INTRODUCTION

*Parking is an attractive nuisance – the attractive bit catches your eye first while the nuisance bit needs a closer look.* James Martin

Parking is a major land use that consumes valuable land for the storage of vehicles. Parking management objectives vary by community; they can be complex, and potentially contradictory in some cases. Managing parking supply is a balancing act. Too much parking, particularly if provided in surface lots for free, uses valuable land resources and often results in widely-spaced and disconnected development patterns; too little parking, or poorly designed or located parking, can result in parking spillover to adjacent areas, increase traffic congestion as drivers search for parking, cause travelers to choose different destinations, and potentially inhibit development desired by a community.

The Rightsizing the Parking Code Project, funded by a Transportation and Growth Management (TGM) grant, is focused on supporting and sustaining vibrant, walkable, and transit-supportive urban and suburban settings in Washington County. Current parking policies in Washington County are an agglomeration of old and new ideas. Current policies attempt to encourage the efficient use of land and promotion of non-automobile trips by adopting development standards (e.g. minimum and maximum parking requirements) consistent with regional guidelines. This TGM project will evaluate how successful these policies have been and what may need to change in order to more fully realize these stated objectives. This project will evaluate policies and strategies representing the state-of-the-practice in parking management, and will identify parking management strategies that would improve the balance of vehicle and bicycle parking demand with the supply of parking for all travel modes and encourage more efficient use of land.

The purpose of this Technical Memorandum is to summarize information about best practices in parking management, particularly related to suburban environments. Much has been written about parking management objectives and strategies applied to urban areas, where parking supply may be limited, and alternatives to driving private vehicles may be more available. However, there is not much information available in the literature about how these strategies might be applied in a suburban setting, or emerging higher density areas outside of central cities.

This Memorandum provides national and local perspectives on parking management based on the findings from the report *Parking Made Easy: A Guide to Managing Parking in Your Community* prepared by the Oregon Transportation and Growth Management Program; several recent books on this subject, additional reports collected from various agencies and jurisdictions around the United States, and
information about parking management for five comparable jurisdictions, including local communities (Portland, Beaverton, Hillsboro, Salem), Walnut Creek, CA, and CMAP (Chicago Metropolitan Agency for Planning). The Memorandum includes a summary of specific parking management strategies and their potential applicability in Town Centers and Station Communities in Washington County. These strategies, summarized in the table at the end of this Memorandum, are grouped into three major categories: 1) strategies that increase the operating efficiency of the parking supply; 2) strategies that reduce parking demand; and 3) support strategies to improve parking utilization and efficiency.

**Purpose of Parking Management**

*They’ve paved paradise and put up a parking lot.* Joni Mitchell

Parking is an essential component of the transportation system. A typical automobile is parked 23 hours each day. Where and how parking needs are accommodated can make a big difference in the success of economic development, traffic reduction, smart growth, historic preservation, and many other planning efforts. Parking management offers an alternative to traditional “predict and provide” parking planning, which has contributed to widespread auto dependency. Instead of providing plentiful free parking, parking management seeks to provide an optimal supply of parking, in the right location(s), and priced to result in efficient use of parking facilities by the traveling public, and efficient utilization of land for parking versus other potential uses.

Parking management represents a fundamental shift in how parking “problems” are perceived and how “solutions” are evaluated and implemented. Until recently the approach to providing parking was that when it came to parking, more is usually better; and that past trends related to parking needs are good predictors of future needs. This creates a self-fulfilling prophecy - since abundant parking (particularly free parking) increases the use of private vehicles for travel, leading to more dispersed land development patterns (in some areas), resulting in continued auto dependency, which requires more parking, and so on. Emerging trends in parking management seek to maximize the utility of existing parking and improve the efficiency of parking in general (e.g., sharing of parking facilities among multiple destinations or properties; and accepting full parking lots provided that additional parking is available nearby, and that parking spillover problems are addressed). This new paradigm emphasizes provision of parking for bicycles to support and encourage multi-modal travel. Rather than incorporating parking costs into building costs it is more efficient and fair to charge vehicle users directly, so that people only pay for the parking they actually use.

When appropriately applied, parking management can reduce the number of parking spaces required in a particular location, and result in a number of other benefits, including:

- Improving the user quality of service in accessing destinations,
- Creating more accessible land use patterns for multiple travel modes,
- Reducing motor vehicle traffic,
Reducing congestion, accidents and pollution,
Creating more attractive and compact communities, and
Improving mobility for non-drivers.

The objectives of this project reflect the relationships between parking and other aspects of the transportation system, and are intended to result in the following outcomes:

- Meeting non-single occupancy vehicle modal targets;
- Reducing vehicle miles traveled and associated greenhouse gas emissions;
- Increasing land use efficiency;
- Complementing and enhancing Transportation Demand Management (TDM) strategies;
- Encouraging safe and convenient walking, biking, and public transportation opportunities;
- Supporting an active lifestyle;
- Ensuring land uses are transit-supportive to leverage and protect transit investments;
- Ensuring that the supply of parking provides the right balance between accommodating parking demand and other state, regional and local policy objectives; and
- Compliance with Metro’s *Regional Transportation Functional Plan* Title 4.

Anticipated outcomes of this project include: 1) improved parking development standards for new development and, 2) a toolkit of context sensitive parking management strategies for Town Centers and Station Communities in Washington County.

**NATIONAL PERSPECTIVE**

*Politics ain’t worrying this country one-tenth as much as where to find a parking spot.* Will Rogers

Several books and reports have been published in the past decade providing a comprehensive look at parking management in the United States. Some of the key documents are summarized briefly in the following section.

**TCHRP (Transit Cooperative Research Program) Report 85, Traveler Response to Transportation System Changes – Chapter 18 – Parking Management and Supply, 2003**

This document reports on how travelers respond to differences in the supply and availability of vehicle parking, including changes that might occur as a result of shifting land-use patterns, changes in regulatory policy, or attempts to “manage” the supply of parking. Other chapters in the report address parking pricing and park-and-ride strategies. Chapter 18 includes information on the objectives of parking management, strategies that can be used to manage parking (e.g., minimum/maximum parking requirements, employer/institutional parking management, on-street residential neighborhood parking management), analytical considerations to keep in mind when developing parking management plans, and a summary of key traveler response findings related to parking management. This chapter does not directly address parking pricing, but does point out the important effects of parking pricing. It provides a summary of information from six urban areas (Portland, OR, Seattle, WA, San Francisco, CA, Los Angeles,
The authors conclude that many variables affect how travelers respond to parking supply management, including land use type and intensity, existing parking supply levels, parking location, pricing, and the number and quality of alternatives (different travel modes and switching to other destinations).

*Parking Management Best Practices, Todd Litman, published by the American Planning Association, 2006*

This book includes an explanation of “the parking problem,” changing perspectives on how to address parking supply and demand, specific parking management strategies that can be used by communities, guidance on how to develop an integrated parking plan utilizing a combination of strategies, and examples of plans prepared for different types of development. The book identifies ten key principles for parking management that were incorporated into the guidelines and recommendations included in the book.

1. **Consumer Choice** - People should have a variety of parking and travel options from which to choose.
2. **User Information** - Motorists should have information on their parking and travel options.
3. **Sharing** - Parking facilities should serve multiple users and destinations.
4. **Efficient Utilization** - Parking facilities should be sized and managed so spaces are frequently occupied.
5. **Flexibility** - Parking plans should accommodate uncertainty and change.
6. **Prioritization** - The most desirable spaces should be managed to favor higher-priority users.
7. **Pricing** - As much as possible, users should pay directly for the parking facilities they use.
8. **Peak Management** - Special efforts should be made to deal with peak parking demand.
9. **Quality versus Quantity** - Parking facility quality should be considered as important as quantity, including convenience, comfort, aesthetics, and security.
10. **Comprehensive Analysis** - All significant costs and benefits should be considered in parking planning.

The author concludes that cost-effective parking management programs can usually reduce parking requirements by 20-40 percent compared with conventional planning requirements. This will result in many economic, social and environmental benefits. The author emphasizes the importance of defining parking “problems” carefully to identify the type of parking problem, where and when it occurs and who is impacted by it. He also presents a number of factors that could be used to determine the “optimal” supply of parking for a particular location. Specific strategies included in the book address a broad range of options, e.g., providing for alternative modes of travel, improving the efficiency in the operation of parking facilities, “ unbundling” parking from building space so that parking is rented or sold separately from the actual development, pricing parking to achieve desired objectives, addressing spillover parking problems and improving the overall location, design and operation of parking supply.

In this report the authors provide a background of the development of parking regulations, and a discussion of how parking policies have affected cities in the United States. They used several case studies to analyze goals for parking management and regulatory policies designed to meet these goals. Specific implementation strategies address on-street parking that is provided and managed by local jurisdictions, and off-street parking that is regulated by planning and zoning departments through zoning codes. The research focused on case studies for six urban areas in the United States: San Francisco, CA, Portland, OR, Boulder, CO, Chicago, IL, New York, NY, and Cambridge, MA. While there are few concrete examples of parking management strategies in use, and many of the experiments in parking management are new, the authors did outline three major observations based on their research:

- **Price Sensitivity** – even small adjustments will induce changes in traveler behavior. Coordinating off-street and on-street curbside pricing is effective in eliminating excess demand at the curb while off-street parking remains available. Increasing the price of parking also can induce travel mode shifts when alternatives are available; and cash-outs offered by employers can result in lower demand for vehicle parking.

- **Performance Standards** – Better performance standards (including established vacancy standards) can reduce illegal parking (double parking), and wasteful cruising for free (or lower priced) curb parking – thus improving traffic flow and operations.

- **Required Minimums** – Minimum parking requirements tend to “flood the market” with supply, leading to driving down the cost of parking and inducement of auto trips. Minimums are generally set by land use type and do not take into consideration the overall development context or the total transportation system serving a specific development.


