Parking Management Best Practices

PARKING MANAGEMENT REFERS TO POLICIES AND PROGRAMS THAT RESULT IN MORE EFFICIENT USE OF PARKING RESOURCES. THIS FEATURE DESCRIBES VARIOUS PARKING MANAGEMENT STRATEGIES AND HOW TO DEVELOP A PARKING MANAGEMENT PROGRAM SUITABLE FOR A PARTICULAR SITUATION.

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INTRODUCTION

While sitting in a local coffee shop, I overhead another customer complain about her difficulty finding a parking space. Walking around the neighborhood a few minutes later, I saw dozens of unoccupied parking spaces nearby, but most were reserved. Each space served a particular destination, such as the coffee shop, a pub, or an office.

Although most of these parking lots fill at certain times during a typical week, at no time are more than 60 percent of the total parking spaces in the area occupied. The coffee shop's parking lot is full most mornings but has unoccupied spaces most evenings. The pub's parking lot is full most evenings but has plenty of spaces available during the day. The office parking is full during weekdays but has plenty of unoccupied spaces during evenings and weekends.

The area does not have a parking supply problem; it has a parking management problem. Parking spaces are unavailable to the people who need them. More efficient management could improve the quality of service available to customers and could avoid the costs of expanding parking supply.

Many planning professionals now promote parking management. It requires changing the way transportation planners think about parking problems and evaluate solutions. When appropriately applied, parking management can significantly reduce the number of parking spaces required in a particular location, which provides various benefits:

- Facility cost savings: Parking management reduces costs to governments, businesses, developers and consumers.
- Improved service quality: Many strategies improve user quality of service by providing better information, increasing user options, reducing congestion and creating more attractive facilities.
- More flexible facility location and design: Parking management gives architects, designers and planners more ways to address parking requirements.
- Revenue generation: Some management strategies generate revenues that can fund parking facilities, transportation improvements, or other important projects.
- Mobility management support: Parking management is an important component of efforts to encourage more efficient travel behavior, which helps reduce traffic problems.
- Smart growth support: Parking management helps create more accessible and efficient land use patterns and supports other strategic land use planning objectives.
- Support for alternative modes: Parking management supports walking, cycling and transit use.
- Reduced stormwater management costs, water pollution and heat island effects: Parking management can reduce stormwater flow, water pollution and solar heat gain.
- Support for equity objectives: Management strategies can reduce the need for parking subsidies, improving travel options for non-drivers.
- More livable communities: Parking management can help create more attractive urban environments.

This feature provides an overview of parking management practices. It is part of efforts by the Institute of Transportation Engineers' Parking Council and other experts to provide practical guidance for parking management program implementation.[1, 2]

HOW MUCH IS OPTIMAL?

Most parking supply decisions are currently based on recommended minimum standards published by professional organizations such as the Institute of Trans-

Table 1. Parking requirement adjustment factors.

Factor	Description	Typical adjustments
Geographic location	Vehicle ownership and use rates in an area	Adjust parking requirements to reflect variations identified in census and travel survey data.
Residential density	Number of residents or housing units per acre/hectare	Reduce requirements 1 percent for each resident/acre; 15-percent reduction at 15 residents/acre; and 30-percent reduction at 30 residents/acre.
Employment density	Number of employees per acre	Reduce requirements 10 to 15 percent in areas with 50 or more employees per gross acre.
Land use mix	Mix of land uses in an area	Reduce requirements 5 to 10 percent in mixed-use areas. Include additional reductions if this results in shared parking.
Transit accessibility	Nearby transit service frequency and quality	Reduce requirements 10 percent within one-quarter-mile of frequent bus service and 20 percent within one-quarter-mile of a rail transit station.
Car sharing	Whether a car sharing service is located nearby	Reduce residential requirements 5 to 10 percent if a car sharing service is located nearby.
Walkability	Walking environment quality	Reduce requirements 5 to 15 percent in walkable communities and more if walkability allows for more shared and off-site parking.
Housing tenure	Whether housing is owned or rented	Reduce requirements 20 to 40 percent for rental versus owner-occupied housing.
Pricing	Parking that is priced, unbundled, or cashed out	Reduce requirements 10 to 30 percent for cost-recovery pricing (such as parking priced to pay the full cost of parking facilities).
Parking and mobility management	Parking and mobility management programs are implemented at a site	Reduce requirements 10 to 40 percent at work sites with effective parking and mobility management programs.
Contingency-based planning	Use lower-bound requirements and implement additional strategies if needed	Reduce requirements 10 to 30 percent and more if a comprehensive parking management program is implemented.

