisco introduced design
29 guidelines to minimize the impact of curb cuts on pedestrians and community character (2, 21)

30 While curb cuts impact urban transportation, they are largely regulated through the
31 zoning code. A few cities like Baltimore and San Francisco provide transportation officials
32 discretionary powers over new curb cuts. Chicago, New York and Philadelphia restrict curb cuts
33 along key corridors.

35 **Other Uses**

36 Curbside management is impacted by uses and considerations not mentioned above. Increasingly
37 policymakers are providing curb space to promote public policy goals. One such use is curbside
38 car share spaces; as a means to promote car sharing, Baltimore and Seattle provide space to car
39 share companies for a fee. Seattle goes as far as identifying car share as a priority use in the city's
40 *Transportation Strategic Plan*.

41 Cities are also changing curbside policies to better suit pedestrians and bicyclists. Curb
42 uses like vehicle parking have the indirect benefit of providing a buffer between pedestrians and
43 the roadway (22). On-street parking also helps as a traffic-calming device, slowing traffic down
44 and making streets safer for those on foot (ibid). As bicycling continues to grow in popularity,
45 cities are looking to curb space to address the demand for bicycle parking. A handful of cities
46 already provide bicycle parking on the roadbed; this practice will likely grow as curb space is
47 used for new bike share programs.

48 Some cities are more radically reconsidering how to use curb space. In New York and
49 San Francisco, the city has piloted the conversion of street parking into temporary public spaces.

1 Called *Parklets* in San Francisco and *Pop-Up Cafes* in New York, these curbside uses provide
2 valuable public space in places where traditional plazas or parks are infeasible to build (23).

3 The growth of alternative uses for curb space illustrates that curb space has inherent value
4 beyond transportation. The Street Management Framework for Lower Manhattan best states the
5 potential of curb space, stating the Lower Manhattan's streets "may weave the dense urban fabric
6 into a greater whole and make [Lower Manhattan] one of the world's most unique, vibrant and
7 sustainable urban districts" (24).

10 **3. STATE OF PRACTICE**

12 **Organizing Curbside Management**

13 Each of the cities surveyed had their own distinct strategies for curbside management that reflect
14 local conditions and circumstances. In the majority of cities surveyed, municipal departments of
15 transportation played the lead role in curbside management. In the case of Baltimore and
16 Philadelphia, the parking authority was the primary agency for curbside management. Regardless
17 of who played the lead role, curbside management required cooperation between multiple
18 agencies.

19 Cities such as San Francisco and New York maintained more centralized oversight of
20 curb space compared to Baltimore, Philadelphia or Chicago. It remains unclear what type of
21 management structure is most effective for curbside management. While centralized management
22 has theoretical benefits, the interviews suggest that other factors like inter-agency
23 communication, political will and agency resources are more critical to determining an agency's
24 flexibility to change policy and innovate.

25 While policies and pricing vary widely among the cities surveyed, the general framework
26 for curbside management differed little. Cities tend to base current curbside practice on historic
27 practice, re-evaluating policies only when specific problems or public demands arise. In New
28 York City and Boston, on-street parking rates remained unchanged for over a decade until recent
29 modest price increases. This incremental model for curbside management relies largely on
30 stakeholder input, and in many of the cities surveyed, elected officials and community groups
31 played a role in curbside policy. While loading and parking in every case but Chicago, is
32 managed by the same agency, cities rarely developed policy for other uses in tandem with on-
33 street parking and loading policies.

35 **Differing Issues with Curbside Management**

36 The cities surveyed all had distinct challenges regarding curbside management. In Boston, Lower
37 Manhattan and Central Philadelphia, a narrow colonial era street grid exacerbates the problem of
38 double parking and other illegal curbside uses. Washington D.C., Philadelphia and New York all
39 examined curbside management, particularly commercial loading, as a strategy to reduce
40 congestion (12, 24, 25).