This book provides both a theoretical framework and practical methods for reforming parking requirements by local jurisdictions - including technical, policy and community participation aspects of parking reform. The book focuses on reforming minimum parking requirements, and moving toward more efficient management and utilization of parking. Willson states that, “Far from being a technical matter best reserved for traffic engineers, parking requirements are a policy choice that lies at the intersection of land use and transportation planning.” In addition to affecting land use and urban form, parking requirements also impact economic development, environmental quality, social equity, and public health. The book includes a 12 step “Parking Requirement Repair Toolkit,” which is applied to a variety of case studies. The twelve steps involve:

1. Determine existing parking utilization – locally calibrated – for peak and non-peak – for a particular land use.
2. Develop the future baseline rate for parking based on the target year for the parking requirement, along with other factors such as national trends, and local conditions.
3. Decide on the best basis for the parking rate considering policy implications involved in translating the expected future baseline into a parking rate requirement.

4. Consider project and context adjustments to the expected characteristics of the land use type, location, and alternative transportation modes providing access to the site.

5. Allow for parking pricing/unbundling/cash-out options that may impact the parking utilization rate.

6. Recognize any transit/shuttle/pedestrian/bicycle requirements that may be required through local codes that would affect the rate of parking utilization.

7. Examine the internal space use efficiency/circulation factor which may assign (or reserve) spaces to individuals (thus requiring more parking since those spaces cannot be used by other parkers).

8. Adjust the on-site ratio to account for off-site accommodation of parking that may be available on street, or in nearby parking facilities (freestanding, or associated with other buildings).

9. Evaluate possible internal shared parking reductions that may occur when single sites sharing parking facilities have different peak parking utilization times (e.g., office space versus theater space).

10. Calculate expected parking utilization, evaluate results, and iterate the toolkit to account for the multiplicative effect of each step in the process.

11. Balance issues of space size efficiency for the size of individual parking spaces and circulation aisles using information about expected vehicle size and mix of vehicles.

12. Explore the possibility of tandem spaces, valet parking and mechanical parking to realize greater space yields for a given amount of land dedicated to parking.

Subsequent chapters of the book involve application of the toolkit to different scenarios such as parking requirements for multi-family housing, workplaces, and mixed-use, and transit oriented developments - using theoretical and actual case studies. The concluding chapters address codification of parking requirement reform, community engagement and politics, and a call for action. Willson concludes by saying,

*The parking requirements of the post-World War II period are complicit in single-use, resource intensive, unhealthy, and socially exclusionary environments. How can we smarten up? For substance abusers, the first step in recovery programs is admitting that there is a problem that one cannot handle on one’s own. In the case of parking, many planners feel powerless in the face of traditional rules of thumb and good practice, even when they produce outcomes inconsistent with goals and plans. Thanks to research and advocacy, planners know that there are problems with conventional parking requirements, but the challenge is how to move forward in the contentious environments that surround parking . . . Assembling sufficient political capital and financial resources to undertake a comprehensive zoning code and parking requirement reform effort is challenging, given municipal government funding constraints . . . There are many situations in which the resources are not available for a comprehensive effort. In these cases, an incremental approach can produce significant results. Small victories create learning and momentum. Let the reform begin.*
Summary

*Prediction is very difficult, especially about the future.* Niels Bohr

These studies and documents generally agree on the problems or negative impacts of past and current parking regulations that require (what they conclude) is an excessive amount of parking for private vehicles. The requirement to provide minimum levels of parking based on prior parking usage studies, prohibitions on multiple properties meeting their requirements through shared parking facilities, and a seeming bias toward accommodating private vehicles have resulted in multiple negative impacts. In addition, this has fueled the cycle of reliance on private vehicles for transportation, increased need for parking, impacts on land development patterns, reliance on private vehicles, increased need for parking, and so on.

These documents also agree on the need for parking reform, implementation of strategies to manage parking (demand, supply, utilization, access, etc.), and many of the policies and strategies that can be used to manage parking in order to achieve the goals and objectives outlined in local and regional land use and transportation plans. They also include specific management strategies, evaluated in different ways that could be used by local communities.

**OREGON PERSPECTIVE**

*When Solomon said there was a time and place for everything he had not encountered the problem of parking his automobile.* Bob Edwards

*Parking Made Easy – A Guide to Managing Parking in Your Community, Oregon Transportation & Growth Management Program, 2013*

The Oregon Transportation and Growth Management (TGM) Program, in partnership with the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development, sponsored this project. The objective of the project was to develop a “primer” to assist local communities in developing parking management strategies to ensure efficient provision and management of parking in their communities to support new economic growth. The document includes background information on the reasons for managing parking and the benefits of doing so, “success factors” and elements of a good plan, guiding principles for access to parking, and more specific information and guidance on data requirements and strategies, development codes, parking standards, and multiple strategies that can be used. These strategies are linked to achievement of specific objectives.

The guidelines stress the importance of acquiring good data in order to assess the parking “needs” of a community, and to separate reality from perception. Sometimes there is sufficient parking, but it’s in the wrong place, or not easily accessible, or not operated efficiently. It is important to account for variations in local travel patterns and land use in determining the right amount of parking that should be provided. Parking needs are quite different in a densely developed area with good public transportation
versus a low density suburban area that is not well served by public transit. As with other aspects of transportation it is important to consider the context in which the parking will be provided and utilized. Benefits of managing parking cited in the report include:

- Use valuable land and economic resources efficiently to “right size” the amount of parking to provide for different land uses and locations;
- Create order and reduce driver anxiety by providing the right amount of parking in the right place and managing it in a way that simplifies driver decision-making;
- Encourage use of alternative travel modes such as transit, biking and walking to reduce the overall demand for parking spaces;
- Encourage parking turnover for more effective utilization of available parking;
- Generate revenue that can be used for area amenities; and
- Get the right people in the right parking space, reflecting community priorities for limited parking spaces.

The report includes information from several case studies in communities in Oregon, the United States and Canada. According to their research, a great parking management plan will be based on the key “success factors” listed below.

- Aligning the parking management plan with larger community goals regarding transportation, access, economic development and livability – agreeing on a succinct set of guiding principles with stakeholders in advance to guide the discussion and development of the parking plan.
- Putting customers first, providing short term access to destinations in support of economic vitality and community revitalization.
- Agreement among various interests on a common definition of the parking market, priority users, roles and responsibilities of various entities in the provision and operating of parking.
- Using a holistic approach to providing and managing on-street and off-street parking facilities in an integrated fashion.
- Coordination of pricing between on- and off-street parking, and public and private facilities, especially in locations where on-street parking is constrained.
- Excellent marketing, communications and branding of parking options so that users can access parking quickly and efficiently.
- Centralized and coordinated management of all parking facilities to enhance short-term access to businesses.

In addition to providing detailed suggestions for collecting data about the supply and utilization of parking in an area, the document includes a discussion of parking management in relation to development codes. Parking requirements typically are embedded in local zoning and development codes. Often requirements are established related to amount (for different land uses), placement of parking on a site, landscaping, ability to share parking among multiple land owners or businesses, and so forth. However, these codes may not be customized for different types of neighborhoods or
development density. A one-size fits all approach does not work for all portions of a community and may result in over-building of parking. This is not only costly and inefficient, but can degrade the environment and overall livability of downtown areas. The report identifies different areas that should be addressed in local policies and codes related to the provision of parking. It also includes examples of how different communities have addressed these code-related issues. Areas to be addressed in developing a parking management plan are summarized below.

- **The amount of parking to be provided** – either minimum or maximum – Base requirements on local conditions, rather than national standards that may not reflect differences in parking need and opportunities for mixed-use developments versus single-use developments. It is critical to “right-size” parking in an area based on a number of factors specific to that area, including development density, type of land use, amount of parking already available, parking utilization patterns, transportation system accessibility, and other factors.

- **Parking provision in historic areas** – Meeting minimum parking ratios is especially difficult for historic properties. In order to provide required parking adjacent to an historic structure it may be necessary to demolish adjoining structures, which may degrade the overall environment and livability of the area around the historic building.

- **The location of parking** – Shoppers and customers generally prefer to walk the shortest distance possible, and desire parking located close to their destination. Many local codes encourage auto-oriented development by allowing large parking lots in front of buildings that are set back from streets and sidewalks. While this is convenient for customers who drive to the destination; it is not convenient for people using other travel modes and may discourage use of those other modes.

- **Allowing credits for on-street parking and reducing requirements for off-street parking** – To reduce development costs and the use of valuable land for vehicle storage, some cities allow property owners to credit on-street parking spaces toward the amount of parking required for their properties. Oregon’s Transportation Planning Rule explicitly sanctions this idea.

- **Landscaping of parking areas** – In order to soften the visual impacts of parking, lessen the heat-island effects of surface parking lots, and improve the livability of communities some local codes require that parking lots be landscaped. This may include plantings along the perimeter to screen parking lots from view, as well as internal landscaping. Oregon’s Transportation Planning Rule requires that parking lots in excess of three acres provide features such as street trees, and planting strips.

- **Shared parking for multiple uses and properties** – Different land uses have different patterns of parking need - with some businesses requiring primarily daytime parking, while others have peak parking demands in the evening and on weekends. Allowing multiple properties to share parking facilities can reduce the overall demand for parking and improve the overall utilization of that parking.

- **Parking garage design** – Poorly designed parking garages that do not integrate with their surroundings not only degrade the pedestrian environment, but also degrade the overall livability of a community. Therefore, many communities are now including specific design requirements for
parking structures to ensure that they blend in with the surrounding land uses using landscaping or specific design features to disguise the parking structure, or allowing multiple use buildings that may have commercial spaces on the ground floor.

This document also includes a discussion of parking pricing strategies linked to desired outcomes, as well as other transportation demand management strategies. Pricing can be a very effective tool to manage the efficient utilization of parking supply. There is, more or less, a willingness to pay for parking depending on a number of factors, including the desirability of a specific destination, parking provisions at competing destinations, pricing strategies and prices, and other travel options available to the site.