Source: Smart Growth Index Model. Accessible via www.epa.gov/smartgrowth/sgipilot.htm.

portation Engineers and the American Planning Association.[3, 4] These standards often result in significantly more supply than needed, even during peak periods.[5] To understand why this occurs, it is helpful to know a little about how these parking standards were developed.[6]

Parking standards are based on numerous parking demand surveys that measure the number of parking spaces occupied during peak periods at various locations. Most of these surveys were performed in automobile-dependent, suburban locations because that is where such studies are easiest to perform, and most new development occurred at these locations during the last half-century. It is more difficult to measure parking generation in urban areas where parking facilities are often shared.

These standards reflect an 85th-percentile curve, which means that 85 out of 100 sites will have empty spaces during peak periods. Peak period is based on the 10th to 20th "design hour," which refers to the number of annual hours that parking demand exceeds supply at a particular location. A parking facility is considered full if it has 85- to 90-percent occupancy.

These various factors result in standards that require more parking supply than needed. These cases can be seen in areas where: parking is shared or priced; overflow parking is available nearby; there are multimodal transport systems; land costs are high; or parking management programs are implemented. As a result, conventional standards can be lowered based on factors summarized in Table 1.

Minimum parking studies are often said to measure parking demand, but demand is actually a function: the quantity of a good consumers would purchase at a given price. To truly measure demand, an analysis must determine how much parking would be used with various prices and conditions. For example, rather than stating that a certain site requires 100 parking spaces, a planner should be able to state that a site requires 100 parking spaces if they are free, 80 spaces if priced at $2 per day and 60 spaces if priced at $3 per day and the employer implements a commute trip reduction program.

This approach results in efficiency-based standards, which take into account geographic, demographic and economic factors that affect demand in order to determine truly optimal parking supply. This means that a parking lot may frequently fill, provided that users have information on parking options and overflow parking is available nearby.

Because it is impossible to predict exactly how much parking will be required in the future, efficiency-based standards rely on contingency-based plans, which identify solutions that can be deployed if needed. For example, if a new building is predicted to need 60 to 100 parking spaces, the conventional approach is to supply either the middle value (80 spaces) or maximum value (100 spaces). With contingency-based planning, the lower-bound value (60 spaces) is initially supplied, with a plan that identifies the solutions that will be implemented if problems develop. These may include adding parking supply and various parking management strategies.

Table 2. Parking management strategies.

Management strategy	Description	Typical reductions	Reduces traffic?
Shared parking	Parking spaces serve multiple users or destinations.	10–30%	
Parking regulations	Regulations result in more efficient use of parking facilities.	10–30%	
More accurate and flexible standards	Adjust parking standards to more accurately reflect demand in a particular situation.	10–30%	
Parking maximums	Establish maximum parking supply standards.	10–30%	
Remote parking	Provide off-site parking facilities and encourage their use.	10–30%	
Smart growth	Encourage more compact, mixed, multimodal development.	10–30%	✓
Walking and cycling improvements	Improved walking and cycling expands the range of destinations served by a parking facility and reduces vehicle trips.	5–15%	✓
Increase capacity of existing facilities	Increase parking supply by using otherwise wasted space, smaller stalls, car stackers and valet parking.	5–15%	
Mobility management	Encourage more efficient travel patterns.	10–30%	✓
Parking pricing	Charge motorists directly for using parking facilities.	10–30%	✓
Improve pricing methods	Use better charging techniques to make pricing more convenient and cost effective.	N/A	✓
Financial incentives	Provide financial incentives to shift mode.	10–30%	✓
Unbundle parking	Rent or sell parking facilities separately from building space.	10–30%	✓
Parking tax reform	Various tax policy changes that support parking management.	5–15%	✓
Bicycle facilities	Provide bicycle storage and changing facilities.	5–15%	✓
Improve user information	Provide convenient and accurate information on parking availability and price.	5–15%	✓
Improve enforcement and control	Ensure that parking regulation enforcement is efficient, considerate and fair.	N/A	
Transportation management associations	Establish member-controlled organizations that provide transport and parking management services in a particular area.	N/A	✓
Overflow plans	Establish plans to deal with occasional excessive demand.	N/A	
Address spillover problems	Use management, enforcement and pricing to address spillover problems.	N/A	
Facility design and operation	Improved parking facility design and operations to help solve problems and achieve parking management objectives.	N/A	