41 Local laws and delegation of powers affect curbside management. Chicago privatized on-
42 street parking in 2008 and today CDOT must maintain a certain number of metered spaces
43 throughout the city, restricting changes in how curb space is allocated. State law limits cities in
44 what they can regulate. For example, New York City is currently lobbying the state legislature to
45 allow the city to regulate where curbside buses may stop. In Boston by contrast, the city is able to
46 prohibit buses from picking up passengers on public roads. Since Washington DC is under the
47 jurisdiction of Congress, changes to on-street parking rates require congressional approval,
48 adding an extra barrier to adjusting curb pricing.

49 The factors that influence curbside policy differ widely across the cities surveyed.
50 Curbside intercity buses have impacted cities in the Northeast and Chicago, but do not operate in

1 markets like San Francisco and Seattle. In New York City, high population densities intensify
2 demand for curb space, and many areas of the CBD allocate curb space purely for loading use.
3 Geography in Seattle means that policies try to reduce congestion-generating curb uses on major
4 north-south arterials.

6 **Commonalities in Curbside Management**

7 As much as conditions differ, the cities surveyed face many of the same challenges. Many of the
8 interviewees expressed a desire to balance competing interests for curb space. Parking frequently
9 took up the longest portion of the conversation. Every city surveyed dealt with issues like
10 residential parking and on-street parking pricing. As parking is such an important issue for many
11 cities, many of the innovations in curbside management deal with on-street parking.

12 Commercial loading is another use that all cities struggled with to varying degrees. Illegal
13 parking and the availability of loading spaces convenient for businesses were the two issues
14 nearly all cities expressed as ongoing challenges.

15 Finally a number of cities are beginning to explore using curb space for new kinds of
16 uses. As bicycling increases in popularity, cities are installing bicycle parking in the roadbed.
17 Similarly, the rise of car share has led cities to create on-street parking reserved for car share. For
18 all of the cities surveyed, these non-standard uses have emerged only in the last few years.

20 **Innovations**

21 From the surveys it seems that there is a growing appreciation for how the regulation and
22 allocation of curb space impacts the transportation system. Cities are beginning to approach
23 curbside management in a more holistic manner instead of focusing on individual uses.

26 *Developing Policy Frameworks*

27
28 Many of the cities surveyed began to evolve their policies based on wider
29 frameworks. In Seattle political consensus in support of variable market based pricing led
30 to a restructuring of on-street parking. Seattle also maintains a list of curbside use
31 priorities to guide decision-making, the only city to publically do so.

32 In Philadelphia, concerns with downtown congestion led the development of a
33 Mobility Enhancement Initiative in 2008; many of the initiatives recommendations were
34 later implemented on select downtown streets. Like in Philadelphia, congestion prompted
35 the Downtown DC Business Improvement District to partner with the city in a curbside
36 management plan for K Street.

37 One of the most ambitious projects however, has come out of New York. The
38 Lower Manhattan Street Management Framework analyzes the nature of use and traffic
39 in Lower Manhattan to create standard street typologies. The framework lays the
40 groundwork for NYC DOT to create new policies tailored to street type.

42 *Technology*

43
44 Some cities have extensively incorporated technology in their curbside
45 management practice. One of the most comprehensive programs nationwide is San
46 Francisco's SFpark. SFpark uses on-street parking sensors to monitor parking occupancy
47 in real time. The sensors allow the city to implement performance based pricing by
48 monitoring parking supply and demand, and adjusting rates monthly by block to meet
49 occupancy targets. The sensors also relay to drivers the locations of available on-street

1 parking, reducing cruising times and providing drivers with reliable information on
2 parking availability.

3 In Seattle technology is used to improve inter- agency and public communication
4 regarding curbside management. The Seattle DOT has implemented GIS based
5 monitoring of public rights of way to keep track of special permits and construction
6 work. SDOT maintains an online interactive map for the public that displays all curbside
7 restrictions by location.