In parking management literature there are frequent references to the “85 percent rule.” This is an operating principle and management tool for ensuring better access to destinations and more efficient utilization of parking. While the concept has been around for some time, it received renewed attention after the release in 2005 of the book The High Cost of Free Parking, by Professor Donald Shoup. He suggests that parking should be priced such that 15 percent of the total parking spaces on a block face would be available at any one time. According to Shoup, 85 percent is the level at which a city’s competing objectives are being met. When 85 percent of the total spaces are in use, it means that a valuable and limited resource is being used efficiently; and 15 percent of the spaces are available to customers who want to be able to quickly find a space close to their destination. Pricing should be adjusted as needed to achieve this 85/15 utilization rate. When less than 15 percent of parking spaces are available, the price of parking needs to be increased; when there is excess parking available the prices should be lowered. Charging a “fair market price” for high-demand spaces increases turnover. This allows more drivers to park in the limited supply of parking spaces and greater efficiency in overall parking utilization, as well as the potential for a net reduction in the amount of parking that will be required.

**UNIQUE CHALLENGES FOR SUBURBAN AREAS**

*It’s really kind of hard to be a suburb of nothing. If you don’t have a downtown, you really don’t have anything. It’s hard to build a community around parking lots and subdivisions.* Ed McMahon

Parking management strategies have been used for some time in dense, central city locations. The higher cost of land, closer spacing between destinations, and the availability of transit and other alternatives to driving provide a much more receptive environment for implementation of parking management. Many central cities, including Portland, have implemented parking maximums, rather than parking minimums, to reduce the amount of land dedicated to storage of vehicles and to encourage travelers to utilize alternatives to driving in these areas. Washington County also has implemented parking maximums.

Parking management is much more difficult to implement in low density suburban areas due to the basic land development form (low density development with plentiful free parking) and the absence or undesirability of alternatives to driving. Many areas have little or no public transit service, so this may
not be a viable alternative for travelers. Longer travel distances between destinations combined with the lack of facilities for bicyclists and pedestrians deter some travelers from using these modes. The provision of large amounts of free parking for employees, customers and visitors encourages travelers to drive their private vehicles because it is more convenient, and possibly less costly than other alternatives.

This combination of factors makes it difficult to implement parking management strategies successfully in suburban areas. Much of Washington County is suburban (or rural), particularly the areas under the jurisdiction of the County. Some of the cities within the county have begun to apply parking management strategies, but it is still a relatively new phenomena. However, with the redevelopment of suburban areas into multi-use, higher density areas, there may be opportunities to manage parking provision and operations in ways that support overall community goals of reduced VMT per capita and increased use of active transportation modes, while supporting desired economic growth and preserving/enhancing the livability of Washington County communities.

The following section of this memorandum summarizes parking management strategies that may be applicable in Washington County.

**SUMMARY OF PARKING MANAGEMENT STRATEGIES**

*Creativity involves breaking out of established patterns in order to look at things in a different way.*

Edward De Bono

Table 1 provides information about a broad array of parking management strategies. They are grouped into three major types of strategies: 1) Strategies that increase parking facility efficiency, 2) Strategies that reduce parking demand, and 3) Strategies that support parking management programs. The table includes information explaining each strategy, along with how it may impact parking demand, the benefits and costs associated with the strategy, suitable applications for each strategy, implementation measures for each strategy, and some specific examples where the strategy has been implemented. Most of the examples in Table 1 are drawn from Todd Litman’s book *Parking Management Best Practices*, 2006. This information is supplemented with information drawn from other sources identified above. General conclusions about the parking management strategies included in Mr. Litman’s book are highlighted below.

- **Impacts are higher where there are better parking and travel options.** For example, parking pricing will have greater demand reduction impacts if implemented in conjunction with improvements in walking and cycling conditions and rideshare and public transit services.
- **Financial incentives tend to have greater impacts on lower-income rather than higher-income consumers.**
- **Some strategies are complementary.** For example, shared parking becomes more effective if implemented with suitable regulations, pricing, and walkability improvements.
Impacts are generally smaller when a strategy is first implemented and increase as programs mature. A low value may be appropriate the first year, but this can increase to medium after two or three years, and high after five or ten years.

**CASE STUDIES**

*The way humans hunt for parking and the way animals hunt for food are not as different as you might think.*  Tom Vanderbilt

This section summarizes pertinent parking studies completed by jurisdictions within the Portland Metropolitan Area, Oregon, California, and Illinois. These include the City of Beaverton, City of Hillsboro, City of Portland, and Salem, OR; Walnut Creek, CA; and the suburban Chicago, IL area.

**CITY OF BEAVERTON PARKING STUDY**

In 2007 Beaverton completed a parking analysis of their downtown area, funded in part with a TGM grant. Beaverton’s study area covered the Regional Old Town (generally south of Canyon Road, north of SW 5th Avenue, west of SW Lombard Avenue, and east of SW Stott Avenue); one of the older areas of Beaverton and one of the higher density mixed use areas in the city. The purpose of the study was to determine why the city has had difficulty in providing appropriate parking in the area. Lack of parking is perceived to be a major barrier in achieving higher density development in the study area.

The study area contained 3,107 parking stalls - 1,107 publically controlled (990 on-street and 117 off-street) and 2,000 privately controlled. The majority of the parking stalls in the study area are designated as 2-hour stalls or are free of charge (30 percent of the 2-hour stalls are eligible for all day use with a valid parking permit). Primary parking management strategies included development requirements, such as minimum, maximum, and variance parking standards. Other strategies included vehicle parking permit fees, parking fines, and, in rare cases, subsidized transit passes (less than 1.5 percent of the employees in the study area).

Data collected for the study showed that the 85 percent occupancy threshold was not met at any time; and that the city’s parking supply was significantly underutilized (over provided) in this area. The parking study concluded that the parking utilization was so low that structured parking was not needed in downtown Beaverton at that time; and that any future discussions regarding a parking structure would require identification of additional sources of revenue beyond parking fees since parking usage was too low to generate sufficient revenue in this area. Parking fines in downtown Beaverton were low compared to other jurisdictions; and the study recommended that parking fines be increased. Further, there was no immediate need to redesign any streets for on-street angled parking due to the underutilization of the existing parking supply.
The parking study suggested a number of other policy level parking management strategies for implementation, including:

- Create a Parking Manager/Coordinator position,
- Eliminate employer subsidized parking by not allowing employees to park in business parking areas,
- Develop advisory role for stakeholders in developing a parking program for the area,
- Eliminate minimum parking requirements for commercial developments in the area,
- Change the existing 1.0 stall/unit minimum parking requirements for residential development to a .75 stall/unit minimum parking standard,
- Establish a parking fee-in-lieu program option to generate revenue for future parking facilities,
- Establish a Downtown Parking and Transportation Enterprise Fund (dedicated parking fund) for future parking facilities,
- Develop Transferable Parking Entitlements,
- Consider provision of on-street angle parking when needed to provide adequate on-street parking,
- Create uniform 2-hour on-street parking stalls (eliminate all 1-hour, 4-hour and No limit stalls,
- Remove all time restrictions on city-owned off-street facilities (possible sites for future parking garages),
- Develop incentive packages for private development of publicly available parking supply and TDM options in the downtown area, and
- Negotiate shared use/lease agreements for private surface lots.

These policies were grouped into near, mid, and long term implementation strategies. Beaverton has implemented some of the strategies including: providing uniform 2-hour parking on some streets, reviewing parking impacts from the downtown Beaverton Farmers’ Market, installing wayfinding signs, and partnering with the Downtown Business Association to address parking management. Many of the parking management recommendations for the downtown area were not implemented due to the recession and the downturn in development activities in the area. Implementation was difficult because some of the businesses in the downtown area did not fully endorse all of the recommendations, and the lack of enforcement of the new regulations reduced the effectiveness of some of the strategies included in the parking management plan.

With more development anticipated for the area, the city will need to reevaluate the study’s recommendations along with other plans, such as the Creekside Master Plan, to determine which of the original recommendations would still be appropriate and how the recommendations for the Creekside Master Plan and the Downtown Plan will work together. Additional analysis determined that the two-way street system in the downtown area does not allow adequate right-of-way to accommodate angled parking, and it would not be safe to implement this type of parking in the downtown area.
CITY OF HILLSBORO PARKING STUDY

In 2007 Hillsboro, with partial funding from the Transportation and Growth Management program, completed a parking analysis covering the entire commercial area of the downtown (east of Adams, north of Walnut, west of 10th and south of 7th/Main Street). The purpose of the study was to develop a “workable parking management plan” for the downtown area since parking was considered to be key to the revitalization and growth of the downtown area.

The study area contained 7,526 parking stalls - 1,981 publically controlled stalls (924 on-street and 1,057 off-street) and 5,545 privately controlled. The majority of the on-street parking stalls in the study area were either 2-hour spaces or unlimited time spaces. Parking strategies in place prior to the study included: minimum and maximum parking requirements for new development, restrictions on auto-oriented uses in the downtown area (commercial uses in the SCC-HOD and SCC-SC zones), parking fines and subsidized transit passes for employees in the downtown area.

The parking analysis showed the 85 percent occupancy threshold was not met at any time during the day, and that the existing parking supply was underutilized and over-provided. Key strategies recommended to improve parking in the area included:

- Create a Parking Manager position,
- Include stakeholders in an advisory role in development of a downtown parking program,
- Implement policies and rules to manage parking (e.g., codifying guiding principles for Parking Management as elements of the City code, developing Parking Management zones),
- Increase parking fines (consistent with other cities of the same size,
- Eliminate minimum parking requirements for commercial developments in Zones A and B and reduce the requirement in residential areas from 1 space/1,000 square feet to .75 spaces/1,000 square feet,
- Establish a parking fee-in-lieu program option to generate funds for future parking facilities,
- Establish a Downtown Parking and Transportation Enterprise Fund (dedicated parking fund),
- Consider development of on-street angle parking when needed,
- Create uniform 2-hour on-street parking in the area (eliminate all No limit stalls and some 30-minute stalls),
- Establish parking fees, e.g., metered zones, off-street parking fees for publicly and privately owned facilities,
- Eliminate employer subsidized parking,
- Develop process for transferable parking entitlements,
- Increase enforcement in the area to encourage more turnovers in some locations and encourage longer parking stays in others,
- Lease/acquire land for use as future public off-street parking, and
- Implement a Residential Permit Parking Program.
These policies were grouped into near, mid, and long term implementation strategies. To date Hillsboro has implemented the following strategies: hired parking enforcement officers, increased fines, reduced minimum parking standards, and created a uniform on-street time limit for parking. Some recommendations were not completed due to budgetary reasons; others have not been completed yet and may be done in the future.