Source: Litman, Todd. *Parking Management: Strategies, Evaluation and Planning*. Victoria, British Columbia, Canada: Victoria Transport Policy Institute, 2006.

PARKING MANAGEMENT STRATEGIES

Parking management involves the application of various specific strategies in an integrated program. Table 2 describes these strategies and indicates their estimated reductions in parking requirements compared with conventional standards. It also indicates whether a strategy directly reduces vehicle traffic and therefore provides additional benefits such as reduced traffic congestion and pollution emissions. These estimates are based on the assessment of numerous examples and studies; they should be adjusted and applied based on professional judgment.

Not every strategy is appropriate in every situation. Actual impacts vary depending on geography and demography, how a strategy is implemented and other factors. General guidelines include the following:

- Impacts are higher where there are more parking and travel options. For example, parking pricing will have

greater demand-reduction impacts if implemented in conjunction with improvements in rideshare and public transit services.

- Some strategies have synergistic effects (total impacts are greater than the sum of their individual impacts) and become more effective if implemented together. For example, shared parking and walkability improvements may reduce parking requirements 10 percent when implemented alone, but they will be 25-percent effective when implemented together because they are complementary.
- Impacts generally increase over time as programs mature. A particular strategy may reduce demand 5 percent the first year it is implemented but will increase to 10 percent after two or three years and up to 15 percent after five or 10 years.

Special care is needed when predicting the impacts of a program that includes multiple parking management strategies. Be careful to take into account strategies with overlapping impacts. For example, transportation management associations (TMAs) provide an institutional framework for implementing strategies that directly affect parking requirements. While it would be true to say that a TMA can reduce parking requirements by 10 to 30 percent compared with not having such an organization, it would be incorrect to add the demand reductions of the TMA to the impacts of the individual strategies it helps implement.

PARKING MANAGEMENT EXAMPLES

Below are just a few of many examples of successful parking management programs.

Downtown Pasadena, CA, USA, Redevelopment[7]

During the 1970s, downtown Pasadena, CA, USA, had become run down, with many derelict and abandoned buildings and few customers, in part due to parking problems. The city proposed pricing on-street parking as a way to increase turnover and make parking available to customers, but local merchants originally opposed the idea. As a compromise, city officials agreed to dedicate all revenues to public improvements to make the downtown more attractive. The merchants agreed to the proposal when they realized that parking revenues could fund services that directly benefited their customers and businesses.

The city formed a parking meter zone, with an advisory board consisting of business and property owners, which recommended parking policies and set spending priorities for the meter revenues. Investments included new street furniture and trees; more police patrols; better street lighting; more street and sidewalk cleaning; pedestrian improvements; and marketing, including maps showing local attractions and parking facilities. This resulted in extensive redevelopment of buildings, new businesses and residential development.

Parking is no longer a problem for customers, who can almost always find a convenient space. Local sales tax revenues have increased far faster than in other shopping districts with lower parking rates and at nearby malls that offer free customer parking.

More Accurate Parking Requirements

The city of Vancouver, British Columbia, Canada, is developing a more flexible approach to parking requirements for multi-family dwellings to support efficient transportation, smart growth and affordable housing planning objectives. The city has proposed a Sustainable Transportation Credit Program that allows developers more flexibility based on their specific location and circumstances. The program is loosely based on the LEED™ Green building rating system. Developers receive credits for reducing the number of parking stalls and providing parking spaces for car share vehicles and annual transit passes to building occupants.