8

9 *Loading*

10

11 Cities have implemented some clever practices to reduce the abuse of loading
12 zones. New York and Washington DC have metered commercial parking to discourage
13 operators from occupying spaces for long periods of time. In San Francisco the city
14 established loading zones that are for exclusive use of 3 axel vehicles. These zones
15 effectively preserve loading zones for large delivery vehicles and prohibit commercial
16 services, like a contractor, from parking all day in the loading zone.

17

18 While all the cities surveyed are constantly improving on curbside management, there continues
19 to be a lack of formalized strategies. As the rise of curbside buses illustrates, new curb uses can
20 shake up established management practices. As policymakers begin to re-evaluate the value of
21 curb space and the potential of its uses, they more than ever need clear ways of structuring and
22 evolving policy. The next section will discuss three methods currently employed to structure
23 curbside management.

1 **TABLE 1: Summary Chart of Curbside Management Policies**
 2

	Baltimore	Boston	Chicago	New York City	Philadelphia	San Francisco	Seattle	Washington DC	
Parking	Max Pricing (per hour)	\$2	\$1.25	\$5	\$3	\$2.50	\$6	\$4	\$2
	Zonal Pricing ^a	yes	yes	yes	yes	yes	yes		
	Variable Pricing ^b						yes	yes	yes
	Demand Pricing ^c				pilot		yes	yes	pilot
	Real Time Data						yes		
	RRPs (per year fee)	\$20	\$0	\$25		\$20/35	\$98	\$65 /2yr	\$15
Loading	Individual Request	yes	yes	yes	yes	yes	yes	yes	
	Loading Zone Fee	\$0	\$0	\$25	\$0	\$250	\$0	\$45-150	
	Metered Loading				yes				yes
Other	Curbside Private Buses	yes		yes	yes	yes			yes
	Curbside DOT Review ^d	yes	limited		limited	limited	yes		
	Parklets				yes	yes	yes		
	Curbside Bike Parking	yes		yes			yes	yes	yes
	Curbside Bike Share		yes						
	Car Share	yes						yes	

3
 a. City broken up into contiguous meter rate zones
 b. Prices vary on a street-by-street basis
 c. Meter rates set to achieve occupancy / turnover target
 d. Cities where DOT has a say in permitting new curb cuts. Cities with limited review limit the review process to certain locations or uses.

4. MODELS FOR CURBSIDE MANAGEMENT

From the survey and review of literature, municipal curbside management strategies follow three general models: the Incremental, Framework and Performance-Pricing Model. The models presented here provide cities with options for organizing their policies and decision-making processes. Cities typically employ some combination of each model in their curb space regulation and pricing strategies. Regardless of which model agencies implement, policies should reflect the different concerns discussed in section 2.

The Incremental Model

All the cities surveyed utilize the Incremental Model of curbside management in one way or another. Under the Incremental Model, cities construct curbside management policies slowly over time. Regulations remain unchanged until a specific problem arises. Cities formulate new policy once the problem becomes pressing enough to warrant pressure from stakeholders and policymakers.