**CITY OF PORTLAND CENTRAL EASTSIDE PARKING MANAGEMENT PLAN**

In June 2012, City of Portland completed a *Parking Management Plan for the Central Eastside* district. The study covered the area south of I-84, east of Willamette River, north of Ross Island Bridge, and west of SW 12th Avenue containing a mix of employment, educational institutions, and retail uses with residential neighborhoods in close proximity. This area, unlike other parking districts, covered a non-downtown area with a variety of land uses similar to those found in Washington County, but at a greater scale. Implementation of the *Eastside Parking Management Plan* addressed the following issues in the area: inefficient management of parking in the district, lack of support of the existing parking policies for the needs of customers and visitors in the study area, use of area parking by out-of-district parkers (downtowners, Lloyd District), potential negative impacts of future parking management policies on adjacent neighborhoods, need for on-going support for transit use, bicycling or other strategies to reduce employee car trips, and accommodating anticipated future demand for parking supply so that parking limitations would not impact future development.

The study area contained 14,605 parking stalls - 6,989 publically controlled stalls (6,324 on-street and 665 off-street), and 7,616 privately controlled. On-street parking stalls ranged from spaces with 5-minute limits to spaces with no time limits. The parking analysis showed the 85 percent occupancy threshold was not exceeded for most parking stall types, except for the “2-hour limit by permit” stalls, which were 89 percent occupied during the 12:00 PM – 1:00 PM peak hour. The no limit stalls were close to the target (84.8 percent occupancy during the peak hour of 11:00 AM - 12:00 PM). The parking supply is underutilized in some areas and for certain stalls. Key strategies outlined in the parking study for implementation included:

- Simplify the parking system (setting a base time limit standard by area/zone),
- Create meter districts,
- Expand the on-street Employee permit program area,
- Create a priority customer area,
- Create a fair exception process (when base time limit standards may not be the right time),
- Streamline the residential parking permit process and protect adjacent neighborhoods from spillover parking,
- Form a Transportation and Parking Management Association, and
- Enforce the regulations from 8:00 AM – 6:00 PM, Monday through Saturday.
With the exception of developing a Transportation Demand Management Group, the recommendations from the parking management plan have been implemented. In Portland, parking management requires ongoing study and constant updating to respond to changing conditions. Areas like the Central Eastside are dynamic districts that require that the parking management plan be constantly fine-tuned. Currently, the city is working on a supplemental review of the parking management strategies for the Central Eastside to address the relationship between parking and the cost of housing, and the correlation between the underlying zoning and the parking situation. Managing parking in the industrial area requires different strategies than managing parking for the mixed use area. Since there are so many influences on parking needs and utilization it is important to tailor parking management plans for each specific area.

**SALEM PARKING STUDY AND TASK FORCE**

Salem, OR is approximately 49 square miles in size with a population of approximately 158,000 people. The City identified four unique parking study areas: Downtown Core, Capitol Mall, North Broadway, and South Waterfront. Annual parking studies for the Capitol Mall and Downtown Core have been done since 2006. Biannual studies are done for the core areas of North Broadway and South Waterfront Areas since no real parking issues have been identified in these areas. Studies of the Downtown Core and Capitol Mall show utilization numbers, in some areas, above the 85 percent threshold that warrants regular parking utilization studies. Salem has a unique parking strategy - parking in the downtown core is free and a parking tax is assessed on businesses in the area to offset the cost. The Capitol Mall has coin based parking meters. The city operates three public garages with a total of 3,000 spaces. Employees are given permits to park in surface parking lots; and annual parking permits are issued to area residents. The Downtown Core of Salem is surrounded by other development, which limits the chances to expand parking supply in this area. Parking regulations are enforced from 8:00 (or 9:00) AM to 5:00 PM. In 2012 a Parking Task Force was commissioned to address the financial stability of the current parking system and the impacts of the parking system on the areas included in the study.

The Task Force provided separate recommendations for the Downton Core, the Capitol Mall, and the core area neighborhoods. Recommendations for areas outside of the downtown included:

- Replace existing meters with new technology,
- Review parking fees annually,
- Develop consistent time limits for on-street parking, and
- Expand the Capitol Mall parking district.

A key issue for the Downtown Core is the shortfall in annual revenue for this parking district. The Task Force recommendations to address this issue included:

- Expand the parking district boundary,
Defer parking garage maintenance,
Privatize parking,
End enforcement hours,
Restructure the parking tax,
Implement paid on-street parking, and
Look at time limit restrictions on parking.

Businesses in the Downtown Core strongly opposed the recommendations, resulting in an interim solution of no fees or time restrictions on parking in the Downtown Core for a year. This caused problems for many businesses in the Downtown Core because parking spaces were not “turning over” during the day, resulting in a parking shortage in the immediate area. In 2014 the City adopted a 3-hour parking limit for the Downtown Core and is monitoring parking in this district. Recommendations for the Capitol Mall included:

Expand the parking district,
Upgrade the parking meters, and
Increase parking fees.

Businesses did not oppose implementation of these recommendations and installation of new parking technology was completed in February/March 2016.

Political conflict was the biggest challenge to implementing the parking management recommendations in Salem. Area residents and businesses did not feel that the process was open to everyone, which resulted in the backlash by the business owners in the Downtown Core. The City worked with the business owners in the downtown core to identify the best parking management strategies for the area. The City has implemented unlimited parking elsewhere, which resulted in problems with 3-hour parking limits in the downtown area; and is continuing to evaluate the effect of the changes to parking access. Community members feel that parking is part the infrastructure and not a commodity to be sold. Good communication with the community is necessary in order to get acceptance of the parking regulations and support for the overall parking management plan.

**Walnut Creek Parking Study and Task Force**

Walnut Creek, located in the East Bay region of the San Francisco Bay Area, has a population of approximately 67,000 people, and is approximately 20 square miles in size. In 2006, the city initiated a parking study of their downtown area to address the perceived issue of parking shortages. The study revealed that the utilization rate for the parking garage and for most of the off-street parking spaces was less than 85 percent. The parking study included the following recommendations:
Improve service on the trolley routes to reduce vehicle usage, especially from downtown to mass transit (BART) stations,

Establish downtown parking meter zones,

Increase parking fees and install parking pay stations in the study area.

In 2009 the Walnut Creek City Council appointed a Downtown Parking Task Force to follow up on the 2006 parking study. The Task Force developed six major parking strategies that provide the framework for the city’s Parking Management Plan. These strategies include:

- Utilize new parking management technology,
- Increase parking utilization of public parking garages,
- Designate parking zones,
- Utilize employee parking management plans,
- Improve utilization of current parking inventory by creating more turnover of spaces, improving informational signage and improving communication regarding parking resources, and
- Encourage other modes of transportation.

One of the challenges in implementing the recommendations is to address the community’s fear about potential negative impacts of the recommended changes. Some business owners think that the recommended changes will cause significant negative impacts to area businesses, or that the parking fees are just another way for the city to generate revenue. Some business owners were concerned that the time restrictions would negatively impact their business since their customers may want to stay longer than the permitted parking maximum. City staff learned the importance of working with the downtown businesses and property owners during implementation to address concerns, and communicating well with all of the stakeholders. As more business owners understand the strategies and their implications more support will be generated for the program. It is important for businesses to inform their customers about the parking changes, and for the city to distribute information on parking restrictions, parking fee increases, and access to public parking structures. In addition, the city can implement special pricing to smooth the transition to the new regulations and prices, e.g., the city distributed free parking passes for use of the city garage when the parking time restrictions were implemented instead of issuing parking tickets.

Prioritizing the recommendations was also important for successful implementation. The first step involved utilizing technology (e.g., using vehicle sensors to provide real time information on parking availability and using www.parkme.com to distribute information about the parking program), setting-up an enterprise fund to determine how revenues should be used, and communicating to the public how the new parking revenues were to be allocated (e.g., the proportion for maintenance, downtown enhancements, free trolley service, and landscape improvements). Other changes followed the initial steps, including charging higher rates for on-street parking, changing the parking ordinance to allow for parking rate increases based on an annual review of parking demand, changing operation hours for
parking enforcement from 8:00 AM - 5:00 PM to 10:00 AM – 8:00 PM to adjust for the specific parking utilization pattern in the downtown area.

As a result of these efforts, the parking utilization rate during peak parking times is 100 percent for the parking garage and 90 percent for on-street parking. To continue the momentum of success the city regularly evaluates parking utilization and rates to determine if changes are needed, (e.g., additional rate increases, different time restrictions, or possibly new parking structures (which could be provided through a public/private partnership). The city is trying to strike a balance between moving people in the area and keeping parking utilization up.

CHICAGO METROPOLITAN AGENCY FOR PLANNING

In April 2012 the Chicago Metropolitan Agency for Planning released its report on Parking Strategies to Support Livable Communities. This report was prepared to help local communities address parking concerns and issues to help make their communities more livable. The local definition of livable communities may vary from one community to another, but generally includes traits such as: they are healthy, safe, and walkable. They offer choices for timely and convenient transportation to schools, jobs, services and other community needs. In addition to quality-of-life benefits, livability and compact growth make good economic sense for the region and its residents. Decisions about parking directly affect the livability of communities.