Campus Parking Management[8]

Many college and university campuses are implementing transportation and parking management in order to reduce traffic and parking problems and allow buildings to be constructed on campus parking lots. Typical strategies include subsidized transit and rideshare services; commute trip reduction programs (for staff); increased parking fees and regulations; and restrictions on vehicle parking by students living on campus. Various strategies are used to deal with spillover parking problems.

Parking Management for Housing Affordability[9]

Parking management can help increase housing affordability and encourage urban redevelopment. For example, Rich Sorro Commons is a mixed-use project with 100 affordable units and approximately 10,000 square feet of ground floor retail recently built in San Francisco, CA. Conventional standards would require 160 parking spaces for such a building, but it has only 85 due to its proximity to high-quality public transit services, the provision of car share services and its low rent, which attracts tenants who own fewer vehicles. Reduced parking supply freed space for a childcare center and more retail. Just 17 avoided spaces allow the project to generate $132,000 in additional annual revenues (300 square feet per space at $26 per square foot in rent), making housing more affordable. Two car share vehicles are available to residents, giving them access to a car without the costs of ownership—an important benefit for low-income households.

Fee-In-Lieu Programs[10]

In-lieu fees allow developers to pay into a fund for off-site municipal parking facilities instead of providing their own on-site parking. For example, Coconut Grove, FL, USA, allows developers to pay a one-time fee of $10,000 or $50 per month per stall as an alternative to providing on-site parking facilities. Jackson, WY, USA, adopted a fee-in-lieu policy in 1994. The fee-in-lieu option was in response to concerns that minimum parking requirements would hinder downtown development. The option is used frequently.

Austin, TX, USA, Parking Benefit District

The city of Austin, TX, USA, is addressing spillover parking problems by allowing neighborhoods to establish parking benefit districts (PBD). A PBD is created by metering on-street parking (either with pay stations on the periphery of the neighborhood or with traditional parking meters) and dedicating the net revenue (less costs for maintenance and enforcement) to neighborhood improvements such as sidewalks, curb ramps and bicycle lanes. The PMD may be used in conjunction with a residential permit parking program to ensure that parking is available for residents and their visitors.

Aspen, CO, USA, Parking Problems

Aspen, CO, USA, experienced growing parking problems due to its success as an international resort. In 1991, the city built a 340-space underground parking structure in the city center, but despite its convenient location and low price, it remained half-empty most days while motorists fought over on-street parking spaces nearby. Local residents and downtown commuters would simply move their cars every 90 minutes to avoid a ticket.

In 1995, the city began charging for on-street parking using multi-space meters. Parking fees are highest in the center and decline with distance from the core. Parking is priced on nearby residential streets, but residents are allowed a limited number of passes. The city had a marketing campaign to let motorists know about the meters, including distribution of one free $20 pre-paid parking meter card to each resident to help familiarize them with the system. Each motorist was allowed one free parking violation, and parking control officers provided an hour of free parking to drivers who were confused by the meters.

Although some downtown workers initially protested (opponents organized a "honk if you hate paid parking" campaign the day pricing began), pricing proved effective at reducing parking problems. Six months later, the program was supported by a 3-to-1 margin in the municipal election. Downtown businesses now support pricing to ensure that convenient parking is available for customers and to raise funds for city programs.

CONCLUSIONS

More efficient management of parking resources can help solve parking problems and reduce the amount of parking that must be supplied in a particular location. This provides a variety of benefits, including improved convenience to motorists, cost savings and more efficient land use development patterns. Some parking management strategies reduce vehicle traffic and so help reduce congestion, accidents and pollution problems.

Individually, most parking management strategies have modest impacts, often reducing parking requirements by 5 to 15 percent. Some cause spillover problems that must be addressed. However, their impacts are cumulative and synergistic. A comprehensive parking management program that includes an appropriate combination of cost-effective strategies can often reduce parking requirements by 20 to 40 percent or even more if implemented with other smart growth policies and mobility management programs.

Although parking management is implemented successfully in many situations, it is not being implemented as much as economically justified. Planners are increasingly applying parking management in a variety of situations to achieve a variety of objectives. ■

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