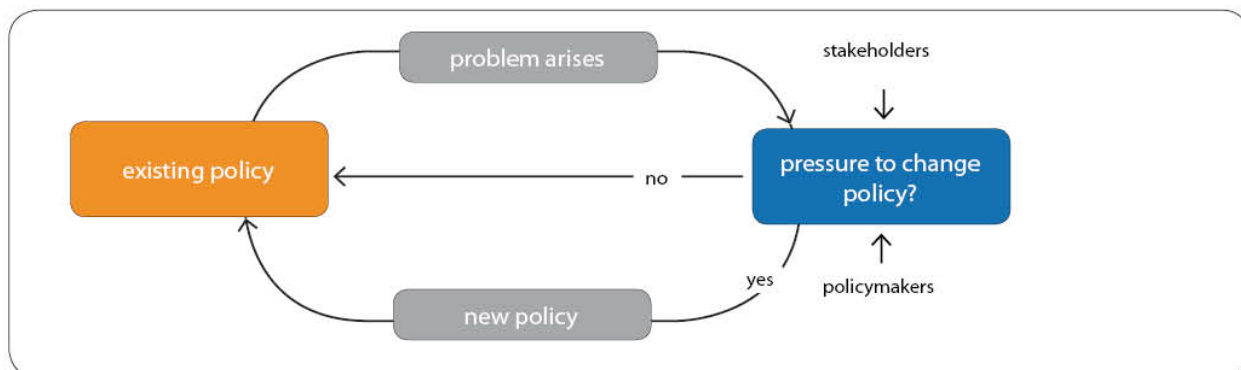
Most cities rely on the Incremental Model for a number of reasons. For a transportation agency it is significantly less time and resource consuming to adjust existing policy over adopting entirely new regulations. The iterative approach of the model means that existing regulations reflect a status quo accepted by the public and politicians. For example, cities like New York and Philadelphia informally tolerate a degree of illegal commercial parking as part of doing business in the urban core. Curbside regulations are enforced almost exclusively through fines, which freight carriers absorb as the cost of doing business. While the current system is not ideal, the practice is so well accepted that unless illegal parking raises the ire of citizens or causes major negative impacts on the transportation system and public safety, the policy will likely remain unchanged.

There are a number of downsides however to the Incremental Model. As policies are changing by a case-by-case basis, the Incremental Model lacks systematic analysis to guide policymakers. Frequently regulations fail to look at the larger context of the transportation system or the intrinsic value of curb space.

Another downside to the model is that curbside management practices often preserve the status quo. If neither policymakers nor stakeholder press for change, policies remain the same. Communities may have policies that are accepted over time but do not result in efficient, equitable or optimal outcomes; One very common example of this are residential parking permit programs. RPPs rarely charge more than a nominal fee, leading to more many more permits than spaces. While low fee RPPs are accepted practice, low costs may exasperate parking problems by allowing demand to greatly outstrip supply.

Curbside management under the incremental model illustrates a hybrid between optimal policy and political compromise. While the Incremental Model may lead cities to formulate ad-hoc regulations that lack consistency, cities can utilize this model with success. Having clear policy goals can help guide decision-making; Seattle has a list of curb use priorities and a Transportation Strategic Plan to guide officials in developing new policy.

1
2 **FIGURE 1: Evolution of Curbside Management under Incremental Model**
3



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6
7 **The Framework Model**

8 The Framework Model is used in limited ways by a number of the cities surveyed. Unlike in the
9 Incremental Model, under this model cities systematically overhaul curbside management
10 practice. The process begins by identifying what the community wants to accomplish through
11 curbside management. The street system is then analyzed and streets are grouped by type.
12 Distinct sets of curbside management practices are applied to each street typology to meet the
13 community's overall goal.

14 The Lower Manhattan Street Management Framework best reflects the Framework
15 Model of curbside management. The plan started with a broad vision, the desire to use curbside
16 management to make Lower Manhattan a more livable, sustainable and globally competitive
17 place. NYC DOT worked to realize this vision through a number of goals such as improving air
18 quality, reducing congestion and enhancing the public realm. From there, NYC DOT analyzed
19 conditions throughout the neighborhood and identified key issues such as illegal placard parking,
20 double parking, idling of tour buses and distribution of curb space among uses. To address these
21 problems and meet the wider policy goals, streets were divided into typologies based on the
22 nature of their use. From there, policymakers can formulate regulations and polices tailored to
23 each street type.