One of the central goals of the Go To 2040 regional plan is to make the region a better place to live by directing investments toward policies that strengthen existing communities. While regional agencies and policies can address livability issues, development decisions are made locally. As such, each community needs to develop its own goals for future growth and determine how parking fits into their future visions for their community. This report points out some of the results of prior approaches to parking, resulting in:

- Provision of parking to meet peak demands keeps buildings widely spaced apart, rendering walking and bicycling unpleasant and unsafe;
- Paving over large areas for parking purposes increases storm water runoff and burdens the storm water systems and can lead to flooding and pollution problems;
- Requiring large amounts of parking in residential developments makes housing more expensive, irrespective of actual resident demand, as the cost of parking is built into the cost of each unit.

According to this Report, parking strategies should be aligned with each municipality’s vision for the future. The report lays out five steps to reforming parking policy for local communities:

- Evaluation of existing conditions for parking supply and parking usage rates to determine the type and extent of parking problems that the community is experiencing;
- Education/outreach to inform the public about the results of the parking evaluation, and what kinds of parking management strategies are being considered for implementation; the most important
goal of the outreach program is to involve people directly in the decision-making process from the beginning, so that they better understand the benefits and cost of parking and so that differing viewpoints are included in the discussion;

- Strategy development to identify specific parking management strategies that will address local issues and work toward achievement of locally determined future visions, which may include strategies related to minimum and maximum parking requirements, a wide range of pricing strategies, incentives for travelers to use alternative modes and reduce the overall demand for parking, options for shared parking, addressing potential spillover parking impacts on nearby areas, changes in parking design and operation, coordination of on-street and off-street parking pricing, and creation of parking benefit districts;

- Implementation of the selected parking management policies and strategies, beginning with developing consensus on which strategies are most appropriate for an individual community, preparing a specific plan laying out when and how strategies will be implemented, how information will be conveyed to the public, enforcement of regulations and other aspects of the parking program, and financial tools to implement individual elements of the parking management plan; and

- Monitoring and evaluating the impacts of the parking management strategies in a consistent and regular way, and then adjusting the program as appropriate to achieve local goals and objectives.

This report is more of a guideline document for use by local communities, rather than documentation of a specific program that has been implemented. However, local communities have proceeded to develop parking management plans, using the regional guidelines. In September 2014, the Village of Hinsdale released their parking management plan, Village of Hinsdale Innovative Parking Management Plan. The Village of Hinsdale is known for its quaint neighborhoods, good schools and its well situated location in northeastern Illinois. The downtown is a vital center serving local residents and large numbers of visitors from the region and elsewhere. It hosts a series of events and festivities year-round, which draw large numbers of people to the downtown area. The current parking system is considered to be outdated and insufficient to meet the needs of residents, visitors, rail commuters, local businesses and restaurants. The limited number of parking spots, parking restrictions and fees and constant traffic congestion caused by drivers searching for convenient parking led to frustrations for numerous stakeholders.

To address these issues, the Village of Hinsdale worked with the Chicago Metropolitan Agency for Planning (CMAP) to thoroughly research the parking situation in Hinsdale, examine successful parking plans implemented locally and throughout the country, and develop a plan for the Village of Hinsdale. The central goal of the plan was to ensure that the existing parking supply was used as efficiently as possible, while managing parking resources to provide for long-term provision of needed parking. The plan was based on a comprehensive public engagement program as well as a thorough examination of local conditions, priorities and long term vision for the community.

The plan details numerous short-, mid-, and long-term strategies to address parking management for the community. Parking is not usually a primary land use in historic, walkable downtowns like Hinsdale, which inevitably leads to a lack of available parking. Simply imposing time limits on parking does not
work due to high costs for enforcement, backlash from visitors and local businesses, and creative ways longer-term parkers have developed to avoid fines. Hinsdale was challenged to determine how to provide enough parking to serve the city’s needs while preserving the Village’s uniqueness and local assets. This was addressed by using a holistic approach to the downtown transportation system and supporting all modes of transportation, including creating a comfortable walking and bicycling environment, offering a variety of transportation options, and adding parking spaces in a judicious and fiscally-responsible manner.

While some newer developments in the area have large surface parking lots, the majority of public parking spaces in the downtown area are located on local streets. Parking on these streets is often at or above capacity from mid-morning to mid-afternoon. The public parking lots in Hinsdale are regulated through a permit system, and some on-street spaces are also regulated through use of permits. There are five types of permits, each with varying costs: commuter, merchant, merchant/overnight, municipal employee and free customer parking. With over three fourths of Hinsdale’s parking supply on local streets, rather than off-street parking lots, balancing the utilization of the on-street parking is essential to addressing the supply and demand challenges. One of the most valuable aspects of a downtown is that visitors to the area can complete a variety of tasks within a single area. Ideally a driver would be able to do all of those things while only using one parking space. With the time limit system in place at that time in Hinsdale people would have had to move their car multiple times or park very far from their destinations.

The Village of Hinsdale plan includes an interesting section on what motivates parkers. Parkers are motivated by a variety of reasons. Therefore, in order to price parking effectively, the city needed to consider the needs and different motivations of parkers in the area. They identified four categories of parkers, as described below. Fortunately, or unfortunately, only a small number of parkers fall into the “demanding” or “reasonable” parker categories. The majority of parkers fall into the other two categories – “time-is-money” and “thrifty”.

- **The Demanding Parker**: There is no winning with the demanding parker. This parker believes that there should be a free parking spot waiting for them whenever and wherever they are going. What the demanding parker may not realize is that if there were free parking everywhere, other people would have the same idea and park all day long right in the most convenient spots. Paying for parking is a nuisance to the demanding parker, as is walking.

- **The Reasonable Parker**: People who account for the time and effort necessary to find a reasonable parking spot are a busy downtown’s dream parker. The reasonable parker understands that they may not be able to park right in front of their destination; they may have to walk for a few minutes from a parking spot. This type of parker also knows that closer parking may come at a higher cost.

- **The Time-is-Money Parker**: For some people, time is money and finding the closest spot to their destination is a priority. If the parker needs to get in and out, drop something off or pick something up, or perhaps is running late, they are willing to pay for the most convenient spot. This doesn’t
mean that they don’t like free parking; they simply would prefer to have a more convenient spot even if it means paying for it.

➢ *The Thrifty Parker:* The thrifty parker would like to avoid paying for parking at all costs. This parker will search out free parking, which may come at a financial cost, but will probably mean driving a few blocks away from their final destination and walking, or driving in circles until they find a space. This person may need to park in the neighborhood for several hours and it isn’t worth the cost of paying for parking for a number of hours. Some thrifty parkers may decide to walk or bike instead of paying for parking; or they may decide to shop elsewhere altogether if they cannot find free parking.

If the price of parking is adjusted according to demand, the parking demands of thrifty parkers and the time-is-money parkers are met with different parking spaces so that the overall demand is spread more evenly around the core downtown shopping area.

The Village of Hinsdale developed five priority goals for their parking management plan. For each of these goals they identified issues associated with achieving the goals, and potential implementation actions for each goal. Their plan includes a detailed table outlining actions, a timeline for implementation, respective responsibilities of different parties, first steps to implementation, and an explanation related to the recommended action. This information is summarized briefly below.
### Village of Hinsdale, IL, Innovative Parking Management Plan – Summary of Goals

<table>
<thead>
<tr>
<th>Goal</th>
<th>Implementation Strategies</th>
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<tbody>
<tr>
<td><strong>Goal #1: Improve the parking experience for visitors and shoppers</strong>&lt;br&gt;Improved parking information can help visitors, employees and residents in their search for parking and in their understanding of available options</td>
<td>• Create new parking maps with clear information – possibly with one map for customers/visitors and another designed for employees&lt;br&gt;• Improve parking information on the website&lt;br&gt;• Encourage the use of new technology for shared parking&lt;br&gt;• Update the Hinsdale webpage on parking, including sections on upcoming changes&lt;br&gt;• Develop informational flyers that business owners can share with customers&lt;br&gt;• Convert the Garfield lot to a gate-controlled lot with progressive pricing or a pay box, allow for longer stays, and raise the current price&lt;br&gt;• Replace existing meters with credit-card accepting meters&lt;br&gt;• Convert the existing 30-minute spaces to 15-minute parking spaces</td>
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<td><strong>Goal #2: Improve parking options for downtown employees and encourage parking outside the core</strong>&lt;br&gt;The employee permit parking is concentrated on the southwestern side of downtown and free employee parking is presently underutilized.</td>
<td>• Promote free employee parking in the designated location and determine if there is anything keeping employees from using the area&lt;br&gt;• Add employee parking on the east side of downtown&lt;br&gt;• Pursue and encourage shared parking agreements&lt;br&gt;• Modify the permit program to allow discounts for a permit holder when they do not drive and allow for shared use of the space&lt;br&gt;• Create a transportation incentive program to get drivers to use other transportation modes</td>
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<td><strong>Goal #3: Plan for the long-term management and provision of parking resources</strong>&lt;br&gt;Reinvest additional parking meter money into investments in the downtown core to support desirable improvements in the downtown area such as fixing sidewalks, repairing potholes, installing amenities, helping businesses improve their facades or constructing additional parking</td>
<td>• Create a downtown parking committee responsible for managing any additional parking meter revenue collected from increased fees and fines, identifying improvements for the downtown area and providing incentives for use of alternative travel modes&lt;br&gt;• Prioritize parking projects and downtown streetscape spending and manage parking pricing to achieve an 85% occupancy level in parking supply</td>
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<td><strong>Goal #4: Promote active transportation for residents and employees</strong>&lt;br&gt;While cars will continue to be the primary travel mode, small increases in other modes could help to alleviate parking problems, activate the sidewalks and improve public health</td>
<td>• Promote walking for health and encourage bicycling as transportation (not just recreation)&lt;br&gt;• Improve the bicycling network to/from the Metra station&lt;br&gt;• Improve bicycle facilities at the Metra station&lt;br&gt;• Improve the pedestrian experience along Hinsdale Avenue</td>
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<td><strong>Goal #5: Improve the management of commuter parking lots</strong>&lt;br&gt;Encouraging alternative modes of travel to/from the station or rewarding commuters who drive less frequently, while modestly raising the cost of parking, can improve the use of transit without deterring transit ridership</td>
<td>• Use pricing to make parking at West Hinsdale more attractive than downtown Hinsdale&lt;br&gt;• Investigate the possibility of “virtual permits” that would give a discount to commuter permit holders if they use the parking less&lt;br&gt;• Allow residents to purchase day-parking passes to ride Metra&lt;br&gt;• Consider leasing a couple of prime parking spaces to a company that offers online reservations (e.g., SpotHero, ParkWhiz, Parking Panda, ParkMe)&lt;br&gt;• Install a concrete slab for a designated scooter parking area&lt;br&gt;• Convert the Village Commuter lot into a pay-by-the-space lot</td>
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### Summary of Parking Management Strategies