24 Many cities employ a more basic version of the Framework Model than Lower
25 Manhattan's Street Management Framework. In the case of Philadelphia, the Mobility
26 Enhancement Initiative reflects an attempt at the Framework Model. The city analyzed conditions
27 in the business core and identified problems that contribute to congestion and reduced mobility.
28 While the plan did not create distinct typologies, it did break up Center City streets by identifying
29 Walnut and Chestnut Street as primary commercial corridors. Because these streets are major
30 crosstown routes, as well as a key commercial corridor with high pedestrian traffic, the city
31 established for them a distinct set of loading and curb cut restrictions.

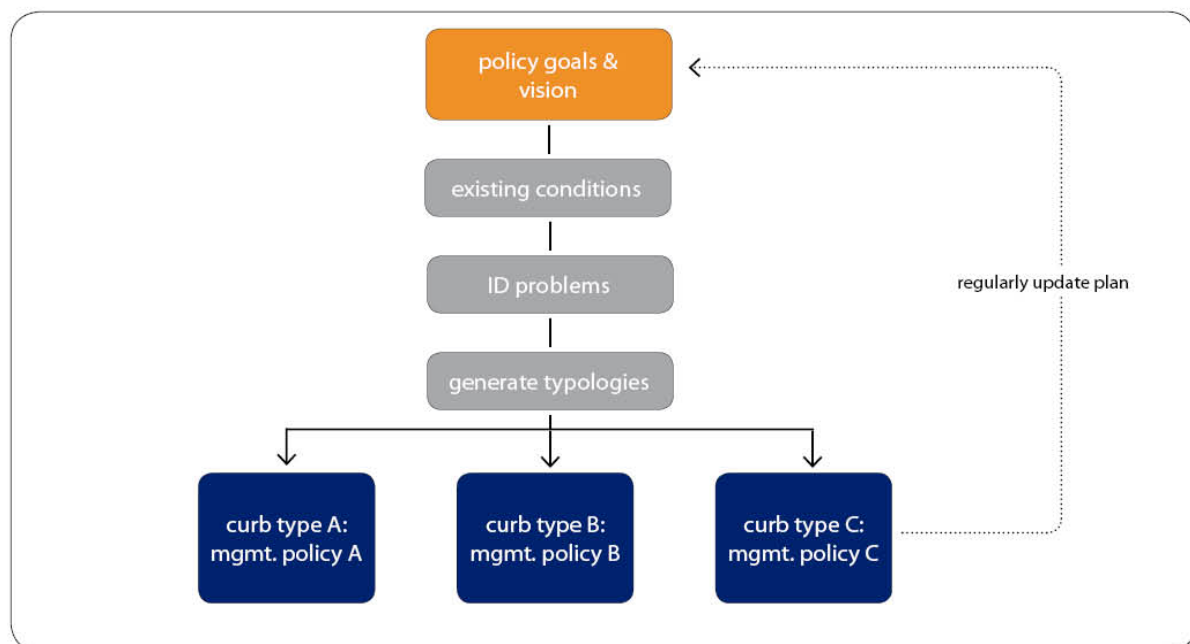
32 The strength of the Framework Model is that it provides a rational way to organize
33 curbside management. The model looks at the whole system, allowing regulations to address the
34 needs of all people impacted by curbside policy. As the Framework Model identifies how streets
35 differ from one another, agencies can tailor policy to distinct conditions throughout a city.

36 The Framework Model has a few downsides. Developing a framework is costly. In New
37 York City the Lower Manhattan Framework received technical and financial assistance from the
38 Manhattan Borough President's Office and Downtown Business Improvement District (BID).
39 Philadelphia's *Mobility Enhancement Initiative* and Washington's *Downtown Curbside*
40 *Management Strategy* were both made possible through the support of BIDs. The resources

1 required to develop a framework model may be prohibitive for cash-strapped municipal
2 transportation departments.

3 Framework plans also depend largely on the vision and goals of policymakers. New
4 York's plan starts off with an ambitious vision for Lower Manhattan. The strength of their policy
5 framework relied on the plan's initial scope. Without strong policy goals, the plan would result in
6 weaker recommendations.