<table>
<thead>
<tr>
<th>Management Strategy</th>
<th>Impact on Demand</th>
<th>Benefits/Costs, Consumer Impacts</th>
<th>Suitable Applications</th>
<th>Implementation</th>
<th>Examples</th>
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<tbody>
<tr>
<td><strong>Strategies that Increase Parking Facility Efficiency</strong></td>
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<td>Share Parking – a parking facility serves</td>
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<td>multiple users or destinations. May include</td>
<td>shifting from reserved to shared parking for employment typically reduces requirements by 10-30%. Shared parking among multiple destinations typically reduces requirements by an additional 10-30%.</td>
<td>reduces parking facility costs, allows greater flexibility in facility location and site design and creates more compact land use. Can reduce vehicle traffic by “park-once trips” where driver parks once and visits several destinations.</td>
<td>Most work sites and many multi-family residential buildings can share parking. Appropriate among different destinations when they have different demand peaks, or have the same patrons and are located within a reasonable walking distance.</td>
<td>shared vs reserved spaces can be implemented by facility managers. May require a third party to manage. May require code changes. Requires effective enforcement.</td>
<td>Moreno, CA</td>
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<td>Regulate Parking – controlling who, when, and how long vehicles may park in order to prioritize use:</td>
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<td>• Prioritize parking facility users</td>
<td>Tends to increase parking supply for higher-priority uses. Can reduce parking demand in an area by encouraging location and mode shifts.</td>
<td>increases parking system efficiency by reducing demand and favoring higher-priority uses. Increases convenience for higher priority users, may inconvenience others. Increases administrative and enforcement costs. May result in spillover effects in adjacent areas.</td>
<td>Appropriate virtually everywhere there are parking conflicts. Need for regulation tends to increase with development density, growing parking demand or decreased parking supply. Particularly important for on-street parking spaces in busy commercial areas, off-street parking in urban areas.</td>
<td>Usually implemented by government agencies, and by facility managers (off-street parking). Should be flexible and adjusted as needed to respond to changes. Must be clearly indicated to users.</td>
<td>City of Highland Park, IL</td>
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<td>Establish More Accurate and Flexible Standards – called “efficiency-based” parking standards – adjustment of standards for specific locations based on a number of factors such as:</td>
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<td>• Geographic and demographic factors,</td>
<td>Conventional parking standards tend to be excessive, resulting in parking facilities that are seldom or never fully occupied. May not affect demand significantly, but may result in more efficient use of supply.</td>
<td>Can significantly reduce the economic, social and environmental costs of excessive parking supply. May allow higher density and more infill development. Reduce cost for property owners and developers, which may encourage them to implement parking and transportation demand management strategies. May increase equity by reducing parking costs imposed on non-drivers and increasing housing affordability. Costs could include additional planning/analysis, spillover problems in adjacent areas and costs for programs to address these problems</td>
<td>Appropriate in most situations. Particularly justified in urban areas due to lower demand, high parking facility costs, and the effectiveness of parking and mobility management. However, suburban areas often have the most generous standards and the greatest degree of parking oversupply.</td>
<td>Could eliminate minimum parking requirements altogether, or by adjusting minimums based on location-specific needs and conditions. Perform detailed parking studies to determine optimal parking supply and management strategies for individual sites, taking into account a full array of possible adjustment factors and the severity of problems that result if parking lots are full. Revise codes. Establish methods for determining parking requirements for individual sites. Allow minimum parking requirements to be adjusted at an administrative level</td>
<td>Concord, NC – Revised zoning code that allows more flexible and accurate parking requirements</td>
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**Notes:**
- Performance indicators that are adjusted over time based on a number of factors such as:
  - Parking standards – adjustment of requirements by an additional 10-30%.
  - Availability of overflow parking nearby. Possible contingency-based standards that are adjusted over time based on performance indicators.
| Establish Parking Maximums | Impacts depend on specific conditions, how much the parking supply is reduced and what other parking management strategies are implemented. | Can reduce parking requirements and development costs. Reduced parking utilization providing economic, social and environmental benefits. May encourage higher density development and support for other parking and mobility management strategies. May reduce motorist convenience. Some businesses may consider this to be a disadvantage compared with competitors who have unrestricted supply. May shift some business activity from commercial districts with maximums to suburban locations with abundant free parking. | Appropriate in areas where, left to their own devices, developers and businesses are likely to supply excess parking. Most effective when maximums are “calibrated” to alternative mode goals and long-term commitment to plans and investments in those modes. | Usually implemented as part of an overall transportation and land-use management plan. Clearly identify objectives, use incentives such as density bonuses and tax reduction. Ensure predictability. Implement in conjunction with other parking management strategies. |

**Establish Parking Maximums** – place an upper limit on the supply of parking allowed by site or over an area such as a commercial district – also called “parking caps”. Could be placed on certain types of parking (long-term, single-use, unpriced or surface parking). Most effective when maximums are “calibrated” to alternative mode goals and long-term commitment to plans and investments in those modes.

**Provide Remote Parking and Shuttle Services** – also called “overflow” or “satellite” parking – involves using off-site parking facilities – frequently shared by multiple users. Shuttle buses may be provided to allow use of more distant parking than would otherwise be unacceptable. May include Park & Ride facilities located at the urban fringe.

Can reduce on-site parking needs by 10-30%. The amount of reduction depends on trip type, relative price for remote parking, incentives used to encourage use and the quality of walking condition or shuttle services to destinations.

Can be used where parking supply is inadequate and additional parking is available within an acceptable distance. Commute and special event travel are particularly suitable for remote parking. More appropriate in urban areas where transit and ridesharing are promoted.

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Implement Smart Growth Policies – a generic term for development practices that result in more compact and accessible land-use development – an alternative to sprawl – parking management supports Smart Growth

| May reduce vehicle ownership and use. | Can provide a variety of benefits including: reduced development costs, reduced VMT, improved social, economic and environmental outcomes. | Can be applied in a variety of geographic conditions, including urban, suburban and rural areas. | Typically implemented by regional and local governments through a strategic planning process that affects comprehensive plans, capital improvement programs, adopted policies, and strategic investments in infrastructure. |
| May reduce vehicle ownership and use. | Costs can include additional planning, construction and operating expenses needed to develop higher density facilities and increase travel choices. May increase traffic congestion and exposure to noise and air pollution at the local level; but these may be offset by improvements at the regional level. Consumer impacts are mixed. | |

Improve Walking and Bicycling Facilities – May encourage use of alternative modes, encourage “park-once” trips for multiple destinations, encourage transit use; and may reduce total vehicle ownership and use.

| According to some estimates, 5 to 30 % of motor vehicle trips can reasonably shift to non-motorized transport. When parking fees or other disincentives reduce automobile travel, 10-35 % of the reduced trips typically shift to walking and cycling. In pedestrian friendly areas can usually reduce parking demand 10-30 %. | Walking and cycling improvements provide a variety of economic, social and environmental benefits, including road and parking facility cost savings, consumer cost savings, congestion reduction, reduced energy use and air pollution, improved mobility options and improved public health. Costs vary depending on the situation and can include facility construction and maintenance expenses, pedestrian security services and sometimes vehicle traffic restrictions. | Appropriate in most geographic conditions. They tend to be most effective at reducing parking demand in dense, urban areas where destinations are clustered together and in suburban areas by allowing more shared parking and park-once trips. Cycling improvements are particularly appropriate for destinations that attract young people. | Implement a non-motorized planning process. Ensure parking facilities are safe and convenient for non-motorized travel modes. Improve access between destinations and off-site parking facilities. Provide multiple pedestrian access points to parking. Implement traffic calming, speed reductions and vehicle restrictions. Address safety and security Concerns. Provide bicycle storage and other amenities for bicyclists. |
| Capacity increases of 5-10 % may be possible. | Can provide economic savings and increased user convenience. Increased revenue if parking is not free. Costs may include repainting, new equipment (stackers), labor for valet parking and reduced motorist convenience. | Tends to be most appropriate in areas with high land value such as major commercial centers. Smaller spaces and mechanical parking systems tend to be most suitable for longer-term parking. Valet parking is most suitable for special events and other predictable periods of high demand (e.g., holidays at shopping centers). | Usually requires consultation with a parking expert to assess the feasibility of different options in specific locations. |

Increase Capacity of Existing Parking Facilities – Capacity can often be increased without requiring more land or major facility construction through:

- Using currently wasted areas
- Where there is adequate street width changing on-street parking from parallel to angel
- Allowing tandem parking and count this toward minimum requirements
- Reduce parking space size
- Use car stackers and mechanical garages
- Use valet parking, particularly during peak periods
- Remove or consolidate non-operating vehicles, equipment, material and junk stored in parking facilities

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- Tandem parking – San Diego, CA, Edmonds, WA
- Automated parking – Japan, Korea and Europe
- Hamburg, Germany – the first automatic parking system to receive a Car Park Seal of Quality

Funding Areas

- Center Commons, Portland, OR
- Maryland Smart Growth – Priority Funding Areas
- Downtown Toledo, OH Revitalization
- Portland, OR Pedestrian Improvement Plan
- Commons, Portland, OR
- Hamburg, Germany – the first automatic parking system to receive a Car Park Seal of Quality
### Strategies that Reduce Parking Demand

#### Implement Mobility Management
An integrated mobility management program that includes multiple strategies can reduce automobile trips and parking demand by 10-30%, and even more if it is implemented as part of a comprehensive, regional effort that includes transit improvements and smart growth land-use development.