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8
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10 **FIGURE 2: Framework Model of Curbside Management**
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15 **The Performance Pricing Model**

16 The Performance Pricing Model remains largely theoretical however the model reflects
17 management strategies currently in limited application across the country. In the model, a price
18 per unit of curbside space is applied so that demand for curbside space roughly equals the supply. Once
19 policymakers set a price, the market effectively manages the use, including duration and type of
20 permitted uses. The performance model follows Richard Epstein's argument that as competition
21 for curbside space grows, systems of privatization and monetary value help regulate its use. Donald
22 Shoup has helped lead the discussion of the Performance Model, advocating for well-designed
23 pricing strategies that negate the need for complex regulations and incentives (27). In this
24 marked-based model, those willing to pay the most earn the right to occupy a space.

25 The model allows individuals to develop their own systems of management. For example,
26 business owners along a retail street may pool resources together to secure a curbside space for all
27 day loading use. The individual business owners then can coordinate among themselves the terms
28 of use, and even provide the space for public use during hours where no loading occurs; Shoup
29 suggests the Performance Model could be used to solve residential parking problems in much the
30 same way. Homeowners can "own" spaces in front of their house and then decide to either
31 occupy the space for their own use, or collect revenue on the space. (28)

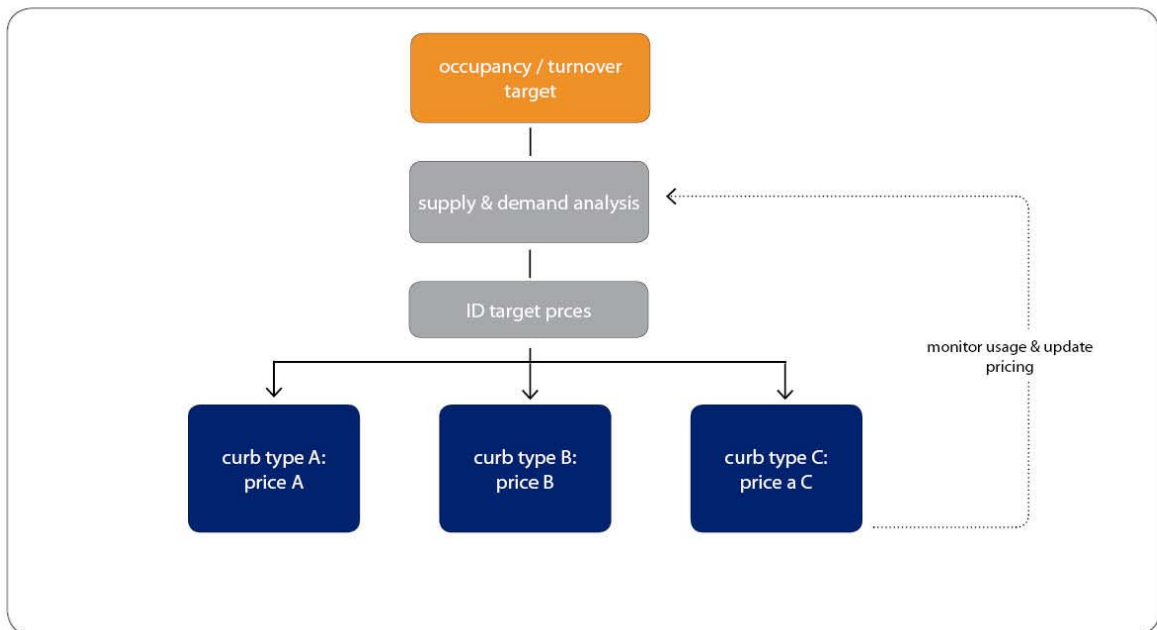
1 The performance-pricing model has a number of strengths. First the model is simple to
 2 implement as curbside use is guided by only one input, pricing. The only part of the model that needs
 3 regular updates are curbside price valuations. As cited in previous examples, market rate curbside pricing
 4 could eliminate adverse pricing incentives that lead to parking shortages and even increased
 5 VMT.