**Benefits include:**
- Road and parking facility cost savings, congestion reduction, consumer cost savings,
- Improved travel options,
- Increased road safety,
- Support for strategic land-use objectives,
- Reduced pollution and improved community livability.

**Costs may include expenses for additional administration and services, and may include consumer inconvenience.**

**Suitable in most situations to address a variety of issues.**

**Most common in large cities and activity centers.**

Can be implemented at suburban worksites, college campuses, schools, residential neighborhoods, transportation terminals, during major events, and at resorts.

**Can be established by various levels of government or through Transportation Management Associations, campus and mall managers and employers.**

Some strategies such as road pricing may require government action.

**Trip Reduction Ordinances – widespread applications including:**
- Other states have also implemented trip reduction requirements associated with major employers.
- Car sharing in Vancouver, BC, Kamloops BC TravelSmart Plan

#### Parking Pricing Strategies
Pricing parking can affect parking location, destination, travel mode, travel time, parking duration and vehicle ownership rates. Cost-based pricing (price set to recover full cost of provision) typically reduces parking demand 10-30%.

**Can provide a wide range of benefits, including:**
- Reductions in parking and roadway facility costs,
- Reduced traffic congestion,
- Reduced urban sprawl,
- Reduced traffic accidents,
- Reduced energy consumption and pollution emissions, and
- Increase revenues.

Tends to increase equity by charging users for their parking costs and by reducing costs imposed on non-drivers. Gives consumers a choice in determining how to spend money.

**Appropriate in a wide range of situations, particularly in areas with high land values, traffic and parking congestion problems or other problems associated with excessive vehicle traffic, and whenever a community needs a new revenue source.**

**Usually implemented by local agencies and property owners.** When implementing pricing strategies it is advisable to involve parking experts familiar with local conditions to determine the most appropriate methods and rates, and to anticipate potential problems, such as spillover parking in adjacent areas.

It is important to define the specific objectives to be achieved through pricing in order to determine how the pricing program should be structured.

**Aspen, CO – implementation of on-street parking pricing to manage employee parking, utilization of underground garage and ensure parking for customers.**

**CH2M-Hill – implemented structured pricing program for employees**

**City parking pricing programs include: Portland, OR, Madison, WI, Chicago, IL, Eugene, OR, and San Francisco, CA**
**Improve Pricing Methods** – to improve convenience for travelers and achievement of objectives. Use improved payment collection methods. Newer electronic systems are more convenient, accurate, flexible, and cost effective.

<table>
<thead>
<tr>
<th>Improved methods</th>
<th>Increased convenience for some travelers, due to flexibility, integration, security, and cost effectiveness. Most new systems are more attractive and use less sidewalk space that older single-space meters. Costs include new equipment, employee costs, training costs, and costs to provide user information.</th>
<th>Appropriate in most locations where parking is priced and is particularly important as part of a comprehensive parking management program.</th>
<th>Implementation requires evaluating, selecting, and installing the most appropriate pricing technique for an individual situation. Most helpful if a parking expert is available to advise on specifics. When possible, standardization of methods is desirable for an area. Information for motorists is critical.</th>
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**Provide Financial Incentives** – providing direct financial rewards to travelers for reducing their vehicle trips or shifting to cheaper parking facilities. Can include:

- Parking cash-out,
- Provision of transit benefits,
- Provision of universal transit passes, Discounted or preferential parking for carpools, and other strategies.

**Financial incentives help to reduce parking and vehicle travel demand, congestion, accidents, and pollution. They tend to increase equity by offering non-drivers benefits comparable to parking subsidies provided to motorists. Costs primarily consist of any additional administrative requirements to distribute benefits and any additional enforcement.**

**Can be implemented in any geographic condition, including urban and suburban areas. They are particularly appropriate if an employer has inadequate parking supply, or in other ways can save money by reducing parking demand.**

**Usually implemented by employers as part of a commute trip reduction program. Local governments and business organizations can help to implement these strategies by supporting other parking management strategies that allow reduced and more flexible parking requirements and TMA’s to provide coordination and/or brokerage services.**

- Italian Parking Payment Smart Cards – involves development of a national smart card standard that allows multiple transactions between drivers, e-purse, and parking management companies.
- Pay-by-Phone systems allow motorists to pay using their cellular telephone.
- San Francisco’s Commercial Parking Control Systems – requires parking operators to use specific revenue control systems that provide a receipt to users and securely record transactions for auditing purposes.

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**Financial incentives such as transit benefits and parking cash-out typically reduce automobile travel 10-30%, depending on the value of the incentive, the quality of alternative travel options and other factors.**

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- Ernst & Young – offers pre-tax transportation and parking benefits to its employees.
- CH2M Hill – offers financial incentives to those who do not drive to work alone.
- New York City – TransitChek program sells vouchers to employers who then provide them to their employees.
- San Francisco Bay Area – Commuter Check program sells $6 million worth of vouchers to about 700 employers.
- Parking Cash-Out programs are sponsored by numerous local governments and Universities, including Oakland, CA, Pleasanton, CA, Bellevue, WA, more than 2 dozen college and university campuses, including the University of Washington in Seattle, Boulder, CO, Santa Clara County, CA EcoPass program, and Portland, OR.
Unbundle Parking – parking spaces are rented or sold separately from building space so occupants only pay for the parking they actually want to use. Can be implemented in numerous ways:
- Facility managers can unbundle parking when renting space in buildings,
- Developers can make some or all parking optional when selling buildings,
- Through use of a discount or rebate to renters who do not use parking,
- Minimum parking requirements can be reduced for developments with unbundled parking, and
- Unbundling can be encouraged by providing a secondary market for available spaces that would be available to persons other than building occupants.

The impact of this is similar to pricing of parking. May result in the reduction in vehicle ownership as a result of unbundling parking from residential space.

Unbundling parking increases efficiency and equity and supports other parking and mobility management programs. The impacts are comparable to parking pricing but usually face less opposition. May increase administration and enforcement costs for property managers. May lead to spillover parking problems in adjacent areas.

Parking can be unbundled in virtually any situation where building space is rented, leased, or sold. It is particularly appropriate in buildings with parking shortages and where increased housing affordability is an objective.

Parking may be unbundled by individual developers and building owners, but public policies can encourage it or require it. Some specific reforms can support unbundling parking such as:
- Reducing or eliminating minimum parking requirements,
- Requiring that parking be a separate line item in building leases,
- Using TMAs and parking brokerage services to facilitate unbundling, and
- Increasing enforcement of parking regulations to avoid spillover problems from drivers parking off-site.

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Soma Studios and Apartments – in San Francisco, CA – the building contains 0.38 spaces per unit, with parking rented separately from housing units
Harris Green Redevelopment, Victoria BC, - minimum parking requirements were eliminated – most units are sold or rented without parking – drivers can rent parking spaces if desired. Developers find they only need about 0.5 spaces/unit as opposed to 1.0 or 2.0 in conventional multifamily buildings.
Reform Parking Taxes – major categories of parking tax reforms include:

- **Commercial Parking Taxes** tend to discourage parking pricing since they make free parking relatively more valuable to motorists and are considered unfair since they are borne primarily in urban centers where parking is priced.
- **Per-space Levies** – are special taxes imposed on parking facilities, such as an annual tax on each non-residential space.
- **Free Parking Levies** – these are special taxes imposed on unpriced parking and are designed to discourage unpriced parking.
- **Storm water Management Fees** – are utility fees based on a property’s impervious surface area.
- **Car-Free Tax Discounts** – are property tax discounts provided to households that do not own an automobile, reflecting the lower roadway and traffic service costs that they impose on the transportation system.
- **Parking Facility Assessment Reforms** – means that property tax assessments value land developed for parking facilities at the same rate as adjacent land used for other purposes.
- **Income Tax Policy Reforms** – means that employee parking subsidies are treated as a taxable benefit – current tax policies make parking subsidies an attractive employee benefit.
- **Smart Growth Tax and Pricing Reforms** – Several different tax reforms can encourage more compact development and discourage sprawl. Development fees, utility rates and tax rates can reflect the higher costs of providing public services to more dispersed locations.

May result in a reduction in parking demand as drivers shift to alternative modes, alternative destinations and/or shorter parking duration. Taxes that specifically target unpriced parking or parking subsidies can encourage parking pricing. If parking pricing is only applied in one area, it may shift business activity and parking demand to other areas.

Can provide several benefits, including: increase economic efficiency and equity, supports parking and mobility management objectives, reducing total parking facility costs and traffic problems. Tax payments themselves are a form of economic transfer, a cost to consumers, and a source of revenue to governments. Taxes on commercial parking may reduce profits and shift some business activity from urban centers to outlying areas where parking is free. Tax reforms that increase parking prices or reduce supply in a particular area may lead to spillover problems in adjacent areas.

Can be applied in just about any situation where governments want to raise parking prices, reduce parking supply, generate revenue or reduce vehicle traffic.

Can be implemented by various levels of government. Must be carefully designed to use the best policy to accomplish desired goals.

- San Francisco, CA imposes a 25% tax on all commercial parking transactions.
- Cleveland, OH implemented an 8% tax in 1995 to fund a new football stadium.
- Parking space levies have been applied on non-residential urban parking spaces to encourage use of alternative modes and fund transportation system improvements in Sydney, Australia and Perth, Australia.
- Toronto Parking Property Tax - a tax of $1/square foot per year was imposed on commercial properties larger than 200,000 square feet to fund transit and road improvements.
- Workplace Parking Levies – some European jurisdictions allow parking space levies to raise revenues, increase parking turnover and encourage the use of alternative travel modes.
- Storm water Management Fees based on a property’s impervious surface area to fund storm water management services.
- Employee Parking Tax Exemptions – in the US, up to $180/month worth of employee parking and up to $200/month in transit benefits is income tax exempt.
- In Canada transit benefits are taxable as income, so few employers offer them.
### Support Strategies

**Improve User Information and Marketing** – information addressed to travelers about parking availability, regulations, price and alternative travel options. There are many ways this information can be provided – from traditional signs and maps to Internet site and applications available through cell phone service providing real-time information. User information is one component of marketing. Parking management marketing activities involve studies to help understand motorists’ needs, preferences, and attitudes about parking options.

| Effective information can increase the effective parking supply, often by 5-15%. Improved information is also critical to the success of most parking management programs. Actual impacts on parking demand and utilization depend on a lot of factors. | Informative and marketing are particularly important where some parking spaces are underused because they are not visible to potential users, when new regulations or pricing are introduced, to promote alternative modes of travel, and when any other new management strategy is to be implemented. | Information and marketing are one component of marketing. Parking management marketing activities involve studies to help understand motorists’ needs, preferences, and attitudes about parking options. | Information can be provided by governments, business organizations, individual businesses, and third party information sources like parking apps for on-line use. | There are numerous examples of marketing and information programs for parking management, including provision of parking maps and brochures by business organizations and individual businesses, parking program web sites, Parking Search (a private company offering parking space brokerage throughout the United States, and variable signs along roadways and at parking facility entrances providing real-time information on current parking availability and price. |

**Improve Enforcement and Control** – this means that regulations and pricing are enforced more effectively and more consistently. In order to be more acceptable, the entire enforcement process must be perceived as fair, efficient and considerate. Parking passes sold or allocated to employees, officials, or visitors should have clear limitations regarding where, when, and by whom they may be used.

| Improved enforcement increases the effectiveness of parking regulations, pricing and tax collection. It can reduce abuse of regulations and increase turnover of spaces, improving the availability of prime parking spaces. Specific impacts will vary by location. | Improved enforcement increases parking management effectiveness, which provides several benefits. It reduces spillover parking in adjacent areas and can increase the political acceptability of parking management programs. | Good enforcement is important anywhere parking is regulated or priced, particularly where there are frequent complaints about spillover impacts. | An enforcement plan should be included in any parking management plan, and enforcement practices should be reviewed regularly and updated to respond to changing needs and best practices. It is usually implemented by a local jurisdiction of the management of a parking facility. | Numerous locations have enforcement programs as part of their parking management. Boulder, CO does something a little unique in their program to remind motorists of the common mistakes that result in parking tickets. An example of poor enforcement is related to Berkeley, CA. |
Establish Transportation Management Associations and Parking Brokerages – these are typically private, non-profit, member-controlled organizations that provide transportation and parking management services for a particular geographic area. TMA’s can be effective in implementing management programs and reducing the total demand for parking through a combination of services.

TMA’s provide an institutional structure for parking and mobility management programs. The can improve program performance significantly compared with programs implemented by a single business.

TMA’s can help implement most of the parking management strategies described in this table. In addition to supporting the parking management program, they also support transportation demand management strategies that help address various traffic problems, including traffic congestion and inadequate mobility for non-drivers.

TMA’s are appropriate for any geographic area where multiple businesses are clustered together. They are particularly beneficial in major activity centers with significant parking and traffic problems.

TMA’s are created by regional or local governments, chambers of commerce or managers of large facilities, such as a mall or hospital.

- The San Francisco TMA is a privately funded association of building owners and managers that encourages the use of alternatives to SOV commuting. This was a cooperative effort between government and office building developers in the downtown area in 1989.
- BWI Business Partnership is a non-profit, member-run organization established in 1985 to support economic development in and around the Baltimore/Washington International Airport.
- Several types of businesses provide parking brokerage services, including specialized national organizations such as Parking Search, local parking operators, and the classified sections of local newspapers and organization newsletters.

Establish Overflow Parking Plans – these plans identify responses to be implemented when parking demand exceeds the available supply at a destination during peak periods, or at special events or during temporary reductions in parking supply. These programs may include special signage to direct motorists to other locations, establishing shared/remote parking arrangements, provision of parking information to participants in special events, encouraging travelers to shift travel mode or use remote parking during peak periods, applying special parking regulations to favor priority vehicles during busy periods, providing special parking and transport services during peak times, or providing additional parking staff to handle large events.

An overflow parking plan allows parking requirements to be reduced since many parking facilities are sized to accommodate infrequent peak periods. The amount of reduction depends on the degree to which parking supply is oversized to accommodate the occasional peak period, the nature of the peak demands and overflow plan effectiveness.

Overflow plans can provide a variety of benefits. By reducing parking requirements they reduce traffic congestion and improve service quality as perceived by users. Costs include additional staff time, equipment or special services required to develop and implement an overflow plan.

This strategy is most appropriate in locations where peak parking demands create problems; it is particularly useful during special events that attract large crowds, for retail centers during peak shopping periods, for resort communities and in locations where parking supply may be restricted.

Overflow plans are usually implemented by facility managers and special event organizers, sometimes with the assistance of local government agencies and law enforcement officials. They may be required for some special events.

- Concord, NC allows turf areas to be designated for overflow parking for occasional use.
- Baseball Fan Transport Management for access to the San Francisco Giants baseball stadium.
- The Houston Livestock Show and Rodeo in Houston is the world’s largest livestock exhibit. To reduce traffic and parking problems the Show and local agencies organized the Rodeo METRO Express, and Park & Ride shuttle bus service.
- The University of Washington has an extensive parking management program for local football games that relies on public transit and existing Park & Ride lots.
Address Spillover Problems – refers to the undesirable use of off-site parking facilities when business customers and employees park on nearby residential streets or use another businesses’ parking lot. This can be addressed in numerous ways, including: providing information on where motorists may and may not park, use regulations to control spillover impacts (such as time limits and permit programs on residential streets), use pricing to control spillover impacts, compensate people who bear spillover parking impacts, and establish a monitoring program to identify when and where parking spillover problems occur.

Effectively addressing spillover problems can reduce a major objection to parking management and a common justification for excessive parking supply.

Addressing spillover problems allows parking management programs to be implemented and expanded, increasing program effectiveness and benefits. Costs may include additional costs for planning, enforcement and management activities.

Parking management programs that reduce the supply of parking, increase parking regulation or apply pricing often have spillover impacts that need to be addressed. These problems tend to be most significant in areas with limited parking supply and growing demand, such as growing commercial districts, popular residential areas, and special uses such as universities.

Spillover management programs are generally implemented by local governments or by facility managers as part of an integrated parking plan. Some recommended actions include: establish clear rules related to where different types of motorists may or may not park, use signs and brochures to inform motorists where they should or should not park, establish and carry out effective enforcement programs, provide information to neighbors concerning how to report parking violations, and if necessary, provide compensation to neighbors who are negatively impacted by spillover parking.

Examples include:
- Christchurch, New Zealand, has a comprehensive parking management program which includes a “zero-tolerance” approach to parking infringements, including monitoring, use of fines and tow-aways. Permits are used to control off-street parking in residential areas.
- Houston, TX Residential Parking Permit Ordinance – provides for the establishment of parking permit areas in residential areas with documented problems of spillover parking.
- Seattle, WA has had a residential parking permit program for many years to address spillover parking problems.

Improve Parking Facility Design and Operation – refers to the physical layout, construction and day-to-day management of parking facilities. Past and current practices tend to emphasize quantity over quality – often resulting in large, but unattractive and inconvenient facilities. More recently emphasis has been placed on aesthetics, pedestrian and bicycle connections, landscaping and security. Parking management can reduce the required number of spaces, freeing up resources to provide more attractive and more functional parking facilities. Some of the key issues associated with design include: access management, accessibility or universal design, aesthetics, asset management, flexibility, the “heat-island” effect, preservation and enrichment of historic, cultural and natural resources, lighting, orientation, security, size and scale, storm water management, traffic calming, traffic circulation, traffic safety, user amenities, user information, and weather protection.

Design and operational improvements can support parking management programs, which can reduce overall demand for parking. For example, access management supports shared parking, design changes can improve walkability and signage can provide important user information.

The benefits of improved design and operating of parking facilities vary depending on specific conditions at each location. They may include increased user convenience and safety, improved environmental and aesthetic qualities and increased facility durability and long-term value. Costs can include additional construction costs, increased operation costs and reduced parking supply.

Most parking facilities (surface or structure) can benefit from improved design and operations.

The first step to improving the design is to shift the emphasis from quantity to quality. Parking standards should devote as much attention to facility design quality as to the number of spaces required; and where appropriate, allow reductions in supply in return for improved design and management.

Examples include:
- Back-in angle parking, which provides a number of benefits, including increased user convenience and safety and greater ease loading/unloading a vehicle. Tucson, AZ has two blocks of reverse diagonal parking on University Boulevard.
- Portland, OR restricts garage doors to 50 percent of the street-facing façade for buildings.
- Gainesville, FL prohibits parking between the built-to line and the front property line in its Traditional City area.
RESOURCE DOCUMENTS


*Parking Strategies to Support Livable Communities*, Chicago Metropolitan Agency for Planning, 2010,


*Parking Management Strategies*, Chicago Metropolitan Agency for Planning

*Driving Urban Environments: Smart Growth Parking Best Practices*, Governor’s Office of Smart Growth, Maryland, prepared by Robin Zimbler, Governor’s Office of Smart Growth, 16 Francis Street, Annapolis, MD 21401, www.smartgrowth.state.md.us


*Municipal Implementation Tool #6: Parking Management Strategies*, Delaware Valley Regional Planning Commission, 2004

*Seattle Parking Management Study*, heffron transportation, inc., 2002

Many of these documents contain reference sections with links to additional documents on parking management and smart growth.