6 The performance model has a number of shortcoming that make its implementation
 7 across all curbside uses a challenge. First the curbside model raises equity issues. Under the
 8 model, cities effectively are privatizing a public resource. In places where curbside space is highly
 9 valued, those most willing to pay for curbside space may not be the same as the best users of curbside
 10 space. For example, if this model were applied to a high value area like the Upper Eastside of
 11 Manhattan, parking rates would be astronomically high. These rates may reasonably burden high-
 12 income residents, but would exclude small businesses or delivery vehicles from using the curbside
 13 space. Providing curbside space for uses like UPS delivery, may offer greater benefit to the
 14 community compared to providing that space for someone's private car.

15 The performance model requires constant monitoring of supply and demand. SFpark
 16 illustrates how technology can make demand pricing possible. For cities like Seattle that adopted
 17 market rate pricing without real-time monitoring systems, the city must regularly review parking
 18 demand and update pricing structures accordingly.

19 Finally, maybe the greatest roadblock to implementing the performance model is the
 20 political opposition that would arise. The model assumes society wants to manage a scarce
 21 resource through pricing (high parking costs) instead of through rationing (harder to find
 22 parking). Opposition to meter rate increase across the country illustrates that implementing a
 23 market based approach to curbside management may be a tough sell.

24 **FIGURE 3: Performance Pricing Model of Curbside Management**



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5. CONCLUSION

The peer agency interviews help illustrate how diverse curbside management practice is across the country. Among the eight survey participants, new public policy, pricing strategies and planning approaches are changing the field of curbside management. While all the cities surveyed are exploring new innovative practice, the research exposed three common flaws in curbside management.

Cities need to do more to treat curbside management as a series of interrelated uses instead of managing each curbside use in isolation. Since multiple agencies share responsibility for curbside management, good communication is critical to create successful policies. Projects like the *Lower Manhattan Street Management Framework* or Philadelphia's *Mobility Enhancement Initiative* begin to break down barriers by proposing inter-agency solutions.

Cities also need to do more to tie curbside management into wider planning and public policy efforts. Seattle's Transportation Strategic Plan provides other communities a good model for developing clear curbside management goals and objectives. Just as comprehensive plans guide incremental changes to land use zoning, Seattle's plan helps guide day to day curbside management decisions. By establishing goals, communities have a solid metric to measure the effectiveness of existing policy.

Finally cities must actively engage stakeholders and the public. Nearly all the interviews mentioned stakeholder buy-in as a challenge to change curbside policy. If politicians and the public are made aware of the tradeoffs of policies like underpriced parking or free loading zones, they may be more open to adopting new kinds of practices and policy. Projects like SFpark introduced higher parking rates by emphasizing the benefits to businesses and residents.

This paper is a cursory attempt to understand curbside management in large American cities and as such cannot answer what constitutes an ideal curbside management policy. Each of the three management models are used with varying success and further research is needed to understand their full impact. The Framework and Performance Pricing models provide interesting alternative solutions, however practitioners need to better understand their feasibility before we can see widespread use of these strategies.

Politics and public opinion play an important role in guiding curbside management. While this paper focused almost exclusively on how transportation agencies managed curbspace, future research should delve further into the political aspects of curbside management. Smaller cities might provide important lessons on how to effectively engage stakeholders. NACTO members introduced innovations like performance pricing after they were successfully used in smaller communities.

Curbside management is a complex and multifaceted issue that cities continue to struggle with. As urban areas face changing land uses and new transportation demands, management practices will have to evolve to meet the needs of users. The models discussed in this paper provide policymakers a strategic way to think about how they make curbside management decisions. For curbside management to succeed, policymakers must appreciate the impact management policies can have on the functionality and livability of our cities.

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